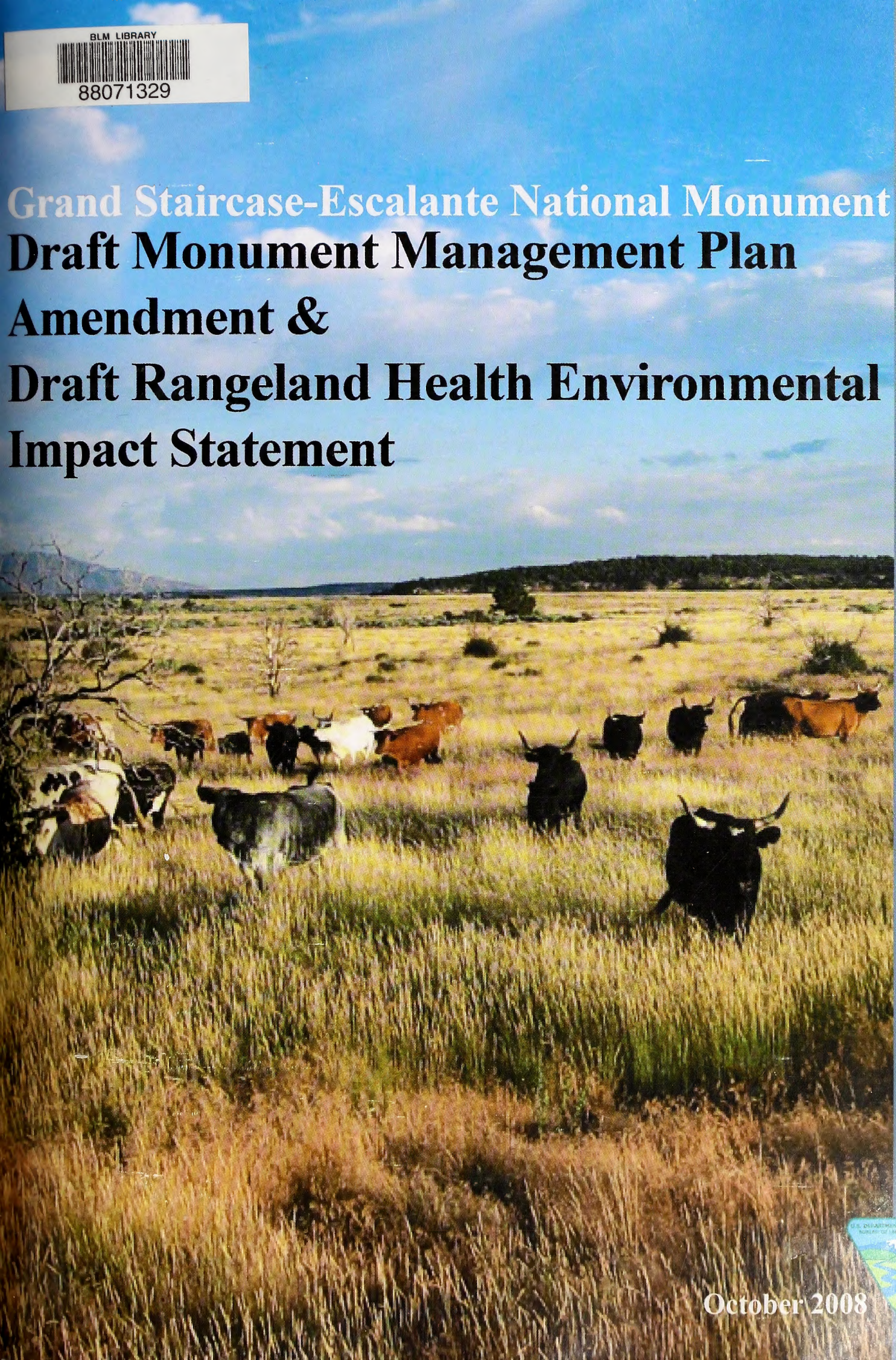
Grand Staircase-Escalante National Monument

Draft Monument Management Plan Amendment & Draft Rangeland Health Environmental Impact Statement



BLM

Grand Staircase-Escalante National Monument

October 2008

BLM Mission

It is the mission of the Bureau of Land Management to sustain the health, diversity and productivity of the public lands for the use and enjoyment of present and future generations

BLM-UT-PL-08-007-1610

UT-030-00-028-EIS

DES-08-36

Map 20 - Allotments and Pastures

Location Map

- Allotment Boundary
- Pasture Boundary
- EIS Study Area
- National Park Service Boundary
- City
- Highway
- GSENM Boundary
- County Boundary
- U.S. Forest Service Boundary

5

Miles

1:200,000

NO WARRANTY IS MADE BY THE BUREAU OF LAND MANAGEMENT FOR USE OF THE DATA FOR PURPOSES NOT INTENDED BY BLM

August 19,2008

R8W R7W R6W R5W R4.5W R4W R3W R2W R1W R1E R2E R3E R4E R5E R6E R7E R8E R9E R10E

T32S T33S T34S T35S T36S T37S T38S 38.5S T39S T40S T41S T42S T43S

Dixie National Forest

Boulder

Escalante

Hatch

Tropic

Cannonville

Henrieville

Alton

Glendale

Orderville

Mt. Carmel

Mt. Carmel Jct.

Kanab

Church Wells

Big Water

Iron

Garfield

Kane

Capitol Reef National Park

Bryce Canyon National Park

Glen Canyon National Recreation Area

Lake Powell

Hole-in-the-Rock Rd.

Cottonwood Rd.

Skutumpah Rd.

UTAH

ARIZONA

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Utah State Office
P.O. Box 45155
Salt Lake City, UT 84145-0155
http://www.blm.gov

IN REPLY REFER TO:
1610
(ut-935)

Dear Reader:
Enclosed for your review is the Draft Monument Management Plan Amendment and Draft Rangeland Health Environmental Impact Statement (EIS) for the Utah Bureau of Land Management (BLM) Grand Staircase-Escalante National Monument (GSENM). This document was prepared by the BLM in consultation with cooperating agencies, and in accordance with the National Environmental Policy Act of 1969 (NEPA), the Federal Land Policy and Management Act of 1976 (FLPMA), implementing regulations, the BLM's land use planning handbook (H-1601-1), and other applicable law.

The planning area consists of about 2.1 million acres of land which includes lands in the Monument, non-monument lands administered by GSENM, lands administered by the Kanab Field Office and Arizona Strip Office of the BLM and portions of Glen Canyon National Recreation Area. These lands occur in Kane and Garfield Counties, Utah and a small area in Coconino County, Arizona.

The BLM is preparing this Plan Amendment because the land use plans that provide direction for livestock grazing and rangeland management for most of the areas administered by the Grand Staircase-Escalante National Monument were completed in 1981 and are more than 20 years old. Because the Monument Management Plan (MMP) did not address most of the prior livestock grazing decisions, these earlier plans continue to govern livestock use and rangeland management. This Plan Amendment will allow the integration of livestock and rangeland management with the other resources in the MMP. Decisions for livestock grazing and rangeland management on lands in the planning area outside of GSENM would be integrated into the Kanab Resource Management Plan (RMP) currently in preparation.

The GSENM also administers livestock grazing on lands managed by the National Park Service (NPS) within Glen Canyon National Recreation Area (GCNRA) as well as lands within BLM's Kanab and Arizona Strip Field Offices through intra-agency agreements. This Plan Amendment will incorporate current plans or portions of plans prepared by those agencies that address livestock grazing. The analysis in the EIS will also lead to the renewal of grazing permits on the Monument in conformance with the direction of the selected alternative.

The document may be viewed and downloaded in PDF format at:
http:/www.blm.gov/ut/st/en/prog/planning/existing_plans.html.

Copies will also be available for distribution and review in CD ROM or printed format during the comment period at the following BLM locations:

BLM GSENM Headquarters
190 East Center St.
Kanab, Utah 84741

Utah State Office, BLM
440 W. 200 S, Suite 500
Salt Lake City, UT
84101

GSENM
Cannonville Visitor Center
10 Center Street
Cannonville, UT 84718

GSENM
Big Water Visitor Center
100 Upper Revolution Way
Big Water, Utah 84741

GSENM
Escalante Visitor Center
755 West Main
Escalante, UT 84726

The BLM encourages you to provide information and comments pertaining to the analysis presented in this document. Of particular importance is feedback concerning the adequacy and accuracy of the five proposed alternatives, the analysis of their respective management decisions and any new information that would help the BLM produce a Proposed Plan Amendment and Final EIS, which is the next phase in the planning process. Comments should be as specific as possible and are more helpful if they include suggested changes, sources, or methodologies, and reference a specific section or page number. Comments that are only opinions or preferences will be considered in the decision-making process but will not receive a formal response from the BLM.

Your timely comments will help formulate the Proposed Plan Amendment and Final EIS and assist BLM's authorized officer in reaching a decision that best meets the needs of the resources and values in this area under the agency's multiple use and sustained yield mandates. Comments will be accepted for ninety (90) calendar days following the Environmental Protection Agency's publication of its Notice of Availability in the Federal Register.

We strongly encourage you to submit comments electronically at UT_GSENM_NEPA@blm.gov. Comments may also be submitted by mail to:

Draft Rangeland Health Amendment Comments
Grand Staircase-Escalante National Monument
Bureau of Land Management
190 East Center Street
Kanab, Utah 84741

Public meetings to provide an overview of the document, respond to questions, and take public comments will be held subsequent to the release of the draft. These meetings will be announced by local media and public mailings. Public meetings will be held at Kanab, Escalante, and Salt Lake City, Utah.

It is the practice of BLM to make comments, including names and addresses of respondents, available for public review. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment, including your personal identifying information, may be made publicly available at any time. Although you may request us to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. All submissions from organizations and businesses, and from individuals identifying themselves as representatives of officials of organizations and businesses, will be available for public inspection in their entirety.

Thank you for your continued interest in the management of the Grand Staircase-Escalante National Monument and your participation in this important process.

Sincerely,

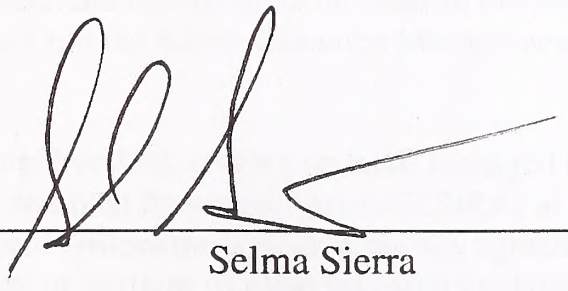
Selma Sierra
State Director

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT
DRAFT MONUMENT MANAGEMENT PLAN AMENDMENT AND
DRAFT RANGELAND HEALTH ENVIRONMENTAL IMPACT STATEMENT

PREPARED BY THE
GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT

OCTOBER 2008



Selma Sierra
State Director

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Grand Staircase-Escalante National Monument Planning Area
Draft Monument Management Plan Amendment and
Draft Rangeland Health Environmental Impact Statement

Lead Agency: U.S. Department of the Interior, Bureau of Land Management
Type of Action: Administrative
Jurisdiction: Portions of Kane and Garfield Counties, Utah and Coconino County, Arizona

Abstract: The Draft Grand Staircase-Escalante National Monument Management Plan Amendment and Draft Rangeland Health Environmental Impact Statement describes and analyzes alternatives for the planning and management of livestock grazing on public lands administered by the Bureau of Land Management, Grand Staircase-Escalante National Monument(GSENM). The planning area includes approximately 2,168,726 acres of Federal land in south-central Utah, mainly within the GSENM, but including portions of Glen Canyon NRA, lands administered by the Kanab Field Office and the Arizona Strip BLM. Approximately 68% of the planning area is in Kane County, with approximately 31% in Garfield County, with less than 1% occurring in Coconino County, AZ.

Public lands administered by the Bureau of Land Management (BLM) are managed under land use plans which require periodic updating. The BLM is preparing this Plan Amendment because the land use plans that provide direction for livestock grazing and rangeland management for most of the areas administered by the Grand Staircase-Escalante National Monument (GSENM) were completed in 1981 and are more than 20 years old. These plans need updating to reflect changes in resource conditions, revisions to grazing regulations, updates and/or amendments to allotment management plans, and the requirements of legal proceedings and court rulings. This Rangeland Health Plan Amendment (Plan Amendment) replaces the grazing portion of these older land use plans.

The existing land use plans providing direction for livestock grazing include the Escalante, Paria, Vermilion, and Zion Management Framework Plans (MFPs) along with the more recent Monument Management Plan (MMP). The Monument Management Plan prepared for the GSENM (2000) covers most of the lands in the planning area. Because the MMP did not address most of the prior livestock grazing decisions, these earlier plans continue to govern livestock use and rangeland management. This Plan Amendment will allow the integration of livestock and rangeland management with the other resources in the MMP and replaces the MFPs. Decisions for livestock grazing and rangeland management on lands in the planning area outside of GSENM would be integrated into the Kanab Resource Management Plan (RMP) currently in preparation.

The GSENM also administers livestock grazing on lands managed by the National Park Service (NPS) within Glen Canyon National Recreation Area (GCNRA) as well as lands within BLM's Kanab and Arizona Strip Field Offices through intra-agency agreements. This Plan Amendment will incorporate current plans or portions of plans prepared by those agencies that address livestock grazing.

Pursuant to BLM policy and regulations, as well as Federal law, the BLM is required to assess whether the public lands are achieving Rangeland Health Standards and complete the appropriate environmental review prior to renewing grazing permits. An interdisciplinary team has developed this Plan Amendment/Draft Environmental Impact Statement (DEIS) for the purpose of analyzing the potential effects of livestock grazing on resources that may be affected in the planning area. This approach is needed to ensure that all management actions on public land conform to the appropriate regulations and planning guidance, and balances the use between different resource values.

Where current land use plan decisions have been found to be valid, they are brought forward as valid existing management determinations. Where current land use plan decisions have been found to be outdated, new management actions are proposed and analyzed in this DEIS. If changes in the terms and conditions of existing grazing permits are required, the permits would be reissued with modified and/or additional terms and conditions.

To assist the BLM Authorized Officer in making decisions and to help cooperating agencies and the public focus on appropriate solutions to identified issues, five alternatives are considered in the DEIS.

Alternative A (No Action): The current level of resource use and protection would be continued. Grazing permits would be renewed with existing Terms & Conditions

Alternative B: Rangeland Health Standards, with minimal stocking adjustments and improved livestock distribution and management would be emphasized. Rangeland restoration and the future installation of structural improvements would be assessed. Grazing permits would be renewed with modified Terms and Conditions consistent with the actions proposed in this alternative.

Alternative C (Agency Preferred Alternative): Rangeland Health Standards would be achieved over the life of the MMP by making allotment specific modifications to grazing management. These management changes would include distribution adjustments, stocking adjustments, and temporary suspensions on less than 10% of allotments when Rangeland Health Standards assessments and monitoring indicate such actions are needed to meet resource objectives. This alternative includes range restoration and future structural improvements assessed under Alternative B. Grazing permits would be renewed with modified Terms and Conditions consistent with the actions proposed in this alternative.

Alternative D: Rangeland Health Standards would be achieved over the life of the MMP by making modifications to grazing management including temporary grazing suspensions on allotments which fail to meet Utah BLM's Rangeland Health Standards for upland soils or desired species. Range restoration and the installation of structural range improvements are assessed under this alternative, but to a lesser degree than in Alternatives B and C. Grazing permits would be renewed with modified Terms and Conditions consistent with the actions proposed in this alternative.

Alternative E: Rangeland Health Standards would be achieved over the life of the MMP by making modifications to grazing management including temporary grazing suspensions on allotments which fail Utah BLM's Rangeland Health Standards for upland soils, desired species, and riparian/wetland functionality. This alternative proposes an emphasis on vegetation restoration activity without structural range improvements. Grazing permits would be renewed with modified Terms and Conditions consistent with the actions proposed in this alternative.

When completed, this plan amendment and EIS will provide a set of comprehensive, long-range decisions for managing livestock grazing throughout the planning area. Comments are accepted for 90 days following the date the U.S. Environmental Protection Agency publishes the Notice of Availability for this Draft Plan Amendment/DEIS in the Federal Register. Comments may be submitted via e-mail at UT_GSENM_NEPA@blm.gov. Alternatively, written comments may be mailed to: Draft Rangeland Health Amendment Comments – Attention Paul Chapman, Grand Staircase-Escalante National Monument, Bureau of Land Management, 190 East Center Street, Kanab, Utah 84741.

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INTRODUCTION

The Draft Grand Staircase-Escalante National Monument Management Plan Amendment and Draft Rangeland Health Environmental Impact Statement describes and analyzes alternatives for the planning and management of livestock grazing on public lands administered by the Bureau of Land Management, Grand Staircase-Escalante National Monument(GSENM). The planning area includes approximately 2,168,726 acres of Federal land in south-central Utah, mainly within the GSENM, but including portions of Glen Canyon NRA, lands administered by the Kanab Field Office and the Arizona Strip BLM. Approximately 68% of the planning area is in Kane County, while the remaining percentage is in Garfield County.

Public lands administered by the Bureau of Land Management (BLM) are managed under land use plans which require periodic updating. The BLM is preparing this Plan Amendment because the land use plans that provide direction for livestock grazing and rangeland management for most of the areas administered by the Grand Staircase-Escalante National Monument (GSENM) were completed in 1981 and are more than 20 years old. This Rangeland Health Plan Amendment (Plan Amendment) replaces the grazing portion of these older land use plans. These plans need updating to reflect changes in resource conditions, revisions to grazing regulations, updates and/or amendments to allotment management plans, and the requirements of legal proceedings and court rulings.

The existing land use plans providing direction for livestock grazing include the Escalante, Paria, Vermilion, and Zion Management Framework Plans (MFPs) along with the more recent Monument Management Plan (MMP). The Monument Management Plan prepared for the GSENM (2000) covers most of the lands in the planning area. Because the MMP did not address livestock grazing decisions, these earlier plans continue to govern livestock use and rangeland management. This Plan Amendment will allow the integration of livestock and rangeland management with the other resources in the MMP. Decisions for livestock grazing and rangeland management on lands in the planning area outside of GSENM would be integrated into the Kanab Resource Management Plan (RMP) currently in preparation.

The GSENM also administers livestock grazing on lands managed by the National Park Service (NPS) within Glen Canyon National Recreation Area (GCNRA) as well as lands within BLM's Kanab and Arizona Strip Field Offices through intra-agency agreements. This Plan Amendment will incorporate current plans or portions of plans prepared by those agencies that address livestock grazing.

Pursuant to BLM policy and regulations, as well as Federal law, the BLM is required to assess whether the public lands are achieving Rangeland Health Standards and complete the appropriate environmental review prior to renewing grazing permits. An interdisciplinary team has developed this Plan Amendment/Draft Environmental Impact Statement (DEIS) for the purpose of analyzing the potential effects of livestock grazing on resources that may be affected in the planning area. This approach is needed to ensure that all management actions on public land

conform to the appropriate regulations and planning guidance, and balances the use between different resource values.

Where current land use plan decisions have been found to be valid, they are brought forward as continuing management determinations. Where current land use plan decisions have been found to be outdated, new management actions are proposed and analyzed in this DEIS. If changes in the terms and conditions of existing grazing permits are required, the permits would be reissued with modified and/or additional terms and conditions as part of the implementation of the MMP.

PURPOSE AND NEED

In general, the purposes of this proposal are to:

- Integrate decisions for livestock and rangeland management into the GSENM MMP through a plan amendment
- Revise GSENM MMP sections affected by rangeland management to integrate livestock grazing into existing resource management
- Update and amend livestock management decisions in land use plans for non-GSENM lands where GSENM has grazing management responsibility.
- Provide the management direction necessary to ensure that public lands are achieving or making progress towards achieving Rangeland Health Standards.

This proposal is needed to:

- Renew livestock grazing permits.
- Update allotment management plans.
- Consider proposed Glen Canyon National Recreation Area grazing management actions.
- Allocate multiple resources to resolve conflicts.
- Incorporate current resource condition inventories into land use decisions.
- Fulfill the mandates of the GSENM Proclamation, and the GSENM Monument Management Plan

PUBLIC INVOLVEMENT

PUBLIC NOTIFICATION PROCESS

A Notice of Intent to Prepare an Environmental Impact Statement for Livestock Grazing Allotments Administered by the Bureau of Land Management, Grand Staircase-Escalante National Monument, Utah, was published in the Federal Register on August 31, 2000. The

public was invited as part of the scoping process to provide "information, data or concerns related to the potential impacts of livestock grazing…".

Three scoping open houses were held on Sept. 18, 2000 in Kanab, Utah; Sept. 20, 2000 in Salt Lake City, Utah; and October 4, 2000 in Escalante, Utah.

In July 2001, an update letter was sent to interested publics. In July 2004, a second update letter was sent to interested publics.

During public review of this Draft Plan Amendment/Environmental Impact Statement public meetings will be held in Kanab, Escalante and Salt Lake City at a minimum.

On March 31, 2008 another update letter was sent to interested publics. This letter was sent 938 groups, organizations, agencies, and individuals. This letter notified the public that the DEIS will be available in three formats;

- viewing and downloading in PDF format at http://www.blm.gov/ut/st/en/prog/planning/existing_plans.html
- Mailed upon request in CD ROM format
- Mailed upon request in hardcopy (paper) format

This letter included a post card with instructions to return if the reviewer wished to receive the DEIS by mail in the CD ROM or hardcopy format otherwise it is assumed the web site version would be used. The letter also indicated that a response could be sent via e-mail to UT_GSENM_NEPA@blm.gov.

Post cards or e-mail responses were received from 109 groups, organizations, agencies, and individuals. The post office returned 124 letters as undeliverable. The names on these were removed from the mailing list.

CONSULTATION AND COORDINATION WITH FEDERAL, STATE, TRIBAL AND LOCAL GOVERNMENTS

Federal

Informal consultation with the U.S. Fish and Wildlife Service (USFWS) has occurred throughout the process. USFWS provided general comments and a list of species of concern. The Environmental Protection Agency has been requested to review this PA/DEIS. Coordination with the Dixie National Forest has occurred informally at the local level through staff at the Escalante Interagency Office. The National Park Service, Glen Canyon National Recreation Area is a Cooperating Agency.

State

The State of Utah is a Cooperating Agency. During the scoping period numerous informal discussions were held with State officials as to the most effective method for State participation.

A representative of State of Utah is a member of the planning team and as such is invited to participate in all team meetings.

Tribal governments

Consultation with tribal governments has been initiated.

Counties

BLM has implemented Cooperating Agency Agreements with both Kane and Garfield counties. Representatives from both Kane and Garfield Counties are members of the planning team and as such are invited to participate in all team meetings.

ISSUE SUMMARY

CLARIFICATION OF MONUMENT MANAGEMENT PLAN DIRECTION

- The MMP direction was developed without an assessment of the interaction between livestock grazing, rangeland management, and other resources uses or an analysis of the impacts on livestock grazing.
- MMP direction for habitat (vegetation) management, while emphasizing the use of native species, does not provide specific direction related to existing rangeland seeding projects. The MMP is inconsistent because it both prohibits and allows the use of non-native species under the same possible set of circumstances.
- Grazing related range improvements, specifically seedings, are not addressed in the MMP.
- Proposed restoration and revegetation projects are not prioritized.
- Existing MMP determinations do not comply with new direction regarding the use of management ignited fire.
- The MMP determination concerning "Noxious weeds" is insufficient, since it does not include exotic or invasive non-native species.

LIVESTOCK GRAZING MANAGEMENT

- There is no consistent direction regarding coordinated management, including recognition of enabling legislation intent and compliance with existing management plans, with the Glen Canyon National Recreation Area, Capital Reef National Park, the U.S. Forest Service, the BLM Arizona Strip Field Office, and the BLM Kanab Field Office.
- Corrective action is required on allotments where periodic monitoring has documented downward trend and/or overuse of forage resources, or BLM has determined that current livestock grazing practices are significant factors in not achieving one or more rangeland health standards or do not conform to grazing management guidelines.

COMPLIANCE WITH STANDARDS AND GUIDELINES FOR RANGELAND HEALTH

Standard 1: Soils

- Analysis of potential impacts of management actions on areas where soil conditions are not meeting the desired Standard due to a lack of vegetative cover and evidence of increased erosion

- Analysis of impacts of management actions that have the potential to degrade soil quality and increase soil erosion due to reduction in vegetative cover

Standard 2: Riparian and Wetland Areas

- Analysis of potential impacts of management activities on riparian areas focusing on areas that currently do not meet the existing Standard for properly functioning condition

- Analysis of potential impacts to watershed health degradation due to cumulative impacts of land use activities

Standard 3: Desired Species

- Identification of rangelands not meeting Standard 3 for the desired species including native, threatened, endangered, and special status species and analysis of management actions on these rangelands
- Analysis of potential impacts of rangeland activities on the habitat characteristics needed for the conservation of migratory bird species of concern as required under Executive Order 13186 *Responsibilities of Federal Agencies to Protect Migratory Birds* (66FR 3853), January 17, 2001

- Analysis of the potential impacts of livestock distribution and season of use on the Paunsaugunt Deer Herd wintering and migration areas

- Analysis of the potential impacts of rangeland activities on the habitat and viability of populations of federally listed threatened or endangered species, BLM State Sensitive Species, or species of special concern listed by the Utah Division of Wildlife Resources, the GSENM, and other state and Federal agencies

- Analysis of the potential impact of rangeland management activities on the recovery of threatened, endangered, and sensitive plant and animal species
- Analysis of potential impact to vegetative ecosystems from livestock management activities

- Analysis of the potential impacts of invasive non-native plants on native plant and animal communities, soil and hydrologic functions, fire regime, wildlife habitat, and recreational opportunities

- Analysis of potential impacts to biological soil crust cover that has been reduced below expected amounts at many sites

Standard 4: Water Quality

- Analysis of management activities on streams and springs that do not currently meet the State of Utah's water quality standards

SOCIO-ECONOMICS

- Analysis of the potential impacts to local custom and culture values due to modification or reduction in traditional uses

CULTURAL RESOURCES

- Analysis of potential impacts of rangeland management activities and related improvements on historic and prehistoric cultural resource sites

RECREATION

- Analysis of the potential competition between recreation and rangeland management activities that compete for use of space, and for use of water resources

- Analysis of the potential impacts rangeland management activities and related improvements on recreational aesthetics and scenic values

ALTERNATIVES

To assist the BLM Authorized Officer in making decisions and to help cooperating agencies and the public focus on appropriate solutions to identified issues, five alternatives are considered in the DEIS. A summary of the alternatives is provided below. A full discussion of the alternatives is provided in Chapter 2.

Alternative A (No Action): Livestock management would continue at the present authorized active use levels with minimal, if any, changes to grazing permit terms and conditions. Changes to existing management would be limited to short-term adjustments commonly associated with on-going allotment administration such as requests for change of season of use, modification to pasture rotation use, voluntary non-use, and temporary non-renewable use. Temporary reductions may be necessary in areas selected for forage restoration projects. Currently closed

areas would remain closed to livestock grazing, but no additional closures would be proposed. Range improvements would be considered on a case-by-case basis.

This Alternative would not be in compliance with existing regulations if minimal changes to grazing permit terms and conditions were not affective at improving the condition of allotments currently failing to achieve the Standards and Guideline for Rangeland Health (Standards) 43 CFR 4180.2 (c).

Alternative B: Grazing management would be modified only as necessary to begin the process of making progress towards meeting Rangeland Health Standards in areas not now meeting Standards and to meet the goals and objectives of the land use plan. Emphasis would be placed on reducing grazing impacts by improving distribution and season-of-use of livestock. Management changes would consist of routine techniques such as modified levels and timing of grazing use. Active use reductions will only be proposed when other options fail to produce improvements in range condition. Where reduced active use is warranted, temporary non-use or temporary suspensions would be used in lieu of reductions in permitted active use.

This alternative would place a high priority on reducing impacts through the use of range improvements. Improvements would be proposed which improve livestock distribution (fences, and water developments), reduce grazing pressure in areas which fail to meet Standards (exclosures or exclusionary devices), or restore lost forage (seeding restoration).

Alternative C (Agency Preferred Alternative): Grazing management would be modified with priority on restoring rangeland health while providing research opportunities in restoration and monitoring success. Emphasis will be placed on modifying livestock management on allotments which fail multiple Standards and where rangeland monitoring shows no indication of positive change. For planning purposes and the estimation of future uses, an assumption has been made that restoration actions would restore forage availability to previous levels. However, allotment specific evaluations would determine the actual active use levels upon successful restoration.

Site specific measures to correct identified problems would be implemented in allotments which did not meet the riparian Standard, or which show declining conditions.

Research opportunities concerning vegetation restoration would be pursued, with emphasis on restoring failed seedings and riparian areas. Coincident with this will be studies involving monitoring techniques. Specific attention will be on determining whether site specific upland stubble height standards have use as a management tool. Implementation monitoring would also be a high priority.

Alternative D: Grazing management would be modified with priority on restoring rangeland health while providing research opportunities in restoration and monitoring success. Livestock grazing would be temporarily suspended in six allotments that did not meet Rangeland Health Standards , and where a determination has been made that the failure to meet Standards was due to existing livestock grazing management practices or levels of use. A future decision to re-initiate active use in these allotments will be considered when rangeland monitoring shows an indication of positive change and Rangeland Health Standards are being met. For planning

purposes and the estimation of future uses, an assumption has been made that restoration actions would restore forage availability to previous levels. However, allotment specific evaluations would determine the actual active use levels upon successful restoration.

Alternative E: Livestock grazing would be temporarily suspended in Collet, Ford Well, Soda, Mollies Nipple, School Section, Upper Paria, Vermilion, Death Hollow, Rock Creek-Mudholes allotments where Rangeland Health Standards are not being met, and where a determination has been made that the failure to meet Standards was due to existing livestock grazing management practices or levels of use. These temporary suspensions would remain in effect until Standards are met, at which time, allotment specific levels of active use and management criteria would be established and the suspension ended. A portion of the Coyote allotment would also be temporarily suspended for restoration purposes. Rehabilitation efforts, such as re-seeding, watershed and riparian projects would be emphasized in those areas. For planning purposes and the estimation of future uses, an assumption has been made that restoration actions would restore forage availability to previous levels. However, allotment specific evaluations would determine the actual active use levels upon successful restoration.

Innovative rangeland management science and techniques would receive priority under this alternative. Scientific study of improved rangeland management methods and practices would be encouraged.

AFFECTED ENVIRONMENT

The planning area includes approximately 2,168,726 acres of Federal land in south-central Utah, mainly within the GSENM, but including portions of Glen Canyon NRA, lands administered by the Kanab Field Office and the Arizona Strip BLM. Approximately 68% of the planning area is in Kane County, with approximately 31% in Garfield County, with less than 1% occurring in Coconino County, AZ.

The planning area is primarily surrounded by other federal lands. Dixie National Forest borders the planning area to the north, Capitol Reef National Park and Glen Canyon National Recreation Area to the east and southeast, Bryce Canyon National Park to the northwest, and other Bureau of Land Management (BLM)-administered lands to the south and west. Kodachrome Basin State Park south of Cannonville, Utah is surrounded by lands within the planning area.

Livestock use is permitted at different times and seasons throughout the year. Season-of-use is largely determined by elevation. Generally, the lower elevation allotments are grazed during the winter, the mid-elevation allotments are grazed during the spring/fall season, and the high elevation allotments in the summer. The majority of livestock permittees do not graze year-round. Most operators have their livestock on non-BLM lands (such as Forest System land, private base property and state lease) at least part of the year. There are 82 separate grazing allotments within the planning area and sixteen closed areas. Currently, 92 permittees are authorized to graze horses and cattle. The authorized active preference is 76,457Animal Unit Months (AUMs). Total authorized AUMs (active and suspended) are 106,138.

The planning area is located along the western boundary of the Colorado Plateau physiographic province in south-central Utah. The vegetation and flora of the Colorado Plateau are sufficiently distinct and uniform to be recognized as their own ecologically-based land area or eco-region. Within the Colorado Plateau eco-region, variations in climate, geology, topography, and influences from adjacent eco-regions have resulted in localized differences in vegetation and species composition. Over the past seven decades, 958 vascular plant taxa have been documented.

Most of the soils in the planning area are semiarid, young, and poorly developed. Chemical and biological soil development processes, such as rock weathering, decomposition of plant materials, accumulation of organic matter, and nutrient cycling, proceed slowly in this environment. In many areas, natural or geologic erosion rates are too fast to develop distinct, deep soil horizons. Most soils are less than one-half meter deep to bedrock. The deeper soils are formed in recent alluvium. Almost all of the local soils are derived from sedimentary rock. The dominant topographic features are structural benches, mesas, valley floors, valley plains, alluvial fans, stream terraces, hills, cuestas, and mountainsides.

There are 82 verified mammalian species within the area, along with 21 species questionably present, 4 introduced species reported, and 6 currently extirpated species. There are also approximately 243 bird species, 20 different fish more than 1,900 invertebrates and 29 species of reptiles and amphibians.

There are more than 4,000 archaeological and historical sites recorded within this planning area, the majority of which are considered eligible to the National Register of Historic Places. This represents only a small fraction of the archaeological and historical sites within this same area but it is safe to assume that there are thousands of sites that have not yet been identified. Within Glen Canyon National Recreation Area (GCNRA), site densities of up to 108 sites per square mile have been recorded. In some areas within GSENM site densities of up to 70 sites/square mile have been recorded.

Encompassing a combined total of approximately 2.3 million acres of scenic, high-plateau canyon country, the planning area provides a wide range of opportunities for diverse recreational activities.

Socioeconomic conditions indicate that there are small but increasing populations within the two counties that have lower income and higher unemployment rates than the average for the State of Utah. Labor income has been decreasing over the past 20 years, while investment and transfer income has increased. The services sector and the government sector have provided the greatest amount of wages and salaries, and both show substantial upward trends. In Garfield County, both mining and construction earnings declined substantially in the early 1980s and have not gone back up. In Kane County, the trade industry has provided substantial and increasing amounts of wages and salaries. Agricultural wages and salaries have been volatile in both counties, including some periods of negative earnings. Today, although fewer families earn their livelihood solely from natural resources such as grazing, timber, and minerals than in previous times, the descendants of the area's settlers still have strong connections to the land. Access to

public land and resources, whether for earning a living or for recreation, is important to the local people.

PREFERRED ALTERNATIVE

Alternative C, "modify grazing management on allotments not meeting Standards including changes in season of use, pasture rotations and suspensions in current authorized active use levels" is the preferred alternative. In developing this alternative, the BLM included an array of actions from among the various proposals that provide advantages with respect to the guiding principles given in Chapter 1. This array of action became Alternative C.

NEXT STEPS

The comment period on this Draft Monument Management Plan Amendment and Draft Rangeland Health Environmental Impact Statement will extend for 90 days following publication of the EPA's Notice of Availability in the Federal Register. After comments are received they will be evaluated. Substantive comments could lead to changes in one or more of the alternatives, or in the analysis of environmental consequences. A Proposed Plan Amendment/Final EIS will then be completed and released for public review. If protests are received on the Proposed Plan Amendment/Final EIS, they will be reviewed and addressed by the Director of BLM before a Record of Decision and Approved Plan Amendment is released.

In addition, allotment specific decisions will be issued to implement provisions of the Plan Amendment and EIS. The public will be afforded an opportunity to participate in this process in accordance with grazing regulations in Title 43 CFR part 4300.

CHAPTER 1
PURPOSE AND NEED

PURPOSE AND NEED FOR THE PLAN AMENDMENT

Public lands administered by the Bureau of Land Management (BLM) are managed under land use plans which require periodic updating. The land use plans that provide direction for livestock grazing and rangeland management for most of the areas administered by the Grand Staircase-Escalante National Monument (GSENM) were completed in 1981 and are more than 20 years old. This Rangeland Health Plan Amendment (further referenced as Plan Amendment) updates the grazing portion of these older land use plans. These plans need updating to reflect changes in resource conditions, revisions to grazing regulations, updates and/or amendments to allotment management plans, and the requirements of legal proceedings and court rulings.

The existing land use plans providing direction for livestock grazing include the Escalante, Paria, Vermilion, and Zion Management Framework Plans (MFPs) along with the more recent Monument Management Plan (MMP). The Monument Management Plan prepared for the GSENM (2000) covers most of the lands in the planning area. Because the MMP did not address most of the prior livestock grazing decisions, these earlier plans continue to govern livestock use and rangeland management. This Plan Amendment will allow the integration of livestock and rangeland management with the other resources in the MMP. Decisions for livestock grazing and rangeland management on lands in the planning area outside of GSENM would be integrated into the 2008 Kanab Resource Management Plan (RMP).

The GSENM also administers livestock grazing on lands managed by the National Park Service (NPS) within Glen Canyon National Recreation Area (GCNRA) as well as lands within BLM's Kanab and Arizona Strip Field Offices through inter-agency agreements. This Plan Amendment will incorporate current plans or portions of plans prepared by those agencies that address livestock grazing.

The purposes of this proposal are to:

- Integrate decisions for livestock and rangeland management into the GSENM MMP through a plan amendment.
- Revise GSENM MMP sections affected by rangeland management to integrate livestock grazing into existing resource management.
- Update and amend livestock management decisions in land use plans for non-GSENM lands where GSENM has grazing management responsibility.
- Provide the management direction necessary to ensure that public lands are achieving or making progress towards achieving Rangeland Health Standards.

This proposal is needed to:

- Renew livestock grazing permits.
- Update allotment management plans.
- Consider proposed Glen Canyon National Recreation Area grazing management actions.

- Allocate multiple resources to resolve conflicts.
- Incorporate current resource condition inventories into land use decisions.
- Fulfill the mandates of the GSENM Proclamation, and the GSENM Monument Management Plan.

BACKGROUND

Pursuant to BLM policy and regulations, as well as Federal law, BLM is required to assess whether public lands are achieving Rangeland Health Standards and complete the appropriate environmental review prior to renewing grazing permits. An interdisciplinary team has developed this Plan Amendment/Draft Environmental Impact Statement (DEIS) for the purpose of analyzing the potential effects of livestock grazing on resources that may be affected in the planning area. This approach is needed to ensure that all management actions on public land conform to the appropriate regulations and planning guidance, and balances the use between different resource values.

Where current land use plan decisions have been found to be valid, they are brought forward as valid existing management determinations. Where current land use plan decisions have been found to be outdated, new management actions are proposed and analyzed in this DEIS. If changes in the terms and conditions of existing grazing permits are required, the permits would be reissued with modified and/or additional terms and conditions.

Recognizing that completing the environmental review requirements for all grazing allotments would take some years to accomplish, starting in 1999 Congress enacted a series of Public Laws allowing BLM to issue new grazing permits for those permits expiring in Fiscal Years 1999 through 2008, with the same terms and conditions contained in the expired permits, pending ". . . processing of such permit[s] . . . in compliance with all applicable laws and regulations." Agency policy was that "compliance with all applicable laws and regulations" included consultation, coordination and cooperation with affected individuals, interested publics, States, Indian Tribes, and other land managing agencies; completion of the applicable level of National Environmental Policy Act (NEPA) review; and consultation with the United States Fish and Wildlife Service (USF&WS) under Section 7 of the Endangered Species Act prior to issuing new grazing permits. Grazing permits renewed under the authority of these Public Laws, which became known as BLM's authority to renew permits under the appropriations rider, can be modified if the above analysis and consultation processes indicates a change was warranted.

Grazing permits within the Grand Staircase-Escalante National Monument (GSENM), and those allotments outside the GSENM but administered by GSENM, have been renewed for up to 10 years upon application pursuant to the provisions of the appropriations rider language until such time that NEPA analysis and compliance with other laws and regulations can be completed.

Livestock grazing is an accepted and valid use of the public land as provided for by the Taylor Grazing Act of 1934 (TGA), the Federal Land Policy and Management Act of 1976 (FLPMA),

and the Public Rangelands Improvement Act of 1978 (PRIA). Grazing regulations require that the BLM pursue an integrated approach to processing grazing permits and leases. The BLM is responsible for ensuring that all management actions on public land conform to the appropriate land use plan(s), that required National Environmental Policy Act (NEPA) analyses are completed, and that public land uses are balanced between competing resource values. The impacts of renewing grazing permits often are analyzed in individual, allotment-by-allotment, Environmental Assessments (EAs). This Plan Amendment/EIS has been prepared instead of preparing individual EAs for the 82 allotments administered by GSENM. The Plan Amendment/EIS analyzes cumulative impacts of BLM's grazing program on these allotments and provides site specific analysis and management direction for individual allotments.
This Plan Amendment/EIS proposal would support two tiers of decision-making. The first tier is a planning decision that would amend the current GSENM management plan. The second tier consists of implementation decisions that would authorize the renewal of grazing permits on the GSENM.

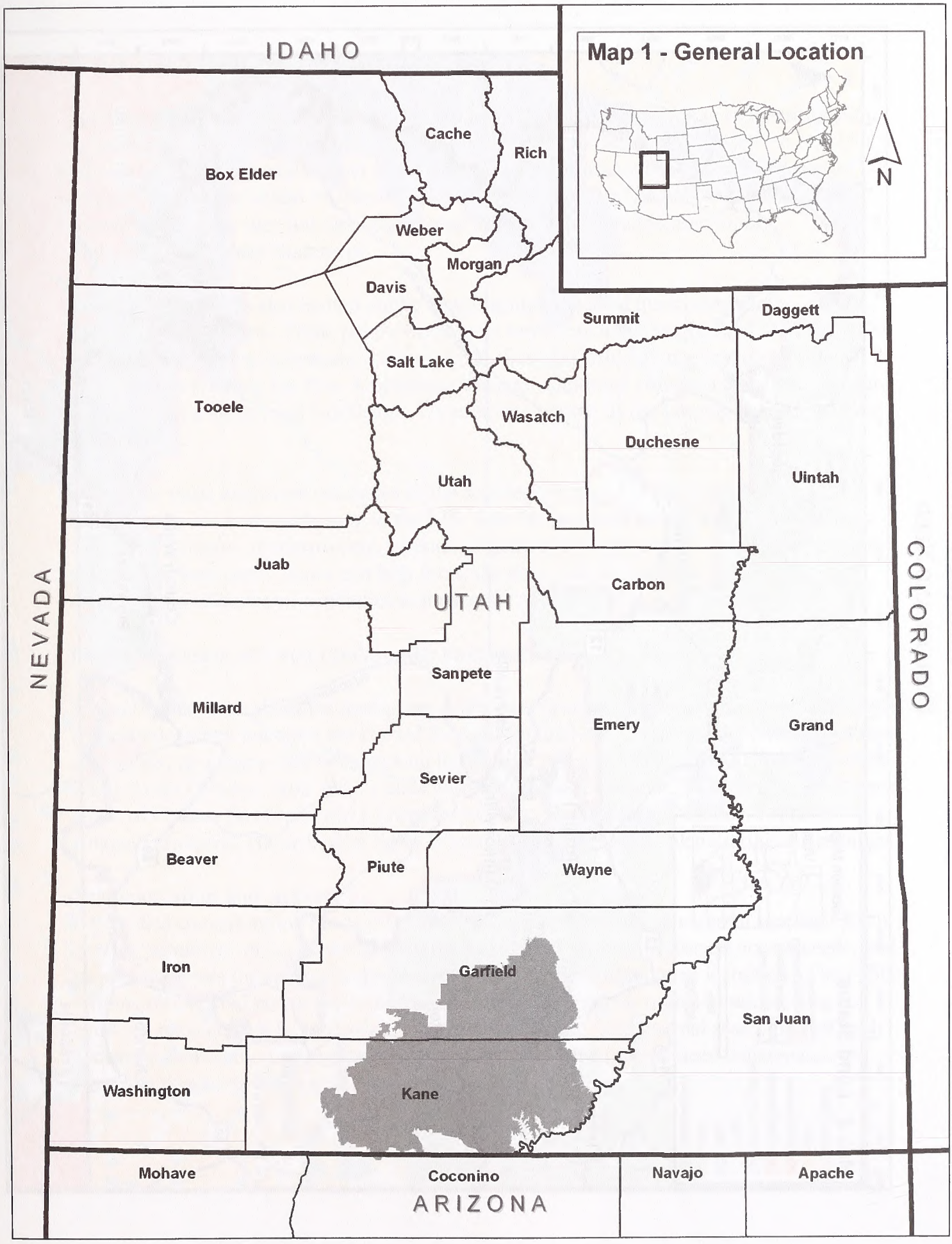
The legislation creating Glen Canyon National Recreation Area (Public Law 92-593, October 27, 1972) authorized livestock grazing within the Recreation Area. This law provides that grazing permits will be administered by the BLM following the same regulations and policies as on the adjacent lands under BLM jurisdiction subject to requirement that the Secretary administer, protect, and develop the recreation area in accordance with the National Park Service (NPS) Organic Act, as amended and supplemented, and with any other statutory authority available to the Secretary for the conservation and management of natural resource to the extent the Secretary finds such authority will further the purpose of the act. The purpose of Glen Canyon National Recreation Area is to provide for public outdoor recreation use and enjoyment of Lake Powell and lands adjacent thereto in the States of Arizona and Utah and to preserve the scenic, scientific, and historic features contributing to public enjoyment.

DESCRIPTION OF THE PLANNING AREA

The planning area includes all lands for which the GSENM office has grazing management responsibility. This includes most of the lands within GSENM, additional lands within the BLM's Kanab and Arizona Strip Field Offices, Glen Canyon National Recreation Area (GCNRA), and non-GSENM BLM lands (totaling approximately 2,168,726 acres of Federal land) near the communities of Escalante, Cannonville, and Tropic, Utah. As a result, the GSENM, the Kanab and Arizona Strip Field Offices, and the GCNRA have intra- or inter-agency agreements to address management and/or permit administration for certain grazing allotments. Map 1 shows the planning area boundary (where GSENM administers livestock grazing) and Map 2 identifies the underlying administrative units.

Grand Staircase-Escalante National Monument was established on September 18, 1996 when President William Jefferson Clinton issued a Proclamation under the provisions of the Antiquities Act of 1906. It was created to protect a vast and austere landscape that embraces a spectacular array of scientific and historic objects, including objects of geological, paleontological, biological, archaeological, cultural and historical value. The boundaries of GSENM do not follow all BLM administrative or livestock grazing allotment boundaries. Thus grazing management

responsibilities for some lands within the GSENM are, through agreement, handled by the BLM's Kanab and Arizona Strip Field Offices. These lands are not included in the planning area for this assessment.


IDAHO
Map 1 - General Location
N
Box Elder
Cache
Rich
Weber
Morgan
Davis
Summit
Daggett
Salt Lake
Tooele
Wasatch
Duchesne
Uintah
Utah
Juab
Carbon
UTAH
NEVADA
COLORADO
Sanpete
Millard
Emery
Grand
Sevier
Beaver
Piute
Wayne
Iron
Garfield
San Juan
Washington
Kane
Mohave
Coconino
Navajo
Apache
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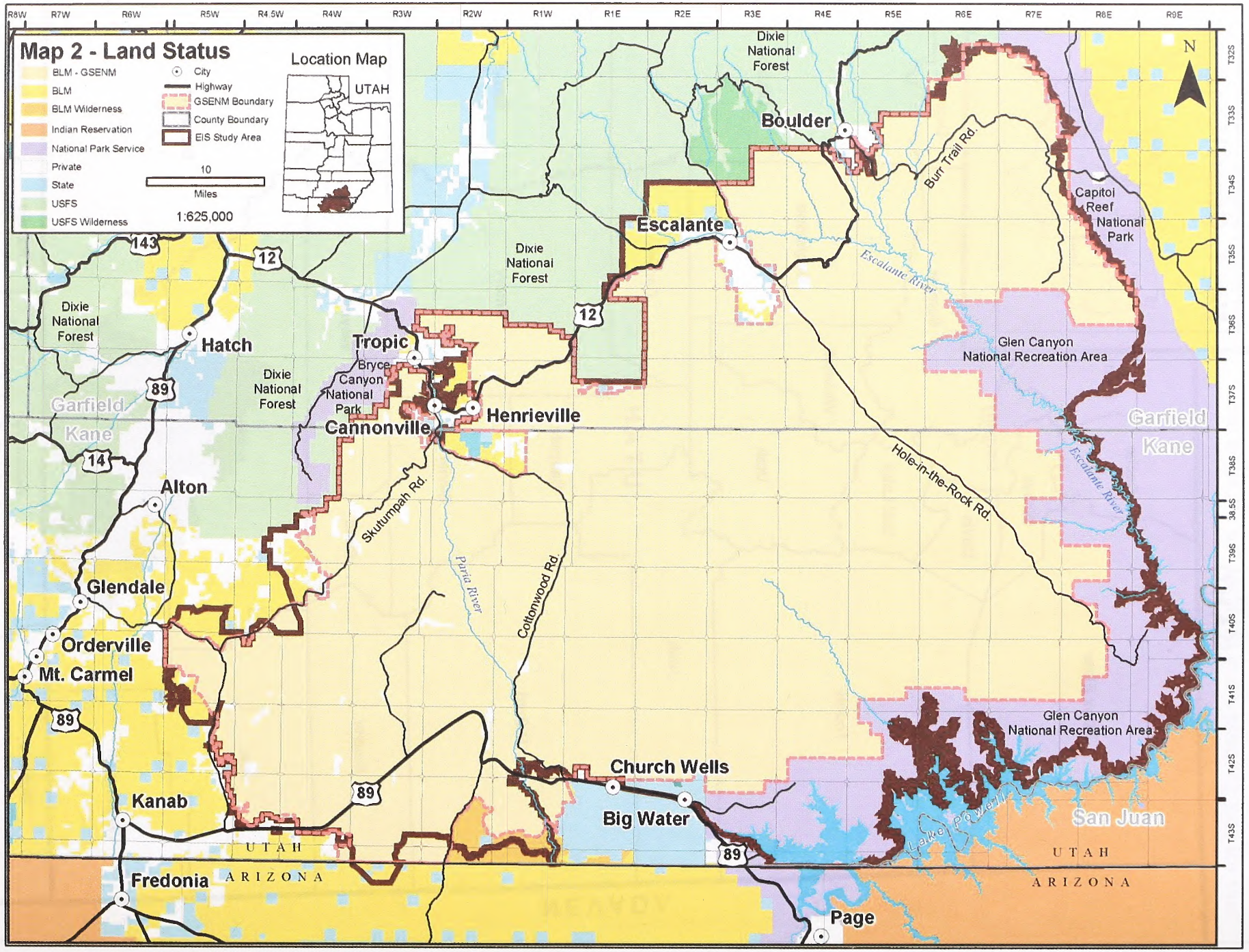

Map 2 - Land Status
BLM - GSENM
BLM
BLM Wilderness
Indian Reservation
National Park Service
Private
State
USFS
USFS Wilderness
City
Highway
GSENM Boundary
County Boundary
EIS Study Area
10
Miles
1:625,000
Location Map
UTAH
N
Boulder
Escalante
Dixie National Forest
Burr Trail Rd.
Capitol Reef National Park
Escalante River
Glen Canyon National Recreation Area
Hatch
Tropic
Bryce Canyon National Park
Henrieville
Cannonville
Garfield
Kane
Alton
Skutumpah Rd.
Hole-in-the-Rock Rd.
Paria River
Cottonwood Rd.
Glendale
Orderville
Mt. Carmel
Church Wells
Big Water
Kanab
Fredonia
Page
San Juan
Lake Powell
UTAH
ARIZONA
143
12
89
14

CHAPTER 1
PURPOSE AND NEED

ISSUE IDENTIFICATION PROCESS

The first step in the planning process was to invite public participation in the identification of planning issues. This "Scoping" process began with publication of the Notice of Intent to prepare an Environmental Impact Statement, which appeared in the Federal Register on August 31, 2000 (Volume 65, No. 170, Pgs. 53028-53029). The public was invited to comment on issues they felt were significant which should be addressed in the Environmental Impact Statement.

The scoping process also invited public input through a mailed questionnaire, the internet, and public workshops. Three public workshops were held in September and October 2000. About 1,200 scoping comments were received. Scoping will continue throughout the process of developing the Plan Amendment through additional comments received through newsletters, meetings, and workshops. A complete outline of the scoping process is found in Chapter 5.

One of the most important outcomes of the scoping process was the identification of the significant issues to be addressed in the EIS. For the purposes of this EIS, an "issue" is defined as a matter of controversy, dispute, or general concern over resource management activities or land uses. Issues can help focus the data collection and inventory efforts, identify areas of concern, conflict or controversy, and limit the scope of analysis.

ISSUES ASSESSED, BUT NOT CONSIDERED FURTHER

Several issues were identified during the assessment process or are required to be addressed by Federal statute, but were not carried forward for analysis. These included transportation and access, air quality, Native American Religious Concerns, Wilderness Areas, Wilderness Study Areas (WSAs), Non WSA Lands with Wilderness Character, Wild and Scenic Rivers, Areas of Critical Environmental Concerns (ACECs), Environmental Justice, Prime or Unique Farmlands, Hazardous or Solid Waste, Wild Horses, and Paleontological Resources.

Transportation and Access

No unfilled transportation needs were disclosed during internal and external scoping. Each grazing permittee was contacted during the assessment process to discuss access needs, and no specific needs for improved access to maintain improvements were identified. The public scoping process did not result in the identification of a need for routes or access for livestock management beyond what is currently available. The internal assessment of each allotment identified range improvements and facilities which would need maintenance or would be proposed, along with access.

Air Quality

No air quality issues were raised during internal and external scoping. No impacts to local or regional air quality, and no impacts to Class 1 airsheds were identified.

Management of air quality in accordance with standards prescribed by federal, state, and local laws, regulations, and policies include the following:

- Applicable National Ambient Air Quality Standards.
- Applicable National Emission Standards for Hazardous Air Pollutants.
- State or tribal implementation plans.
- Prevention of Significant Deterioration (PSD), if applicable.
- Conformity analyses and determinations.
- Regional haze regulations, including visibility impacts on mandatory federal Class I areas.
- Utah Smoke Management Plan.

Comply with the Clean Air Act through the application of the National Environmental Policy Act (NEPA) process on a case-by-case basis.

Comply with Utah Administrative Code Regulation R307-205, which prohibits the use, maintenance, or construction of roadways in disturbed areas without taking appropriate dust abatement measures.

Compliance would be obtained through site-specific stipulations identified on a case-by-case basis for new projects and through the use of dust abatement control techniques in problem areas.

Mitigate actions that compromise ambient air quality standards or visibility within the Class I air areas.

BLM will continue to work cooperatively with state, federal, and tribal entities in developing air quality assessment protocols to address cumulative impacts and regional air quality issues.

National Ambient Air Quality Standards are enforced by the Utah Department of Environmental Quality, Division of Air Quality, with Environmental Protection Agency (EPA) oversight. Special requirements to reduce potential air quality impacts will be considered on a case-by-case basis in processing land use authorizations.

Project specific analyses will consider use of quantitative air quality analysis methods (i.e. modeling), when appropriate as determined by BLM, in consultation with state, federal, and tribal entities.

Global Climate Change

On-going scientific research has identified the potential impacts of climate changing pollutants on global climate. These pollutants are commonly called "greenhouse gases" and include carbon dioxide, CO2; methane; nitrous oxide; water vapor; and several trace gas emissions. Through complex interactions on a regional and global scale, these emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the Earth back into space. Although climate changing pollutant levels have varied for millennia (along with corresponding variations in climatic conditions), recent industrialization and burning of fossil carbon sources have caused CO2 concentrations to increase dramatically, and are likely to contribute to overall climatic changes, typically referred to as global warming. Increasing CO2 concentrations also lead to preferential fertilization and growth of specific plant species.

Global mean surface temperatures have increased nearly 1.0°C (1.8°F) from 1890 to 2006 (Goddard Institute for Space Studies, 2007). However, observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Figure 3-10 demonstrates that northern latitudes (above 24° N) have exhibited temperature increases of nearly 1.2°C (2.1°F) since 1900, with nearly a 1.0°C (1.8°F) increase since 1970. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of these "greenhouse gases" are likely to accelerate the rate of climate change.

The Intergovernmental Panel on Climate Change (IPCC) has recently completed a comprehensive report assessing the current state of knowledge on climate change, its potential impacts, and options for adaptation and mitigation. At printing of this DEIS, this assessment is available on the IPCC website at http://www.ipcc.ch/. According to this report, global climate change may ultimately contribute to a rise in sea level, destruction of estuaries and coastal wetlands, and changes in regional temperature and rainfall patterns, with major implications to agricultural and coastal communities. The IPCC has suggested that the average global surface temperature could rise 1 to 4.5 degrees Fahrenheit (°F) in the next 50 years, with significant regional variation. The National Academy of Sciences (2006) has confirmed these findings, but also indicated that there are uncertainties regarding how climate change may affect different regions. Computer models indicate that such increases in temperature will not be equally distributed globally, but are likely to be accentuated at higher latitudes, such as in the Arctic, where the temperature increase may be more than double the global average (BLM 2007b). Also, warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures is more likely than increases in daily maximum temperatures. Vulnerabilities to climate change depend considerably on specific geographic and social contexts. BLM recognizes the importance of climate change and the potential effects it may have on the natural environment. Several activities occur within the planning area that may generate emissions of climate changing pollutants. For example, large fires, and recreation using

combustion engines, can potentially generate CO2 and methane. Wind erosion from disturbed areas and fugitive dust from roads along with entrained atmospheric dust has the potential to darken glacial surfaces and snow packs resulting in faster snowmelt. Other activities may help sequester carbon, such as managing vegetation to favor perennial grasses and increase vegetative cover, which may help build organic carbon in soils and function as "carbon sinks".

Since none of the actions proposed in this EIS would generate additional greenhouse gases that would contribute to global warming, this issue will not be further addressed.

Native American Religious Concerns
Local tribes were contacted during public scoping, and no Native American religious or other issues were raised.

Wilderness Areas
A small portion of the Paria Canyon-Vermilion Cliffs Wilderness Area extends into the Clark Bench and Mollies Nipple allotments. No facilities or improvements are approved as part of this analysis, and all future construction would require site specific assessment, including assessing impacts on Wilderness Areas.

Wilderness Study Areas
Wilderness Study Areas were addressed during the scoping process. No specific issues were identified during scoping. Livestock grazing is authorized and occurs within Wilderness Study Areas within the EIS area. Rangeland management activities in WSAs are administered under guidelines in the Interim Management Policy for Lands under Wilderness Review (IMP H-8550-1). While some facilities or improvements are proposed in the alternatives, none are approved as part of this analysis. All future construction would require site specific assessment, including assessing impacts on WSAs. The impacts of future management actions on wilderness characteristics, will be deferred until the nature of the impact can be assessed; i.e., upon the proposing of a specific improvement, along with design specifications. Livestock grazing has been occurring in WSAs and continued grazing would not impair wilderness characteristics and would not affect their eligibility for wilderness consideration. Under all the alternatives livestock grazing would continue at or below current livestock grazing levels.

Non WSA Lands with Wilderness Characteristics
There are Non WSA Lands with Wilderness Characteristics in the decision area outside of existing WSAs that were determined by the BLM in the1999 Utah Wilderness Inventory to have wilderness characteristics. Members of the public submitted information suggesting that additional areas outside of existing WSAs have wilderness characteristics and should be managed to preserve those values. Livestock grazing is authorized, and occurs, within Non WSA Lands with Wilderness Characteristics within the EIS area. While some facilities or improvements are proposed in the alternatives, none are approved as part of this analysis,

and all future construction would require site specific assessment, including assessing impacts on Non WSA Lands with Wilderness Characteristics. The impacts of future management actions on wilderness characteristics, will be deferred until the nature of the impact can be assessed; i.e., upon the proposing of a specific improvement, along with design specifications. Livestock grazing has been occurring in these areas and continued grazing would not impair wilderness characteristics and would not affect their eligibility for wilderness consideration. Under all the alternatives livestock grazing would continue at or below current livestock grazing levels.

Wild and Scenic Rivers System
In the EIS area, there are no designated Wild and Scenic Rivers System segments. There are approximately 252 miles of river segments that have been determined suitable for inclusion in the National Wild and Scenic River System. No facilities or improvements are approved as part of this analysis, and all future construction would require site specific assessment, including assessing impacts on Wild and Scenic River suitability. Livestock grazing is a current activity in these areas and continued grazing would not affect their eligibility for Wild and Scenic River consideration.

Areas of Critical Environmental Concern
The Monument Management Plan states: "No Areas of Critical Environmental Concern (ACECs) are designated in the Monument Management Plan." Further, there are no ACECs within the EIS area.

Environmental Justice
According to the EPA Region VIII, State of Utah, Environmental Justice Map, the region has been categorized as a minority population area of 0-10% and a poverty population area of 10-20%. No minority or economically disadvantaged communities or populations are present which could be affected by the proposed action or alternatives. (see http://www.epa.gov/enviro/ej).

Prime or Unique Farmlands
No Prime or Unique Farmlands exist within the EIS area. (see http://www.ut.nrcs.usda.gov/technical/nri.)

Hazardous or Solid Wastes
No anticipated impacts were identified relating to hazardous or solid wastes.

Wild Horses
Concerns relating to a small band of horses (13-16 head) located in the Harvey's Fear/Spencer Bench area will not be addressed. Removal of these horses is provided for in the Escalante MFP which will be carried forward as discussed in the Chapter 2 section of Existing Land Use Plan Decisions To Be Carried Forward. Therefore, this is an administrative action to be implemented under an existing land use plan decision.

Paleontological Resources
Paleontological resources generally require management protection only if they have significant scientific, historic, cultural, or educational value. Such significant fossil sites are invariably in rock or sediment exposures relatively free of soils and extensive vegetation. Historically, use of such areas by cattle is rather limited. The only possible direct impact cattle may have on fossil resources is trampling and such low levels of grazing activity would not be a significant threat. Other activities associated with grazing that involve ground disturbance such as water developments, laying of subsurface pipelines, post-hole digging, and road construction/maintenance could significantly impact paleontological resources but would be examined on a case-by-case basis by a qualified paleontologist before being approved. Significant resources found during such examinations would be collected or mitigated, thus preventing significant impacts. As a result, paleontological resources are given no further consideration in the analysis.

ISSUE SUMMARY

This section describes the issues or concerns that will be analyzed in this EIS. The process used to identify these issues or concerns were described earlier.

CLARIFICATION OF MONUMENT MANAGEMENT PLAN DIRECTION

- The MMP direction was developed without an assessment of the interaction between livestock grazing, rangeland management, and other resources uses or an analysis of the impacts on livestock grazing.
- MMP direction for habitat (vegetation) management, while emphasizing the use of native species, does not provide specific direction related to existing rangeland seeding projects. The MMP is inconsistent because it both prohibits and allows the use of non-native species under the same possible set of circumstances.
- Grazing related range improvements, specifically seedings, were not addressed in the MMP.
- Proposed restoration and revegetation projects are not prioritized.
- Existing MMP determinations do not comply with new direction regarding the use of management ignited fire.
- The MMP determination concerning "Noxious weeds" is insufficient, since it does not include exotic or invasive non-native species.

LIVESTOCK GRAZING MANAGEMENT

- There is no consistent direction regarding coordinated management, including recognition of enabling legislation intent and compliance with existing management plans, with Glen Canyon National Recreation Area, Capital Reef National Park, U.S. Forest Service - Dixie National Forest, BLM Arizona Strip Field Office, and the BLM Kanab Field Office.

- Corrective action is required on allotments where periodic monitoring has documented downward trend, and/or overuse of forage resources, or BLM has determined that current livestock grazing practices are significant factors in not achieving one or more rangeland health standards, or do not conform to grazing management guidelines.

COMPLIANCE WITH STANDARDS AND GUIDELINES FOR RANGELAND HEALTH

Standard 1: Soils

- Analysis of potential impacts of management actions on areas where soil conditions are not meeting the desired Standard due to a lack of vegetative cover and evidence of increased erosion.

- Analysis of impacts of management actions that have the potential to degrade soil quality and increase soil erosion due to reduction in vegetative cover.

Standard 2: Riparian and Wetland Areas

- Analysis of potential impacts of management activities on riparian areas focusing on areas that currently do not meet the existing standard for properly functioning condition.

- Analysis of potential impacts to watershed health degradation due to cumulative impacts of land use activities.

Standard 3: Desired Species

- Identification of rangelands not meeting Standard 3 for the desired species including native, threatened, endangered, and special status species and analysis of management actions on these rangelands.

- Analysis of potential impacts of rangeland activities on the habitat characteristics needed for the conservation of migratory bird species of concern as required under Executive Order 13186 *Responsibilities of*

Federal Agencies to Protect Migratory Birds (66FR 3853), January 17, 2001.

- Analysis of the potential impacts of livestock distribution and season of use on the Paunsaugunt Deer Herd wintering and migration areas.
- Analysis of the potential impacts of rangeland activities on the habitat and viability of populations of federally listed threatened or endangered species, BLM Utah State Sensitive Species, or species of special concern listed by the Utah Division of Wildlife Resources, GSENM, and other state and Federal agencies.
- Analysis of the potential impact of rangeland management activities on the recovery of threatened, endangered, and sensitive plant and animal species.
- Analysis of potential impact to vegetative ecosystems from livestock management activities including season-long or early spring grazing and drought and long-term climate change.
- Analysis of the potential impacts of invasive non-native plants on native plant and animal communities, soil and hydrologic functions, fire regime, wildlife habitat, and recreational opportunities.
- Analysis of potential impacts to biological soil crust cover that has been reduced below expected amounts at many sites.

Standard 4: Water Quality

- Analysis of management activities on streams and springs that do not currently meet the State of Utah's water quality standards.

SOCIO-ECONOMICS

- Analysis of the potential impacts to local custom and culture values due to modification or reduction in traditional uses.

CULTURAL RESOURCES

- Analysis of potential impacts of rangeland management activities and related improvements on historic and prehistoric cultural resource sites.

RECREATION

- Analysis of the potential competition between recreation and rangeland management activities that compete for use of space, and for use of water resources.

- Analysis of the potential impacts rangeland management activities and related improvements on recreational aesthetics and scenic values.

PLANNING CRITERIA AND CONSIDERATIONS

BLM planning regulations (43CFR1600) require the preparation of planning criteria to guide the development of resource management plans. Planning criteria ensure that plans are tailored to the identified issues and ensure that unnecessary data collection and analysis are avoided. Planning criteria are based on applicable law, agency guidance, public comment, and coordination with other Federal agencies, state and local governments, and Native American tribes.

The planning criteria used in developing this plan for the management of livestock grazing on GSENM and administration of livestock permits on GCNRA are as follows:

- The plan amendment will be completed in compliance with FLPMA, NEPA, and all other applicable laws. It will meet the requirement of the Proclamation to protect the objects of geological, paleontological, archaeological, biological, and historic values within GSENM.

- The Planning Team will work cooperatively with the State of Utah, tribal governments, county and municipal governments, other Federal agencies, and all other interested groups, agencies, and individuals.

- The plan amendment will incorporate the Fundamentals of Rangeland Health and the Utah Standards for Rangeland Health and Guidelines for Grazing Management (these are listed in Appendix 8).

- The plan amendment will incorporate the NPS's 1999 GCNRA Grazing Management Plan and 2005 Values and Purposes Determination.

- Vegetation management activities and treatment of invasive species will follow principles of integrated pest management. The following documents are incorporated by reference as current national guidance, although they may be updated over the life of this plan: Final Environmental Impact Statement Vegetation Treatment on BLM Lands in Thirteen Western States and associated

Records of Decision. BLM Wyoming State Office, Casper Wyoming. 1991. (BLM-WY-ES-91-036-4320); Record of Decision Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic Environmental Impact Statement USDI, Bureau of Land Management, 2007. (FES 07-21).

- All management actions proposed will be in accordance with applicable laws, regulation, policy, and guidance.

- BLM will follow the guidelines for processing the voluntary relinquishment of grazing permits and preferences as directed in Washington Office (WO) Instruction Memorandum (IM) number 2007-067(refer to Appendix 7).

PLAN AMENDMENT GOALS

LIVESTOCK GRAZING MANAGEMENT

- Meet Utah's Rangeland Health Standards on all allotments.
- Keep lands productive, while minimizing conflicts with other resources.
- To the extent possible, ensure continuation of viable livestock operations, consistent with existing laws, regulations, and resource management goals.

VEGETATION MANAGEMENT

- Achieve or maintain desired plant communities (incorporating a natural range of native plant associations and seral stages where applicable) with appropriate species density and composition.
- Utilize the principles of Integrated Pest Management to control existing noxious and invasive weed species and reduce their introduction and spread.
- Maintain or increase species diversity and cover.
- Ensure the proper functioning and distribution of biological soil crust.

SOILS

- Maintain soils in a healthy condition.
- Restore soil health in degraded areas.

REVEGETATION

- Stabilize areas that are disturbed to prevent further degradation.
- Reduce the visual contrast between revegetated areas and the existing landscape.
- Revegetate with native species whenever feasible.

RIPARIAN

- Maintain or restore riparian areas to properly functioning conditions.

WATER RESOURCES

- Manage streams and springs to meet the State of Utah's water quality standards.
- Ensure that water developments provide sufficient water (where possible) to support riparian resources, wildlife and other values.

SPECIAL STATUS SPECIES

- Ensure the Special Status Species existence would not be jeopardized.
- Ensure that Special Status Species habitat would not be not adversely modified .

WILDLIFE

- Protect and enhance wildlife habitat.
- Preserve the integrity of wildlife corridors and migration routes.
- Ensure wildlife availability, and access to, key forage, nesting, and spawning areas.

SOCIO-ECONOMIC

- Support a diverse economy that relies on multiple use and sustainable yield principles.
- Provide for economic opportunities and social sustainability.
- Maintain natural values and resources.

CULTURAL RESOURCES

- Protect archaeological and historical sites by putting comprehensive mitigation measures in place (see Cultural Protocol, Appendix 3).
- Protect Traditional Cultural Properties (TCPs) to insure their continued access and availability for use.

RECREATION

- Consider important recreational concerns, such as aesthetics, scenic values, access to clean water, access to quality campsites, and opportunities for solitude when authorizing livestock use and management actions.
- Reduce conflicts between recreational users and livestock grazing wherever possible, particularly those areas with high recreational use activity, during the peak seasons of use.

CONSISTENCY WITH OTHER PLANS

Section 202 of the Federal Land Policy Management Act (FLPMA) requires, to the extent practical, that the BLM keep itself informed of other Federal, State and local land use plans, and assure that consideration is given to those plans in the development of BLM land use plan decisions. During the course of this planning effort, the following local, State and Federal land use plans were considered:

County Land Use Plans
Kane and Garfield Counties have developed County land use plans that include guidance for the management of Federal lands and activities. To the extent that the County land use plans encourage and support the continued traditional uses of the public lands (in this specific planning effort, livestock grazing) and the custom and culture of the region, the plan amendment continues this traditional use and is consistent with the County land use plans. Where the County land use plans proscribe a use level or prohibit the reduction in use levels of federally managed and permitted uses, federal laws and regulations, and resource inventory data, are used to establish allowable use levels.

Appendix 5 details the specific elements of the County and State plans which address grazing and rangeland health, and establishes whether this plan amendment is consistent with them. In general, this draft plan amendment is consistent with portions of the County plans which require the maintenance of the livestock industry, and is not consistent with those portions which call for an increase in livestock grazing, or "no net loss" of AUMs.

National Park Service, Glen Canyon National Recreation Area
Public Law 92-593 established GCNRA on October 27, 1972. That enabling legislation specifically required the continuation of livestock grazing, under the administration of the BLM, but "subject to the provisions of" the National Park Service (NPS) Organic Act of August 25, 1916. The Directors of the NPS and BLM signed a Memorandum of Understanding on September 4, 1984 requiring the BLM to "consult and cooperate with" the NPS in grazing administration on GCNRA. The NPS was required to participate in planning, to ensure that the "values and purposes" of the NRA were "adequately considered".

The process of consultation on grazing administration, and incorporation of GCNRA values and purposes into that consultation, was described in an interagency agreement between the BLM's Utah State Director and the Superintendent of GCNRA. The BLM would inform the NPS of any proposed changes in grazing administration, and the NPS would then determine how those changes would conform to the values and purposes of GCNRA. The details as to what constituted "values and purposes" were established when a grazing component was incorporated into the General Management Plan for Glen Canyon National Recreation Area on October 31, 1998. Upon being presented with a proposed change in

grazing administration, the Superintendent of GCNRA would provide the BLM with a Values and Purposes Determination based upon the GCNRA's plan.

Glen Canyon National Recreation Area has been participating in this planning process as a cooperator since its initiation. A Values and Purposes Determination has been completed, and of the eighteen allotments (and several unallotted closed areas) on NPS lands, the proposals for all but three were found to be consistent with the values and purposes of GCNRA. Those three (Rock Creek-Mudholes, Lake and Soda Allotments) had archeological conflicts which could be resolved through preservation activities and cooperative "protection alternatives", such as the proposed Cultural Resource Protocol. The BLM and the NPS will continue to work together to identify and protect cultural sites which may be impacted by livestock during the implementation phase of this plan amendment.

Grand Staircase-Escalante National Monument Science Plan

Grand Staircase-Escalante National Monument was established by Presidential proclamation on September 18, 1996 to protect its "spectacular array of scientific and historic resources". Archaeology, biology, geology, history and paleontology, among other items, were specifically mentioned in the enabling proclamation emphasizing opportunities for science. The focus on science was integrated in the MMP, completed in November 1999, and effective February 2000. The plan identifies scientific study as part of an overall vision for GSENM. The plan further states that: "Monument management priorities and budgets will focus on a comprehensive understanding of the resources of the Monument while assisting in the development of improved and innovative land management, restoration, and rehabilitation practices. The natural, physical, and social sciences, including the study of history will each play an essential role in science and research activities". The MMP identifies three priorities for the science program: 1) study, collect, or record scientific information that is most at risk of being damaged or lost through disturbance or the passage of time; 2) continue gathering baseline data on the biological, physical, cultural, and social sciences within GSENM and; 3) conduct applied research regarding the management of natural systems, including disturbance and recovery strategies. In addition to these priorities the Monument Advisory Committee (MAC) also serves to review and refine science recommendations to the Monument Manager.

There are three indentified areas for science in GSENM: to focus on the at-risk resources, continue baseline documentation and, apply science to management. These goals will be accomplished through integrated activity planning.

Overall, GSENM management priorities and budgets will focus on a comprehensive understanding of Monument resources with a focus on the development of improved and innovative land management, restoration, and rehabilitation practices. Multi-scale and interdisciplinary approaches will be used whenever possible. Uses of the GSENM will be

managed to complement science and research objectives and to provide information that feeds directly into the adaptive management framework.

The science component related specifically to the Rangeland Health Plan Amendment and Grazing EIS will focus on several components including, but not limited to: understanding and restoring native systems through ecological research and restoration of "native landscapes"; understanding native and non-native species utility and viability; developing desired plant communities; identifying major vegetation types; identifying palatable forage species and noxious weeds; understanding biological soil crusts; understanding springs, riparian, and relict areas; understanding and correcting soil erosion and compaction; determining hydrological and watershed needs; identifying and protecting threatened and endangered species (plant and animal); understanding the effects and needs of rangeland management; understanding the influences of locating range improvements relative to other resources; understanding recreation and livestock interactions; identifying cultural and historic resources; and monitoring. GSENM offers extremely high-value research opportunities, some of which may not be available elsewhere.

The GSENM science program is an example of how the BLM is applying research to improve management of public lands. Data gathering for management purposes is reflected in the fieldwork behind the rangeland health assessment program. In addition to aiding in the analysis of the grazing management practices and constraints, these data will have many additional uses, such as developing a vegetation classification scheme or picking sites with different levels of grazing impacts for experimentation. This information also has provided a baseline for future monitoring efforts. This adaptive management loop will be closed when decisions are made, based on the information collected, to continue current management or to change management of the areas being monitored.

ORGANIZATION OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)

The remainder of this document outlines alternatives for addressing the issues within the framework established by the Federal Land Policy and Management Act, the GCNRA establishing legislation and National Park Service Organic Act, and for lands within GSENM, the Monument Proclamation, applicable laws and regulations, and other directives. Briefly, the remaining chapters of this document are described as follows:

- ***Chapter 2 – Alternatives***

  This chapter describes the alternatives in detail, including specific actions that would be taken under each alternative, as well as items that would be common to all of the alternatives.

- *Chapter 3 – Affected Environment*

  The chapter characterizes the existing condition of the planning area, including baseline data and trends based on historical and current conditions.

- *Chapter 4 – Environmental Impacts*

  This chapter evaluates and displays the possible environmental, social, and economic consequences of implementing each alternative given the baseline data in Chapter 3.

- *Chapter 5 – Public Participation & Preparers*

  This chapter focuses on the consultation and coordination that took place throughout this effort including but not limited to:

  - the public participation process,
  - the review of planning consistency,
  - a list of agencies and organizations that were consulted,
  - a list of preparers of this document.

The appendices, glossary, and references can be found at the end of the document.

CHAPTER 2
ALTERNATIVES

INTRODUCTION

This chapter describes and compares five alternatives, consisting of four "Action" alternatives and the "No Action" Alternative. The alternatives vary in both context and intensity of potential management, and in sum constitute a wide-ranging set of designations, land use allocations, and management decisions. The action alternatives meet the underlying need for the proposed plan amendment and achieve the purposed goals of the amendment. Table 2-2 provides a tabular summary of management actions proposed for each alternative. A detailed discussion of potential impacts by alternatives is presented in Chapter 4 – Environmental Impacts.

Each alternative portrays a different concept for management, as defined by the application of desired future conditions, land use allocations, and management actions. All action alternatives afford protection for public land and Grand Staircase-Escalante National Monument (GSENM) resources, as required by FLPMA and the Monument Proclamation, and ensure that progress will be made towards meeting Rangeland Health Standards in those areas currently evaluated as not meeting Standards.

GSENM will continue to collect standard rangeland measurements on allotments during the DEIS comment period, prior to the release of the Final EIS and Record of Decision (ROD). These data will be considered and incorporated into the allotment permit renewal process prior to permit renewal. These new data will not change alternatives or affect proposed plan decisions described below.

This EIS proposes actions in many different resources as identified in the Management Common to All section. Differences in actions between alternatives occur only in Livestock Grazing and Wildlife Management which is why the alternatives discussion is limited to these two resources. Resources with impacts are addressed in Chapter 4.

DEVELOPMENT OF THE ALTERNATIVES

Continued livestock management under the existing Management Framework Plans (MFPs), as amended, is the No Action Alternative.

The planning team developed four additional alternatives using input from the public, BLM and NPS staffs, and cooperating agencies. The National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations, as well as BLM and NPS planning regulations, require the formulation of a reasonable range of alternatives to address identified planning issues and management concerns. Each alternative was evaluated for consistency with the Monument Proclamation, the Glen Canyon National Recreation Area (GCNRA) enabling legislation, as well as current laws, regulations, and policies.

Some of the livestock management actions included in the MFPs and the 1999 MFP Amendment were found to be acceptable and reasonable and would thus be carried forward under all the alternatives (See Management Actions Common to All Alternatives).

CHAPTER 2
ALTERNATIVES

Public input received during the scoping process was considered to ensure that all issues and concerns were addressed, as appropriate, in developing the alternatives and their management action options. The public scoping process and its results are presented in more detail in Chapter 5 – Public Participation and Preparers.

A number of cooperating agencies participated in alternative development including Kane County, Garfield County, the National Park Service, and the State of Utah. The staff of the BLM Kanab Field Office also participated in the planning process. The BLM coordinated a series of interagency planning meetings during the allotment evaluation and alternative development process. Preliminary drafts of the plan amendment and alternatives were provided to the cooperating agencies for review and comment.

IDENTIFICATION OF THE PREFERRED ALTERNATIVE (C)

Alternative C, "modify grazing management on allotments not meeting Standards including changes in season of use, pasture rotations and temporary suspensions in current authorized active use levels" is the preferred alternative. In developing this alternative, the BLM included an array of actions from among the various proposals that provide advantages with respect to the guiding principles given in Chapter 1. This array of action became Alternative C.

ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

The CEQ guidelines for implementing NEPA requires federal agencies to analyze a "reasonable" range of alternatives that substantially meet the purpose and need for this Draft Plan Amendment/DEIS. There were no reasonable alternatives identified that were beyond the jurisdiction of the BLM. The following specific alternatives, or actions that could be components of alternatives, were suggested but not analyzed or carried forward because they do not fulfill the requirements and needs of this Draft Plan Amendment/DEIS or are outside the scope of the Draft Plan Amendment/DEIS:

No Livestock Grazing Within GSENM

Numerous public comments received during scoping stated that Monument status was sufficient to justify closure to livestock grazing. (Note – GSENM encompasses 83% of the planning area covered by this Draft Plan Amendment.)

The Monument Proclamation states that, "Nothing in this proclamation shall be deemed to affect existing permits or leases for, or levels of, livestock grazing on Federal lands within the monument; existing grazing uses shall continue to be governed by applicable laws and regulations other than this proclamation." Therefore, it would not be appropriate to eliminate livestock grazing solely due to Monument designation.

An alternative that proposes to close the entire planning area to grazing would not meet the purposes and need of this Draft EIS. The National Environmental Policy Act (NEPA) requires that agencies study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of

available resources. No issues or conflicts have been identified during this land use planning effort which requires the complete elimination of grazing within the planning area for their resolution. Where appropriate, closures and adjustments to livestock use have been incorporated into the alternatives on an allotment or area basis to address issues identified in the document. Since the BLM has considerable discretion, through its grazing regulations, to determine and adjust stocking levels, seasons-of-use, and grazing management activities, and to allocate forage to uses of the public lands, the analysis of an alternative to entirely eliminate grazing is not needed.

An alternative that proposes to close the entire planning area to grazing would also be inconsistent with the intent of the Taylor Grazing Act (TGA) which directs the BLM to provide for livestock use of BLM lands, to adequately safeguard grazing privileges, to provide for the orderly use, improvement, and development of the range, and to stabilize the livestock industry dependent upon the public range.

The Federal Land Policy and Management Act (FLPMA) requires that public lands be managed on a "multiple use and sustained yield basis" (FLPMA Sec. 302(a) and Sec. 102(7)) and includes livestock grazing as a principal or major use of public lands. While multiple use does not require that all lands be used for livestock grazing complete removal of livestock grazing on the entire planning area would be arbitrary and would not meet the principle of multiple use and sustained yield.

Livestock grazing is and has been an important use of the public lands in the planning area for many years and is a continuing government program. Although the Council on Environmental Quality (CEQ) Guidelines for compliance with NEPA require that agencies analyze the "No Action Alternative" in all Environmental Impact Statements (EISs) for purposes of this NEPA analysis, the" no action alternative" is to continue the status quo which includes livestock grazing (CEQ Forty Most Asked Questions, Question 3). For this reason and those stated above a no grazing alternative for the entire planning area has been dismissed from further consideration in this LUP."

No Reduction In Livestock Grazing Within GSENM

Numerous public comments received during the scoping period stated that the Monument Proclamation prohibited livestock grazing reductions and "grandfathered" livestock grazing use, therefore preventing any consideration of changes in livestock grazing use levels in the Draft Plan Amendment/DEIS. As quoted previously, the Proclamation neither prohibits livestock grazing reductions nor does it "grandfather" in a specific level of grazing use. Rather, the "applicable laws and regulations" under which livestock grazing is administered by the BLM provide for the adjustment of grazing use, up or down, in response to resource conditions and monitoring. The grazing regulations require that the "appropriate action" be taken when grazing management practices or when levels of grazing use are significant factors in failing to achieve the standards and guidelines for grazing administration. About nineteen percent of the assessed lands do not meet the Standards as a result of existing or historical livestock grazing. Reductions in livestock numbers are one of the options available in meeting the requirement for "appropriate action," and are considered as a potential change in management.

Close To Livestock Grazing All Riparian Areas Determined In The MMP As Suitable For Designation Into The National Wild and Scenic River System (NWSRS)

The determinations for areas suitable for designation into the NWSRS were done with livestock grazing as one of the existing uses. There is no justification based on NWSRS criteria for now closing these areas to livestock grazing, a use which at the time of determination did not impact their being judged as suitable for inclusion in the NWSRS.

Manage Livestock Grazing Based Upon Monitoring Indices, Specifically Forage Utilization And Residual Plant Stubble Height

The interdisciplinary team suggested managing grazing by setting 40% utilization objectives on allotments that fail to meet Standards. Several variations of this approach were discussed, along with riparian and upland stubble height objectives. It was determined that setting utilization and/or stubble height indicators as objectives in a planning document conflicted with current BLM policy, and are not necessarily the resource objectives that needed to be met, so the proposal was not carried forward. Allotment specific utilization and stubble height indicators may be used in subsequent Allotment Management Plans to achieve allotment specific resource objectives, but will not be considered further as a planning level requirement or objective.

Submissions By Third Parties

Two proposals were submitted by specialists on behalf of potential affected interests. While neither submittal was consistent with the Purpose and Need behind the proposed changes in grazing management (and as such, did not constitute "alternatives" in the sense of the CEQ Regulations), both provided technical methodologies and information which proved valuable. Data and disclosures from both submittals were incorporated into the analysis to the maximum extent practicable.

MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES

This section lists management actions that do not vary by alternative (excepting Alternative A, the "No Action" Alternative) and are therefore "Common to All". They are grouped and listed here for simplicity. While management actions proposed under the alternatives vary, there are numerous discrete actions that are desirable regardless of which alternative is ultimately selected. Some of these actions consist of management decisions carried forward from older planning documents, while others have been developed during the planning process. The majority of decisions carried forward do not reflect a change in management, either being existing decisions retained (Management Plan Decision to "be carried forward"), or actions required to bring management into conformance with existing laws and policy (such as complying with the Endangered Species Act, or various Executive Orders).

CHAPTER 2
ALTERNATIVES

EXISTING LAND USE PLAN DECISIONS TO BE CARRIED FORWARD

Continue to authorize livestock grazing - Hall Ranch and South Fork Allotments.
Hall Ranch (34 acres) and South Fork (120 acres) are isolated parcels of public lands within private lands. They have been given the designation of "allotment," and each are authorized 12 Animal Unit Months (AUMs) of livestock use. The authorization is year-long but the areas are only used when livestock are on the adjacent private lands. These parcels may potentially be identified for disposal in the ongoing Kanab Field Office Resource Management Plan process.

Planning Action:
Reauthorize livestock grazing on Hall Ranch and South Fork allotments at 12 AUMs each.

Continue an existing Forage Reserve designation – Phipps Pasture
The Phipps Pasture of the Phipps allotment was designated as a "forage reserve" in a 1999 Land Use Plan (MFP) Amendment. The pasture remains in a condition where the vegetation could provide forage should an emergency situation (fire, drought, infestation) make regularly grazed areas unavailable. The pasture continues to be a viable option for use during emergency circumstances or during restoration efforts on other allotments.

Planning Action:
Retain the existing designation of Phipps Pasture as a Forage Reserve.

Continue most existing closures to livestock grazing
The areas listed below (Table 2-1) were closed to livestock grazing in coordination with Glen Canyon National Recreation Area/National Park Service access difficulties, watershed and riparian protection, conflict with management plans of other agencies, and conflicts with other resource uses. These concerns and the resultant closures remain valid. (See Chapter 3 – Affected Environment).

The seven areas closed in the MFP were found to be unsuitable for livestock grazing in the Kanab/Escalante Grazing Management EIS (1980).

Planning Action:
Continue the following closure decisions:

Table 2-1 Allotments Closed By Previous Land Use Plan

Area / Allotment	Decision Date	Management (minor/major)	Rationale for Closure
Lower Calf Creek	1964	BLM	Riparian Values & Livestock/Recreation Use Conflicts
Harvey's Fear	MFP 1981	NPS/BLM	Wildlife (Bighorn Sheep) Conflicts
Muley Twist	MFP 1981	NPS/BLM	Unsuitable for Grazing
Navajo Bench	MFP 1981	NPS/BLM	Wildlife (Bighorn Sheep) Conflicts
Spencer Bench	MFP 1981	BLM/NPS	Wildlife (Bighorn Sheep) Conflicts
Dry Rock Creek Pasture, Rock Creek	MFP 1981	NPS/BLM	Critical Watershed Areas
Middle Rock Creek Pasture, Rock Creek	MFP 1981	NPS	Critical Watershed Areas
Rattlesnake Bench	MFP 1981	BLM	Unsuitable for Grazing
Cottonwood Pasture, Deer Creek	LUP Amendment 1999	BLM	Riparian Values & Livestock/Recreation Use Conflicts
Escalante River	LUP Amendment 1999	NPS/BLM	Riparian Values & Livestock/Recreation Use Conflicts
McGath Point	LUP Amendment 1999	BLM	Riparian Values & Livestock/Recreation Use Conflicts
River and Horse Canyon Pastures, Big Bowns Bench	LUP Amendment 1999	BLM	Riparian Values & Livestock/Recreation Use Conflicts
River Pasture, Deer Creek	LUP Amendment 1999	BLM	Riparian Values & Livestock/Recreation Use Conflicts
River Pasture, Phipps	LUP Amendment 1999	BLM	Riparian Values & Livestock/Recreation Use Conflicts
Saltwater Creek	LUP Amendment 1999	BLM	Riparian Values & Livestock/Recreation Use Conflicts
Steep Creek	LUP Amendment 1999	BLM	Riparian Values & Livestock/Recreation Use Conflicts

Remove existing Horses from Navajo Bench, Harvey's Fear, and Spencer Bench Areas
Recommendation RM-5.1 from the Escalante MFP called for the removal of these horses. It was never implemented. There has been no change in circumstances since then. The vegetation resource conditions are still degraded, and the herd size (13-16 animals) is too small to maintain genetic viability. Introducing new genetic stock would increase the herd size, with an unacceptable negative impact on the plant community. A portion of the forage

base for the herd is on NPS lands, a use which conflicts with NPS regulations concerning exotic species.

Planning Action:
Recommendation RM-5.1 from the Escalante MFP will be carried forward and implemented.

EXISTING LAND USE PLAN DECISIONS TO BE MODIFIED AND CARRIED FORWARD

Close one currently unallotted allotment – Antone Flat
The Antone Flat Allotment, designated for unallotted status (no grazing) in the Escalante MFP (RM 2.8), would be closed to livestock use and the available forage allocated for wildlife. The allotment has not been used for livestock grazing. It is located within critical deer winter range and provides important forage for wildlife as well as watershed protection for the Escalante River system. No livestock grazing AUMs are currently authorized for this area. This decision clarifies the intent of the Escalante MFP decision and updates the wording to current direction in BLM's Land Use Planning Handbook 1601-1.

Planning Action:
Close Antone Flat allotment to livestock grazing.

Close one allotment and one pasture which are currently unused, but designated as forage reserves – Wolverine Pasture on Deer Creek Allotment, Little Bowns Bench Allotment
The Wolverine Pasture of the Deer Creek allotment and the Little Bowns Bench allotment, designated as forage reserves in a 1999 Land Use Plan Amendment Decision, would be closed to livestock use and managed for watershed protection and wildlife purposes. These two areas were placed in forage reserve status because the rugged topography, lack of access, lack of water, and limited forage made grazing difficult. There was no interest during the 1998-2004 drought emergency in accessing the forage in these "reserves." There were two requests to use these reserves in July 2007, but it was recommended by Monument range staff that they not be used because of drought conditions at that time. The request came in response to the Milford Flat Wildfire that consumed more than 300,000 acres of grazing allotments in Beaver and Millard Counties. This closure would not change management that has existed since the relinquishments were offered, therefore it will not be analyzed in Chapter 4, Environmental Impacts.

Planning Action:
Close Little Bowns Bench allotment to livestock grazing.
Close Wolverine Pasture of Deer Creek allotment to livestock grazing.

Vacate a 1981 MFP closure decision for the Dry Hollow Allotment
The Dry Hollow allotment, designated for closure in the Escalante MFP (1981), would be open for livestock grazing and be combined with the Boulder Creek allotment. The decision in the Escalante MFP to close the allotment to livestock grazing was never implemented. The allotment has been used as a pasture in conjunction with the adjacent Boulder Creek allotment and has been grazed every other year. A rangeland health assessment conducted in

the allotment found that it is meeting Rangeland Health Standards. Grazing use would be authorized as part of the Boulder Creek allotment and no additional AUMs, above those currently permitted, would be authorized.

Planning Action:
Designate lands within Dry Hollow allotment as open to livestock grazing.

Implementation Action:
Incorporate Dry Hollow allotment into Boulder Creek allotment by a rangeline agreement.

Open one currently closed area to grazing – Flag Point
Flag Point will be opened and combined with the White Sage allotment, but with no increase in AUMs above those currently authorized on the White Sage allotment The area is located between two sections of the White Sage allotment and separated from other public lands by private lands and the Vermilion Cliffs of Flag Point. This former allotment (or piece of an allotment) comprising 300 acres, was apparently closed to livestock grazing prior to 1980, but has been used without authorization for trailing between the two sections of the White Sage allotment, and by horses from adjacent private lands. This area would provide improved management and greater flexibility in managing the White Sage allotment by dispersing livestock use. Fencing would be required to ensure that livestock do not drift onto adjacent private land.

Planning Action:
Designate 300 acres open, and add to White Sage allotment with no increase in AUMs.

Implementation Action:
Execute rangeline agreement and cooperative range improvement (fence) agreement with permittee.

Future Project Implementation:
Construct a fence to separate the area from adjacent private lands.

Amend the GRAZ-1Monument Management Plan Grazing Decision
Decision GRAZ-1 in the Monument Management Plan (MMP) describes the Fundamentals of the Rangeland Health assessment and evaluation process, as well as other portions of the BLM grazing regulations. The BLM is already required to follow these regulations so they do not require a plan level decision. Changes in the grazing regulations or BLM policy would introduce conflict with the Monument Management Plan. Since the Rangeland Health assessment process is being completed, it is appropriate to remove the process description from the MMP and replace it with specific land use plan levels determinations. While several sections in GRAZ-1 remain current, other items are not consistent with the BLM's planning regulations (i.e., Allotment Management Plans would designate lands available for livestock grazing) or are out of date (i.e., completion of AMPs within 3 years of MMP approval) and need to be deleted.

Planning Action:
Amend the MMP by removing all of GRAZ-1 except for the following:

> "Grazing permits will ~~also~~ include any administrative access granted for the operation of the permit, and may include other authorizations (such as overnight camping or group size exceptions) necessary for operation of the permit."
>
> "No allotments will be converted from cows and horses to domestic sheep ***or goats*** within at least a 9-mile buffer of bighorn sheep habitat, except where topographic features or other barriers prevent physical contact."

EXISTING MONUMENT MANAGEMENT PLAN DECISIONS TO BE AMENDED OR CLARIFIED

Discussion
Over eight years of experience in Monument Management Plan implementation has uncovered inconsistencies and/or conflicts in the determinations concerning Vegetation Restoration Methods, Noxious Weed Control, Forestry Products, Native Vs. Non-native Plants, Reseeding after Fires, and Restoration and Revegetation. In particular, a central issue has surfaced concerning inconsistencies and conflicting direction in the use of native and non-native plant species in revegetation projects. The MMP anticipated a need for future modification, using a process outlined in the adaptive management section. Implementation experience has provided the knowledge necessary to apply the adaptive management process.

Additionally, the MMP does not analyze the impacts of (or to) livestock grazing from other resources. Consequently, some of the existing MMP decisions conflict with authorized and on-going rangeland activities. This conflict requires resolution.

Additional plan issues which need resolution/clarification:

- Grazing related range improvements, specifically seedings, are not addressed.
- The existing determinations on "Management ignited fire" have been superseded by the new Utah BLM Statewide Fire Plan.
- The "Noxious weed" determination does not include exotic or invasive non-native species.
- Current plan determinations do not allow for the creation of restoration forage reserves containing local genetics.

In order to simplify and consolidate land use plan decisions for vegetation management and provide for coordination with rangeland management and livestock grazing, the below listed sections are being merged into a single Vegetation Management section and the individual sections deleted.

- Forestry Products (i.e., decisions FP-1 through FP-4).
- Native Vs. Non-native Plants (i.e., decisions NAT-1 through NAT-6).
- Noxious Weed Control (i.e., decisions NW-1 through NW-8).
- Restoration and Revegetation (i.e., decisions REV-1).

- Vegetation Restoration Methods (i.e., decisions RM-1 through RM-7).
- Reseeding after Fires (i.e., decisions SEED-1 and SEED-2).
- Special Status Plant Species (i.e. decision SSP-6).

Items in the referenced sections of the MMP which merely restated existing agency policy or regulatory requirements, rather than land use plan level decisions, have been deleted and some operational requirements have been incorporated into the Standard Operating Procedures.

Planning Action
Replace portions of the existing Monument Management Plan with language ***added*** or ~~deleted~~ as shown below:

NOTE: A discussion/rational section follows the complete listing of the amendments.

Vegetation
[Retain existing language, with the following modification]

VEG-1
The BLM will place a priority on the control of noxious weed species and prevent the introduction of new invasive species ***per national guidance and local weed management plans***, in conjunction with Kane and Garfield Counties and the adjacent U.S. Forest Service, ~~and~~ National Park Service units, ***and appropriate local resource groups or individuals***. Further, in keeping with the overall vegetation objectives and Presidential Executive Order 11312, native plants will be used as a priority for all projects in the Monument except existing range seedings where a mixture of native and non-native will be used. ~~(see the **Noxious Weed Control** section for related decisions).~~

VEG-2 (unchanged)
The BLM will continue to coordinate with other organizations to inventory the Monument and evaluate the need for vegetation protection strategies. Such research will be coordinated as part of the implementation and adaptive management framework outlined in Chapter 3, and the results will be interpreted for management and public education purposes.

VEG-3
All proposed developments or surface disturbing activities will be required to include a site assessment for impacts to vegetation. Appropriate strategies will be used to avoid sensitive vegetation associations, and restoration provisions will be included in projects ~~(see the **Restoration and Revegetation** section for related decisions).~~

Special Status Plant Species
[Retain existing language, with the following modifications]

SSP-5
Future fuelwood cutting areas will not be designated in listed plant populations. ~~(see the **Forestry Products** section for related decisions).~~ ***(See "Vegetation Management" section).***

SSP-6 delete. [addressed in VM-7]
~~Areas with threatened or endangered plants will be targeted for noxious weed control activities as a first priority. BLM employees or contractors with appropriate certification will be responsible for use of chemicals in noxious weed~~

SSP-10 [clarify legal protections under Endangered Species Act]
Reseeding or surface disturbing restoration after fires will not be allowed in areas with ~~special status~~ *listed* and candidate plant species. Natural diversity and vegetation structure will provide adequate regeneration. Management ignited fires will also not be allowed in these areas unless consultation with the USFWS indicates that fire is necessary for the protection and/or recovery of listed species.

Vegetation Management
[New section, replaces "Vegetation Restoration," "Noxious Weed Control," "Forestry Products," "Native Vs. Non-native Plants," "Reseeding after Fires," and "Restoration and Revegetation"]

Consistent with the overall goal of achieving a natural range of native plant associations on the Monument, the intent of vegetation management on the Monument is to restore plant communities to a fully functional condition, with the appropriate, site specific, mix of native species, except for existing seedings which were established before monument designation (see VEG-1).

Vegetation management consists of the removal or reduction of undesired species, and the introduction or increase of desired species, through preparation of the site for seeding/transplanting, and follow-up actions which ensure seedling success. Techniques which alter the existing species composition include mechanical reduction, managed herbivory (livestock and wildlife), managed fire, and chemical herbicides. Methods of seedbed preparation are mainly mechanical. Seedling success is achieved through removal of plant competition (chemical or mechanical) and removal of undesired animal herbivory.

VM-1 (new)
All surface disturbing projects proposed in the Monument will contain a restoration or revegetation component.

VM-2 (MMP RM-7 revised)
Monitoring plans with quantitative success criteria will be developed for each restoration project. These success criteria will determine the effectiveness of management decisions for the project area, including setting goals for wildlife and livestock management.

VM-3 (new)
Equipment selection will be consistent with the Monument Management Zones. Within the primitive zone, only hand tools and non-motorized mechanized equipment may be used for restoration work.

VM-4 (new)
Outside of the primitive zone, mechanized motorized equipment may be used for surface scarification, site preparation and seeding. Equipment selection will be made with emphasis on minimizing surface disturbance, detrimental impacts on soils, and unnecessary impacts on Monument resources. The GSENM Advisory Committee will be consulted before the use of machinery for treatments is permitted.

VM-5 (MMP RM-4 and NW-5 revised)
Chemical application methods may be used in restoration to remove undesired species, Chemical herbicide use must conform to the intent of restoring vegetation communities, and must be esseutial to achieving Desired Future Condition. The Monument Advisory Committee will be consulted before any aerial application.

VM-6 (MMP NW-3 revised)
An array of methods will be used as appropriate for the control of specific exotic or invasive species. These methods include: the use of chemicals (aerial spraying, hand spraying, and painting), haud cutting, biological control agents, aud manual pulliug. Each of these methods has a place in the control

of these invasive species and will be evaluated for their effectiveness as eradication projects are designed.

VM-7 (NW-6 revised)
The exotic or invasive species control program will target species in a prioritized manner. Priorities for weed control may include: invasiveness of the species, extent of invasion, sensitivity of the area being invaded, and accessibility. Areas with special status species habitat will have a high priority for removal.

VM-8 (RM-6 revised)
The intent of managed fire is to restore natural fire regimes and fire dependent plant communities. Introduced fire may be used as a restoration tool on the Monument, but will not be used within plant communities (such as Blackbrush) where fire is not a naturally occurring disturbance. Proposed ignition sites will be assessed for the presence of non-native species (e.g., cheatgrass) which would alter natural fire regimes.

VM-9 (MMP NAT-1 & NAT-2 consolidated and revised)
Outside of range seedings (see VEG-1), non-native plants may be used in situations where they are essential to protecting Monument resources by stabilizing soils or displacing invasive and noxious weeds. In these situations, non-persistent, non-invasive species should be used in combination with native species to facilitate the ultimate establishment of native species. Non-native plants may also be approved when they constitute an integral part of research projects.

VM-10 (new)
The proposed use of non-native plants will be assessed by an interdisciplinary team during environmental analysis. The analysis should include an "all native" alternative to evaluate the impacts of approving non-native species. The GSENM Advisory Committee will be consulted prior to the use of non-native seed.

VM-11 (MMP NAT-5 revised)
Non-native plants will not be used to increase forage for livestock and wildlife, except in restoration of non-structural range improvements (i.e., range seedings) which were permitted prior to the creation of the Monument. All range improvement seedings shall be maintained for their intended purposes, and should include a diversity of species, including natives, appropriate for the location.

VM-12 (new)
When available, the use of locally adapted and collected native species will take precedence over native species from dissimilar ecoregions when selecting seed mixes.

VM-13 (MMP RM-3, RM-6 revised)
Livestock grazing may need to be modified, or excluded, following rangeland restoration projects, rangeland seeding maintenance, or introduced fire. If exclusion is necessary, at least two growing seasons will be required, except in experimental or research capacity or for restoration purposes. The exclusion may be continued until such time as monitoring determines the purpose of the project has been achieved, and that sufficient forage exists to resume grazing.

VM-14 (FP-1 revised)
Fuelwood harvesting, post cutting, and Christmas tree cutting, either private or commercial, will be authorized by permit within designated areas (MMP Map 3).

VM-15 (FP-2 revised)
Additional areas may be designated to meet the overall vegetation management objectives within either previously disturbed areas (i.e. existing rangeland seedings, wildfires, historic permitted woodcutting

areas, etc.) or areas where the removal of woodland products is necessary to achieve Desired Future Condition.

VM-16 (FP-3 unchanged)
In general, the off-highway vehicle restrictions discussed in the Transportation and Access sections will apply to forestry product areas (i.e., travel will be allowed only on designated routes and vehicles will be permitted to pull no more than 50 feet off designated routes in the Outback Zone). However, because forestry product collection activities are controlled by a permit and permits are issued to further overall management objectives, the BLM could authorize access on administrative routes and, in some cases, in areas more than 50 feet away from routes. These areas/provisions will be delineated in the permit prior to its issuance.

VM-17 (FP-4 revised)
Vegetation treatments within woodlands may include the commercial resale of residual products to offset treatment costs (i.e., Stewardship contracting). Commercial resale authority would not include commercial timber harvesting for Aspen, Douglas fir or ponderosa pine species.

Collections

COL-1 (seed collection language added)
Collection of Monument resources, objects, rocks, petrified wood, fossils, plants, parts of plants, animals, fish, insects or other invertebrate animals, bones, waste, or other products from animals, or of other items from within the Monument will be prohibited. Exceptions could include: collections authorized by permit in conjunction with authorized research or management activities ***including commercial collection of native plant seeds for public lands restoration***; the collection of small amounts of fruits, nuts, and berries for personal, non-commercial use; the collection of certain natural materials by Native American Indians under BLM permit; the collection of antlers or horns as provided for by UDWR regulations; and the collection of dead and down wood for immediate use in campfires, where campfires are allowed. The above prohibitions shall not be deemed to diminish the responsibility and authority of the State of Utah for management of fish and wildlife, including the regulation of hunting and fishing, on Federal lands within the Monument.

Discussion and Rationale for Proposed MMP Amendments

VM-9, VM-10, VM-11– MMP direction for using, or not using, native and non-native plant species in project work is unclear, which became apparent when rangeland seeding projects were considered as part of this Draft Plan Amendment. Currently VEG-1 and NAT-1 place a "priority" on the use of native species; NAT-2, NAT-4 and SEED-1 describe where non-native species may be used; NAT-3 prohibits the consideration of non-native species in project planning; and NAT-6 establishes requirement for monitoring non-native species when they are used. As a result of these seemingly conflicting decisions, the MMP appears to mandate the use of native species while allowing flexibility to include non-natives. VM-9, VM-10, & VM-11 clarify this issue by specifying the restrictive conditions under which non-native seed would be considered along with instituting a review and analysis process.

VM-11– Most rangeland seedings were authorized under Section 4 of the Taylor Grazing Act, and predate the creation of the Monument. Cooperative Agreements between the BLM and the grazing permittees define the intent of the seedings, along with individual responsibilities for maintenance. These Cooperative Agreements remain in effect until cancelled in a grazing decision (which would remove any existing requirements for management). Many of the seedings provided increased forage in one location so that

grazing could be reduced or temporarily suspended in other locations where watershed stability issues had been identified (e.g., Colorado River salinity). Future management of these seedings was not addressed in the MMP. The new wording clarifies that existing range permit privileges will be respected, while modifying species selection to increase plant community diversity.

VM-12, COL-1 – For vegetation restoration projects, locally adapted native seed is preferred over "native" seed collected in other areas. MMP COL-1 has been interpreted as prohibiting the issuance of commercial seed collecting permits within GSENM. As the need for native seed has greatly increased, the desire for locally adapted seed has increased. This revision is intended to facilitate the collection and availability of locally adapted native seed for vegetation restoration within the Monument.

VM-13 - In order for rangeland restoration to be successful, there must be sufficient time given for the vegetation to establish itself in self-sustaining communities. This requires a period of time when major disturbances or use of emerging vegetation must be restricted as much as possible. All rangeland restoration projects would have restoration objectives developed prior to initiation to provide for a measure of success and attainment of restoration objectives.

VM-15 – Implementation of FP-2 has been hindered by confusion over the scope of "previously disturbed." This revision attempts to provide additional guidance concerning this term. The revision also provides for the opportunity to identify treatment areas and use woodland product sales to achieve vegetation management objectives in woodlands (primarily pinyon-juniper woodlands).

VM-17 – A major tool available for woodland vegetation treatments is the commercial resale of woodland products under new authorities such as Stewardship Contracting to reduce costs and make available non-typical forest products. Biomass used as an alternative for power plant fuel and school utility systems has become a common use for these products. The MMP FP-4's prohibition on commercial timber harvest could be interpreted as preventing the commercial resale of woodland products. This revision is intended to differentiate woodland product resale from "traditional" commercial timber harvesting. Site specific environmental analysis would be conducted to analyze woodland treatment proposals and to establish stipulations.

NEW MANAGEMENT ACTIONS – LIVESTOCK MANAGEMENT

Desired Future Conditions

- Grazing would be authorized at a level which ensures both long term rangeland health and sufficient capacity to withstand periods of stress, while maintaining the economic vitality of the local livestock industry.
- All grazing lands, either upland or riparian, would meet or be making progress towards meeting the Utah Resource Advisory Council Standards for Rangeland Health. While maintaining progress, sufficient forage resources would be available to ensure the continuation of grazing during periods of exceptional disturbance, such as drought or fire.

- Long term authorized use levels would be predictable, allowing economic stability to the permittees, while maintaining the economic base of the industry within local communities.

Add a Growing Season Rest or Deferment Requirement

Vegetation, particularly grasses, is most vulnerable to grazing impacts during the period of time when a plant devotes its energy towards the production of flowers and ultimately seeds. Use of plants by grazing animals year after year during this period has been shown to seriously compromise plant vigor, root growth, and seed production. A restriction on grazing in consecutive years would provide a minimum of one season of rest and recovery over two growing seasons. The growing season is considered the time from boot stage to seed ripe (or sometimes called 'floral initiation to seed scatter'). The "growing season" may vary annually and is affected by factors such as elevation, precipitation, slope, aspect, and species. As a result, plant physiology and monitoring will determine the "growing season" rather than fixed dates. Growing season rest will also have a positive impact on soils, reducing compaction during times of high soil moisture. The exception for single pasture allotments meeting RLH Standards would avoid creating an unworkable management plan and recognize the fact that current grazing practices are allowing RLH Standards to be met.

Planning Action:

Amend plan to add the following determination:

GRAZ-2: Livestock grazing will not be authorized for consecutive years in the same pasture during the growing season for cool (spring) and warm (summer) season grasses with exceptions for single pasture allotments used during the warm season grass growing season where RLH Standards are being met.

Open one unallotted area –Varney Griffin allotment

The Varney Griffin allotment has been managed as an unallotted allotment with multiple annual trailing permits issued to one of the Permittees who trails through the area to access their permits on the Dixie National Forest. This allotment has been used to gather to and then move onto the forest or to their winter permit areas. Often livestock bunch up on the end fences and watering locations and increase impacts on the surrounding riparian areas, and wildlife habitat. The new authorized permit of 50 AUM's will allow for small herds to be trailed through the pasture. These small herds will move through the trailing area in a single days time. This permit will be issued to the Permittee with terms and conditions that will restrict the use to no more than 50 AUM's in a trailing season. The Trailing Pasture ingress and egress points and the actual dates of entry will be based on the Forest Service pasture rotation. Livestock will not be allowed to enter the trailing pasture before authorization to enter Forest Service Pastures has been received.

Planning Action:

Open the Varney Griffin allotment to grazing and authorize 50 AUM's of permitted (trailing) use.

Include one unallotted area within Upper Paria allotment
Add one unallotted area, referred to as Unalloted-South in Appendix 1, consisting of approximately 16,826 acres, to the Upper Paria allotment. This action would allow livestock grazing in this area during the current season of use for the Upper Paria allotment, but would not change the permitted AUMs or grazing preference.

Planning Action:
Include the Unallotted-South area in the Upper Paria allotment.

Close one unallotted area– Glen Canyon NRA
This is a small area in the Glen Canyon National Recreation Area located between the Soda Allotment and lands closed to grazing. It is inaccessible due to topography and is not used for livestock grazing. It appears to be a remnant area cut off when Lake Powell was filled. No livestock grazing AUMs are currently authorized in this area.

Planning Action:
Close Unallotted area on Glen Canyon National Recreation Area to livestock grazing.

Set Standard Requirements and Design Restrictions on Range Improvements
Range improvements impact wildlife and cultural sites. Proper range improvement design will prevent or mitigate many of these impacts. BLM policy requires the use of protective measures during the construction of rangeland improvements, with intent to ensure that environmental impacts are minimized. The current design criteria will be updated based upon this impact assessment. Specific measures include fencing design requirements which do not hinder wildlife movement, riparian protective measures, and wildlife safety measures.

Planning Action:
Kanab/Escalante Grazing Management EIS, *Design Specifications and Standard Operating Requirements for Rangeland Developments* (see Appendix 10) will be revised, updated, and incorporated into the Monument Management Plan.

Incorporate BLM guidance for Drought Management
BLM has issued Instruction Memorandum No. 2003-074 (Appendix 2)for drought management.

NEW MANAGEMENT ACTIONS – VEGETATION

Desired Future Conditions
- "Desired species, including native, threatened, endangered, and special-status species, are maintained at a level appropriate for the site and species involved as indicated by… appropriate amount, type, and distribution of vegetation reflecting the presence of (1) the Desired Plant Community [DPC], where identified in a land use plan conforming to these Standards." (*Utah BLM Fundamentals of Rangeland Health, Standard 3*)
- "The Monument will be managed to achieve a natural range of native plant associations. Management activities will not be allowed to significantly shift the makeup of those

associations, disrupt their normal population dynamics, or disrupt the normal progression of those associations." (*Monument Management Plan*)

Manage for Desired Plant Community

The existing Monument Management Plan language requires that vegetation be "managed to achieve a native range of plant associations," but does not specify what that range of "plant associations" are. The Utah Rangeland Health Standards also requires management for the "appropriate amount, type and distributions of vegetation reflecting the presence of the Desired Plant Community [DPC] where identified in a land use plan conforming to these Standards." A Desired Plant Community is established in Appendix 6, which includes values for cover, functional group composition, dominant and desired species, revegetation, and wildlife habitat.

Planning Action:

Amend Plan to add the following determination:

VEG-4: Manage vegetation to achieve or maintain Desired Plant Communities. When the Desired Plant Community can no longer be achieved due to vegetation having crossed an ecological threshold, manage sites to maintain soil, hydrologic, and biotic processes.

NEW MANAGEMENT ACTIONS – SPECIAL STATUS PLANT SPECIES

Desired Future Conditions

- Species listed as threatened or endangered would be recovered, with no prospective future species listings.
- Management actions would not jeopardize the continued existence of special status plants.
- Noxious and invasive species that compete with rare plants would be contained.

Modify grazing management to protect federally listed plants

Surface disturbing activities associated with grazing management facilities will be prohibited within habitat occupied by Federally listed plant species.

Planning Actions:

Addressed in existing determinations:

SPP-11 through SPP-25

Amend Plan to add the following determination:

VEG-5: Range improvements, salt blocks, and supplements will not be placed within habitat occupied by threatened or endangered plant species.

NEW MANAGEMENT ACTIONS – RIPARIAN AND WATER RESOURCES

Desired Future Conditions

- Riparian areas would continue in, or progress towards, Proper Functioning Condition (PFC).
- Watersheds would meet, or be making progress towards meeting, Standards for Rangeland Health.

- Stream channel morphology and functions would be appropriate to the local soil type, climate, and landform.
- Livestock grazing would not prevent riparian areas from achieving state water quality standards.
- Livestock grazing in riparian areas would not adversely affect the natural life cycles of amphibians, fish, and aquatic invertebrates.
- New water developments could be used as a management tool to better distribute livestock when deemed to have an overall beneficial effect on Monument resources, including water sources and riparian areas, or to restore or manage native species or populations. Existing water developments will be managed to meet the objectives of the MMP and the goals of this plan amendment.

Restore functionality to riparian areas impacted by range improvements
Riparian areas in locations where range improvements have been installed, or are proposed, will be restored to natural plant demographic and successional processes, by the use of proper improvement design, installation and operation.

Planning Actions:
Addressed in existing determinations:
RIPA-2, WAT-1, WDEV-1
Addressed in proposed determinations:
Design Restrictions and Standard Operating Requirements for Rangeland Development (See Appendix 10)

Implementation Actions:
- Implement the Riparian Toolbox as an assessment and corrective action instrument. (See Appendix 4)
- Pipe water to tanks or troughs outside of the immediate riparian area when waters are developed or redeveloped.
- Install float valves on all new and existing water developments when appropriate.
- Turn off water systems when not required by livestock unless otherwise required to meet resource or maintenance needs
- Implement a monitoring and science program to determine the effectiveness of management actions, assess resource conditions over time, and provide for adaptive management as land use decisions are implemented.

NEW MANAGEMENT ACTIONS – BIOLOGICAL SOIL CRUST (Issue 1, Standard 3, Desired Species)

Desired Future Conditions
- The health and distribution of biological soil crust is retained or improved.
- Research is undertaken to improve understanding and management of biological soil crusts, to include determining proper function, distribution and species composition of crusts.

Identify, prioritize and protect important areas of biological soil crust
Preserve and protect reference areas and populations of rare species and unique habitats (i.e., gypsum soils).

Planning Actions:
Addressed in existing determination
SOIL-1, SOIL-2, VEG-3

Implementation Actions
Locate rangeland improvements, salt blocks, and supplements on sites with low potential for biological soil crust when possible.

NEW MANAGEMENT ACTIONS – WILDLIFE

Desired Future Conditions - General
- Sufficient forage, water, cover, and space would be available for wildlife.
- Plant communities, and their dependent wildlife species, would be maintained or restored.
- Habitat connectivity and migration corridors would be maintained and wildlife movement would not be impeded by livestock management.

Manage riparian habitat for wildlife (see also New Management Actions – Riparian)
Meet wildlife needs by protecting and preserving water availability and quality.

Planning Actions:
Addressed in existing determinations:
RIPA-2, WAT-1
Addressed in proposed determinations:
Design Restrictions and Standard Operating Requirements for Rangeland Development (See Appendix 10)

Implementation Actions:
- Design water developments to maintain sufficient water to sustain existing native flora and fauna at the source and in downstream riparian areas.
- Make water sources available to wildlife outside the grazing season.
- Install wildlife escape ramps on water improvements.

Desert Bighorn Sheep
- Objectives contained within the Utah Statewide Management Plan for Bighorn Sheep would be achieved.
- Natural water sources in bighorn sheep habitat would provide for multiple uses while maintaining them as a viable bighorn sheep water source.

Planning Actions:
Addressed in existing determinations:
FW-1 and 3, GRAZ-1 (as proposed)

Greater Sage Grouse

- The conservation of sage grouse and sage grouse habitat would be advanced in accordance with the BLM's National Sage Grouse Habitat Conservation Strategy and Utah's Strategic Management Plan, to avoid contributing to the need to list the sage grouse as a threatened or endangered species under the Endangered Species Act.
- The integrity of sagebrush habitats will be sustained and improved, insuring that habitats will be of such quality, quantity and continuity to maintain sustainable populations of sage grouse. (*BLM National Sage Grouse Habitat Conservation Strategy)*

Planning Actions:
Addressed in existing determinations:
SSA-1, 2, 5, and 8

Implementation Action:
Implement the UDWR Sage Grouse Strategic Management Plan, the BLM National Sage Grouse Habitat Conservation Strategy, and recommendations from local sage grouse working groups to protect, maintain, or enhance current greater sage grouse populations and habitat.

Mule Deer

- Critical winter habitat would contain a mixture of shrub, grass, and forbs species.
- Mule deer migration routes would remain unfragmented.

Planning Actions:
Addressed in proposed determinations:
VEG-4
Design Restrictions and Standard Operating Requirements for Rangeland Development (See Appendix 10)

Implementation Actions:

- All fences in mule deer habitat would be modified or constructed to accommodate migration and movement.
- Mule deer habitats would be managed towards the population goals and objectives contained within UDWR's Deer Herd Management Plans for units 26 and 27.

Pronghorn Antelope

- Pronghorn antelope habitat would include a mix of forbs, grasses, and browse species.
- Water sources would ensure good year-round distribution of Pronghorn antelope.
- Pronghorn antelope movements would be unimpeded.

Planning Actions:
Addressed in proposed determinations:
VEG-4

Design Restrictions and Standard Operating Requirements for Rangeland Developments

Implementation Actions:

- Institute a monitoring plan to serve in achieving habitat and population goals.
- Work cooperatively with UDWR to achieve a population of approximately 500 animals in the Clark Bench/Lake Powell area of Herd Unit 26.
- Manage fawning grounds for sufficient browse cover to protect fawns and for forb production to provide for lactating does.
- Develop new water sources, or reconstruct existing ones, to gain better distribution.
- All existing and future fences in Pronghorn antelope habitat would be modified or constructed to accommodate migration and movement

NEW MANAGEMENT ACTIONS – SPECIAL STATUS WILDLIFE SPECIES (Issue 1, Standard 3, Desired Species)

Bald Eagle

- Livestock grazing practices are adopted that would protect or improve riparian structure and/or composition to provide prey habitat.
- Livestock grazing practices would provide for the regeneration of large trees as replacement roosts, perches, and nest platforms.

Planning Actions:
Addressed in existing determination:
RIPA-1

Implementation Actions:

- Manage riparian areas for Desired Plant Community
- Manage riparian areas for woody species multiple age class structure to produce replacement roost and perch platforms.

California Condor

California condor key habitats, including those for foraging, nesting, and roosting, would be managed to protect and preserve those associated vegetation communities by applying sound grazing management principles.

Planning Action:
Addressed in existing determination:
SSA-23

Implementation Action:
When consistent with other laws and regulations, encourage livestock owners to leave livestock carcasses on rangelands to provide an important food source for condors.

Mexican Spotted Owl

- Prey species habitat is managed to maintain populations of mice, voles, and rats within Mexican spotted owl critical habitats. Habitat maintenance includes good herbaceous ground cover (as indicated by good to excellent rangeland conditions), along with adequate levels of residual plant cover, seeds, fruits, and regeneration.
- The goals identified in the USFWS Mexican spotted owl Recovery Plan would be met.
- Livestock management related disturbances are avoided within critical habitat

Planning Action:
Addressed in existing determination:
SSA-21
Addressed in proposed determinations:
Design Restrictions and Standard Operating Requirements for Rangeland Developments

Implementation Actions:

- No range improvement construction within Mexican spotted owl Protected Activity Centers (PACs).
- No vegetation restoration in areas where Mexican spotted owls roost or nest unless USFWS consultation indicates no adverse effects.
- Vegetation treatments within PACs limited to non-breeding season (September 1st through February 28th).

Southwestern Willow Flycatcher

- Negative impacts by livestock grazing are reversed or eliminated in suitable or potentially suitable Southwest Willow Flycatcher habitat.
- The Southwest Willow Flycatcher USFWS livestock management guidelines are met.

Planning Action:
Addressed in existing determination:
SSA-22

Implementation Actions:

- Restrict livestock trampling impacts to less than 10% of alterable stream banks.
- Limit utilization to 40% on current year's growth of woody species and herbaceous species in Southwest Willow Flycatcher breeding habitat.
- Manage livestock within the Paria River segment of the Powell Management Unit to recover potential Southwest Willow Flycatcher breeding habitat.

NEW MANAGEMENT ACTIONS – CULTURAL RESOURCES

Desired Future Condition
Adverse impacts to National Register eligible sites from grazing are prevented or minimized with no discernable net loss of cultural resources scientific information.

Initiate a Cultural Protocol for livestock grazing impacts **(Appendix 3)**
Exclude, or if impractical, mitigate the impacts of livestock at all significant cultural sites.

Planning Action:
Amend Plan to add the following determination:

GRAZ-4: Cultural resource impacts from livestock will be prevented or mitigated by adherence to the Livestock Grazing Impacts Cultural Resources protocol.

Implementation Actions:

- Identify, quantify, assess and monitor livestock impacts through a comprehensive inventory and monitoring program.
- Prioritize protective actions which meet the threshold criteria given in the Protocol.

Table 2-2 Summary of the Alternatives

Resource or Resource Use	Alternative A No Action	Alternative B	Alternative C Management Preferred	Alternative D	Alternative E
General theme of Alternative	Maintain current level of resource use and protection. Reissue grazing permits with existing Terms & Conditions.	Make progress towards Standards using current range management techniques, with minimal stocking adjustments. Reissue grazing permits with existing Terms & Conditions.	Achieve Standards by allotment specific modification of grazing management with minimal temporary grazing suspensions and adjustments. Reissue grazing permits with Terms & Conditions.	Achieve Standards by allotment specific modification of grazing management including temporary grazing suspensions on allotments which fail upland Standards. Reissue grazing permits with Terms & Conditions.	Achieve Standards by allotment specific modification of grazing management including temporary grazing suspensions on allotments which fail riparian and/or upland Standards. Reissue grazing permits with Terms & Conditions.
Authorized Grazing Use (AUMs)					
AUMs estimated as available for active use upon implementation of Alternative (initial)	76,457	76,507	74,580	62,681	58,829
AUMs estimated as available for active use upon achieving Rangeland Health Standards (potential)	76,457	76,507	76,507	75,757	73,800
AUMs proposed for temporary suspension from current active use upon (initial) implementation	0	0	1,877	13,776	17,628
AUMs that could be restored to active use upon achieving Rangeland Health Standards (potential)	0	0	1,927	13,076	14,971
Long-term change in active use following successful alternative implementation	0	50	50	-700	-2,657

Table 2-2 Summary of the Alternatives Continued

Resource or Resource Use		Alternative A No Action	Alternative B	Alternative C Management Preferred	Alternative D	Alternative E
Livestock Grazing Management						
Allotments which meet all Rangeland Health and monitoring standards.	Management	No change	No change	No change	No change	No change
	Active Use	No change	No change	No change	No change	No change
	Monitoring	By MIC priorities	Minimal monitoring	Minimal monitoring	Minimal monitoring	Minimal monitoring
	Range Improvements	As proposed, site specific. Not tied to rangeland health.	Moderate priority overall.	Moderate priority overall.	Moderate priority overall.	Low priority overall.
Allotments which meet Rangeland Health Standards, but where monitoring indicates a need for action.	Management	Allotment or site specific as issues identified	Allotment specific actions in response to resource concerns	Allotment specific actions in response to resource concerns	Allotment specific actions in response to resource concerns	Allotment specific actions in response to resource concerns
	Active Use	No change in authorized use.	No change in authorized use	No change in authorized use.	No change in authorized use.	No change in authorized use.
	Monitoring	Continue MIC (Maintain, Improve, Custodial) priorities as listed in older land use plans.	Monitoring sufficient to detect changing conditions and response to needed actions.	Monitoring sufficient to detect changing conditions and response to needed actions.	Monitoring sufficient to detect changing conditions and response to needed actions.	Monitoring sufficient to detect changing conditions and response to needed actions.
	Range Improvements	On a site specific basis. Not prioritized.	Priority on response to site specific resource needs and vegetation restoration.	Priority on response to site specific resource needs and vegetation restoration.	Priority on response to site specific resource needs and vegetation restoration.	Priority on response to site specific resource needs and vegetation restoration.

Table 2-2 Summary of the Alternatives Continued

Resource or Resource Use		Alternative A No Action	Alternative B	Alternative C Management Preferred	Alternative D	Alternative E
Livestock Grazing Management						
Allotments which fail to meet Riparian Health Standard, but meet Upland Health Standards.	Management	No change. Existing range improvements would be maintained to exclude livestock from riparian areas.	Allotment specific management changes would be made with emphasis on exclusionary range improvements.	Allotment specific management changes would be made to include seasonal closures, season of use changes and range improvements.	Allotment specific management changes would be made to include seasonal closures, season of use changes and range improvements.	Grazing suspension until Standards are met. Prior to grazing use, complete new assessment to determine active use level and management direction.
Allotments: *Death Hollow* *Ford Well* *Rock Creek-Mudholes*	Active Use	No change in authorized active use.	No change in authorized active use.	No change in authorized active use.	No change in authorized active use.	Livestock Grazing would be temporarily suspended until the Standard for Riparian is met.
	Riparian Monitoring	PFC done prior to allotment evaluations.	Higher priority for riparian monitoring.	Annual riparian monitoring a high priority	Annual riparian monitoring a high priority	Annual riparian monitoring a high priority
	Range Improvements	As proposed, on a site specific basis.	High priority on exclusionary structures.	High priority on exclusionary structures. Medium priority for improved water distribution.	High priority on exclusionary structures. Medium priority for improved water distribution.	As proposed, on a site specific basis.

Table 2-2 Summary of the Alternatives Continued

Resource or Resource Use		Alternative A No Action	Alternative B	Alternative C Management Preferred	Alternative D	Alternative E
Livestock Grazing Management Continued						
Allotments which fail to meet Upland Health Standards (most also failing Riparian Standard) **Allotments:** *Collet* *Mollies Nipple* *School Section* *Soda* *Upper Paria* *Vermilion*	Management	Allotment-by-allotment. Allotments would continue to fail Standards.	Allotment specific management changes would include rest, rotational grazing systems, changes in grazing seasons.	Allotment specific management changes would include rest, changes in grazing seasons, rotational grazing systems, and temporary suspensions in active use for restoration.	Grazing suspension until Standards are met. Before re-authorizing grazing, complete new allotment evaluation to determine active use level and management direction.	Grazing suspension until Standards are met. Before reauthorizing grazing, complete new allotment evaluation to determine active use level and management direction.
	Active Use	No change in authorized active use.	No change in active use. Temporary non-use at discretion of permittee subject to grazing regulations.	Allotment evaluation to determine new stocking level following restoration.	Livestock grazing would be temporarily suspended until upland Standards are met.	Livestock grazing would be temporarily suspended until upland and riparian Standards are met.
	Monitoring	By MIC priorities	Higher priority, but standard monitoring cycle.	Allotment evaluation to determine new stocking level. Standard, approved monitoring procedures.	Allotment evaluation to determine new stocking level. Standard, approved monitoring procedures.	Allotment evaluation to determine new stocking level. Standard, approved monitoring procedures.
	Range Improvements	On a site specific basis. Not prioritized.	High priority for fences and water improvements to improve distribution. High priority on vegetation restoration projects.	Moderate priority for fences and high priority for water improvements based upon use pattern maps. High priority for vegetation restoration.	High priority for fences and water improvements to improve distribution. High priority for vegetation restoration.	Moderate priority for vegetation restoration. .

Table 2-2 Summary of the Alternatives Continued

Resource or Resource Use	Alternative A No Action	Alternative B	Alternative C Management Preferred	Alternative D	Alternative E
Relinquishment					
Reassignment of Relinquished AUMs and forage made available	BLM will follow the guidelines given for the process in the Washington Office (WO) Instruction Memorandum (IM) on processing relinquishments (refer to Appendix 7).	BLM will follow the guidelines given for the process in the Washington Office (WO) Instruction Memorandum (IM) on processing relinquishments (refer to Appendix 7).	BLM will follow the guidelines given for the process in the Washington Office (WO) Instruction Memorandum (IM) on processing relinquishments (refer to Appendix 7).	BLM will follow the guidelines given for the process in the Washington Office (WO) Instruction Memorandum (IM) on processing relinquishments (refer to Appendix 7).	BLM will follow the guidelines given for the process in the Washington Office (WO) Instruction Memorandum (IM) on processing relinquishments (refer to Appendix 7).
Allotment Specific Proposals (Allotments which fail to meet upland Standards)					
Collet	Continue current management.	No change in grazing management. Temporary closure Right Hand Collet Canyon.	Same as Alternative B.	Temporarily suspend grazing use until Standards are met.	Same as Alternative D. .
Mollies Nipple	Continue current management.	Authorize use at existing active use level. Implement six-pasture rotation. .	Restore production in four seedings. Follow BLM manual direction of rest for at least two growing seasons then conduct allotment evaluation to determine new stocking level. Create limited use Buckskin Gulch Pasture east of House Rock Valley Road.	Temporarily suspend use until Standards are met. Create limited use Buckskin Gulch Pasture east of House Rock Valley Road. Restore seedings. Allotment evaluation to determine new stocking level. Standard, approved monitoring procedures.	Same as Alternative D.

Table 2-2 Summary of the Alternatives Continued

Resource or Resource Use	Alternative A No Action	Alternative B	Alternative C Management Preferred	Alternative D	Alternative E
Allotment Specific Proposals (Allotments which fail to meet upland Standards), Continued					
School Section	Continue current management.	Authorize use at existing active use level. Implement two pasture rotation. Restore seeding then conduct allotment evaluation to determine new stocking level.	Same as Alternative B.	Temporarily suspend use until Standards are met. Restore seeding then conduct allotment evaluation to determine new stocking level.	Temporarily suspend use until Standards are met.
Vermilion	Continue current management.	Authorize use at existing levels, but with a revised Spring rest. Restore failed seedings.	Restore seeded pastures. Follow BLM manual direction of rest for two growing seasons. Allotment evaluation to determine new stocking level upon completion of restoration. Standard, approved monitoring procedures. Implement pasture rotation with rest or deferment. Create three-pasture deferred rotation on Nephi pasture.	Temporarily suspend use until Standards are met. Develop new AMP with pasture rotation and Spring rest. Create three-pasture deferred rotation on Nephi pasture. Allotment evaluation to determine new stocking level. Standard, approved monitoring procedures.	Same as Alternative D.

Table 2-2 Summary of the Alternatives Continued

Resource or Resource Use	Alternative A No Action	Alternative B	Alternative C Management Preferred	Alternative D	Alternative E
Allotment Specific Proposals (Allotments which fail to meet riparian Standards)					
Death Hollow	Continue current management.	Limit season of use to no later than 3/31.	Limit season of use to no later than 3/31. Restrict livestock access into upper Little Death Hollow and Wolverine Creek at the beginning of the narrows near the heads of the canyons.	Same as Alternative C.	Temporarily suspend livestock use. Upon reaching riparian Standards, limit season of use to no later than 3/31. Restrict livestock access into upper Little Death Hollow and Wolverine Creek utilizing existing recreation protection fence.
Ford Well	Continue current management.	No change from current authorized use. Riparian protection structures.	Same as Alternative B.	Same as Alternative B.	Temporarily suspend livestock grazing until Rangeland Health Standards are achieved.
Rock Creek-Mudholes	Continue current management.	No change from current authorized use. Riparian protection structures.	Same as Alternative B.	Same as Alternative B.	Temporarily suspend livestock grazing until Rangeland Health Standards are achieved. Closure of near relic area on southern tip of Grand Bench reducing allotment by 72 AUMs as per GCNRA.

Table 2-2 Summary of the Alternatives Continued

Resource or Resource Use	Alternative A No Action	Alternative B	Alternative C Management Preferred	Alternative D	Alternative E
Allotment Specific Proposals (Allotments which meet Standards)					
Big Bowns Bench	Continue current management.	Continue current management.	Same as Alternative B.	Close the remaining portions of the allotment to livestock grazing; a reduction of 750 AUMs.	Same as Alternative D.
Circle Cliffs	Continue current management	Limit season of use in Upper Gulch Pasture to 3/15.	Same as Alternative B.	Same as Alternative B.	Same as Alternative B.
Clark Bench	Continue current management.	Adjust season of use to 11/1 to 3/31. Create a Dive Pasture where grazing use would only be authorized when snow provided water availability.	Same as Alternative B.	Same as Alternative B.	Same as Alternative B.
Coyote	Continue current management.	Re-authorize livestock grazing at current active use level. Seeded pastures requiring restoration will remain open with reduced use until restoration work commences. Allotment evaluation to determine new stocking level upon completion of restoration. Standard, approved monitoring procedures.	Temporary non-use or suspensions of 588 active AUMs in the Sand Gulch and Five Mile pastures until restoration can be accomplished. Allotment evaluation to determine new stocking level upon completion of restoration. Standard, approved monitoring procedures.	Same as Alternative C.	Same as Alternative C.

Table 2-2 Summary of the Alternatives Continued

Resource or Resource Use	Alternative A No Action	Alternative B	Alternative C Management Preferred	Alternative D	Alternative E
Allotment Specific Proposals (Allotments which meet Standards), Continued					
King Bench Allotment - King Bench Pasture and the Lower Gulch	Continue current management.	Continue current management.	Develop a pasture use system in which the Gulch is not grazed after 2/28.	Same as Alternative C.	Same as Alternative C.
Lake	Continue current management.	Continue current management.	Continue current management.	Continue current management.	Close Navajo Point to grazing as per GCNRA.
Last Chance	Continue current management.	Continue current management.	Continue current management.	Continue current management.	Close a large a portion of the Winter Pasture accessed through East Rogers Canyon.
Willow Gulch Allotment - Upper Falls and Calf Creek riparian areas	Continue current management.	Continue current management.	Same as Alternative B.	Same as Alternative B.	Close Calf Creek to livestock grazing between the Upper and Lower Falls. Provide alternate water(s).

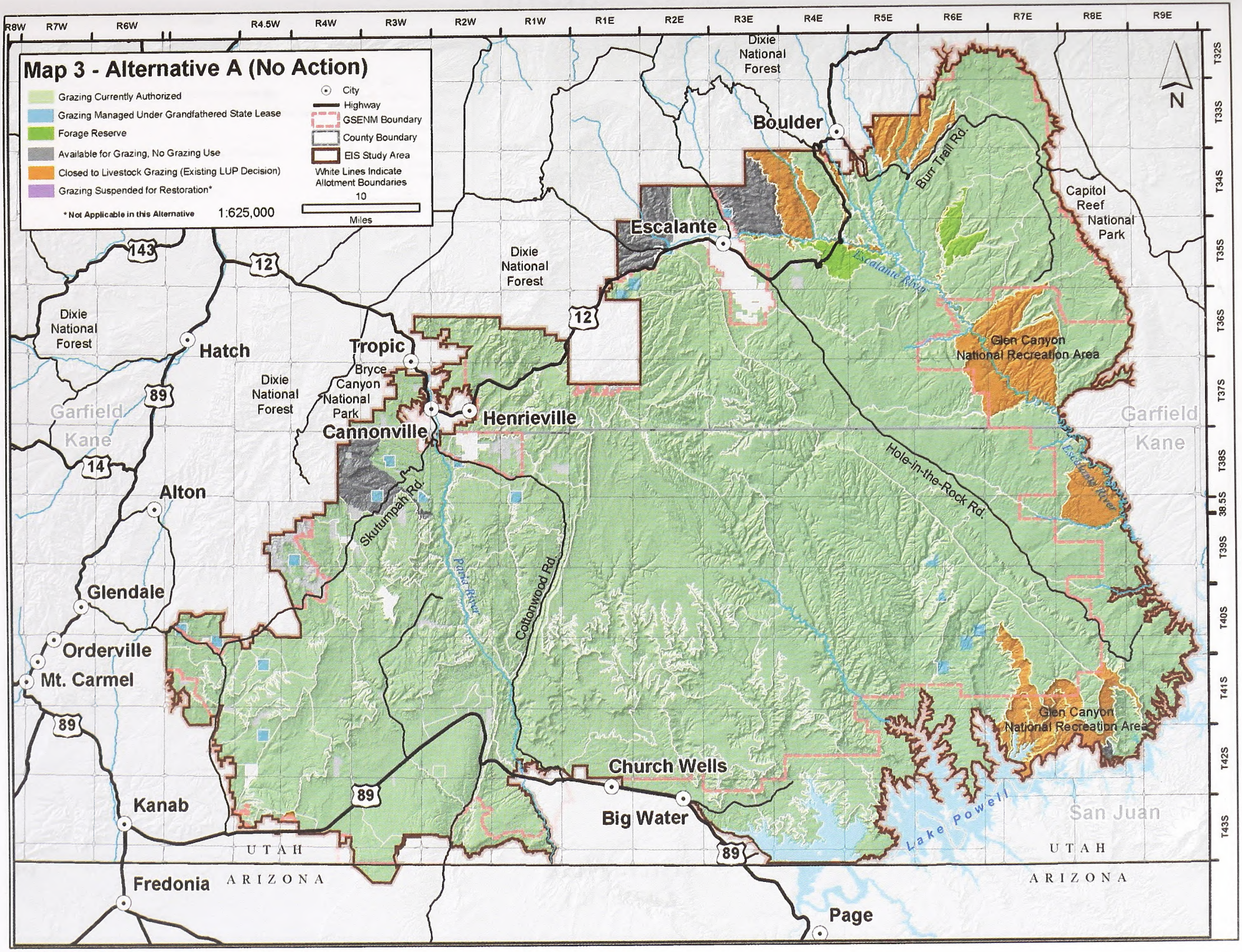
Table 2-2 Summary of the Alternatives Continued

Resource or Resource Use	Alternative A No Action	Alternative B	Alternative C Management Preferred	Alternative D	Alternative E
Threatened and Endangered Wildlife Management Proposals					
Southwest Willow Flycatcher (SWFL) – season of use	No seasonal use restrictions for livestock grazing within SWFL habitats.	No seasonal use restrictions for livestock grazing within SWFL habitats.	Livestock grazing would only be authorized from 11/1 to 2/28 in suitable SWFL habitat.	Livestock grazing would only be authorized from 11/1 to 2/28 in suitable SWFL habitat.	Livestock grazing would only be authorized from 11/1 to 2/28 in suitable or potentially suitable SWFL habitat.
Southwest Willow Flycatcher (SWFL) – plant utilization	Utilization standards for current year's growth are 50% for grass and 40% for woody species.	Utilization standards for current year's growth are 50% for grass and 40% for woody species.	Within SWFL habitat plant utilization of current year's growth would not exceed 35% for grass and 40% for shrubs.	Within SWFL habitat plant utilization of current year's growth would not exceed 35% for grass and 40% for shrubs.	Within SWFL habitat plant utilization of current year's growth would not exceed 35% for grass and 40% for shrubs.
Mexican spotted owl – season of use in Protected Activity Centers (PACS)	No season of use restrictions.	No season of use restrictions.	No livestock grazing would be authorized within PACS during breeding and nesting	No livestock grazing would be authorized within PACS during breeding and nesting.	No livestock grazing would be authorized within PACS during breeding and nesting.

Table 2-3 AUM Numbers by Allotment and Alternative

Allotment Name	AUMS in Current Actual Use	Alt. A	Alt. B	Alt. C		Alt. D		Alt. E	
				Initial	Potential	Initial	Potential	Initial	Potential
68 Allotments (unchanged, all alternatives)	55,833	55,833	55,833	55,833	55,833	55,833	55,833	55,833	55,833
Collet	97	97	97	97	97	0	97	0	97
Coyote	2,044	2,044	2,044*	1,456	2,044	1,456	2,044	1,456	2,044
Ford Well	328	328	328	328	328	328	328	0	328
Soda	2,798	2,798	2,798	2,798	2,798	0	2,798	0	2,798
Lake	1,310	1,310	1,310	1,310	1,310	1310	1310	1,016	1,016
Mollies Nipple	3,862	3,862	3,862	3,307	3,862	0	3,862	0	3,307
School Section	102	102	102	102	102	0	102	0	102
Upper Paria	2,780	2,780	2,780	2,780	2,780	0	2,780	0	2,780
Vermilion	2,849	2,849	2,849	2,065	2,849	0	2,849	0	1,813
Death Hollow	1,057	1,057	1,057	1,057	1,057	1,057	1,057	0	1,057
Rock Creek-Mudholes	2,173	2,173	2,173	2,173	2,173	2,173	2,173	0	2,101
Varney Griffin	0	0	50	50	50	50	50	50	50
Big Bowns Bench	750	750	750	750	750	0	0	0	0
Willow Gulch	474	474	474	474	474	474	474	474	474
Active Use Total	76,457	76,457	76,507	74,580	76,507	62,681	75,757	58,829	73,800

*If restoration is initiated this allotment would be temporarily reduced to 1,456 AUMs.


Map 3 - Alternative A (No Action)
Grazing Currently Authorized
Grazing Managed Under Grandfathered State Lease
Forage Reserve
Available for Grazing, No Grazing Use
Closed to Livestock Grazing (Existing LUP Decision)
Grazing Suspended for Restoration*
* Not Applicable in this Alternative
1:625,000
City
Highway
GSENM Boundary
County Boundary
EIS Study Area
White Lines Indicate Allotment Boundaries
10
Miles
N
R8W R7W R6W R4.5W R4W R3W R2W R1W R1E R2E R3E R4E R5E R6E R7E R8E R9E
T32S T33S T34S T35S T36S T37S T38S 38.5S T39S T40S T41S T42S T43S
Dixie National Forest
Boulder
Burr Trail Rd.
Capitol Reef National Park
Escalante
Escalante River
Glen Canyon National Recreation Area
143
12
Hatch
Tropic
Bryce Canyon National Park
Henrieville
Cannonville
Garfield
Kane
89
14
Alton
Skutumpah Rd.
Paria River
Cottonwood Rd.
Hole-in-the-Rock Rd.
Glendale
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Church Wells
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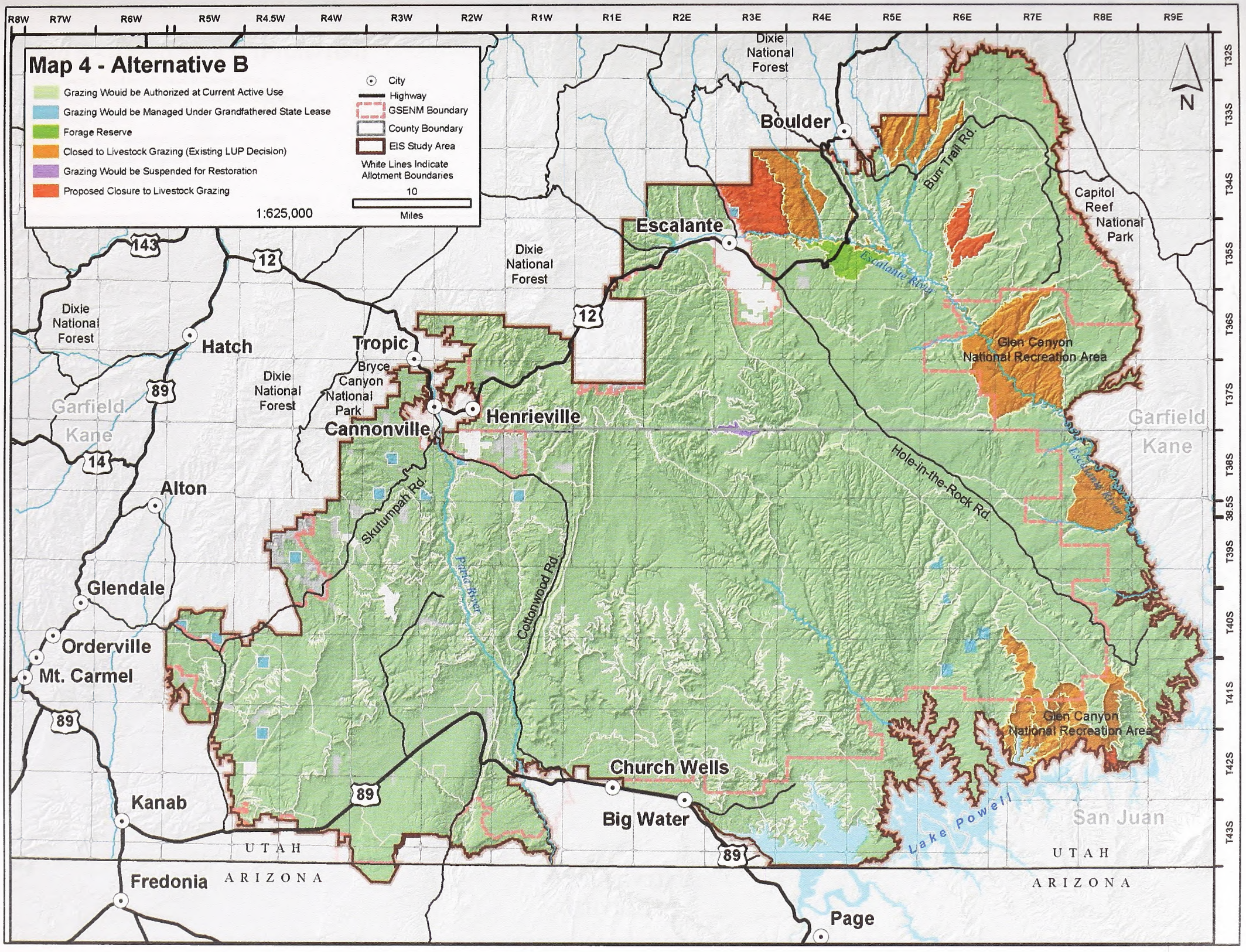
Map 4 - Alternative B
Grazing Would be Authorized at Current Active Use
Grazing Would be Managed Under Grandfathered State Lease
Forage Reserve
Closed to Livestock Grazing (Existing LUP Decision)
Grazing Would be Suspended for Restoration
Proposed Closure to Livestock Grazing
1:625,000
City
Highway
GSENM Boundary
County Boundary
EIS Study Area
White Lines Indicate Allotment Boundaries
10
Miles
N
R8W R7W R6W R5W R4.5W R4W R3W R2W R1W R1E R2E R3E R4E R5E R6E R7E R8E R9E
T32S T33S T34S T35S T36S T37S T38S 38.5S T39S T40S T41S T42S T43S
Dixie National Forest
Boulder
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Capitol Reef National Park
Escalante
Escalante River
Glen Canyon National Recreation Area
Hatch
Tropic
Bryce Canyon National Park
Henrieville
Cannonville
Garfield
Kane
Hole-in-the-Rock Rd.
Alton
Skutumpah Rd.
Paria River
Cottonwood Rd.
Glendale
Orderville
Mt. Carmel
Church Wells
Big Water
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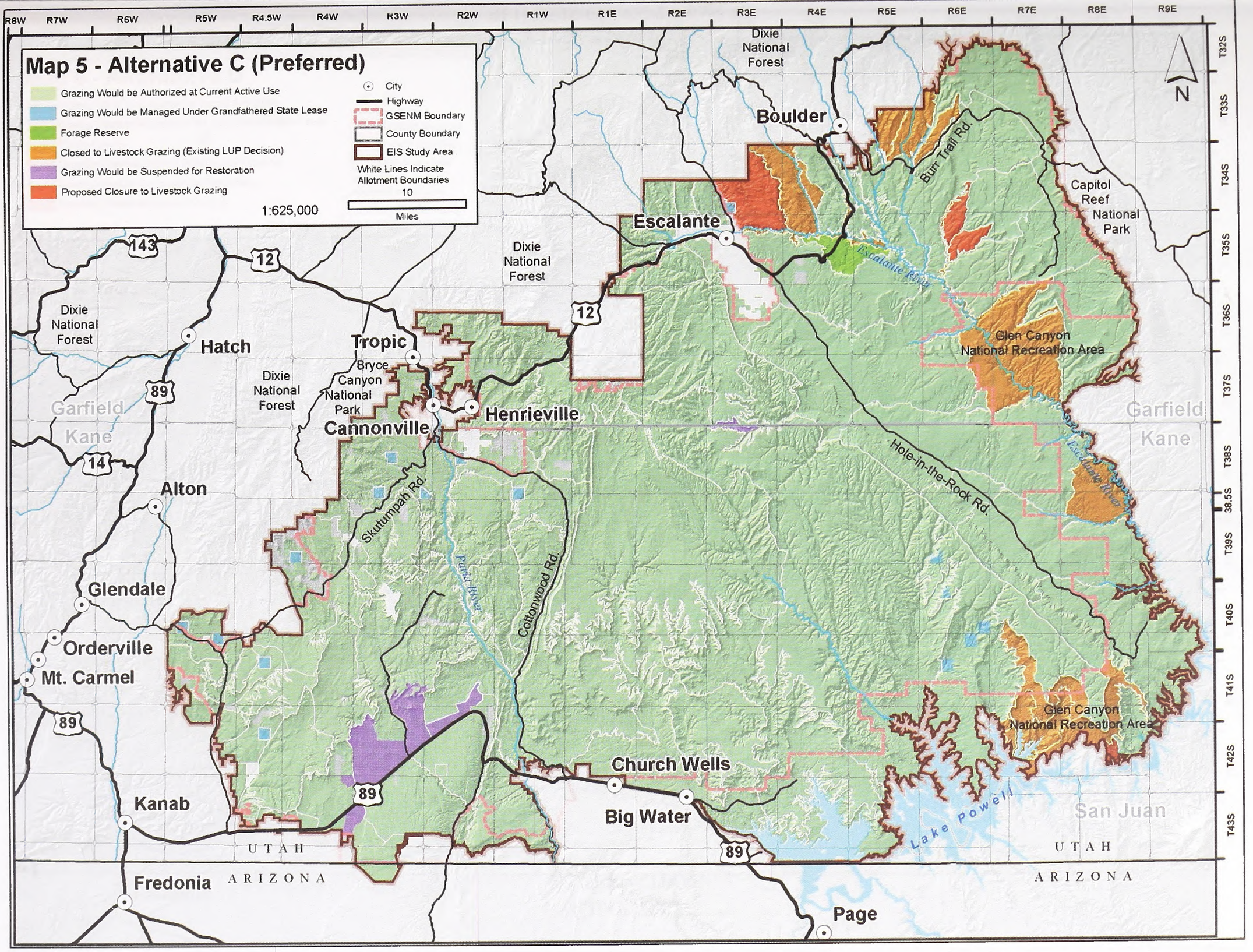
Map 5 - Alternative C (Preferred)
Grazing Would be Authorized at Current Active Use
Grazing Would be Managed Under Grandfathered State Lease
Forage Reserve
Closed to Livestock Grazing (Existing LUP Decision)
Grazing Would be Suspended for Restoration
Proposed Closure to Livestock Grazing
1:625,000
City
Highway
GSENM Boundary
County Boundary
EIS Study Area
White Lines Indicate Allotment Boundaries
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Miles
R8W R7W R6W R5W R4.5W R4W R3W R2W R1W R1E R2E R3E R4E R5E R6E R7E R8E R9E
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Dixie National Forest
Capitol Reef National Park
Burr Trail Rd.
Escalante River
Glen Canyon National Recreation Area
Hole-in-the-Rock Rd.
Tropic
Bryce Canyon National Park
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Cannonville
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Alton
Skutumpah Rd.
Paria River
Cottonwood Rd.
Glendale
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Mt. Carmel
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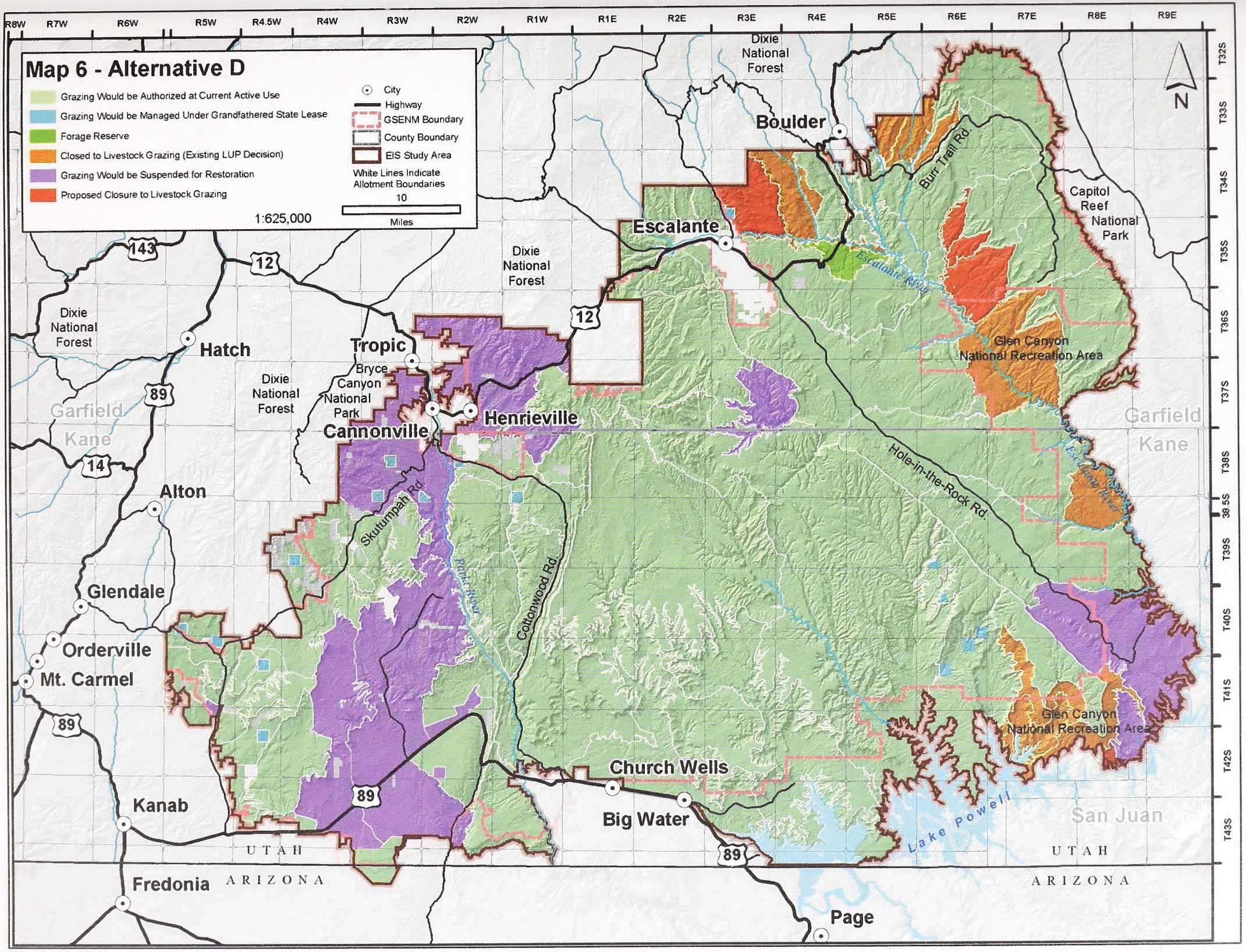
Map 6 - Alternative D
Grazing Would be Authorized at Current Active Use
Grazing Would be Managed Under Grandfathered State Lease
Forage Reserve
Closed to Livestock Grazing (Existing LUP Decision)
Grazing Would be Suspended for Restoration
Proposed Closure to Livestock Grazing
1:625,000
City
Highway
GSENM Boundary
County Boundary
EIS Study Area
White Lines Indicate Allotment Boundaries
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Miles
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Dixie National Forest
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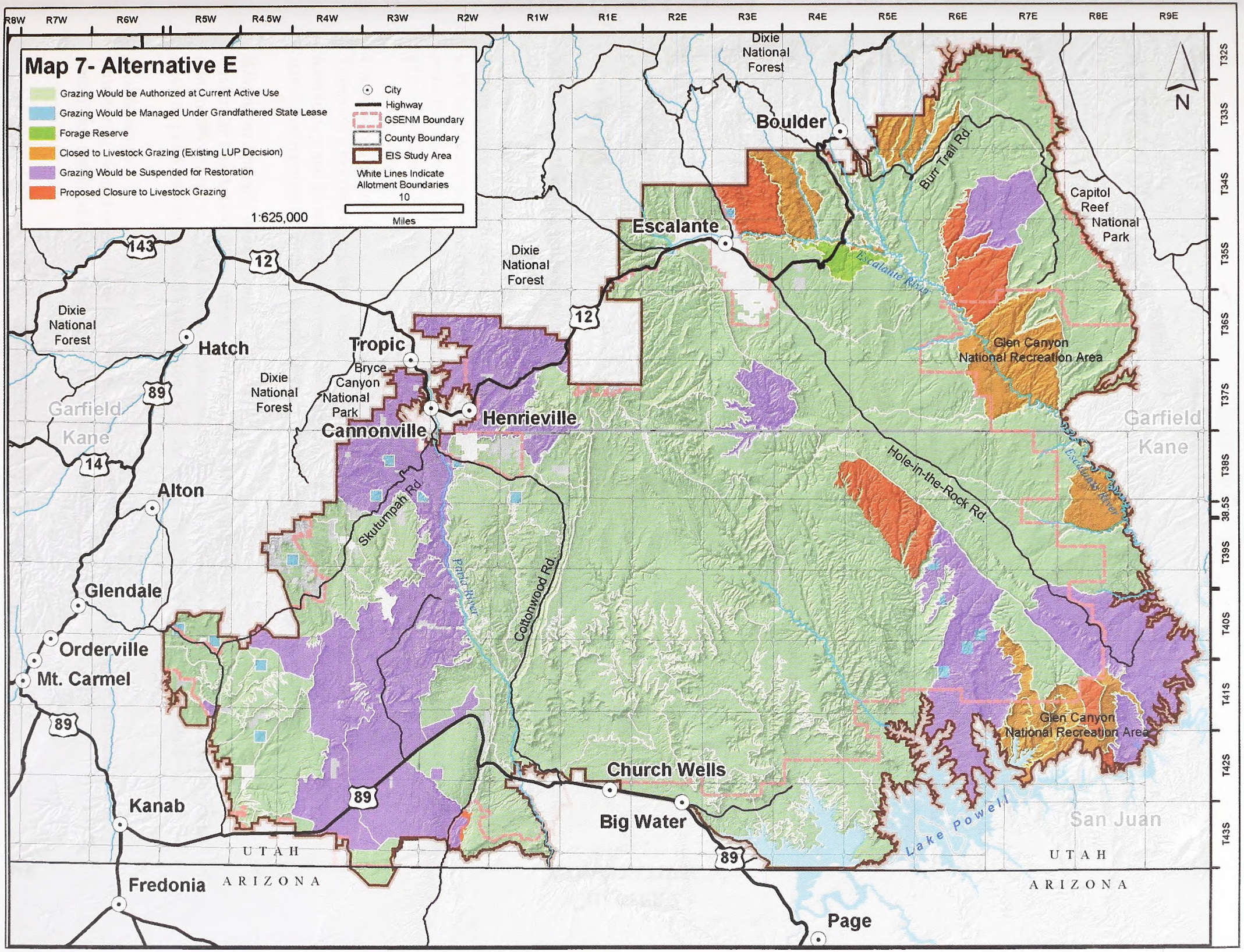
Map 7- Alternative E
Grazing Would be Authorized at Current Active Use
Grazing Would be Managed Under Grandfathered State Lease
Forage Reserve
Closed to Livestock Grazing (Existing LUP Decision)
Grazing Would be Suspended for Restoration
Proposed Closure to Livestock Grazing
City
Highway
GSENM Boundary
County Boundary
EIS Study Area
White Lines Indicate Allotment Boundaries
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Miles
1:625,000
R8W R7W R6W R5W R4.5W R4W R3W R2W R1W R1E R2E R3E R4E R5E R6E R7E R8E R9E
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Escalante River
Glen Canyon National Recreation Area
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Bryce Canyon National Park
Cannonville
Henrieville
Garfield
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Hole-in-the-Rock Rd.
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Skutumpah Rd.
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ALTERNATIVES ANALYZED IN DETAIL

ALTERNATIVE A - No Action

ALTERNATIVE SUMMARY

Livestock management would continue at the present authorized active use levels with minimal, if any, changes to grazing permit terms and conditions. Changes to existing management would be limited to short-term adjustments commonly associated with on-going allotment administration such as requests for change of season of use, modification to pasture rotation use, voluntary non-use, and temporary non-renewable use. Temporary suspensions may be necessary in areas selected for forage restoration projects. Currently closed areas would remain closed to livestock grazing, but no additional closures would be proposed. Range improvements would be considered on a case-by-case basis.

This Alternative would not be in compliance with existing regulations if minimal changes to grazing permit terms and conditions were not affective at improving the condition of allotments currently failing to achieve Rangeland Health (Standards) 43 CFR 4180.

LIVESTOCK GRAZING MANAGEMENT ACTIONS

Authorized livestock grazing

Continue to authorize 76,457 AUMs of active use livestock grazing. Total permitted use would remain at 106,138 AUMs, with 29,681 AUMs suspended use.

All allotments would be authorized for livestock grazing at current active use. Management changes in response to monitoring would continue to use routine grazing management techniques such as season of use, stocking modifications to allow for forage and precipitation fluctuations, pasture rotations, reduced use periods when existing utilization guidelines are reached, along with temporary non-use during restoration projects. No long-term closures or active use reductions would take place. Current restrictions on grazing which would be continued in this alternative are:

Grazing restrictions

Temporary grazing restrictions would be limited to areas of concern determined through monitoring and in response to events such as drought, fire and rangeland restoration projects. Areas undergoing restoration would be rested for at least two growing seasons.

Allotment Specific Management Actions

Under the No Action Alternative current management practices would be continued on all allotments except as noted above. Management changes would be considered on a case-by-case basis as proposed by either the permittee or BLM Rangeland Management Specialists.

Monitoring

Monitoring would continue to be prioritized by the MIC (Maintain, Improve, Custodial) categories assigned in the existing Management Framework Plans.

Rangeland Improvements
Existing rangeland improvements would be maintained (where they continue to serve their intended purpose(s)), or removed if necessary. Proposed new rangeland improvements would continue to be considered on a case-by-case basis.

WILDLIFE MANAGEMENT ACTIONS

Southwest Willow Flycatcher – season of use standards
Season of use grazing restrictions would not be implemented

Southwest Willow Flycatcher – plant utilization standards
Current utilization standards of 50% for herbaceous vegetation during the spring/summer season and 40% for browse species would continue.

Mexican Spotted Owl – season of use in Protected Activity Centers (PACS)
Season of use grazing restrictions would not be implemented.

ALLOTMENT SPECIFIC MANAGEMENT ACTIONS COMMON TO ALTERNATIVES B, C, D, & E

Circle Cliffs
Upon re-authorizing livestock grazing, alternate year spring/fall grazing would be required in the Upper Gulch Pasture. The season of use for the Upper Gulch Pasture would be limited to no later than March 15th.

Clark Bench
- Maintain the availability of the allotment for livestock grazing.
- Adjust season of use to November 1st to March 31st.
- Create a Dive Pasture where grazing use would only be authorized when snow provided water availability.
- Apportion AUMs between the pastures designating 938 AUMs to the current Clark Bench "pasture" and 300 AUMs to the new Dive Pasture.

The allotment is meeting Rangeland Health Standards. Use during the winter grazing season for the past several years is resulting in an upward trend. Portions of the allotment are only usable for grazing when winter rain or snow provides water in potholes.

Future Project Implementation:
- Install gap fencing (total approximately 1 mile) to create the Dive Pasture to be used when winter snows provide sufficient water availability.
- Repair the existing water catchment to limit use of and reliance on Calf Spring.
- Take necessary steps to keep livestock off the impoundment berm at Calf Spring and study the feasibility of pumping water away from Calf Spring for livestock.

ALTERNATIVE B

ALTERNATIVE SUMMARY

Grazing management would be modified only as necessary to begin the process of making progress towards meeting Rangeland Health Standards in areas not now meeting Standards and to meet the goals and objectives of the land use plan. Emphasis would be placed on reducing grazing impacts by improving distribution and season-of-use of livestock. Management changes would consist of routine techniques such as modified levels and timing of grazing use. Temporary suspensions will only be proposed when other options fail to produce improvements in range condition. Where reduced active use is warranted, temporary non-use or temporary suspensions would be used in lieu of reductions in permitted active use.

This alternative would place a high priority on reducing impacts through the use of range improvements. Improvements would be proposed which improve livestock distribution (fences, and water developments), reduce grazing pressure in areas which fail to meet Standards (exclosures or exclusionary devices), or restore lost forage (seeding restoration).

All items listed under **Management Actions Common to All Alternatives** are incorporated by reference.

LIVESTOCK GRAZING MANAGEMENT ACTIONS

Authorized livestock grazing
Initially authorize 76,507 AUMs of active use livestock grazing. Total permitted use would be 106,188 AUMs, including an allocation of 50 AUMs for Varney Griffin allotment, with 29,681 AUMs suspended use

Management changes in response to monitoring and those designed to move areas towards meeting Rangeland Health Standards would utilize routine grazing management techniques such as season of use modifications, pasture rotations, reduced use periods when utilization guidelines are reached, and temporary closures during restoration projects rather than long-term closures or actual use reductions.

For some allotments, proposed management actions and implementation actions have already been developed and these are listed below. Appendix 1 describes the proposed management for individual allotments in greater detail.

Grazing restrictions
Temporary grazing restrictions would be limited to areas of concern determined through monitoring and in response to events such as drought, fire and rangeland restoration projects. Areas undergoing restoration would be rested for at least two growing seasons.

Allotment Specific Management Actions
[Livestock grazing use in allotments listed below varies in at least one alternative. The allotments not listed would have livestock grazing re-authorized at current active use levels in all alternatives.]

Big Bowns Bench
No change from currently authorized active use.

Collet (same as Alternative C)
- Re-authorize livestock grazing at current active use level.
- Temporarily exclude livestock grazing from the portion of the Right Hand Collet Canyon that does not meet Rangeland Health Standards until Standards are met.

  Due to an allotment boundary fence problem, livestock from the Upper Cattle allotment have been using the lower end of Right Hand Collet within the Collet allotment. Relocating the allotment boundary fence to the correct location and eliminating use by livestock from the adjacent allotment is expected to result in recovery of this area. The permittee supports this action.

  Future Project Implementation:
  - Construct an allotment boundary fence at the correct location.
  - Install gap fencing to create three pastures to be used in rotation rather than every year.
  - Use limited to two pastures until Right Hand Collet riparian area recovers.

Coyote
- Re-authorize livestock grazing at current active use level.
- Seeded pastures requiring restoration will remain open with reduced use until restoration work commences.

  Implementation Action:
  Restore rangeland seedings; place in temporary non-use for at least two growing seasons. Livestock grazing will be considered as long as the seeding is moving toward desired plant community.

Death Hollow
- Re-authorize livestock grazing at current active use level.
- Limit the season of use for livestock grazing to no later than March 31st.
- Restrict livestock access into upper Little Death Hollow and Wolverine Creek at the narrows near the head of the canyons.

  While most livestock are usually off this allotment by March 31st, a small number are often left through May 15th. The BLM range staff considers use between March 31st and May 15th as a contributing factor in the allotment's not meeting Rangeland Health Standards, particularly as it occurs during the critical growing season for spring grasses. If this period of use is terminated the causal factor in not meeting Standards would be eliminated. No AUM adjustments are proposed.

  Restricting access into the canyons will prevent livestock from being "driven" into the narrows to avoid hikers.

Future Project Implementation:

- Construct drift fences to restrict livestock access into upper Little Death Hollow and Wolverine Creek narrows.
- Construct riparian protection fences.

Ford Well (same as Alternatives C & D)
No change from currently authorized active use. Maintain the Ford Well Spring protection fence, repair/replace collection and storage system.

Future Project Implementation:
Construct a fence, collection system and install a trough at Old Corral Spring.

Soda (same as Alternative C)
No change from currently authorized active use.

Future Project Implementation:
BLM and Glen Canyon NRA would fence springs while maintaining livestock water access.

King Bench
No change from currently authorized active use.

Lake
No change from currently authorized active use.

Future Project Implementation:

- Riparian area protection on a site-by-site basis.

Last Chance
No change from currently authorized active use.

Mollies Nipple

- No change to currently authorized active use, however, voluntary non-use would continue until restoration is completed.
- Upon successful restoration of the seeded pastures, establish a new authorized use level based on the restored forage (potentially 3,862 active use AUMs for the allotment).
- Rest two of the five transition pastures in the spring (approximately April 1st to May 31st) in order to meet the spring growing requirements of emerging vegetation. Rest two transition pastures in the fall (October 1 – November 30) alternating years with the other two transition pastures.
- Summer (approximately June 1 to September 30) and winter (approximately December 1 to March 31) use would continue as presently authorized.
- Initiate seven-pasture deferred rest rotation.
- Control the season of use in the newly created Gulch Pasture east of the House Rock Valley Road to resolve or reduce recreational impacts.

- Create a "new" Buckskin Gulch Pasture in the southeast corner of the Buckskin Pasture above the Buckskin Narrows.
- When conditions allow, grazing could be authorized in the new pasture from December 1st to February 28th every other year.

Following the developed seven-pasture deferred rotation plan is necessary to provide for periodic pasture rest and improved plant vigor. In the past, failure to fully implement the rotation plan, and the extended periods of drought, has resulted in a decline in the condition of the seeded pastures. The seeded pastures, which have accounted for 43% of the allotment's AUMs in the past, are being restored.

The Mollies Nipple allotment experiences conflicts between livestock use and hikers in the Buckskin Narrows. Because livestock congregate at the small seep above the Narrows, there is a tendency for them to be "pushed" down the Narrows as they try to avoid hikers. Additionally, the small seep in the area does not provide sufficient water for livestock purposes and is being impacted by livestock use. The area concerned is dominated by a large gravelly wash bottom and does not produce sufficient forage for annual grazing use. This alternative would manage the season of use and place protective structures for livestock control and spring protection in Buckskin Narrows to resolve the recreational conflict and allow restoration of the riparian area.

Implementation Actions:

- Rock House, Jenny Clay, Blue Spring, and Telegraph Pastures would be placed in temporary non-use as they are treated.
- Resume livestock grazing after at least two growing seasons and monitoring determines forage availability and appropriate active use upon restoration of seedings.
- Develop an interim pasture rotation schedule while the treated pastures are in the restoration phase.

Future Project Implementation:

- Split Nipple Pasture into East Nipple and West Nipple Pastures. Initiate deferred summer rotation using the two pastures generally from 6/1 to 7/31 and 8/1 to 9/30.
- Deferred use of the five transition pastures by alternating use to ensure spring and fall rest period every other year. Generally 4/1/ - 5/15, and 10/1 – 11/30.
- Continue winter use of Buckskin Pasture. Generally 12/1 to 3/31.
- Construct 3.7 miles of fence along the House Rock Valley Road, and livestock drift and spring protection fences in the Gulch pasture.
- Develop alternate water sources in the Buckskin Pasture in the vicinity of the House Rock Valley Road, the south western half of Buckskin, and Deer Trails area of the Nipple Pasture.
- Summer (approximately June 1 to September 30) and Winter (approximately December 1 to March 31) use would continue as presently authorized.

Rock Creek-Mudholes

No change from currently authorized active use.

School Section (same as Alternative C)

- No change from currently authorized active use.
- Divide the allotment into two pastures by fencing the old seeding from the untreated area of the allotment. Implement a two pasture deferred grazing system on the allotment, which would defer the early spring grazing on one pasture each grazing season.
- Restore the old seeding. The area that would be reseeded would rest from livestock grazing for at least 2 years

Upper Paria

No change from currently authorized active use.

Future Project Implementation:

Manage South Pasture within Upper Paria allotment for emergency use.
Seeded pastures requiring restoration will remain open with reduced use until restoration work commences, and then will be placed in temporary non-use for at least two years until restoration objectives are met.

Vermilion

- Re-authorize livestock grazing at current active use level.
- Change the season of use to April 16th through May 20th and June 1st through February 28th.
- Seeded pastures requiring restoration will remain open with reduced use until restoration work commences, and then will be placed in temporary non-use for at least two years until restoration objectives are met.

Implementation Action:

Restore seeded pastures RCA1 and Fossil Wash.

Willow Gulch

Re-authorize livestock grazing at current active use level.

Implementation Actions

Monitor use levels and riparian conditions adjacent to Upper Calf Creek Falls and in Calf Creek above the Lower Falls and adjust or restrict use based on riparian conditions.

Priorities for Monitoring

Rangeland monitoring would continue using the existing monitoring schedule. A higher monitoring priority would be placed upon allotments which do not meet standards, while a lower priority would exist for allotments with no identified concerns. No GSENM-wide priorities would be set; monitoring priorities would be set on an allotment specific basis to respond to identified issues.

Rangeland Improvements

Existing rangeland improvements would be maintained where they continue to serve their intended purpose(s), or removed if necessary. Proposed new rangeland improvements would

continue to be considered on a case-by-case basis, with emphasis on improving distribution, or removing grazing pressure from riparian areas which fail to meet Standards.

A factor in not meeting Rangeland Health Standards and Proper Functioning Condition for many riparian (spring) areas is the lack of adequate maintenance of protective fencing around water sources. Many fences were found to be down due to age, flood damage, or livestock pressure. Repairs to these protective fences is expected to provide the action(s) necessary to reverse site deterioration and lead to these areas making progress towards, and eventually meeting, Rangeland Health Standards and Proper Functioning condition.

Implementation Actions Proposed:

- Repair fencing projects where field evaluations have identified maintenance needs.
- Evaluate all other projects for maintenance needs and functionality.
- Decommission projects no longer required or functioning.

WILDLIFE MANAGEMENT ACTIONS

Southwest Willow Flycatcher – season of use standards
Season of use grazing restrictions would not be implemented.

Southwest Willow Flycatcher – plant utilization standards
Current utilization standards in suitable habitat of 50% for herbaceous vegetation during the spring/summer season and 40% for browse species would continue.

Mexican Spotted Owl – season of use in Protected Activity Centers (PACS)
Season of use grazing restrictions would not be implemented.

ALTERNATIVE C – PREFERRED ALTERNATIVE

ALTERNATIVE SUMMARY

Grazing management would be modified with priority on restoring rangeland health while providing research opportunities in restoration and monitoring success. Emphasis will be placed on modifying livestock management on allotments which fail multiple Standards and where rangeland monitoring shows no indication of positive change. For planning purposes and the estimation of future uses, an assumption has been made that restoration actions would restore forage availability to previous levels. However, allotment specific evaluations would determine the actual active use levels upon successful restoration.

Site-specific measures to correct identified problems would be implemented in allotments which did not meet the riparian Standard, or which show declining conditions.

Research opportunities concerning vegetation restoration would be vigorously pursued, with emphasis on restoring failed seedings and riparian areas. Coincident with this will be studies involving monitoring techniques. Specific attention will be on determining whether site specific upland stubble height standards have use as a management tool. Implementation monitoring would also be a high priority.

All items listed under **Management Actions Common to All Alternatives** are incorporated by reference.

LIVESTOCK GRAZING MANAGEMENT ACTIONS

Authorized livestock grazing
Initially authorize 74,580 AUMs of active use livestock grazing. Following successful rangeland restorations and evaluations that show allotments to be meeting Standards and forage to be available, active use AUMs may be increased to 76,507. Total permitted use would be 106,188 AUMs, including an allocation of 50 AUMs for Varney Griffin allotment.

Livestock grazing in Allotments which met Rangeland Health Standards
Rangeland Health in the 73 allotments listed below were evaluated as meeting Rangeland Health Standards. Management changes in response to monitoring would involve routine grazing management techniques such as season of use modifications, pasture rotations, reduced use periods when utilization guidelines are reached, and temporary closures during restoration projects.

Table 2-4 Proposed Livestock Grazing in Allotments Meeting RLH Standards (Alternative C)

Allotment	Active Use		Allotment	Active Use	
	Initial	Potential		Initial	Potential
Alvey Wash **	1,424	1,424	Long Canyon *	289	289
Big Bowns Bench *	750	750	Locke Ridge (State)	27	27
Big Horn **	3,515	3,515	Lower Hackberry	435	435
Black Ridge	903	903	Last Chance	4,289	4,289
Black Rock	408	408	Lower Cattle	7,488	7,488
Black Rock (State)	64	64	Lower Warm Creek	225	225
Boot	45	45	Main Canyon (State)	14	14
Boulder Creek	80	80	Moody	909	909
Bull Run (State)	5	5	Moyle C. Johnson	53	53
Bunting Trust	16	16	Mud Springs **	277	277
Calf Pasture	176	176	Neaf	9	9
Circle Cliffs**	1,050	1,050	Nipple Bench	993	993
Clark Bench *, **	1,238	1,238	Pine Creek	144	144
Cockscomb	36	36	Pine Creek (State) **	27	27
Cottonwood	3,153	3,153	Pine Point	365	365
Coyote**	1,456	2,044	Round Valley	522	522
Deer Creek	358	358	Roy Willis	9	9
Deer Range **	231	231	Rush Beds **	252	252
Deer Springs Point **	503	503	Second Point **	69	69
Deer Springs (State)	82	82	Second Point (State)	29	29
Dry Valley	677	677	Sink Holes	154	154
Dry Valley (State)	22	22	Slick Rock State	24	24
Five Mile Mountain**	385	385	South Fork	12	12
First Point	410	410	Swallow Park**	1,068	1,068
Flood Canyon	--	--	Timber Mountain	426	426
Fortymile Ridge	4,290	4,290	Upper Cattle **	8,158	8,158
Hall Ranch	12	12	Upper Hackberry	654	654
Granary Ranch	70	70	Upper Warm Creek **	1,638	1,638
Haymaker Bench	100	100	Varney Griffin	50	50
Johnson Canyon **	274	274	Wagon Box Mesa	637	637
Headwaters**	3,822	3,822	Wahweap	491	491
Hells Bellows	44	44	White Rock	60	60
Johnson Lakes **	495	495	White Sage **	76	76
Johnson Point	135	135	Wide Hollow *	353	353
King Bench *	1,515	1,515	Willow Gulch *	474	474
Lake Powell	20	20	Wiregrass	99	99
Lake	1,310	1,310			

* see Allotment Specific Actions below

** area(s) within allotment did not meet RLH Standards but allotment as a whole did

Allotment notes - Johnson Lakes includes Flood Canyon AUMs; Long Canyon – combination of Locke Ridge & Meadow Canyon allotments

Livestock Authorization in allotments which did not meet Rangeland Health Standards Due to Livestock Grazing

The following allotments were evaluated as not meeting Rangeland Health Standards. Management changes in active use are proposed as detailed below. For a complete description of changes in individual allotments, see Appendix 1.

Table 2-5 Proposed Livestock Grazing in Allotments Not Meeting RLH Standards Due to Livestock Grazing (Alt. C)

Allotment	Proposed Active Use		Current Active Use
	Initial	Potential	
Collet	97	97	97
Death Hollow	1,057	1,057	1,057
Ford Well	328	328	328
Mollies Nipple	3,307	3,862	3,862
Rock Creek-Mudholes	2,173	2,173	2,173
School Section	102	102	102
Soda	2,798	2,798	2,798
Upper Paria	2,780	2,780	2,780
Vermilion	2,065	2,849	2,849

Grazing restrictions

- Livestock grazing in areas undergoing rest as a result of range restoration projects or post fire rehabilitation would be placed in temporary non-use or suspensions for at least two growing seasons until restoration objectives have been met.
- Temporary restrictions of varying lengths could also apply to areas where rangelands are not making progress towards achieving Standards and to recover from events such as drought.

In order for rangeland restoration projects to be successful, there must be sufficient time given for the vegetation to establish itself in self sustaining communities. This requires a period of time when major disturbances or use of emerging vegetation must be restricted as much as possible. All rangeland restoration projects would have restoration objectives developed prior to initiation to provide for a measure of success and attainment of restoration objectives. Where rangelands are not making progress towards meeting Standards with actions already implemented, additional measures such as temporary non-use would be considered.

Implementation Actions Proposed:

- Develop rangeland restoration projects and stipulations in consultation with grazing permit holder(s).
- Ensure the required rest period through either a voluntary non-use by the permittee or by decision.
- Implement a monitoring process in order to provide timely evaluation as to whether or not areas not meeting Standards are improving.

Allotment Specific Management Actions
For some allotments, proposed management and implementation actions have been developed and are listed below. Appendix 1 describes the proposed management for all individual allotments in greater detail.

Big Bowns Bench (same as Alternative A & B)
Re-authorize livestock grazing at the current active use level.

Collet (same as Alternative B)
- Re-authorize livestock grazing at the current active use level.
- Temporarily exclude livestock grazing from the portion of the Right Hand Collet Canyon that does not meet Rangeland Health Standards until Standards are met.

Due to an allotment boundary fence problem, livestock from the Upper Cattle allotment have been using the lower end of Right Hand Collet within the Collet allotment. Relocating the allotment boundary fence to the correct location and eliminating use by livestock from the adjacent allotment is expected to result in recovery of this area.

Future Project Implementation:
- Construct an allotment boundary fence at the correct location.
- Install gap fencing to create three pastures to be used in rotation rather than every year.
- Use limited to two pastures until Right Hand Collet riparian area recovers.

Coyote
Temporary nonuse or suspensions of 588 active AUMs in the Sand Gulch and Five Mile Pastures, which are rangeland seedings that are no longer producing desired forage. Temporary nonuse or suspensions would occur until restoration can be accomplished.

Implementation Action:
Initiate restoration of Sand Gulch and Five Mile Pastures.

Death Hollow (same as Alternative B)
- Re-authorize livestock grazing at current active use level.
- Limit the season of use for livestock grazing to no later than March 31st.
- Restrict livestock access into upper Little Death Hollow and Wolverine Creek at the narrows near the head of the canyons.

While most livestock are usually off this allotment by March 31st, a small number are often left through May 15th. The BLM range staff considers use between March 31st and May 15th as a contributing factor in the allotment's not meeting Rangeland Health Standards, particularly as it occurs during the critical growing season for spring grasses. If this period of use is terminated the causal factor in not meeting Standards would be eliminated. No AUM adjustments are proposed.

Restricting access into the canyons will prevent livestock from being "driven" into the narrows to avoid hikers.

Future Project Implementation:

- Construct drift fences to restrict livestock access into upper Little Death Hollow and Wolverine Creek narrows.
- Construct riparian protection fences.

Ford Well (same as Alternative B)
No change from currently authorized active use. Maintain the Ford Well Spring protection fence, repair/replace collection and storage system.

Future Project Implementation:
Construct a fence, collection system and install a trough at Old Corral Spring.

Soda (same as Alternative B)
No change from currently authorized active use because the removal of approximately 50 wild cows in 2000 has allowed the recovery of springs and upland vegetation. The allotment has an upward trend (Appendix 1). The BLM and NRA will use methods from the "riparian toolbox" to achieve standards in riparian areas. To help meet upland standards the Soda allotment may be combined with the adjacent Fortymile Ridge allotment. This may result in an eleven pasture deferred rest rotation grazing system. With an implementation of this grazing system uplands should continue to move towards meeting standards.

Future Project Implementation:
Glen Canyon NRA and BLM would fence springs while maintaining livestock water access.

King Bench (same as Alternatives D & E)

- Develop a three-pasture system by dividing the King Bench Pasture into two pastures, King Bench and Deer Creek. Use water developments to draw livestock away from the Gulch.
- Implementation of the new pasture will be contingent upon installation of sufficient reliable water and other necessary improvements by BLM.

The Gulch is a very popular and heavily used hiking area and one of the areas most noted for livestock/recreation conflict. It currently provides the only reliable water for most of the pasture so livestock tend to stay there. King Bench Seep no longer provides reliable water, so it will be necessary to develop water catchments or other water developments on King Bench that would hold livestock on King Bench and out of the Gulch. The new pasture would provide the opportunity to develop a rotation system where use of the Gulch area is reduced.

Future Project Implementation:

- Split the King Bench Pasture into two pastures.

- Develop water catchments to provide sufficient water, potentially using bare rock areas as collectors.
- Develop interpretative signage for human/livestock interaction.

Lake
No change from currently authorized active use.

Future Project Implementation:
- Riparian area protection on a site-by-site basis.

Last Chance (same as Alternative A)
No change from currently authorized active use.

Mollies Nipple
- Take temporary non-use or suspensions to 3307 AUMs from 3,862 AUMs to reflect reduced forage production on seeded pastures.
- Upon successful restoration of the seeded pastures, establish a new authorized use level based on the restored forage (potentially 3862 active use AUMs for the allotment).
- Rest two of the five transition pastures in the spring (approximately April 1st to May 31st) in order to meet the spring growing requirements of emerging vegetation. Rest two transition pastures in the fall (October 1 – November 30) alternating years with the other three transition pastures.
- Summer (approximately June 1 to September 30) and winter (approximately December 1 to March 31) use would continue as presently authorized.
- Initiate seven-pasture deferred rest rotation grazing system.
- Control the season of use in the newly created Gulch Pasture east of the House Rock Valley Road to resolve or reduce recreational impacts.
- Create a "new" Buckskin Gulch Pasture in the southeast corner of the Buckskin Pasture above the Buckskin Narrows.
- When conditions allow, grazing could be authorized in the new pasture from December 1st to February 28th every other year.

Following the developed seven-pasture deferred rotation plan is necessary to provide for periodic pasture rest and improved plant vigor. In the past, failure to fully implement the rotation plan, and the extended periods of drought, has resulted in a decline in the condition of the seeded pastures. The seeded pastures are being restored.

The Mollies Nipple allotment experiences conflicts between livestock use and hikers in the Buckskin Narrows. Because livestock congregate at the small seep above the Narrows, there is a tendency for them to be "pushed" down the Narrows as they try to avoid hikers. Additionally, the small seep in the area does not provide sufficient water for livestock purposes and is being impacted by livestock use. The area concerned is dominated by a large gravelly wash bottom and does not produce sufficient forage for annual grazing use. This alternative would manage the season of use and place protective

structures for livestock control and spring protection in Buckskin Narrows to resolve the recreational conflict and allow restoration of the riparian area.

Implementation Actions:

- Rock House, Jenny Clay, Blue Spring, and Telegraph Pastures would be placed in voluntary non-use or temporarily suspended through decision as they are treated.
- Resume livestock grazing after at least two growing seasons and monitoring determines forage availability and appropriate active use upon restoration of seedings.
- Develop an interim pasture rotation schedule while the treated pastures are in the restoration phase.

Future Project Implementation:

- Split Nipple Pasture into East Nipple and West Nipple Pastures. Initiate deferred summer rotation using the two pastures generally from 6/1 to 7/31 and 8/1 to 9/30
- Deferred use of the five transition pastures by alternating use to ensure spring and fall rest period every other year. Generally 4/1/ - 5/15, and 10/1 – 11/30
- Continue winter use of Buckskin Pasture from approximately 12/1 to 3/31.
- Construct 3.7 miles of fence along the House Rock Valley Road, and livestock drift and spring protection fences in the Gulch pasture.
- Develop alternate water sources in the Buckskin Pasture in the vicinity of the House Rock Valley Road, the south western half of Buckskin, and Deer Trails area of the Nipple Pasture.
- Summer (approximately June 1 to September 30) and winter (approximately December 1 to March 31) use would continue as presently authorized.

Rock Creek-Mudholes (same as Alternative B)

No change from currently authorized active use. Since 2000 the removal of the wild cattle has been a primary management objective. Due to work from the BLM and existing permittee objectives have been reached and the permittee is still actively working to keep wild cattle off the allotment. Since the removal of the wild cattle and no authorized grazing since 2000 through 2007 this allotment appears to have an upward trend. Methods from the "riparian toolbox" will continue to be used to bring riparian areas up to meeting standards.

Future Project Implementation:

Relocate West End Spring fence in order to access West End Spring from West End pasture.

School Section (same as Alternative B)

- No change from currently authorized active use.
- Divide the allotment into two pastures by fencing the old seeding from the untreated area of the allotment. Implement a two pasture deferred grazing system on the allotment, which would defer the early spring grazing on one pasture each grazing season.
- Restore the old seeding. The area that would be reseeded would rest from livestock grazing for at least 2 years

Upper Paria

- No change from currently authorized use. Although the allotment fails to meet Standards, the mutual cooperation and coordination with the Upper Paria Grazing Association has been effective at determining annual stocking rates based upon available forage, precipitation, and overall range condition without stocking reductions. For the past five years, the average actual use for the Upper Paria allotment has not exceeded 50% (See Upper Paria Actual Use table in Appendix 1). Due in part to these voluntary reductions, on the ground gains, as indicated by trend, have been made in several pastures, *i.e.,* Mudholes, Lower Coal Bench, Bulldog, and Upper Jim. It is likely that progress will continue to be made toward meeting standards under this management strategy.
- Fall use pasture created on Bulldog Bench. Implementation of this action will reduce grazing by 68 AUMs during the critical spring growing season; use will occur during forage dormancy.
- Seeded pastures requiring restoration will remain open with reduced use until restoration work commences, and then will be placed in voluntary non-use or temporarily suspended through decision for at least two years until restoration objectives are met. Since these projects are funding-dependant, the BLM will continue to actively seek opportunities and partners in restoration in exchange for continued cooperation with permittees in meeting management objectives.

Future Project Implementation:
Manage South Pasture within Upper Paria allotment for emergency use.
Seeded

Vermilion

Temporarily suspend 784 AUMs, to reflect reduced forage production on seeded pastures. The authorized use on the allotment would be 2,065 AUMs. The grazing privilege on the allotment would remain at 2,849 AUMs.

- Upon successful restoration of the seeded pastures establish a new authorized use level based on the restored forage (potentially 2,849 AUMs for the allotment).
- Rest one of the winter pastures each year after February 28th in order to give growing season rest. The winter season of use would occur approximately December 1st through February 28th. The winter pasture that would normally be grazed during the winter season would be Fossil Wash, Government Reservoir and Old Paria Road pastures.
- Rest at least two transition pastures (Clark Ranch, Petrified Hollow, Seamen Wash, RCA 1, RCA 2 and RCA 3) during each grazing period for the transition season of use. The grazing periods for the transition season of use would include a spring period that would occur approximately April 15th through May 20th , and the fall period, which would occur approximately between October 1st through November 30th.
- Rest the public lands on the allotment between March 1st through April 14th and again May 21st through May 31st, in order to meet the spring growing requirement of emerging vegetation.
- Initiate a 10 pasture modified deferred rest rotation.
- RCA 1 and the Clark Ranch pasture would be grazed and rested together during the spring or fall periods of the transition season of use.

- Create a three-pasture deferred rotation scheme for the Nephi Pasture once new water development are completed.

  Implementation Action:
  Restore RCA 1 and Fossil Wash pastures. These pastures would be placed in temporary non-use or suspensions as they are treated. The pasture rotation would be modified while these pastures are treated.

  Future Project Implementation:
  Install range improvements (water development or fences) necessary to initiate a rotation on Nephi pasture.

Willow Gulch (same as Alternative A)
Re-authorize livestock grazing at current active use level.

Implementation Actions
Monitor use levels and riparian conditions adjacent to Upper Calf Creek Falls and in Calf Creek above the Lower Falls and adjust or restrict use based on riparian conditions.

Priorities for Monitoring
Monitoring would be prioritized towards allotments which fail to meet Rangeland Health Standards. Allotments which meet Standards would receive appropriate levels of monitoring necessary to verify that they have not departed from prior assessments. Specific monitoring requirements would be established for allotments with either riparian or upland failures.

Rangeland Improvements
New rangeland improvements including pasture division fences, pipeline extensions and new water sources would be used to provide more intense livestock management through greater control over movement and dispersion. Existing rangeland improvements would be maintained where they continue to serve their intended purpose(s), or removed if necessary.

Implementation Actions Proposed:

- Repair fencing projects where field evaluations have identified maintenance needs.
- Evaluate all other projects for maintenance needs and functionality.
- Decommission projects no longer required or functioning.

Future Project Implementation:

- Construct pasture division fences where greater control of livestock movement is required.
- Extend existing pipelines and better utilize existing wells to provide better livestock dispersion including Coyote (well and pipeline), Deer Springs Point (windmill), First Point (private well), Meadow Canyon (private well), Twentymile (Lower Cattle), Upper Cattle/Ten Mile, Devil's Rock Garden (well and pipeline).

- Consider new wells to replace spring use at Nephi and Fin Little Springs (Vermilion allotment), Big Hollow Spring (Fortymile Ridge allotment).

WILDLIFE MANAGEMENT ACTIONS

Southwest Willow Flycatcher (SWFL) – season of use standards
Limiting livestock grazing to winter would eliminate any livestock related interaction with SWFL during their breeding and nesting season.

Implementation Action:
Livestock grazing in suitable SWFL habitat would only be authorized between September 1st and March 15th.

Southwest Willow Flycatcher – plant utilization standards
Plant utilization in suitable SWFL habitat would be limited to 35% for herbaceous and 40% for browse species.

Mexican Spotted Owl – season of use in Protected Activity Centers (PACS)
Limiting livestock use in PACS during the breeding and nesting seasons would reduce displacement of prey species and their protective plant cover.

Implementation Action:
Livestock grazing would not be authorized in identified PACS during the breeding and nesting seasons.

ALTERNATIVE D

ALTERNATIVE SUMMARY

Grazing management would be modified with priority on restoring rangeland health while providing research opportunities in restoration and monitoring success. Livestock grazing would be temporarily suspended in six allotments that did not meet Rangeland Health Standards. A future decision to re-initiate active use in these allotments will be considered when rangeland monitoring shows an indication of positive change and Rangeland Health Standards are being met. For planning purposes and the estimation of future uses, an assumption has been made that restoration actions would restore forage availability to previous levels. However, allotment specific evaluations would determine the actual active use levels upon successful restoration.

All items listed under **Management Actions Common to All Alternatives** are incorporated by reference.

LIVESTOCK GRAZING MANAGEMENT ACTIONS

Authorized livestock grazing
Initially authorize 62,681 AUMs of active use livestock grazing. Following successful rangeland restorations and evaluations that show allotments to be meeting Standards and forage to be available, active use may be increased to 75,757 AUMs. Total permitted use would be 105,438 AUMs, because of a cancelation of 750 AUMs (from Big Bowns Bench allotment) and including an allocation of 50 AUMs (for Varney Griffin allotment), with 29,681 AUMs of suspended use.

> This alternative would reduce authorized livestock grazing by suspending livestock grazing in six of nine allotments that did not meet Rangeland Health Standards. A failure to achieve the Standards for upland range health is indicative of grazing management practices that are detrimental to rangeland health or that do not provide for recovery from past management practices. Uplands constitute nearly ninety nine percent of the surface area assessed (riparian areas constitute 1.03%) so negative monitoring data indicates widespread impacts. Failure to meet upland Standards usually corresponded with failure to meet other goals.
>
> *Implementation Actions Proposed:*
> Livestock grazing in six allotments would be temporarily suspended.

Livestock grazing in allotments which met Rangeland Health Standards
Rangeland Health in the 73 allotments listed below was evaluated as meeting Rangeland Health Standards. Management changes in response to monitoring would involve routine grazing management techniques such as season of use modifications, pasture rotations, reduced use periods when utilization guidelines are reached, and temporary closures during restoration.

Table 2-6 Proposed Livestock Grazing in Allotments Meeting RLH Standards (Alt. D)

Allotment	Active Use		Allotment	Active Use	
	Initial	Potential		Initial	Potential
Alvey Wash **	1,424	1,424	Long Canyon *	289	289
Big Bowns Bench *	0	0	Locke Ridge (State)	27	27
Big Horn **	3,515	3,515	Lower Hackberry	435	435
Black Ridge	903	903	Last Chance	4,289	4,289
Black Rock	408	408	Lower Cattle	7,488	7,488
Black Rock (State)	64	64	Lower Warm Creek	225	225
Boot	45	45	Main Canyon (State)	14	14
Boulder Creek	80	80	Moody	909	909
Bull Run (State)	5	5	Moyle C. Johnson	53	53
Bunting Trust	16	16	Mud Springs **	277	277
Calf Pasture	176	176	Neaf	9	9
Circle Cliffs**	1,050	1,050	Nipple Bench	993	993
Clark Bench *, **	1,238	1,238	Pine Creek	144	144
Cockscomb	36	36	Pine Creek (State) **	27	27
Cottonwood	3,153	3,153	Pine Point	365	365
Coyote**	1,456	2,044	Round Valley	522	522
Deer Creek	358	358	Roy Willis	9	9
Deer Range **	231	231	Rush Beds **	252	252
Deer Springs Point **	503	503	Second Point **	69	69
Deer Springs (State)	82	82	Second Point (State)	29	29
Dry Valley	677	677	Sink Holes	154	154
Dry Valley (State)	22	22	Slick Rock State	24	24
Five Mile Mountain**	385	385	South Fork	12	12
First Point	410	410	Swallow Park**	1,068	1,068
Flood canyon	--	--	Timber Mountain	426	426
Forty Mile Ridge	4,290	4,290	Upper Cattle **	8,158	8,158
Hall Ranch	12	12	Upper Hackberry	654	654
Granary Ranch	70	70	Upper Warm Creek**	1,638	1,638
Haymaker Bench	100	100	Varney Griffin	50	50
Johnson Canyon **	274	274	Wagon Box Mesa	637	637
Headwaters**	3,822	3,822	Wahweap	491	491
Hells Bellows	44	44	White Rock	60	60
Johnson Lakes **	495	495	White Sage **	76	76
Johnson Point	135	135	Wide Hollow *	353	353
King Bench *	1,515	1,515	Willow Gulch *	474	474
Lake Powell	20	20	Wiregrass	99	99
Lake	1,310	1,310			

(* see Allotment Specific Actions below) (** area(s) within allotment did not meet RLH Standards but allotment as a whole did, management actions to be taken, see Appendix1.)
Allotment notes - Johnson Lakes includes Flood Canyon AUMs; Long Canyon – combination of Locke Ridge & Meadow Canyon allotments

Livestock Authorization in allotments which did not meet Rangeland Health Standards Due to Livestock Grazing

The following allotments were evaluated as not meeting Rangeland Health Standards. Management changes in active use are proposed as detailed below. For a complete description of changes in individual allotments, see Appendix1.

Table 2-7 Proposed Livestock Grazing in Allotments Not Meeting RLH Standards Due to Livestock Grazing (Alt. D)

Allotment	Proposed Active Use		Current Active Use
	Initial	Potential	
Collet	0	97	97
Death Hollow	1,057	1,057	1,057
Ford Well	328	328	328
Mollies Nipple	0	3,307	3,862
Rock Creek-Mudholes	2,173	2,173	2,173
School Section*	0	102	102
Soda	0	2,798	2,798
Upper Paria	0	2,780	2,780
Vermilion	0	2,849	2,849

Grazing restrictions

- Temporary suspensions of varying lengths could apply to areas where rangelands are not making progress towards achieving Standards and to recover from events such as drought.
- Livestock grazing in six allotments which are not meeting Upland Standards of Rangeland Health (Soils and/or Vegetation) would be temporarily suspended until the Standards for Rangeland Health have been achieved. This suspension would affect six allotments.
- Upon achieving the Standards, as determined by monitoring, the forage available would be reassessed and the appropriate active use level for the allotment(s) determined.

Allotment Specific Management Decision

Big Bowns Bench (same as Alternative E)

Close the remaining portions of the allotment to livestock grazing.

> Portions of this allotment were closed to grazing use in 1999 to lower conflicts recreational users. The three pastures on Big Bowns Bench which remain open to livestock use have a season of use from November 1st to March 31st. No livestock grazing has occurred here since 1999. Both the current and previous permit holders have taken voluntary non-use.

Collet (same as Alternative E)

Suspend livestock grazing until Rangeland Health Standards are achieved.

Coyote (same as Alternative C)
Temporary nonuse or suspensions of 588 active AUMs in the Sand Gulch and Five Mile Pastures, which are rangeland seedings that are no longer producing desired forage. Temporary nonuse or suspensions would occur until restoration can be accomplished.

Implementation Actions:
Initiate restoration of the Sand Gulch and Five Mile Pastures.

Death Hollow (same as Alternative B)

- Re-authorize livestock grazing at current active use level.
- Limit the season of use for livestock grazing to no later than March 31st.
- Restrict livestock access into upper Little Death Hollow and Wolverine Creek at the narrows near the head of the canyons.

While most livestock are usually off this allotment by March 31st, a small number are often left through May 15th. The BLM range staff considers use between March 31st and May 15th as a contributing factor in the allotment's not meeting Rangeland Health Standards, particularly as it occurs during the critical growing season for spring grasses. If this period of use is terminated the causal factor in not meeting Standards would be eliminated. No AUM adjustments are proposed.

Restricting access into the canyons will prevent livestock from being "driven" into the narrows to avoid hikers.

Future Project Implementation:

- Construct drift fences to restrict livestock access into upper Little Death Hollow and Wolverine Creek narrows.
- Construct riparian protection fences.

Ford Well (same as Alternative B)
No change from currently authorized active use. Maintain the Ford Well Spring protection fence, repair/replace collection and storage system.

Future Project Implementation:
Construct a fence, collection system and install a trough at Old Corral Spring.

Soda Allotment (same as Alternative E)
Suspend livestock grazing until Rangeland Health Standards are met.

Future Project Implementation:
Glen Canyon NRA and BLM would fence springs while maintaining livestock water access.

King Bench (same as Alternatives C & E)

- Develop a three-pasture system by dividing the King Bench Pasture into two pastures, King Bench and Deer Creek. Use water developments to draw livestock away from the Gulch.
- Implementation of the new pasture will be contingent upon installation of sufficient reliable water and other necessary improvements by BLM.

The Gulch is a very popular and heavily used hiking area and one of the areas most noted for livestock/recreation conflict. It currently provides the only reliable water for most of the pasture so livestock tend to stay there. King Bench Seep no longer provides reliable water, so it will be necessary to develop water catchments or other water developments on King Bench that would hold livestock on King Bench and out of the Gulch. The new pasture would provide the opportunity to develop a rotation system where use of the Gulch area is reduced.

Future Project Implementation:

- Split the King Bench Pasture into two pastures.
- Develop water catchments to provide sufficient water, potentially using bare rock areas as collectors.
- Develop interpretative signage for human/livestock interaction.

Lake

No change from currently authorized active use.

Future Project Implementation:

- Riparian area protection on a site-by-site basis.

Last Chance (same as Alternative A)

No change from currently authorized active use.

Mollies Nipple

- Implement suspensions of livestock grazing until Rangeland Health Standards are achieved.
- Prior to re-authorizing grazing in the allotment develop a new Allotment Management Plan incorporating a pasture rotation system and a spring rest period from April 1st to May 31st for two of the five scheduled transition pastures.
- Control the season of use in the newly created Gulch Pasture east of the House Rock Valley Road to resolve or reduce recreational impacts.

Implementation Action:

Restore seeded pastures.

Future Project Implementations:

- Construct 3.7 miles of fence along the House Rock Valley road at Buckskin Draw prior to livestock use of the area.
- If grazing is re-authorized, develop an alternate water source in the Buckskin Pasture in the vicinity of the House Rock Valley Road prior to livestock use of the area.

Rock Creek-Mudholes

- Continue ongoing riparian restoration projects.
- No change from currently authorized active use
- Relocate West End Spring fence in order to access West End Spring from West End pasture.

School Section (same as Alternative E)
Suspend livestock grazing until Rangeland Health Standards are met and seeding restoration criteria has been achieved.

Upper Paria (same as Alternative E)
Suspend livestock grazing until Rangeland Health Standards are achieved.

Future Project Implementation:
Manage South Pasture within Upper Paria allotment for emergency use.

Vermilion (same as Alternative E)

- Implement temporary suspensions on livestock grazing until Rangeland Health Standards are achieved.
- Prior to re-authorizing grazing in the allotment develop a new Allotment Management Plan incorporating a pasture rotation system and a spring rest period from March 1st to May 31st in three of the seven scheduled transition pastures.
- Create a three-pasture deferred rotation scheme for Nephi Pasture.

Implementation Action:
Restore seeded pastures RCA1 and Fossil Wash.

Future Project Implementation:
Install range improvements necessary to manage Nephi Pasture as three separate pastures.

Willow Gulch (same as Alternative A)
Re-authorize livestock grazing at current active use level.

Implementation Actions
Monitor use levels and riparian conditions adjacent to Upper Calf Creek Falls and in Calf Creek above the Lower Falls and adjust or restrict use based on riparian conditions.

Priorities for Monitoring
Monitoring would be prioritized towards allotments which fail to meet Rangeland Health Standards. Allotments which meet Standards would receive minimal monitoring, necessary to verify that they have not departed from prior assessments. Specific monitoring requirements would be established for allotments with riparian failures. Allotments with upland failures, being closed under this alternative, would receive monitoring specific to making Standards determinations for the soils and species mix Standards.

Rangeland Improvements
This alternative would place a high priority on resolving grazing issues through the use of structural range improvements. New rangeland improvements including pasture division fences, pipeline extensions and new water sources would be considered on a case-by-case basis where necessary for the protection of natural and cultural resources. Existing rangeland improvements would be maintained where they continue to serve their intended purpose(s), or otherwise removed.

The temporary suspensions in authorized grazing use should reduce the need for many of the rangeland improvements proposed in Alternative C. Rangeland improvements would be focused more on protecting natural and cultural resources than providing for more intensively managed grazing.

A factor in not meeting Rangeland Health Standards and Proper Functioning Condition for many riparian (spring) areas is the lack of adequate maintenance of protective fencing around water sources. Many fences were found to be down due to age, flood damage, or livestock pressure. Repairs to these protective fences is expected to provide the action(s) necessary to reverse site deterioration and lead to these areas making progress towards, and eventually meeting, Rangeland Health Standards and Proper Functioning condition.

Implementation Actions:
- Repair fencing projects where field evaluations have identified maintenance needs.
- Evaluate all other projects for maintenance needs and functionality.
- Decommission projects no longer required or functioning.
- Construct pasture division fences where greater control of livestock movement is required.
- Extend existing pipelines and better utilize existing wells on both public and private lands where this could replace the use of natural springs and leave more water for riparian purposes, obligate vegetation and wildlife.

Future Project Implementation:
Propose new wells to replace spring use at Nephi and Fin Little Springs (Vermilion allotment), Big Hollow Spring (Fortymile allotment)

WILDLIFE MANAGEMENT ACTIONS

Southwest Willow Flycatcher (SWFL) – season of use standards (same as C)
Limiting livestock grazing to winter would eliminate any livestock related interaction with SWFL during their breeding and nesting season.

Implementation Action:
Livestock grazing in suitable SWFL habitat would only be authorized between September 1st and March 15th. Although the recovery plan only specifies grazing use be curtailed during growing and mating season, between March 15th and September 1st , the season of use as proposed provides for SWFL protection.

Southwest Willow Flycatcher – plant utilization standards (Same as alternative C)
Plant utilization in suitable SWFL habitat would be limited to 35% for herbaceous and 40% for browse species.

Mexican Spotted Owl – season of use in Protected Activity Centers (PACS) (Same as C)
Limiting livestock use in PACS during the breeding and nesting seasons would reduce displacement of prey species and their protective plant cover.

Implementation Action:
Livestock grazing would not be authorized in identified PACS during the breeding and nesting seasons.

ALTERNATIVE E

ALTERNATIVE SUMMARY

Livestock grazing would be temporarily suspended in Collet, Ford Well, Soda, Mollies Nipple, School Section, Upper Paria, Vermilion, Death Hollow, Rock Creek-Mudholes allotments where Rangeland Health Standards are not being met, and where a determination has been made that the failure to meet Standards was due to existing livestock grazing management practices or levels of use. These temporary suspensions would remain in effect until Standards are met, at which time, allotment specific levels of active use and management criteria would be established and the suspension ended. A portion of the Coyote allotment would also be temporarily suspended for restoration purposes. Rehabilitation efforts, such as re-seeding, watershed and riparian projects would be emphasized in those areas. For planning purposes and the estimation of future uses, an assumption has been made that restoration actions would restore forage availability to previous levels. However, allotment specific evaluations would determine the actual active use levels upon successful restoration.

Innovative rangeland management science and techniques would receive priority under this alternative. Scientific study of improved rangeland management methods and practices would be encouraged.

All items listed under **Management Actions Common to All Alternatives** are incorporated by reference.

LIVESTOCK GRAZING MANAGEMENT ACTIONS

Authorized livestock grazing
Authorize an initial level of 58,829 AUMs of active use livestock grazing. Place AUMs in nine allotments not meeting Rangeland Health Standards in suspension until the allotment(s) is/are re-evaluated as meeting Rangeland Health Standards. Authorize up to 73,800 AUMs active use when all allotments are evaluated as meeting Rangeland Health Standards. Total permitted use would be 103,481 AUMs because of the cancelation of 2,657 AUMs (from Big Bowns Bench, and portions of Mollies Nipple and Vermilion allotments), including an allocation of 50 AUMs (for Varney Griffin allotment), and requested closures by Glen Canyon NRA), with 29,681 AUMs of suspended use.

Livestock grazing in allotments which met Rangeland Health Standards
Rangeland Health in the 73 allotments listed below was evaluated as meeting Rangeland Health Standards. Active livestock grazing use would be re-authorized at current active use levels in 72 of those allotments (not including Lake allotment). Management changes in response to monitoring would involve routine grazing management techniques such as season of use modifications, pasture rotations, reduced use periods when utilization guidelines are reached, and temporary closures during restoration projects.

Table 2-8 Proposed Livestock Grazing in Allotments Meeting RLH Standards (Alternative E)

Allotment	Active Use		Allotment	Active Use	
	Initial	Potential		Initial	Potential
Alvey Wash **	1,424	1,424	Long Canyon *	289	289
Big Bowns Bench *	0	0	Locke Ridge (State)	27	27
Big Horn **	3,515	3,515	Lower Hackberry	435	435
Black Ridge	903	903	Last Chance	4,289	4,289
Black Rock	408	408	Lower Cattle	7,488	7,488
Black Rock (State)	64	64	Lower Warm Creek	225	225
Boot	45	45	Main Canyon (State)	14	14
Boulder Creek	80	80	Moody	909	909
Bull Run (State)	5	5	Moyle C. Johnson	53	53
Bunting Trust	16	16	Mud Springs **	277	277
Calf Pasture	176	176	Neaf	9	9
Circle Cliffs**	1,050	1,050	Nipple Bench	993	993
Clark Bench *, **	1,238	1,238	Pine Creek	144	144
Cockscomb	36	36	Pine Creek (State) **	27	27
Cottonwood	3,153	3,153	Pine Point	365	365
Coyote**	1,456	2,044	Round Valley	522	522
Deer Creek	358	358	Roy Willis	9	9
Deer Range **	231	231	Rush Beds **	252	252
Deer Springs Point **	503	503	Second Point **	69	69
Deer Springs (State)	82	82	Second Point (State)	29	29
Dry Valley	677	677	Sink Holes	154	154
Dry Valley (State)	22	22	Slick Rock State	24	24
Five Mile Mountain**	385	385	South Fork	12	12
First Point	410	410	Swallow Park**	1,068	1,068
Flood Canyon	--	--	Timber Mountain	426	426
Forty Mile Ridge	4,290	4,290	Upper Cattle **	8,158	8,158
Hall Ranch	12	12	Upper Hackberry	654	654
Granary Ranch	70	70	Upper Warm Creek**	1,638	1,638
Haymaker Bench	100	100	Varney Griffin	50	50
Johnson Canyon **	274	274	Wagon Box Mesa	637	637
Headwaters**	3,822	3,822	Wahweap	491	491
Hells Bellows	44	44	White Rock	60	60
Johnson Lakes **	495	495	White Sage **	76	76
Johnson Point	135	135	Wide Hollow *	353	353
King Bench *	1,515	1,515	Willow Gulch *	474	474
Lake Powell	20	20	Wiregrass	99	99
Lake	1,310	1,310			

* see Allotment Specific Actions below

** area(s) within allotment did not meet RLH Standards but allotment as a whole did

Allotment notes - Johnson Lakes includes Flood Canyon AUMs; Long Canyon – combination of Locke Ridge & Meadow Canyon allotments

Livestock Authorization in allotments which did not meet Rangeland Health Standards Due to Livestock Grazing

The following allotments were evaluated as not meeting Rangeland Health Standards. Management changes in active use are proposed as detailed below. For a complete description of changes in individual allotments, see Appendix1.

Table 2-9 Proposed Livestock Grazing in Allotments Not Meeting RLH Standards Due to Livestock Grazing (Alt. E)

Allotment	Proposed Active Use		Current Active Use
	Initial	Potential	
Collet	0	97	97
Death Hollow	0	1,057	1,057
Ford Well	0	328	328
Mollies Nipple	0	3,307	3,862
Rock Creek-Mudholes	0	2,101	2,173
School Section	0	102	102
Soda	0	2,798	2,798
Upper Paria	0	2,780	2,780
Vermilion	0	1,813	2,849

Grazing restrictions

Livestock grazing in nine allotments evaluated as not meeting Rangeland Health Standards and where a determination was made that the failure to meet Standards was due to existing livestock grazing management practices or levels of use would be temporarily suspended until an allotment re-evaluation finds that Rangeland Health Standards are being met.

> In order for rangeland restoration to be successful, there must be sufficient time given for the vegetation to establish itself in self sustaining communities. This requires a period of time when major disturbances or use of emerging vegetation must be restricted as much as possible. The complete cessation of livestock use in allotments not meeting RLH Standards would provide the opportunity for an accelerated process of rangeland recovery. Rangeland restoration projects would have site-specific restoration objectives developed prior to initiation to provide for a measure of success and attainment of restoration objectives.

Allotment Specific Management Actions

Big Bowns Bench (same as Alternative D)

Close the remaining portions of the allotment to livestock grazing.

> Portions of this allotment were closed to grazing use in 1999 to lower conflicts recreational users. The three pastures on Big Bowns Bench which remain open to livestock use have a season of use from November 1st to March 31st. No livestock grazing has occurred here since 1999. Both the current and previous permit holders have taken voluntary non-use.

Collet (same as Alternative D)
Temporarily suspend livestock grazing use until Rangeland Health Standards are achieved.

Coyote (same as Alternative C)
Temporary nonuse or suspensions of 588 active AUMs in the Sand Gulch and Five Mile Pastures, which are rangeland seedings that are no longer producing desired forage. Temporary nonuse or suspensions would occur until restoration can be accomplished.

Implementation Action:
Initiate restoration of the Sand Gulch and Five Mile Pastures.

Death Hollow

- Temporarily suspend livestock grazing use until Rangeland Health Standards are achieved.
- Restrict livestock access into upper Little Death Hollow and Wolverine Creek at the narrows near the head of the canyons using the existing recreational protection fence.

While most livestock are usually off this allotment by March 31st, a small number is often left through May 15th. The BLM range staff considers use between March 31st and may 15th as a contributing factor in the allotment's not meeting Rangeland Health Standards, particularly as it occurs during the critical growing season for spring grasses. If this period of use is terminated the primary causal factor in not meeting Standards would be eliminated.

Restricting access into the canyons will prevent livestock from being "driven" into the narrows to avoid hikers.

Future Project Implementation:
Construct fences to restrict livestock access into upper Little Death Hollow and Wolverine Creek narrows.

Ford Well

- Temporarily suspend livestock grazing use until Rangeland Health Standards are achieved.

Soda (same as Alternative D)

- Temporarily suspend livestock grazing until Rangeland Health standards met.
- Fence the heads of Willow, Fortymile, Llewellyn, and Davis Gulches to exclude livestock

Future Project Implementation:
BLM and Glen Canyon NRA would fence springs while maintaining livestock water access

King Bench (same as Alternatives C & D)

- Develop a three-pasture system by dividing the King Bench Pasture into two pastures, King Bench and Deer Creek. Use water developments to draw livestock away from the Gulch.

- Implementation of the new pasture will be contingent upon installation of sufficient reliable water and other necessary improvements by BLM.

The Gulch is a very popular and heavily used hiking area and one of the areas most noted for livestock/recreation conflict. It currently provides the only reliable water for most of the pasture so livestock tend to stay there. King Bench Seep no longer provides reliable water, so it will be necessary to develop water catchments or other water developments on King Bench that would hold livestock on King Bench and out of the Gulch. The new pasture would provide the opportunity to develop a rotation system where use of the Gulch area is reduced.

Future Project Implementation:

- Split the King Bench Pasture into two pastures.
- Develop water catchments to provide sufficient water, potentially using bare rock areas as collectors.
- Develop interpretative signage for human/livestock interaction.

Lake

Close the GCNRA portion of the Navajo Point Pasture, reducing 294 AUMs on the Lake Allotment.

Future Project Implementation:

- Riparian area protection on a site-by-site basis.

Last Chance

- Continue to authorize 4,289 AUMs for livestock grazing.
- Close a portion of the winter pasture east of Rogers Canyon.

Future Project Implementation:

- Construct a fence across East Rogers Canyon.

Mollies Nipple

- Temporarily suspend livestock grazing use until Rangeland Health Standards are achieved.
- Reduce active use by 555 AUMs.
- Incorporate a pasture rotation system and a spring rest period from April 1st to May 31st for all public range on the allotment.
- Close the area in the Buckskin Pasture east of the House Rock Valley Road from future livestock use.

Implementation Action:

Restore seeded pastures.

Future Project Implementation:

- Construct 3.7 miles of fence along the House Rock Valley Road prior to livestock use of the area.

- Develop an alternate water source in the Buckskin Pasture in the vicinity of the House Rock Valley Road prior to livestock use of the area.

Rock Creek-Mudholes

- Temporarily suspend all livestock grazing until Rangeland Health Standards are achieved.
- Close the tip of Grand Bench to livestock grazing to protect relic plant communities. Allotment active use reduction of 72 AUMs.
- Continue ongoing riparian restoration projects.

Future Project Implementation:
Glen Canyon NRA would install drift fencing to implement the closure of the tip of Grand Bench per existing MOU.

School Section (same as Alternative D)
Temporarily suspend livestock grazing until Rangeland Health Standards are met and seeding restoration criteria has been achieved.

Upper Paria (same as Alternative D)
Temporarily suspend livestock grazing until Rangeland Health Standards are achieved.

Future Project Implementation:
Manage South Pasture within Upper Paria allotment for emergency use.

Vermilion

- Temporarily suspend livestock grazing use until Rangeland Health Standards are achieved.
- Reduce active use by 1,036 AUMs.
- Prior to re-authorizing grazing in the allotment develop a new pasture rotation system and a spring rest period from March 1st to May 31st for all Federal range within the allotment.
- Create a three-pasture deferred rotation scheme for Nephi Pasture.

Implementation Action:
Restore seeded pastures RCA1 and Fossil Wash.

Future Project Implementation:
Install range improvements necessary to manage Nephi Pasture as three separate pastures.

Willow Gulch
Re-authorize livestock grazing at current active use level.

Implementation Actions

- Monitor use levels and riparian conditions adjacent to Upper Calf Creek Falls and in Calf Creek above the Lower Falls and adjust or restrict use based on riparian conditions.
- Close the area to livestock grazing along Calf Creek between Upper and Lower Falls.

Priorities for Monitoring
Monitoring would be prioritized towards allotments which fail to meet Rangeland Health Standards. Allotments which meet Standards would receive minimal monitoring, necessary to verify that they have not departed from prior assessments. Specific monitoring requirements would be established for allotments with either riparian or upland failures, with emphasis on determining when allotments have successfully met standards.

Rangeland Improvements
- A strong emphasis would be placed upon plant restoration.
- Restoration of existing rangeland seedings would be a high priority.

WILDLIFE MANAGEMENT ACTIONS

Southwest Willow Flycatcher (SWFL) – season of use standards
Limiting livestock grazing to winter would eliminate any livestock related interaction with SWFL during their breeding and nesting season.

Implementation Action:
Livestock grazing in suitable SWFL habitat would only be authorized between September 1st and March 15th.

Southwest Willow Flycatcher – plant utilization standards
Plant utilization in suitable SWFL habitat would be limited to 35% for herbaceous and 40% for browse species.

Mexican Spotted Owl – season of use in Protected Activity Centers (PACS)
Limiting livestock use in PACS during the breeding and nesting seasons would reduce displacement of prey species and their protective plant cover.

Implementation Action:
Livestock grazing would not be authorized in identified PACS during the breeding and nesting seasons.

Table 2-10 presents a comparison summary of anticipated impacts from proposed actions for the five alternatives analyzed in the DEIS. Chapter 4 provides a more detailed impact analysis.

Table 2-10 Comparative Summary of Impacts by Alternative

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Livestock Grazing				
• No change in authorized AUMs on all allotments • No change in livestock management proposed • Livestock/recreation conflicts not resolved • Downward trend and/or failure to meet Rangeland Health Standards would continue on allotments where this is occurring	**ALLOTMENT SPECIFIC CONSEQUENCES:** **Circle Cliffs** • Grazing preference remains the same • Conflict between livestock and hikers would be reduced in Upper Gulch • Use from Upper Gulch(105 AUMs) would be distributed among other pastures which may require future adjustments in grazing use **Clark Bench** • Grazing preference remains the same • Grazing season reduced by 30 days • Improved livestock distribution & trend	**ALLOTMENT SPECIFIC CONSEQUENCES:** **Circle Cliffs** •Same as Alternative B **Clark Bench** •Same as Alternative B	**ALLOTMENT SPECIFIC CONSEQUENCES:** **Circle Cliffs** •Same as Alternative B **Clark Bench** •Same as Alternative B	**ALLOTMENT SPECIFIC CONSEQUENCES:** **Circle Cliffs** •Same as Alternative B **Clark Bench** •Same as Alternative B

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Livestock Grazing (cont.)				
	Collet • Grazing preference remains the same • Improved livestock distribution •Livestock excluded from Right Hand Collet Canyon •Slow progress toward meeting Standards **Coyote** • Grazing preference remains the same • Temporary suspension of 588 AUM begins if restoration is initiated • Increase in forage following restoration **Death Hollow** • Conflict between livestock and hikers reduced • Grazing preference remains the same • Change in season of use •Progress towards meeting riparian Standards	**Collet** •Same as Alternative B **Coyote** • Immediate temporary suspension of 588 AUMs for restoration in Sand Gulch and Fivemile Pastures • Long term increase in forage availability • Static or upward trend would be achieved • Progress toward meeting standards **Death Hollow** • Conflict between livestock and hikers reduced • Grazing preference remains the same • Change in season of use & livestock distribution • Greater progress towards meeting riparian Standards compared to B	**Collet** •Temporary suspension of all 97 AUMs •Progress towards Standards would be more rapid then Alternatives B and C **Coyote** • Same as Alternative C **Death Hollow** •Same as Alternative C	**Collet** •Same as Alternative D **Coyote** • Same as Alternative C **Death Hollow** • Immediate temporary suspension of all 1,057 AUMs until Standards are met • Improved rangeland health •Increased recovery of riparian areas compared to Alternatives A – D • Increased risk of grazing related impacts to riparian when grazing returns

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Livestock Grazing (cont.)				
	Ford Well • Grazing preference remains the same •Progress towards meeting riparian Standards **Soda** • Grazing preference remains the same • Slow progress towards meeting riparian Standards • Continued static to upward trend **King Bench** • Same as Alternative A	**Ford Well** • Same as Alternative B **Soda** • Same as Alternative B **King Bench** • Grazing preference remains the same	**Ford Well** • Same as Alternative B **Soda** • Immediate temporary suspension of all 2,798 AUMs until Standards are met • Progress towards meeting riparian Standards more rapid than Alternatives A, B and C • Upward trend **King Bench** • Same as Alternative C	**Ford Well** • Immediate temporary suspension of all 328 AUMs until Standards are met • Improved rangeland health •Progress towards meeting riparian Standards more rapid than Alternatives A, B, C and D **Soda** • Same as D **King Bench** • Same as Alternative C

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts on Livestock Grazing (cont.)				
	Lake • Grazing preference remains the same • Change in livestock distribution and season of use • Riparian areas protected • Upward trend would continue **Last Chance** • Same as Alternative A	**King Bench** (cont.) • Conflict between livestock and hikers reduced in The Gulch • Increased livestock use and hiker conflict in proposed Deer Creek Pasture • Increased livestock concentration and potential of vehicle collisions on Burr Trail **Lake** • Same as Alternative B **Last Chance** • Same as Alternative A	**Lake** • Same as Alternative B **Last Chance** • Same as Alternative A	**Lake** • GCNRA portion of Navajo Point Pasture closed and active AUMs reduced by 294 • Increased health of riparian areas • Minimal improvement of upland areas • Upward trend would continue **Last Chance** • Grazing preference remain the same • Portion of Winter Pasture closed • Riparian area in East Rogers Canyon enhanced • Overall downward trend would continue

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Livestock Grazing (cont.)				
	Mollies Nipple • Grazing preference remains the same • Management actions result in improved livestock management • Slow progress towards meeting Standards • Trend would slowly improve • Livestock/hiker conflict resolved **Rock Creek-Mudholes** • Grazing preference remains the same • Slow progress towards meeting riparian Standards • Upward trend would continue	**Mollies Nipple** • Immediate temporary suspension of 555 AUMs for restoration • Total potential of 3,862 AUMs after restoration • Management actions result in improved livestock management • Rangeland health and forage conditions would be enhanced • Slow progress towards meeting Standards • Trend would improve more quickly than B • Livestock/hiker conflict resolved **Rock Creek-Mudholes** • Same as Alternative B	**Mollies Nipple** • Immediate temporary suspension of 3,862 AUMs until Standards are met • Total potential of 3,862 AUMs after restoration • Progress towards meeting riparian Standards more rapid than Alternatives A, B and C • Conflict between livestock and hikers would be resolved **Rock Creek-Mudholes** • Progress towards meeting riparian Standards more rapid than Alternatives A, B and C • Upward trend would continue	**Mollies Nipple** • Immediate temporary suspension of 3,862 AUMs until Standards are met • Total potential of 3,307 AUMs after restoration • season of use shortened by 61 days •Progress towards meeting riparian Standards more rapid than Alternatives A, B and C • Conflict between livestock and hikers would be eliminated • Upward trend expected **Rock Creek-Mudholes** • Immediate temporary suspension of 2,101 AUMs until Standards are met • Southern tip of Grand Bench Pasture closed resulting in a permanent reduction of 72 AUMs • Progress towards meeting riparian Standards more rapid than Alternatives A, B and C • Trend would improve

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Livestock Grazing (cont.)				
	School Section • Grazing preference remains the same • Slow progress towards meeting upland Standards following restoration • Trend would improve **Upper Paria** • Temporary change in grazing management for restoration • Progress towards meeting Standards following restoration • Trend would improve **Vermilion** • Grazing preference remains the same • Slow progress towards meeting Standards • Trend would improve	**School Section** • Same as Alternative B **Upper Paria** • Same as Alternative B **Vermilion** • Grazing preference remains the same • Temporary suspension of 784 AUMs until restoration is completed • Improved rangeland health • Improved livestock distribution	**School Section** • Immediate temporary suspension of 102 AUMs until Standards are met • Progress towards meeting upland Standards following restoration more quickly than Alternative A, B, and C • Trend would improve **Upper Paria** • Immediate temporary suspension of 2,780 AUMs until Standards are met • Progress towards meeting upland Standards following restoration more quickly than Alternative A, B, and C • Trend would improve & move toward potential natural community **Vermilion** • Immediate temporary suspension of 2,849 AUMs until Standards are met	**School Section** • Same as Alternative D **Upper Paria** • Same as Alternative D **Vermilion** • Immediate temporary suspension of 2,849 AUMs until Standards are met • Permanent reduction of 1,036 AUMs

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Livestock Grazing (cont.)				
	Willow Gulch • Same as Alternative A	**Vermilion** (cont.) • Progress towards meeting Standards quicker than Alternative A and B • Trend would improve **Willow Gulch** • Same as Alternative A	**Vermilion**(cont.) • Progress towards meeting Standards more quickly than Alternative A, B, and C • Trend would be upward **Willow Gulch** • Same as Alternative A	**Vermilion** (cont.) • Progress towards meeting Standards more quickly than Alternative A, B, C and D • Trend would be upward **Willow Gulch** • Closure of Calf Creek to livestock grazing between Upper and Lower Falls • Other impacts same as Alternative A
Impacts to Vegetation				
• No direct impacts • No progress toward achieving desired plant community (DPC) for any community type **Aspen** • continue to regenerate **Evergreen Forest** • Light use & minimal impact would continue • Potential increase in grazing use from shift in livestock distribution into this community	• No direct impacts **Aspen** • Same as A **Evergreen Forest** • Same as A	• No direct impacts **Aspen** • Same as A **Evergreen Forest** • Same as A	• No direct impacts **Aspen** • Same as A **Evergreen Forest** • Same as A	• Impacts to all plant communities same as Alternative D

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Vegetation (cont.)				
Oak woodland • Potential degradation in health & conversion to P/J from increase in livestock use in this community **Pinyon-juniper** • Continued degradation of understory vegetation • Potential change from cool to warm season grasses **Ponderosa/Douglas Fir** • Light use & minimal impact would continue • Potential negative impact from shift in livestock distribution to this community **Blackbrush** • Degradation from increase in exotic species and conversion from cool to warm season grasses **Desert Shrub** •Decrease in shrubs and grasses and Increased exotics • Potential shift to non-functioning	**Oak woodland** • Continue to function • DPC would be achieved **Pinyon-juniper** • More diverse age structure and diversity of understory species • Progress toward achieving DPC **Ponderosa/Douglas Fir** • Same as A except slight improvement in community health expected **Blackbrush** • Gradual improvement in community health • Slow progress toward achieving DPC • Conversion from cool to warm season grasses **Desert Shrub** • Gradual improvements in veg. cover • Slow progress toward achieving DPC	**Oak woodland** • Same as B **Pinyon-juniper** • More diverse age structure and diversity of understory species • Progress toward achieving DPC • Decrease in plant cover due to increased livestock dispersal **Ponderosa/Douglas Fir** • Same as B **Blackbrush** • Same as B **Desert Shrub** • Moderate improvements in veg. cover and biological soil crust. • Increased progress toward achieving DPC compared to B	**Oak woodland** • Same as B **Pinyon-juniper** • Increase in age structure and diversity of understory species • Decrease in plant cover due to increased livestock dispersal • Increase in cool season grasses • Greater progress toward achieving DPC compared to A, B, or C **Ponderosa/Douglas Fir** • Same as B **Blackbrush** • Greater ability for community to recover than A, B, or C **Desert Shrub** • Increased progress toward achieving DPC compared to B or C	

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Vegetation (cont.)				
Grassland & Meadow • Increased exotics • Conversion to other communities likely **Mountain shrub** • Light use & minimal impact would continue **Sagebrush/grassland** • Reduced vigor & reproduction of desired shrubs and grasses • Increase in undesired shrubs, P/J and soil loss from erosion **Seedings** • Continued downward trend • Potential to be dominated by exotics **Wetland/riparian** • Continued degradation and loss of riparian vegetation • Continued spread of exotics	**Grassland & Meadow** • long term increase in veg. cover • Slow progress toward achieving DPC **Mountain shrub** • Same as A **Sagebrush/grassland** • Increased veg. cover, species composition & diversity • Slow progress toward achieving DPC **Seedings** • Continued deterioration of soil conditions • Limited long-term persistence • slow progress toward DPC **Wetland/riparian** • Increase in total veg. cover and age classes of woody species • Potential expansion of riparian zone • Continued competition of exotic species	**Grassland & Meadow** • Same as B **Mountain shrub** • Same as A **Sagebrush/grassland** • Increased veg. cover, species composition & diversity over larger area than in B • Greater potential in achieving DPC • Early detection of community changes **Seedings** • Potential increase in weeds • Slow to moderate progress toward DPC **Wetland/riparian** • Greater increase in total veg. cover and age classes of woody species than B • Potential larger expansion of riparian zone than B	**Grassland & Meadow** • Same as B but with more rapid progress toward achieving DPC **Mountain shrub** • Same as A **Sagebrush/grassland** • Same increases identified in C over larger area • Greater potential in achieving DPC compared to B or C • Early detection of community changes **Seedings** • Slow to moderate progress toward DPC • Greater chance for long term persistence **Wetland/riparian** • Greater increase in total veg. cover and age classes of woody species than B or C • Potential larger expansion of riparian zone than B or C	

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Threatened, Endangered & Sensitive Plant Species				
• Continued little to no impacts from livestock grazing on most species • Potential loss of pollinators as health of adjacent communities decline • Potential decline of Kodachrome Bladderpod	• Continued little to no impacts from livestock grazing on most species • Potential loss of pollinators as health of adjacent communities decline • Kodachrome Bladderpod would not change or show improvement	• Same as B	• Same as B	• Same as B
Impacts to Riparian and Water Resources				
Watershed Health • Degraded hydrologic conditions would remain static or continue to degrade. • Degraded seedings would continue to deteriorate and be vulnerable to high rates of runoff.	**Watershed Health** • Slight to moderate reduction in the severity of impacts on upland hydrologic processes. • Slight to moderate improvements in understory cover causing commensurate reductions in runoff. • Degraded seedings would continue to deteriorate and be vulnerable to high rates of runoff.	**Watershed Health** • Moderate reduction in the severity of impacts on upland hydrologic processes. • Moderate improvements in understory cover causing commensurate reductions in runoff. • Beneficial impacts would occur more quickly under this Alternative than under Alternative B • Increase in vegetation, infiltration, and decreased runoff.	**Watershed Health** • Similar as Alternative C, except improvements would occur more quickly and over a much larger portion of the EIS area	**Watershed Health** • Similar as Alternative D, except improvements would occur over a larger portion of the EIS area

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Riparian and Water Resources (cont.)				
Riparian PFC • Riparian area restoration would occur on a site by site basis as resources allow. • Riparian areas would receive improved protection and restoration **Water Quality** • Current trends in upland and riparian areas would continue. • Grazing would continue to have negligible to minor impact on TDS and salinity.	**Riparian PFC** • Riparian systems on all allotments would benefit • Bank stability would improve • Headcut development and migration would slow • herbivory and trampling would be reduced **Water Quality** • Livestock use around springs would be reduced • Riparian vegetation near unfenced streams would continue to be impacted by livestock. • Channel incision and widening would continue, although recovery of riparian vegetation would allow channels to stabilize over time.	**Riparian PFC** • Same as Alternative B **Water Quality** • Same as Alternative B	**Riparian PFC** • Similar to Alternatives B and C, except riparian areas would see immediate removal of livestock impacts where grazing suspensions or closures occur. **Water Quality** • Similar to Alternative B, except springs and streams would see immediate removal of livestock impacts where grazing suspensions or closures occur.	**Riparian PFC** • Similar to Alternatives B, C, and D, except riparian areas would see immediate removal of livestock impacts where grazing suspensions or closures occur. **Water Quality** • Similar to Alternative B, except springs and streams would see immediate removal of livestock impacts where grazing suspensions or closures occur.
Impacts to Biological Soil Crust				
• No change in impacts	• No new direct impacts from grazing • Trampling impacts reduced • Localized impacts from proposed improvements	• Same as B	• Greater decrease in livestock related impacts than B or C • Localized impacts from proposed improvements	• No concentrated impacts around structural improvements

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Soils				
• Soil resource condition would improve the least and likely would further degrade • No increase in protective cover of vegetation and litter • No new grazing management strategies for enhanced soil protection measures	• Soil resource condition would be maintained but enhancement would be slow • Slow increase in protective cover • New grazing management strategies only to make progress towards meeting Standards may provide some enhanced soil protection measures over time.	• Soil resource condition would improve more readily than under A or B • Protective cover would be maintained or increased. • Changes in grazing management strategies would consider soils with a high risk of degradation	• Soil resource condition would improve more readily than under A, B, or C • Protective cover would increase more rapidly than C • Changes in grazing management strategies would consider soil resource with emphasis on minimizing soil disturbance	• Soil resource condition would improve most readily compared to other alternatives • Protective cover would increase most rapidly • Changes in grazing management strategies would emphasize plant restoration resulting in expedited recovery of soil health.
Impacts to Noxious Weeds and Non-native Plants				
• Gradual increase in Noxious and/or invasive plant species spread likely • Current closed allotments would not experience any livestock dispersed increase in noxious and/or exotic species.	• Gradual increase in Noxious and/or invasive plant species spread likely • Decrease in noxious and invasive plant species with successful restoration. • Potential for localized increase in weed spread from soil disturbing actions	• Closed allotments or pastures would not experience any livestock dispersed Noxious and/or invasive plant species. • Reduced spread noxious and/ or invasive plant species on allotments with temporary non-use or suspension of livestock grazing	• Same as C except number of allotments closed or having temporary suspensions differs	• Same as C except number of allotments closed or having temporary suspensions differs

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Noxious Weeds and Non-native Plants (cont.)				
	• Increase in distribution of Noxious and/or invasive species likely from increased livestock distribution • Reduced spread of noxious and/or invasive plant species by removal of feral cows	• Decrease in noxious and invasive plant species with successful restoration • Potential for localized increase in weed spread from soil disturbing actions • Increase in distribution of Noxious and/or invasive species likely from increased livestock distribution		
Impacts to Wildlife				
• Impacts to bird species from continued changes in veg. cover, diversity & structure • Continued trampling impacts on ground nesting birds • Continued impacts on riparian dependant species due to increased recovery time for riparian and meadow communities • Minimal impacts to bat species	• Reduced impacts to bird species compared to A • Reduced trampling impacts on ground nesting birds. • Reduced impacts to riparian dependent species • Reduced competition for food and water resources for many wildlife species	• Greater reduction in habitat related impacts to wildlife compared to B • More fence related impacts to migrating mule deer and pronghorn antelope. • Increase in cover impacting barren ground dependant migratory bird species. • Habitat enhanced for riparian dependent species	• Similar impacts to Alt C with greater reduction in habitat related impacts and forage and water competition • Greater enhancement of habitat conditions for Mexican Spotted Owl and Southwestern Willow Flycatcher compared to B or C	• Similar impacts to Alt C with greater reduction in habitat related impacts and forage and water competition than other alternatives • Greater enhancement of habitat conditions for Mexican Spotted Owl and Southwestern Willow Flycatcher compared to B, C ,or D

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Wildlife (cont.)				
• Continued competition for food and water resources for many wildlife species • No improvement to habitat conditions for Mexican Spotted Owl and Southwestern Willow Flycatcher	• Improved habitat conditions for Mexican Spotted Owl and Southwestern Willow Flycatcher	• Greater reduction in competition for food and water resources for many wildlife species compared to B • Greater enhancement of habitat conditions for Mexican Spotted Owl and Southwestern Willow Flycatcher compared to B		
Impacts to Cultural Resources				
• Existing impacts would continue but no new impacts expected • Less protection to cultural resource than alternatives B-E	• Grazing related impacts would continue or have slight reduction	• Decreased grazing related impacts to cultural resources over Alternative B	• Decreased grazing related impacts to cultural resources over Alternative B and C	• Decreased grazing related impacts to cultural resources compared to B, C, or D
Impacts to Recreation				
• Conflicts between recreational users and livestock would worsen over the long-term	• Conflicts between recreational users and livestock partially resolved • Proposed range improvements reduce natural appearing landscapes	• Conflicts between recreational use and livestock would mostly be reduced or eliminated	• Same as Alternative C	• Same as Alternative C

Table 2-10 Comparative Summary of Impacts by Alternative Continued

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Socio-Economics				
•Minimal Change to present total economic situation for area •Minimal change to economic situation of ranching and farming industry •No permittees would cease operations as a result of action •Custom and culture of ranching unchanged	• Minimal Change to present total economic situation for area •Minimal change to economic situation of ranching and farming industry •No permittees would cease operations as a result of action •Custom and culture of ranching unchanged	• Short-term potential total income loss of .04% for area •Long-term potential total income loss of .02% for area •Short-term potential income loss of 3% to ranching and farming industry •Long-term potential income loss of 2% to ranching and farming industry •5 permittees may cease operations •Custom and culture of ranching continues for area	•Short-term potential total income loss of .10% for area •Long-term potential total income loss of .02% for area •Short-term potential income loss of 7.8% to ranching and farming industry •Long-term potential income loss of 2% to ranching and farming industry •7 permittees may cease operations •Custom and culture of ranching continues for area	•Short-term potential total income loss of .14% for area •Long-term potential total income loss of .02% for area •Short-term potential income loss of 11.3% to ranching and farming industry •Long-term potential income loss of 2% to ranching and farming industry •10 permittees may cease operations •Custom and culture of ranching continues for area

CHAPTER 3
AFFECTED ENVIRONMENT

INTRODUCTION

This section describes the existing condition of resources in the planning area that may be impacted by changes in grazing management. The understanding of these resources serves as the baseline for analysis, including determining the impacts of the various alternatives on resources. Resource descriptions are only depicted in as much detail as needed to analyze the effects of proposed actions.

GENERAL SETTING

Land Ownership

The planning area includes approximately 2,168,726 acres of Federal land in south-central Utah, mainly within the GSENM, but including portions of NPS lands, lands administered by the Kanab Field Office (Map 2) and the Arizona Strip BLM. Approximately 68% of the planning area is in Kane County, with approximately 31% in Garfield County, with less than 1% occurring in Coconino County, AZ.

The planning area is primarily surrounded by other Federal lands. Dixie National Forest borders the planning area to the north, Capitol Reef National Park and Glen Canyon National Recreation Area to the east and southeast, Bryce Canyon National Park to the northwest, and other Bureau of Land Management (BLM)-administered lands to the south and west. Kodachrome Basin State Park south of Cannonville, Utah is surrounded by lands within the planning area.

Transportation and Access

There are two major highways which pass through the planning area: U.S. Highway 89 and Utah State Route (SR) 12. Both are major traffic arteries bringing visitors to the GSENM and regional destinations such as Grand Canyon National Park, Lake Powell, Bryce Canyon National Park, Capitol Reef National Park, and Zion National Park. From west to east, US 89 traverses the planning area beginning about 10 miles east of Kanab east to the town of Big Water near the Arizona State line. Utah SR 12, a Scenic-Byway, runs west to east through Tropic, Cannonville, Henrieville, Escalante, and Boulder. There are six State Scenic-Backways in and around the planning area including Burr Trail, Hole-in-the-Rock, Smoky Mountain, Cottonwood Wash, Paria River Valley, and Posey Lake.

Transportation needs of permittees was assessed during the evaluation process, and some additional access requirements were noted (Appendix 1).

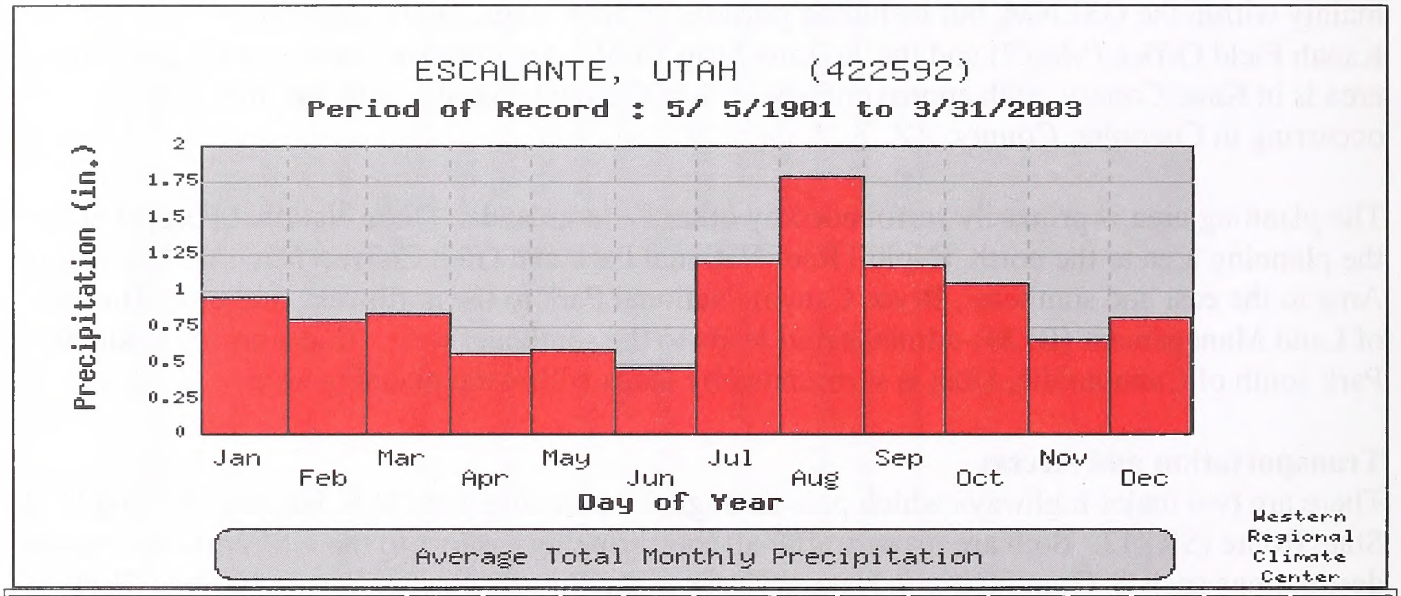
Climate

The climate in the planning area is classified as semiarid. Annual precipitation ranges from 13 inches in the Grand Staircase area to about 8 inches in the lower Escalante desert. The area experiences a bimodal precipitation pattern, with peaks in the summer and winter. During the summer months of July, August, and September, precipitation comes to the area by way of thunderstorms as part of the North American Monsoon. These thunderstorms tend to advance northward out of Arizona, producing isolated, but often heavy, storms. Because of the way these thunder cells form, it is common for one area to receive heavy rain, while just a few miles away, no precipitation occurs. During the winter months, precipitation mainly falls as snow, with some

rain showers in the valleys. These winter storms advance into the region from out of the northwest portion of the United States and are much more widespread than summer storms. A series of tables (Table 3-1, Table 3-2, and Table 3-3) provided by the Western Regional Climate Center depict monthly average precipitation and temperatures for three towns surrounding the planning area.

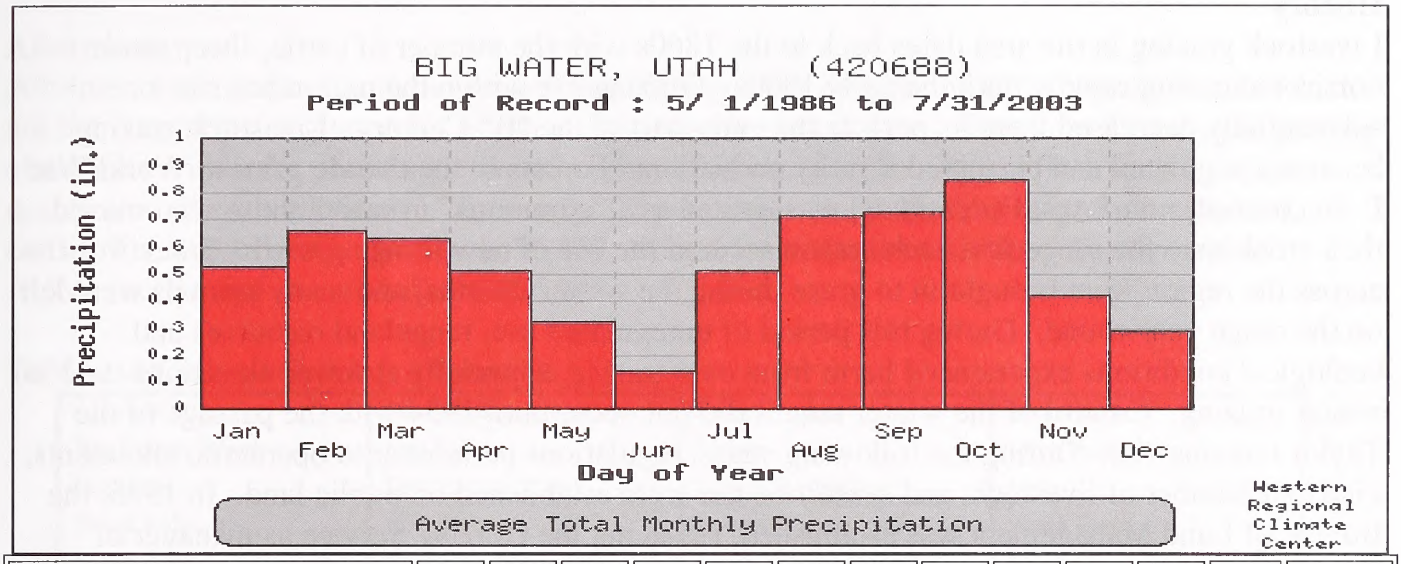
Summertime temperatures range from the mid to upper 90s°F during the day and drop to the 60s°F overnight. During the winter, temperatures in the lower 40s°F are common during the daytime with nighttime lows often between 10-20°F.

Table3-1 Average Monthly Precipitation and Temperature - Escalante, Utah (422592)



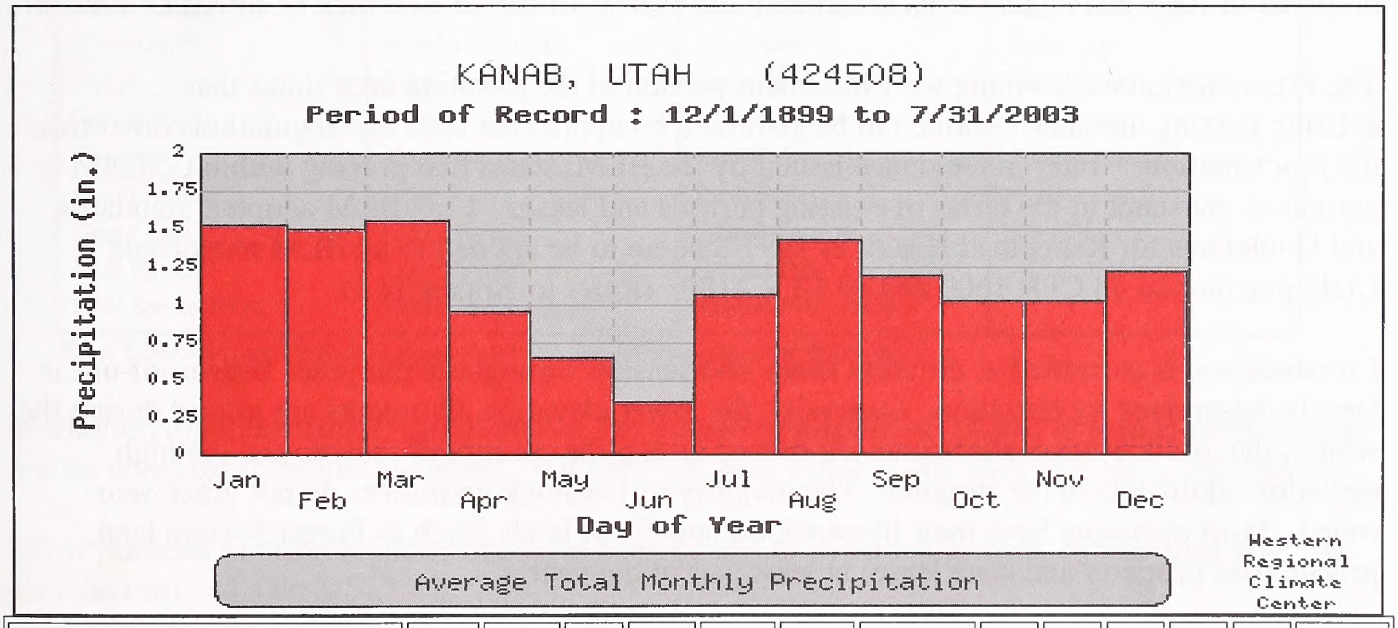
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	40	46	55	63	73	84	89	86	78	67	53	42	65
Average Min. Temperature (F)	14	20	26	33	40	47	54	53	44	35	24	16	34
Average Total Precipitation (in.)	0.94	0.80	0.84	0.57	0.60	0.46	1.20	1.82	1.16	1.05	0.65	0.81	10.89

Table 3-2 Average Monthly Precipitation and Temperature – Big Water, Utah (420688)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	47	54	65	75	84	95	100	96	88	75	59	47	74
Average Min. Temperature (F)	24	29	36	43	50	60	66	65	56	44	32	23	44
Average Total Precipitation (in.)	0.50	0.69	0.61	0.45	0.31	0.15	0.52	0.71	0.71	0.83	0.43	0.29	6.19

Table 3- 3 Average Monthly Precipitation and Temperature - Kanab, Utah (424508)



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	47	52	591	68	77	87	93	90	84	72	59	49	70
Average Min. Temperature (F)	22	26	30	36	43	50	58	57	50	40	30	23	39
Average Total Precipitation (in.)	1.52	1.50	1.53	0.96	0.63	0.35	1.07	1.43	1.20	1.02	1.04	1.22	13.48

CHAPTER 3
AFFECTED ENVIRONMENT

LIVESTOCK GRAZING

History

Livestock grazing in the area dates back to the 1860s with the number of cattle, sheep, and horses increasing rapidly until the early 1900s. Grazing use within the region has since substantially decreased from its peak in the early part of the 20th Century. Livestock grazing became a regulated and permitted activity on National Forests in the decade prior to World War I. In contrast, non-forest Federal land was treated as a "commons" in which those who moved their stock onto the range first each season secured the use of new forage growth. Stock from across the region were brought in to graze during the winter months, and many animals were left on the range year-round. During this period of unregulated use, rangeland resources and ecological conditions experienced harm from overgrazing, especially at lower elevations used for winter grazing. Control of the winter ranges did not occur until 1934 with the passage of the Taylor Grazing Act. During the following years, regulations pertaining to operators, allotments, kind and number of livestock, and season-of-use were established on public land. In 1946, the Bureau of Land Management was established, replacing the Grazing Service as manager of grazing on public range. During the late 1950s and early 1960s, range surveys were completed to determine the capacity of the land for grazing.

Following these surveys, decisions on forage were adjudicated and livestock numbers on most allotments were reduced. A Federal court order on April 11, 1975 required the BLM to prepare Grazing Environmental Impact Statements on public grazing lands over a ten-year period. To comply with this agreement, the Kanab/Escalante Grazing Environmental Impact Statement was prepared in 1981 and adjustments in number and season-of-use of livestock occurred as a result.

The Proclamation establishing the Monument portion of the planning area states that ". . . existing grazing use shall continue to be governed by applicable laws and regulations other than the proclamation." Interim Guidance issued by the BLM, states that grazing within GSENM is permitted, pursuant to the terms of existing permits and leases. Utah BLM adopted Standards and Guidelines for Rangeland Health in 1997 that are to be applied to all BLM rangelands in Utah, pursuant to 43 CFR 1600 and 43 CFR 4180. (Refer to Appendix 8).

Livestock use is permitted at different times and seasons throughout the year. Season-of-use is largely determined by elevation. Generally, the lower elevation allotments are grazed during the winter, the mid-elevation allotments are grazed during the spring/fall season, and the high elevation allotments in the summer. The majority of livestock permittees do not graze year-round. Most operators have their livestock on non-BLM lands (such as Forest System land, private base property and state lease) at least part of the year.

Approximately 175,000 acres within GSENM were formerly administered by the State of Utah School and Institutional Trust Lands Administration (SITLA). These lands were exchanged between the State of Utah and the Federal government in 1998. Most of the former State lands transferred to the BLM are grazed in conjunction with the original BLM allotments through exchange of use agreements. Some of the transferred lands are fenced square miles that are managed as individual allotments. In accordance with the Congressional legislation authorizing

the exchange, the former State grazing permits shall be managed under their original (State issued) terms and conditions until their scheduled expiration.

Allotments

Allotments are areas of land designated and managed for the grazing of livestock. Lands which are not currently designated for livestock grazing are closed areas. There are 82 separate grazing allotments within the planning area and sixteen closed areas (See Appendix 1 for a complete description of each allotment). Currently, 92 permittees are authorized to graze horses and cattle. The authorized active use is 76,457 Animal Unit Months (AUMs). Total permitted AUMs (active and suspended) are 106,138.

Table 3-4 Current Grazing Allotments

Alvey Wash	Deer Springs (State)	Long Canyon	Sink Holes
Big Bowns Bench	Dry Valley	Lower Cattle	Slick Rock State
Big Horn	Dry Valley (State)	Lower Hackberry	Soda
Black Ridge	First Point	Lower Warm Creek	South Fork
Black Rock	Five Mile Mountain	Main Canyon (State)	Swallow Park
Black Rock (State)	Flood Canyon**	Mollies Nipple	Timber Mountain
Boot	Ford Well	Moody	Upper Cattle
Boulder Creek	Fortymile Ridge	Moyle C Johnson (State)	Upper Hackberry
Bull Run (State)	Granary Ranch	Mud Springs	Upper Paria
Bunting Trust*	Hall Ranch	Neaf	Upper Warm Creek
Calf Pasture	Haymaker Bench	Nipple Bench	Varney Griffin
Circle Cliffs	Headwaters	Pine Creek	Vermilion
Clark Bench	Hells Bellows	Pine Creek (State)	Wagon Box Mesa
Cockscomb	Johnson Canyon	Pine Point	Wahweap
Collet	Johnson Lakes	Rock Creek-Mudholes	White Rock
Cottonwood	Johnson Point	Round Valley	White Sage
Coyote	King Bench	Roy Willis	Wide Hollow
Death Hollow	Lake	Rush Beds	Willow Gulch
Deer Creek	Lake Powell	School Section	Wire Grass
Deer Range	Last Chance	Second Point	
Deer Spring Point	Locke Ridge (State)	Second Point (State)	

Note: * See Johnson Canyon in Appendix 1; ** See Johnson Lakes in Appendix 1.

In addition to the allotments listed above, the following unallotted, closed or forage reserve areas will be considered in this document: Antone Flat, Flag Point, Little Bowns Bench, and Phipps.

All or portions of sixteen allotments have been closed to livestock grazing by previous land use plan decisions (Table 3-5).

Table 3-5 Areas closed to Livestock Grazing by Previous Land Use Plan Decisions

Allotment / Pasture		Decision Date	Management (minor/major)
Lower Calf Creek		1964	BLM
Harvey's Fear		MFP 1981	NPS/BLM
Muley Twist		MFP 1981	NPS/BLM
Navajo Bench		MFP 1981	NPS/BLM
Spencer Bench		MFP 1981	BLM/NPS
Rock Creek	Dry Rock Creek Pasture	MFP 1981	NPS/BLM
Rock Creek	Middle Rock Creek Pasture	MFP 1981	NPS
Rattlesnake Bench		MFP 1981	BLM
Escalante River		LUP Amendment 1999	NPS/BLM
McGath Point		LUP Amendment 1999	BLM
Big Bowns Bench	River Pasture	LUP Amendment 1999	BLM
Phipps	River Pasture	LUP Amendment 1999	BLM
Deer Creek	River Pasture	LUP Amendment 1999	BLM
Deer Creek	Cottonwood Pasture	LUP Amendment 1999	BLM
Saltwater Creek		LUP Amendment 1999	BLM
Steep Creek		LUP Amendment 1999	BLM

Lower Calf Creek (pasture) was closed as a result of the construction of the Calf Creek Recreation site and Campground in 1964. The trail to the lower falls is used almost daily year-round and often has hundreds of visitors hiking to the falls during high use periods. This is the highest concentrated recreation use area in the planning area.

The Harvey's Fear, Navajo Bench and Spencer Bench areas are located on a relatively narrow "mid" bench between the top of Fiftymile Mountain and Lake Powell. They surround the southern tip of Fiftymile Mountain. These areas are extremely difficult to access due to cliffs both above and below. Limited access, water, and forage make these areas unsuitable for grazing. It is unclear when these areas were initially closed to grazing. The 1980 Grazing EIS and subsequent 1981 Management Framework Plan (MFP) both recommend continuing the closure.

The Muley Twist area located in the far northeast corner of the planning area was closed to livestock grazing due to management decisions associated with Capital Reef National Park.

The Dry Rock Creek and Middle Rock Creek pastures (Rock Creek-Mudholes Allotment) were closed by decision in the MFP due to slope and topography, lack of access, and limited forage. Dry Rock Creek, the larger area, has largely been cut off from other areas due to Lake Powell.

Rattlesnake Bench was closed by decision in the MFP due to suitability issues including access, terrain, limited forage, and lack of water.

The river pastures on the Escalante (Phipps, Big Bowns Bench, and Deer Creek), the Escalante River, McGath Point, Salt Water Creek, Steep Creek and Cottonwood pasture (Deer Creek Allotment) areas were all closed to livestock grazing by plan amendment in 1999. The primary reason for closure was to eliminate resource use conflicts between recreational users and livestock. The Escalante and its tributary canyons receive very high use from both day and overnight hikers. The canyon bottom areas are primary travel routes and use areas. The closures

also benefited riparian and upland vegetation, water quality and wildlife dependent on available forage. In the years since these closures, recreational use has continued to increase substantially and riparian vegetation has noticeably increased.

The Little Bowns Bench Allotment, Phipps Pasture (Phipps Allotment) and Wolverine Pasture (Deer Creek Allotment) were designated as grass banks in a 1999 plan amendment. The grass banks forage could be used in times of loss of forage elsewhere due to drought, fire, or disease.

Grazing in Wilderness Study Areas

Livestock grazing is authorized, and occurs, within Wilderness Study Areas within the Planning area. Rangeland management activities in WSAs are administered under guidelines in the Interim Management Policy for Lands under Wilderness Review (IMP H-8550-1).

Allotment Management

As part of this evaluation, management direction for livestock grazing will be proposed for individual allotments within this planning area (Appendix 1). It should be noted that the BLM will continue to develop and issue Annual Operating Plans to the permittee to specify actions which are required to implement existing Allotment Management Plans (AMPs), along with specific grazing actions to be taken within the operating year.

Range Improvements

Range improvements are constructed to achieve livestock management objectives. The two types of range improvements are non-structural and structural. Non-structural improvements include seedings and other vegetative treatments. Structural range improvements include: fences, corrals, stock trails, cabins, cattle guards, and water developments such as pipelines, wells, troughs, and reservoirs. Range improvements are authorized through either a Cooperative Range Improvement Agreement or a Range Improvement Permit. Most range improvements are authorized through cooperative agreement and prior to the 1995 grazing regulations have shared ownership in proportion to the actual amount of the respective contribution to the initial construction. Ownership of projects constructed after 1995 are held in the name of the United States except for removable projects which can be authorized under a Range Improvement Agreement. Maintenance of structural range improvement projects are generally the permittees and for non-structural projects is the BLMs.

Rangeland Monitoring

Range management is an adaptive process, where ongoing grazing is appraised through monitoring, then modified, and then re-appraised. Grazing system effectiveness can be determined through monitoring. The two main concerns in determining effectiveness are assessing whether or not the level of use is sustainable and if other resource objectives are being met. Vegetation vigor is affected by grazing by both domestic animals and wildlife. Improper grazing practices, such as excessive utilization or improper timing and frequency, reduce plant vigor thus decreasing the plant's ability to reinitiate growth after grazing has occurred and after periods of dormancy as well as recovering after periods of stress, such as drought. Utilization measurements estimate the amount of current years vegetation that is removed during a grazing period. The measurements do not indicate whether this use has a negative or positive effect on the forage resource, hence vegetative community trend is monitored to determine if site specific

vegetative objectives are being met. For our purposes, trend is identified as a transition toward or away from management goals or Desired Plant Community (DPC). The Utah Standards and Guidelines are written toward management of DPC, not Potential Natural Community (PNC). PNC may, however, be the objective on much of the lands the Monument administers.

The BLM has an ongoing monitoring program in the planning area with several decades of collected data. The specific data, by allotment, is given in Appendix 1.

Range Monitoring Methods

Utilization

The Key Forage Species method is used to measure utilization in the planning area. Allowable use levels set by the Kanab/Escalante MFPs are 50% to 60% on grasses and forb species and 40% of current year's growth on browse species. Some AMPs allow up to 70% use in seeded areas. The larger number was set where rangeland seedings were available, since the seeded species could withstand a higher level of grazing use, and for some winter ranges. Utilization is measured using key species (referred to as Key Forage Species), which may vary by allotment or pasture. Utilization measurements are estimates of plant use and an allotment was determined to be within its allowable utilization level if the average measurements on all key species were within 10% of the standard. If one or more key species had an average utilization level that exceeded the allowable level by more than ten percent, the allotment was judged as being above the standard. If utilization on all key species was more than 10% below the allowable level, the allotment was judged as being below the standard.

Trend

There are two different methods that are used to monitor long term trend within the planning area. One is called the photo plot method and the other is called frequency. There are numerous photo plot and frequency studies located throughout the planning area. Both methods provide information as to the species trend of the observed plant community.

Rangeland Health Indicators

"Interpreting Indicators of Rangeland Health" Technical Reference 1734-6, 2000 was used as a key method for assessing range condition along with other monitoring studies. The assessment technique depends on comparing the area being assessed with an undisturbed reference site or, if one is not available, to range ecological descriptions. Eighteen (seventeen required, and one optional) qualitative indicators are rated based on that indicator's degree of departure from the ecological site description and/or ecological reference area. The summation of the qualitative factors results in a "snapshot" appraisal of range condition.

It should be noted that the Rangeland Health Indicator method is just that, i.e., a series of indicators. The methodology is not qualitative, and is not intended to provide either range trend or be the sole support for management decisions. It is primarily designed to provide a preliminary evaluation, identify areas at risk of degradation, give early warning of potential problems and to communicate range conditions between manager and interested publics.

Range Monitoring Data

Utilization

Thirty seven allotments, covering 33% of the planning area, were above the utilization standard. Eight allotments, or 7% of the area, were below. Twenty-one allotments, or 56% of the area, were within the standard. Data was not collected on 17 allotments, or 4% of the area. The results for individual allotments are listed in Table 3-6. These utilization levels are a general indication as to the level of use being made on these allotments.

Table 3-6 Utilization Monitoring Summary

Allotment	Utilization		Allotment	Utilization
Alvey Wash	Above		Lower Cattle	Above
Big Bowns Bench	Above		Lower Hackberry	In Range
Big Horn	Above		Lower Warm Creek	In Range
Black Ridge	Above		Main Canyon (State)	No Data
Black Rock	Above		Mollies Nipple	In Range
Black Rock (State)	No Data		Moody	In Range
Boot	Above		Moyle C. Johnson	No Data
Boulder Creek	Below		Mud Springs	In Range
Bull Run (State)	No Data		Neaf	Above
Calf Pasture	Below		Nipple Bench	In Range
Circle Cliffs	In Range		Phipps	No Data
Clark Bench	In Range		Pine Creek	Below
Cockscomb	No Data		Pine Creek (State)	Above
Collet	Above		Pine Point	Below
Cottonwood	In Range		Rock Creek-Mudholes	Above
Coyote	Above		Round Valley	In Range
Death Hollow	Above		Roy Willis	No Data
Deer Creek	Below		Rush Beds	In Range
Deer Range	Above		School Section	Above
Deer Spring Point	Above		Second Point	Above
Deer Spring Point (State)	No Data		Second Point (State)	Above
Dry Valley	In Range		Sink Holes	Above
Dry Valley (State)	No Data		Slick Rock (State)	No Data
First Point	Above		Soda	Above
Five Mile Mountain	Above		South Fork	No Data
Ford Well	Above		Swallow Park	Above
Fortymile Ridge	In Range		Timber Mountain	Above
Hall Ranch	No Data		Upper Cattle	In Range
Haymaker Bench	No Data		Upper Hackberry	Below
Headwaters	In Range		Upper Paria	In Range
Hells Bellows	Above		Upper Warm Creek	Below
Johnson Canyon	Above		Varney Griffin	No Data
Johnson Lakes	Above		Vermilion	Above
Johnson Point	Above		Wagon Box Mesa	Above
King Bench	In Range		Wahweap	In Range
Lake	In Range		White Rock	Above
Lake Powell	No Data		White Sage	Above
Last Chance	In Range		Wide Hollow	Above
Locke Ridge (State)	Above		Willow Gulch	Below
Long Canyon	Above		Wiregrass	No Data

Trend

Approximately 21% of the allotments have a downward trend, 35% have a static trend, and 35% have an upward trend. There are 17 allotments on which trend studies have never been established. Tend monitoring data is summarized in Table 3-7.

Table 3-7 Trend Monitoring Summary

Allotment Name	1980 Trend	Current Trend	Allotment Name	1980 Trend	Current Trend
Alvey Wash	Static	Static	Long Canyon (new)		Static
Big Bowns Bench	Static	Static	Lower Cattle	Static	Upward
Big Horn		Downward	Lower Hackberry		Static
Black Ridge		Downward	Lower Warm Creek	Static	Static
Black Rock	Static	Upward	Main Canyon (State)		
Black Rock (State)			Mollies Nipple	Static	Downward
Boot	Static	Upward	Moody	Static	Static
Boulder Creek	Poor	Static	Mud Springs	Static	Downward
Bull Run (State)			Neaf	Static	
Calf Pasture	Static	Upward	Nipple Bench	Static	Static
Circle Cliffs	Static	Upward	Pine Creek	Static	
Clark Bench	Static	Upward	Pine Creek (State)		
Cockscomb	Static		Pine Point		Upward
Collet	Declining		Rock Creek -Mudholes	Static	Upward
Cottonwood	Static	Upward	Round Valley	Static	Static
Coyote	Static	Downward	Roy Willis		
Death Hollow	Static	Downward	Rush Beds	Static	Upward
Deer Creek	Static	Static	School Section	Declining	
Deer Range	Declining		Second Point		Static
Deer Springs Point	Static	Static	Second Point (State)		
Deer Springs (State)			Sink Holes	Static	Static
Dry Valley	Static		Slick Rock (State)		
Dry Valley (State)			Soda	Static	Upward
First Point	Static	Static	South Fork		
Five Mile Mountain	Static		Swallow Park		Static
Ford Well	Static	Upward	Timber Mountain	Static	Static
Fortymile Ridge	Static	Downward	Upper Cattle	Static	Static
Hall Ranch			Upper Hackberry	Static	Upward
Haymaker Bench	Static		Upper Paria		Static
Headwaters	Up	Upward	Upper Warm Creek	Static	Static
Hells Bellows	Declining		Varney Griffin		
Johnson Canyon	Static	Downward	Vermilion	Static	Downward
Johnson Lakes	Static	Static	Vermilion (State)		
Johnson Point	Declining	Static	Wagon Box Mesa	Static	Upward
Johnson, Moyle C.			Wahweap	Static	Static
King Bench	Static	Static	White Rock	Static	Downward
Lake	Static	Upward	White Sage	Declining	
Lake Powell			Wide Hollow	Static	Upward
Last Chance	Static	Downward	Willow Gulch	Static	Static
Locke Ridge (State)		Static	Wiregrass		

Note: indicates information not available.

Rangeland Health Indicators

The Rangeland Health Indicators worksheet assesses seventeen required indicators and one optional. The eighteen indicators evaluated represent a degree of departure from either the ecological site description or an ecological reference area. Together, the indicators survey

soil/site stability, hydrological function, and biotic community integrity. A five-point summary rating was assigned to each assessment point ranging from "none to slight departure" from the ecological reference (a '5') to "extreme departure" from ecological reference (a '1'). Monitoring of Rangeland Health Indicators was done in 1999, 2002, and 2003. Five hundred and five sites were monitored in the 2002-2003 period. The summary results shown in the following tables list, by allotment, the number of sites and their rating broken down into the three rated categories of indicators – biological (Table 3-8), hydrological (Table 3-9) and soils (Table 3-10). The eighteenth, optional, indicator for biological crusts was also rated, with the results in the Biological Soil Crust section under Vegetation.

Table 3-8 Biological Indicators

ALLOTMENT	1	2	3	4	5	ALLOTMENT	1	2	3	4	5
Alvey Wash		2	3	9	4	Long Canyon					
Antone Flat				1		Lower Cattle			3	1	
Big Bowns Bench		1	3	6	2	Lower Hackberry			1	1	
Big Horn			4	9		Lower Warm Creek				3	
Black Ridge			1	2		Main Canyon (State)					
Black Rock			3	2		Mollies Nipple		5	13	18	2
Black Rock (State)						Moody			1	4	1
Boot						Moyle C Johnson (State)					
Boulder Creek				3	1	Mud Springs			2	4	
Bull Run (State)				1		Neaf					
Calf Pasture						Nipple Bench			9		
Circle Cliffs	1	3	3	5	9	Phipps			1	5	
Clark Bench			2	8	1	Pine Creek					1
Cockscomb				1		Pine Creek (State)					
Collet			1			Pine Point				1	
Cottonwood		2	7	12	8	Rock Creek-Mudholes/State			1	10	
Coyote	2	2	4	9		Round Valley		1	2	4	
Death Hollow			2	2	1	Roy Willis				1	
Deer Creek			1	3	2	Rush Beds				2	
Deer Range			2	2	1	School Section					
Deer Spring Point						Second Point					
Deer Spring Point (State)						Second Point (State)					
Dry Valley			2	1		Sink Holes			1	2	
Dry Valley (State)						Slick Rock (State)					
First Point						Soda		1	6	3	
Five Mile Mountain			1	3	2	South Fork					
Ford Well				2		Swallow Park			2	3	
Fortymile Ridge		1	5	3		Timber Mountain					1
Hall Ranch						Upper Cattle			6	11	4
Haymaker Bench				2	1	Upper Hackberry			3	12	1
Headwaters	1	2	13	16	2	Upper Paria		3	14	19	9
Hells Bellows						Upper Warm Creek			2	2	
Johnson Canyon			1	1		Varney Griffin		1		2	
Johnson Lakes			3	2		Vermilion		2	10	21	1
Johnson Point						Wagon Box Mesa				2	5
King Bench			2	6	1	Wahweap				2	
Lake		1	4	5	1	White Rock				1	
Lake Powell				1		White Sage					
Last Chance			3	11	2	Wide Hollow					
Little Bowns Bench				2	1	Willow Gulch				3	
Locke Ridge (State)						Wire Grass			4	2	

Table 3-9 Hydrological Indicators

ALLOTMENT	1	2	3	4	5	ALLOTMENT	1	2	3	4	5
Alvey Wash			3	13	2	Long Canyon					
Antone Flat					1	Lower Cattle				4	
Big Bowns Bench			4	6	2	Lower Hackberry				1	1
Big Horn			2	9	2	Lower Warm Creek				2	1
Black Ridge				3		Main Canyon (State)					
Black Rock				5		Mollies Nipple		2	11	23	2
Black Rock (State)						Moody				3	3
Boot						Moyle C Johnson(State)					
Boulder Creek				2	2	Mud Springs			3	2	1
Bull Run (State)					1	Neaf					
Calf Pasture						Nipple Bench			5	4	
Circle Cliffs		5	2	4	10	Phipps				4	2
Clark Bench			2	6	3	Pine Creek					1
Cockscomb				1		Pine Creek (State)					
Collet			1			Pine Point				1	
Cottonwood			8	12	9	Rock Creek-Mudholes			1	7	3
Coyote	1	1	5	9	1	Round Valley			2	3	2
Death Hollow			1	3	1	Roy Willis				1	
Deer Creek				5	1	Rush Beds				1	1
Deer Range		1	2	1	1	School Section					
Deer Spring Point						Second Point					
Deer Spring Point (State)						Second Point (State)					
Dry Valley			3			Sink Holes				1	2
Dry Valley (State)						Soda			4	6	
First Point						Slick Rock (State)					
Five Mile Mountain			1		5	South Fork					
Ford Well				2		Swallow Park			2	2	1
Fortymile Ridge			5		4	Timber Mountain				1	
Hall Ranch						Upper Cattle			2	16	3
Haymaker Bench				1	2	Upper Hackberry			4	9	3
Headwaters	1	4	10	14	5	Upper Paria		5	16	13	11
Hells Bellows						Upper Warm Creek				4	
Johnson Canyon				2		Varney Griffin		1		2	
Johnson Lakes			1	4		Vermilion		3	12	16	3
Johnson Point						Wagon Box Mesa				5	2
King Bench			1	7	1	Wahweap				2	
Lake			3	8		White Rock			1	0	
Lake Powell				1		White Sage					
Last Chance			2	9	5	Wide Hollow					
Little Bowns Bench				1	2	Willow Gulch				1	2
Locke Ridge (State)						Wire Grass			3	3	

Table 3-10 Soil Indicators

ALLOTMENT	1	2	3	4	5	ALLOTMENT	1	2	3	4	5
Alvey Wash		1	1	12	4	Long Canyon					
Antone Flat					1	Lower Cattle			4		
Big Bowns Bench			6	4	2	Lower Hackberry				1	1
Big Horn			2	7	4	Lower Warm Creek			1	2	
Black Ridge			1	1	1	Main Canyon (State)					
Black Rock			1	4		Mollies Nipple		2	9	22	5
Black Rock (State)						Moody				4	2
Boot						Moyle C Johnson (State)					
Boulder Creek			1	2	1	Mud Springs			2	1	3
Bull Run (State)				1		Neaf					
Calf Pasture						Nipple Bench		1	4	4	
Circle Cliffs		5	3	6	7	Phipps			1	3	2
Clark Bench			2	7	2	Pine Creek				1	
Cockscomb				1		Pine Creek (State)					
Collet			1			Pine Point				1	
Cottonwood			9	11	9	Rock Creek-Mudholes			2	6	3
Coyote		3	7	5	2	Round Valley			3	2	2
Death Hollow		1		3	1	Roy Willis			1		
Deer Creek				6		Rush Beds				2	
Deer Range		1	2	1	1	School Section					
Deer Spring Point						Second Point					
Deer Spring Point (State)						Second Point (State)					
Dry Valley			2	1		Sink Holes				1	2
Dry Valley (State)						Slick Rock (State)					
First Point						Soda			7	4	
Five Mile Mountain			1	1	4	South Fork					
Ford Well				1	1	Swallow Park			3	1	1
Fortymile Ridge			6	3		Timber Mountain				1	
Hall Ranch						Upper Cattle		1	1	14	5
Haymaker Bench				1	2	Upper Hackberry			4	8	4
Headwaters	1	5	7	16	5	Upper Paria		5	17	13	10
Hells Bellows						Upper Warm Creek				3	1
Johnson Canyon			1	1		Varney Griffin		1		2	
Johnson Lakes			2	3		Vermilion		3	12	14	5
Johnson Point						Wagon Box Mesa				4	3
King Bench			1	6	2	Wahweap				2	
Lake			4	7		White Rock			1		
Lake Powell				1		White Sage					
Last Chance		1	2	7	6	Wide Hollow					
Little Bowns Bench				2	1	Willow Gulch				1	2
Locke Ridge (State)						Wire Grass			3	3	

CHAPTER 3
AFFECTED ENVIRONMENT

RANGELAND HEALTH STANDARDS

The information gathered through rangeland monitoring, trend and utilizations studies, rangeland health indicator assessments, and resource assessments by staff specialists is used to evaluate whether or not allotments are meeting the Standards for Rangeland Health and Guidelines for Grazing Management developed by the BLM and the Utah Resource Advisory Council. There are four Rangeland Health Standards: (1) upland soils, (2) riparian and wetland areas, (3) desired species, and (4) water quality (see Appendix 8 for expanded discussion).

The Standards assessments are determined on an allotment-by-allotment basis. Where an allotment is assessed as not meeting one or more Standards, an additional determination must be made as to whether existing livestock grazing practices are a causal factor and/or whether changes to existing livestock grazing practices are required (see Appendix 11 for expanded discussion). The allotment evaluation found that nine allotments were not meeting one or more Rangeland Health Standards due to existing livestock grazing. It was additionally determined that existing livestock management needed to be changed on the nine allotments in order for them to meet Standards in the future. Several allotments failed Standard 4 (water quality) due to natural conditions unrelated to livestock grazing. The allotments with livestock grazing as a causal factor for not meeting Standards incorporate 446,938 (19%) acres of the planning area (see fold out Map 20). Table 3-11 depicts which of the Standards were not met for each of the nine allotments.

Table 3-11 Allotments Evaluated as Not Meeting Standards for Rangeland Health Due To Existing Livestock Grazing

Allotment	Evaluation Standard Not Met				Determination; Grazing a cause for not meeting Standard(s)	Determination; Existing grazing management changes needed in order to meet Standard(s)
	1	2	3	4		
Collet		X	X		Yes	Yes
Death Hollow		X			Yes	Yes
Ford Well		X			Yes	Yes
Soda	X	X			Yes	Yes
Mollies Nipple	X	X	X		Yes	Yes
Rock Creek-Mudholes		X			Yes	Yes
School Section			X		Yes	Yes
Upper Paria	X	X			Yes	Yes
Vermilion	X	X	X	X	Yes	Yes

While several allotments have springs or stream reaches which did not meet Utah Division of Water Quality standards, in all but one of these allotments were there causal factors for non-attainment unrelated to livestock grazing. Only in the Vermillion allotment did a spring fail water quality standards with livestock being a major factor. It should be noted that even though this spring failed water quality standards, the State of Utah has not determined that it should be elevated to the 303(d) list as partially or not supporting its beneficial use.

CHAPTER 3
AFFECTED ENVIRONMENT

VEGETATION

The planning area is located along the western boundary of the Colorado Plateau physiographic province in south-central Utah. The vegetation communities and flora of the Colorado Plateau are sufficiently distinct and uniform to be recognized as their own ecologically-based land area or eco-region. Within the Colorado Plateau eco-region, variations in climate, geology, topography, and influences from adjacent eco-regions have resulted in localized differences in vegetation and species composition.

Despite its immense area and remoteness, the planning area has a long history of botanical exploration and a relatively well-documented flora. Over the past seven decades, 958 vascular plant taxa have been documented. It is estimated that the area may contain as many as 1,100 taxa of vascular plants, representing approximately 50% of the flora of the Colorado Plateau floristic region and 30% of the flora of Utah. Seventy one percent of the flora (684 taxa) consists of relatively common species that are common across western North America. Another 18% of the flora (178 taxa) is comprised of species that are endemic to the Colorado Plateau or immediate vicinity.

The lower stairs of the Grand Staircase (Chocolate and Vermilion cliffs) and the vicinity of Lake Powell have been described as part of the "Dixie Corridor" and contain a number of Mohave or Sonoran desert species that reach the northern edge of their range along the Virgin and Colorado River watersheds in southern Utah. These species include Whipple's cholla, Mexican manzanita, Turbinella live oak, Anderson's wolfberry, Creosote bush, and Desert rue. In addition, the Dixie Corridor has an unusually high concentration of local endemics restricted to Navajo sand dunes (Welsh's milkweed, Escarpment milkvetch), Moenkopi clay flats (Kane breadroot, Meager camissonia, Atwood's pretty phacelia), and Chinle badlands (Gumbo milkvetch, Murdock's evening primrose, Chinle chia, and Kanab thelypody). Many of these endemics are listed as Threatened, Endangered, or BLM Sensitive.

Buckskin Mountain south of US Highway 89 and west of the Cockscomb contains the only extensive outcrops of Paleozoic and early Mesozoic limestone bedrock found on the Monument and represents the northernmost extension of the Grand Canyon Plateaus floristic element. This region has relatively few endemics compared to the adjacent Canyonlands or Mohave Desert areas, but represents the northern boundary for several species including Chestnut milkvetch, Fern bush, Darrow's buckwheat, and Jones' false cloakfern.

The flora and vegetation of the Skutumpah Plateau, White Cliffs, and Canaan and Boulder mountains are influenced by their proximity to the Utah High Plateaus eco-region. These montane uplands serve as a corridor for migration of members of the Rocky Mountain floristic element, but also act as an effective barrier to desert species from the Great Basin region. In addition, this extension of the Utah High Plateaus region contains endemic species include MacDougal's aletes, Zion draba, Breaks draba, Canaan daisy, Zion daisy, Panguitch buckwheat, Paria breadroot, and Smooth penstemon.

CHAPTER 3
AFFECTED ENVIRONMENT

VEGETATION CLASSIFICATION

The vegetation classification adopted for the purpose of this EIS is modified from the Utah Gap Analysis Project. Similar vegetation types (such as pinyon, juniper, and Pinyon-juniper) have been combined for greater simplicity and clarity. This classification consists of major upland and wetland vegetation types, each of which is summarized in the following table.

Table 3-12 Vegetation Classification

Vegetation Type	Acres	% of Study Area	Definitions
Aspen	426	0.02	Deciduous forest dominated by Quaking aspen. Often associated with Douglas-fir, Ponderosa pine, Mountain snowberry, and Saskatoon serviceberry.
Barren Rock Outcrop	617,892	27	Sand, rock, salt flats, playas, and lava fields largely devoid of vegetation.
Blackbrush	269,382	12	Shrubland dominated by Blackbrush. Associated species include Hopsage, Green Ephedra, Shadscale, and Broom snakeweed.
Desert Shrub	166,882	7	Shrublands dominated by Shadscale, Mat atriplex, Fourwing saltbush, Winterfat, Mormon tea, Horsebrush, Rubber rabbitbrush, and Broom snakeweed. Associated species include Greasewood, Big sagebrush, and Blackbrush. Includes UT Gap types Salt Desert Scrub and Greasewood.
Evergreen Forest	646	0.03	Common species of the evergreen plant community include White fir, Bigtooth maple, Mountain lover, and Fendler's meadow rue.
Grassland & Meadow	39,310	2	Perennial and annual grasslands or dry herbaceous meadows with low to no shrub cover. Primary grass species include Indian ricegrass, Bluebunch wheatgrass, Sandberg bluegrass, Crested wheatgrass, Needle-and-Thread grass, Sand dropseed, Galleta, Purple three-awn, and Blue grama. Primary forb species include Yarrow, Larkspur, Balsamroot, and Golden aster. Associated shrub species (if present) include Big sagebrush, Fourwing saltbush, Shadscale, and Utah juniper. Includes UT Gap types Grassland, Dry Meadow, and Desert Grassland.
Mountain Shrub	271	0.01	Deciduous shrubland dominated by Alder leaf mountain mahogany, Cliffrose, Bitterbrush, Utah serviceberry, Chokecherry, Mountain snowberry, and Greenleaf manzanita. Associated species include Big sagebrush, Gambel oak, and Quaking aspen. Includes UT Gap types Mountain Mahogany and Mountain Shrub.
Oak Woodland	6,868	0.30	Deciduous shrubland dominated by Gambel oak or Shrub live oak. Associated species include Big sagebrush, Utah juniper, Pinyon, and Ponderosa pine.
Pinyon-Juniper Woodland	966,709	42	Low to medium elevation conifer woodlands dominated by Pinyon pine and Utah juniper. Associated shrubs include Dwarf mountain mahogany, Big sagebrush, Blackbrush, and Gambel oak.

Table 3-12 Vegetation Classification (Cont.)

Vegetation Type	Acres	% of Study Area	Definitions
Ponderosa Pine/ Douglas-fir	26,550	1	Medium to high elevation conifer forests dominated by Ponderosa pine and Douglas-fir. Includes UT Gap types Spruce-Fir, Ponderosa Pine, Mountain Fir, Spruce-Fir/Mountain Shrub, Mountain Fir/Mountain Shrub, and Ponderosa Pine/Mountain Shrub.
Riparian	11,898	0.51	Streamsides, seeps, washes, hanging gardens, or saturated floodplains dominated by trees, shrubs, forbs, or graminoids. Dominant trees and shrubs include Fremont cottonwood, Coyote willow, Whiplash willow, Yellow willow, Water birch, Box-elder, Salt-cedar, and Squawbush. Dominant herbaceous and graminoid species include sedges, Arctic rush, Common reed, reedgrass, willow-herb, and clover. Hanging gardens are specialized wet seeps or springs found in alcoves of cliffs dominated by columbine, Scratchgrass, Bundle panicgrass, Helleborine, and Maidenhair fern. Includes UT Gap types Mountain Riparian, Lowland Riparian, and Wet Meadow.
Sagebrush Grassland	190,668	8	Shrubland dominated by Big sagebrush or Black sagebrush, or a mix of sagebrush and perennial grasses including Indian ricegrass, Bluebunch wheatgrass, Sandberg bluegrass, Crested wheatgrass, Needle-and-Thread, Sand dropseed, Galleta, and Blue grama. Associated species include Utah juniper, Pinyon, Rubber rabbitbrush, Green rabbitbrush, Broom snakeweed, Bitterbrush, Fourwing saltbush, and Winterfat. Includes UT Gap types Sagebrush and Sagebrush/Perennial Grass.
Seedings	5,768	0.25	Range seeding areas traditionally dominated by introduced pasture grasses such as Crested wheatgrass and Russian wildrye. Rehabilitated seedings composed of a mixture of introduced and native species with shrubs, forbs, and grasses included.
Urban/Agriculture/ Disturbed	13,752	0.59	Residential, agricultural zones, or heavily disturbed areas that fall within the EIS boundaries.

FORESTS AND WOODLANDS

Aspen

Forests dominated by Quaking aspen are a minor vegetative community. Small stands of aspen are located on the summit of Fiftymile Mountain and have been reported along Death Ridge and the slopes of Canaan Peak near the Dixie National Forest boundary. These communities are usually found on benches with perched water tables or ravines associated with springs. Most stands occur in deep, sandy loam or clay loam soils with high organic carbon and nitrogen. Quaking aspen is typically the dominant tree species present, accounting for 20-40% of total canopy cover. Other commonly associated species include Bigtooth maple, Gambel's oak, Mountain snowberry, Woods' rose, Big sagebrush, Rubber rabbitbrush, Muttongrass, Cheatgrass, and Silvery lupine. Aspen stands intergrade with adjacent mountain brush, oak, and sagebrush meadow communities on Fiftymile Mountain. Despite their limited extent, aspen woodlands are relatively species-rich, averaging 43 species per 1,000 square meters (NREL unpublished data). At least 100 plant taxa have been documented from 6 aspen stands on

Fiftymile Mountain and 204 taxa from the Monument flora are known to occur in aspen communities in Utah.

Recent studies in (Anderson 2007) indicate that aspen stands on Fiftymile Mountain are slowly progressing towards DPC standards.

Rangeland Health Assessments
Because Quaking aspen make up such a small component of the vegetation in the planning area, no rangeland health sites were assessed.

Evergreen Forest
This uncommon plant community typically occurs in mesic sites on steep lower slopes with northern aspects or in narrow canyons and ravines. Because of the inaccessibility, few impacts have affected this community type. Understory species are site specific but are dominated by native cool season grasses and forbs typical of more mesic sites. Common species of the Evergreen Forest plant community include White fir, Bigtooth maple, Mountain lover, and Fendler's meadow rue.

Rangeland Health Assessments
Because Evergreen Forest communities are such a small component of the planning area, no rangeland health sites were assessed.

Oak Woodland
Oak woodlands are dominated by Gambel's oak or consist of mixed forests of Gambel's oak, Pinyon pine, Utah juniper, or Ponderosa pine. Turbinella live oak and Shinnery oak are included as dominants in oak woodlands, but occur only sporadically and do not constitute dominant cover. Oak woodlands are often found on sandy loam soils on benches or terraces, but may also occur on shallow slopes of sandstone channel derived from the Carmel Formation. These communities are most abundant along the White Cliffs and Skutumpah Terrace in the Grand Staircase subregion, but also occur intermittently along the east flank of Fiftymile Mountain (Kaiparowits subregion) and other high elevation plateaus. Common understory species in oak woodlands include Mountain mahogany, Bigtooth maple, Utah serviceberry, Big sagebrush, and Mountain snowberry. Oak communities average 35 plant species/1,000 square meters and provide habitat for at least 173 plant taxa.

Rangeland Health Assessments
Only four rangeland health assessments were conducted and all were rated as "slight to moderate" or "none to slight" departures from reference conditions.

Pinyon-Juniper Woodlands
Woodlands and forests dominated by Pinyon pine and Utah juniper constitute the most common vegetation type. Pinyon-juniper woodlands are especially abundant on the high tablelands and rocky sandstone slopes of the Kaiparowits Plateau, Circle Cliffs, Escalante Canyons, Vermilion Cliffs, and White Cliffs where they occur on shallow sand, loam, clay, shale, hardpan, or stony soils. These woodlands are characterized by an open canopy (the tree crowns rarely touch) and relatively low stature. Although usually codominant, Utah juniper tends to be more abundant

than Pinyon pine at lower elevations and in drier or cooler sites. Common associated species include Big sagebrush, Utah serviceberry, Roundleaf buffaloberry, Rubber rabbitbrush, Ephedra, Broom snakeweed, Bitterbrush, Gambel's oak, Blue grama, Indian ricegrass, Needle-and-thread grass, Muttongrass, and Sand dropseed. Species richness within undisturbed Pinyon-juniper woodlands averages 27-32 taxa per 1,000 square meters.

Pinyon-juniper woodlands are intergraded with adjacent sagebrush, oak, Ponderosa pine/Douglas-fir, and aspen communities. Stands with a high density of oak or manzanita typically have higher species richness (35-37 taxa/1,000 square meters) than typical Pinyon-juniper or mixed Pinyon-juniper/sagebrush communities. Disturbed Pinyon-juniper stands have high cover of cheatgrass and other exotics in their understory and markedly reduced species diversity. Pinyon-juniper stands have been chained, burned, or chemically treated to create open areas for seeding with Crested wheatgrass, Russian wildrye, and other perennial bunchgrasses to create forage.

Throughout the West, there has been an increase of pinyon and, especially, juniper in shrublands over the last century. The mechanisms for this shift in the planning area are largely unknown, but several factors are probably involved. Some researchers have suggested that the introduction of grazing in the late 1800's resulted in a decline in grasses and other fine fuels, which reduced fire frequency and allowed tree density to increase. Decreased grass cover may also have allowed shrub density to increase, and since pinyon and juniper use shrubs as nurse plants, more shrubs facilitated an increase in trees. However, in the planning area, current research shows that fire return intervals may have been very long, perhaps on the order of hundreds of years. Studies on the Monument and in Grand Canyon show that pinyon and juniper have increased even in the absence of grazing, which suggests that climate also plays a role in Pinyon-juniper stand expansion in the planning area.

Determining the proper vegetative characteristics of Pinyon-juniper woodlands in the planning area is problematic. It is not understood how anthropogenic disturbances have altered the landscape, and there is a great deal of natural variability in understory composition, structure, and dynamics. In general, however, Pinyon-juniper woodlands probably had a more savanna-like appearance in the past, especially in deeper soils. It is likely that understories were dominated by a mix of cool season perennial bunchgrasses and warm season grasses. Warm season grasses often predominate today, especially in areas where late spring grazing or prolonged drought has reduced cool season species.

Rangeland Health Assessments

Most of the 192 rangeland health assessments in Pinyon-juniper communities rate as none to slight departure from reference conditions.

Ponderosa pine/Douglas-fir

Forests dominated by Ponderosa pine or Douglas-fir occur sporadically in shady, cool, slickrock canyons, along montane streams, and on the rims and north-facing slopes of high elevation slickrock mesas in the White Cliffs and Canaan Peak regions of the Monument. Ponderosa pine is the more widely distributed of the two species, with Douglas-fir limited mostly to mesic canyon bottoms, higher elevations, or more calcareous substrates. Prior to the onset of fire

suppression, Ponderosa pine forests often had an open, savanna-like understory dominated by patches of Greenleaf manzanita and bunchgrasses adapted to acidic soils produced from abundant needle debris. Fire suppression has altered competitive relations. Communities are now denser with understory shrubs and trees and more susceptible to outbreaks of Mountain pine beetle or catastrophic crown fires following drought. Lower elevation stands may intergrade with mountain brush, aspen, and Pinyon-juniper communities. Ponderosa pine/Douglas-fir communities average nearly 30 plant taxa per 1,000 square meters and provide potential habitat for about 35% of the area's flora.

Rangeland Health Assessments

This community is not a large component of the planning area and no rangeland health assessments were conducted.

SHRUBLANDS AND GRASSLANDS

Blackbrush

Blackbrush is the dominant shrub species over extensive areas on the southern flanks of the Kaiparowits Plateau and the south end of the Hole-in-the-Rock Road. These communities occur on non-saline sandy or stony loams of old pediment slopes and terraces with caliche layers. Grasses such as Galleta, Three-awn, or Indian ricegrass may co-occur with Blackbrush on sites where the calcic layer is deep, but are sparse to absent where the calcic layer approaches the surface. Sites with deep sandy soils may also be co-dominated by Green Ephedra. Blackbrush sites with shallow soils may have well-developed biological soil crusts, although these may be diminished in areas with high levels of surface disturbance. Blackbrush is more drought tolerant than sagebrush, but less so than Shadscale, Fourwing saltbush, and most other dominant shrubs of desert shrubland communities. Desert shrub species are also favored on finer-grained soils and more alkali sites. Blackbrush communities typically have low species richness, averaging 24 taxa per 1,000 square meters.

Rangeland Health Assessments

In the planning area, the blackbrush community had the highest percentage of sites of all communities except seedings that showed moderate, moderate to extreme, and extreme departures from reference conditions (soil - 54%; hydrology - 35%; biotic integrity - 50%). Common problems include soil erosion, exotic invasion, loss of species composition.

Desert Shrub

Desert shrublands are the most heterogeneous local vegetation type. Desert shrublands include any dry, low elevation, upland habitat dominated by shrubby species other than sagebrush or Blackbrush. The dominant shrub species vary, but most frequently are members of the Goosefoot Family (Chenopodiaceae). Desert shrublands typically have low vegetative cover, with individual shrubs being widely spaced. Grass cover is variable, depending on soil properties and disturbance history, but typically is comprised of Galleta, Three-awn, Alkali sacaton, Indian ricegrass, Western wheatgrass, or Blue grama. Desert shrublands occur widely across the Kaiparowits Plateau from the Cockscomb to Lake Powell, and in sandy habitats in the Grand Staircase and Escalante Canyons subregions. Desert shrublands are the second largest vegetation type in the area. Sites dominated by desert shrub species average 27 taxa/1,000 square meters, while communities with higher grass cover typically have 29 taxa/1,000 square

meters. More than 470 local plant species are known or suspected to occur within these Desert shrub communities.

Low elevation desert shrublands with well-drained clay soils and a dry climate (less than 7 inches of annual precipitation) are frequently dominated by Shadscale. Common associated species include Bud sagewort, Fourwing saltbush, Gardner's saltbush, Green rabbitbrush, Grayia, Winterfat, Galleta, Indian ricegrass, Bottlebrush squirreltail, Alkali sacaton, and Desert needlegrass. Shadscale stands typically are relatively open with low to moderate cover of perennial grasses. Shadscale may be codominant with Bud sagebrush on rocky, calcareous alluvium along the southern flanks of the Kaiparowits.

Mat saltbush forms a distinct community on barren, fine-textured clays of the Tropic Shale from the Paria River to Lake Powell. Some Mat saltbush communities are subject to invasion by undesirable weedy exotics, such as Red brome, Cheatgrass, Mediterranean barley, African mustard, and Russian thistle.

Sandy, well-drained sites at low elevations are often dominated by Fourwing saltbush, Green Ephedra, Cutler Ephedra, Sand sagebrush, Resinbush, Rubber rabbitbrush, Sand dropseed, yucca, Indian ricegrass, and Dune scurfpea. These communities typically have low cover and wide interspaces between shrubs. Purple sage occasionally forms small stands intermixed with Sand sagebrush in deep sand dunes east of the Hole-in-the-Rock Road, but is otherwise a minor vegetation type.

Communities dominated by Winterfat and cool season grasses occur sporadically in the Kaiparowits region on shallow to deep, sandy or alkaline soils. This species is highly palatable (especially in winter) and may be tolerant of heavy browsing in favorable habitats.

Valley bottoms with poorly drained alkaline clay soils with a high water table are often dominated by Greasewood or Torrey's seepweed. Greasewood communities may lack an herbaceous understory or have up to 20% cover of Desert saltgrass, Western wheatgrass, Bottlebrush squirreltail, and Foxtail barley. With or without disturbance, these stands are susceptible to invasion by Red brome, Cheatgrass, Halogeton, and Prickly lettuce. Greasewood is highly tolerant of water-saturated and oxygen-depleted soils and enjoys a competitive advantage over other desert shrub species and sagebrush in sites that are permanently or intermittently flooded. The species is capable of resprouting following fire, but is vulnerable to water stress and drought.

Permanent wetlands of Baltic rush, Desert saltgrass, Scratchgrass, Common threesquare bulrush, or Torrey's spikerush are often interspersed with desert shrublands where the water table reaches the surface (at least seasonally). Desert wetlands are vulnerable to invasion by non-native and inedible shrub and graminoid species ranging from Tamarisk and Russian olive to Copperweed and Rabbitsfoot grass.

Rangeland Health Assessments

Many of the Rangeland Health assessments showed moderate, moderate to extreme, or extreme departures from reference conditions (soils - 26%; hydrology -18%; biotic integrity - 34%).

Common problems are mostly biotic and include shifts in species composition and increased exotics. Soil loss and soil erosion were also often seen in these assessments.

Grassland and Meadow

The floristic composition of grasslands varies depending on elevation, soil moisture, and climate, but all grasslands share a predominance of annual or perennial graminoids or forbs and low cover of shrubs and trees. The most abundant species in grassland communities include Indian ricegrass, Bluebunch wheatgrass, Sandberg bluegrass, Crested wheatgrass, Needle-and-Thread, Sand dropseed, Galleta, Purple three-awn, Black grama, and Blue grama. Grassland communities intergrade with desert shrub and sagebrush grasslands on dry, upland sites at lower elevations and with mountain brush, aspen, and Pinyon-juniper woodlands at higher elevations. Grass or forb-dominated communities along streams, seeps, and other wetlands are considered under riparian vegetation. Area grasslands average 24-30 plant taxa per 1,000 square meters and provide habitat for as many as 160 plant species.

Seedings of Crested wheatgrass, Russian wildrye and other exotic grasses occur sporadically throughout the area. These seedings were usually established within sagebrush grasslands or Pinyon-juniper communities to augment existing forage.

Rangeland Health Assessments

A majority of the rangeland health assessments showed moderate, moderate to extreme, or extreme departures from reference conditions (soils - 34%; hydrology - 24%; biotic integrity - 39%). Common issues at these sites include; shifts in species composition, reduced soil surface resistance to erosion, invasion of exotics, and increased bare ground.

Mountain Shrub

Mountain shrublands are found primarily on open, rocky sites in valley bottoms or foothills slopes. Dominant species include Utah serviceberry, Mountain snowberry, and Chokecherry in mesic sites with high snow accumulation, and Alder-leaf mountain mahogany, Cliffrose, Bitterbrush, and Greenleaf manzanita in rockier or less fertile sites. Several mountain shrub species are capable of Nitrogen fixation and may be better adapted to nutrient poor sites than other shrubs or trees. Mountain shrub communities may intergrade with aspen, sagebrush, Ponderosa pine/Douglas-fir, or Pinyon-juniper communities, but always lack a closed tree canopy. Most mountain shrub species are adapted to fire and will resprout if burned. Periodic fire is a factor in the persistence of mountain shrub stands or their establishment in burned sagebrush, oak, Ponderosa pine, or Pinyon-juniper communities. Species richness is often high in mountain shrub stands, averaging 34 taxa/1,000 square meters. Nearly 300 taxa are known or potentially occur in this vegetation type.

Rangeland Health Assessments

Sites dominated by this community were not common in the planning area. Only two sites were assessed, and both showed "slight to moderate" or "none to slight" departures from reference conditions.

Sagebrush Grassland

Vegetation dominated by Big sagebrush or other sagebrush species replaces desert shrub at higher elevation sites with greater precipitation (>7 inches) and are the third most extensive plant community in the area after Pinyon-juniper woodlands and desert shrublands. Sagebrush stands occur throughout the area on loamy bottomlands in broad valleys, lower slopes, mesa tops, and stabilized sand dunes. Several different sagebrush communities can be recognized depending on whether Basin big sagebrush, Wyoming big sagebrush, Sand sagebrush, or Black sagebrush are dominant, but all share a common physiognomy characterized by a sparse to dense shrub canopy of sagebrush interspersed with other shrubs, biotic soil crusts, perennial or annual grasses, and forbs. Species richness may be low within sagebrush stands, especially where disturbance has been high. More than 450 plant species have been recorded in sagebrush habitats on the area.

Big sagebrush is the most widespread local sagebrush species. Basin big sagebrush is the typical form along washes and valley bottoms and in sites with rich, sandy-loam soils. Wyoming big sagebrush is also frequent, especially in clay-rich or gravelly loam sites. Mountain big sagebrush has been reported from cooler, high elevation plateaus along Skutumpah Road, but these stands may actually consist of atypically short forms of Basin big sagebrush. Common shrubs associated with Big sagebrush grasslands include Gray horsebrush, Rubber rabbitbrush, Grayia, Fourwing saltbush, Ephedra, Bitterbrush, or Winterfat. Important grass species include cool season perennials such as Thickspike wheatgrass, Western wheatgrass, Indian ricegrass, Bottlebrush squirreltail, Sand dropseed, Muttongrass, and Needle-and-thread.

Small stands dominated by Black sagebrush occur on rocky mesa tops or sites with shallow soils (often with a caliche layer) along Skutumpah Terrace and small knolls north of US Highway 89. Sand sagebrush may be co-dominant with other desert shrub species (especially Fourwing saltbush and Green Ephedra) in stabilized sand dunes in the western third of the area and in the Escalante Canyons subregion. Bigelow's sagebrush replaces Big sagebrush on steep, rocky sandstone slopes in the Vermilion Cliffs region, but is rarely abundant enough to constitute its own community type.

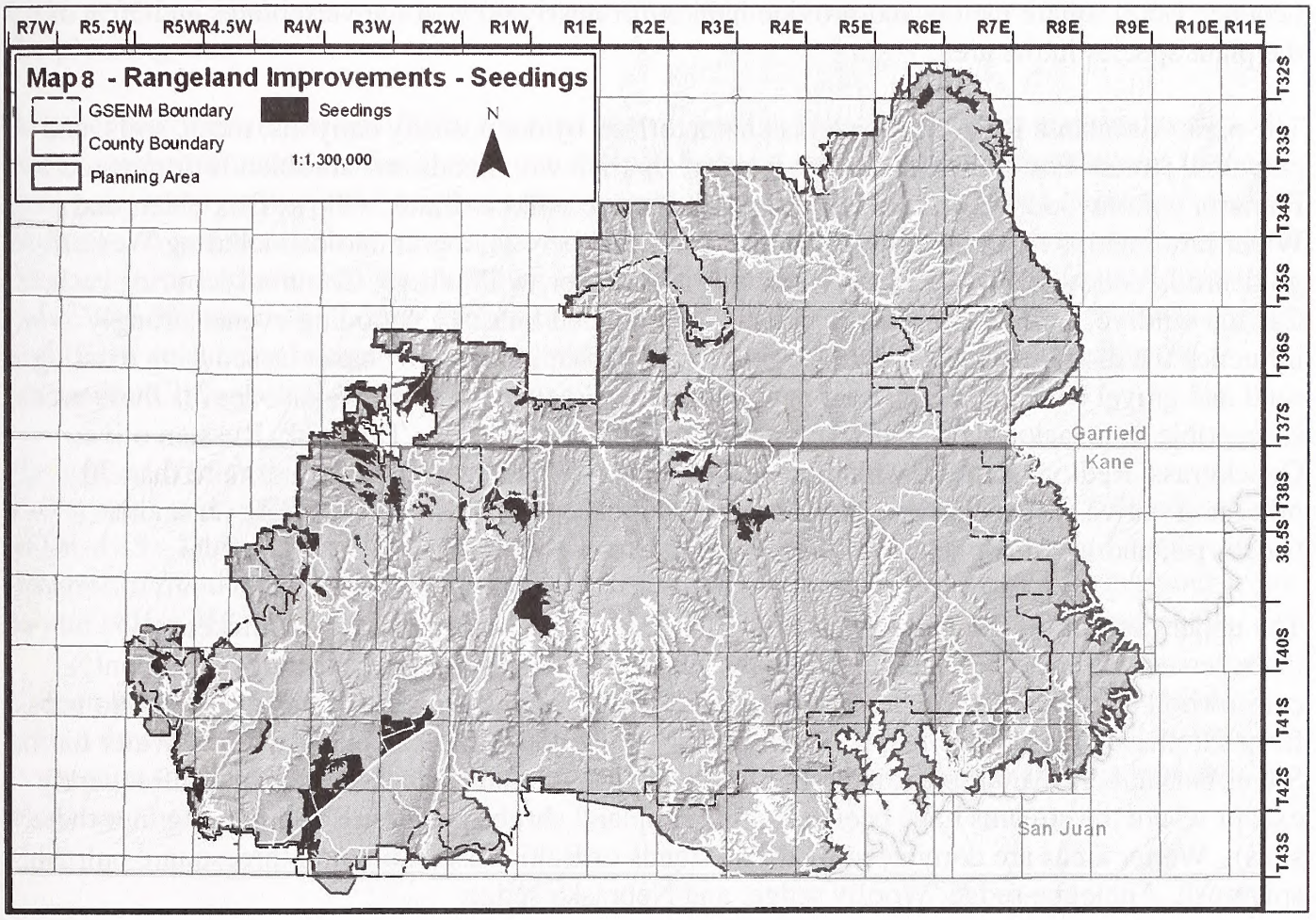
Rangeland Health Assessments

Of all the sites in the rangeland health assessment, sagebrush grassland seedings had the highest percentage of sites that showed moderate, moderate to extreme, or extreme departures from reference conditions (soil - 73%; hydrology - 65%; biotic integrity - 69%). By far the greatest resource issues are reduction in biological soil crust, shift in functional/structural groups, increased soil erosion, and bare ground.

Seedings

The majority of these areas designated as Seedings were formerly sagebrush grassland or Pinyon–juniper Woodland vegetation types that were converted to grasslands containing both native and non-native desirable grasses. Though a relatively minor component of BLM administered lands in this area, these seedings provide a valued forage base for livestock and wildlife throughout the Monument. Most of these seedings were established under cooperative agreement with grazing permittees. Commonly seeded species included crested wheatgrass, pubescent wheatgrass, alfalfa and Russian wildrye. Current treatment of seedings includes both

native and introduced species and a mix of shrubs, forbs, and grasses. For seeding locations see Map 8.



Rangeland Health Assessments

Soils, hydrology, and biotic integrity showed similar ratings in rangeland health analyses of seedings. Sites that showed moderate, moderate to extreme, and extreme departures from reference conditions (soils – 70%; hydrology – 69%; biotic integrity 70%) had concerns with soil stability, desirable species composition, seeded species die-off, and weed invasion.

WETLANDS

Riparian habitats include forest, shrub, graminoid, and forb-dominated vegetation types associated with rivers, streams, springs, seeps, and ephemeral wetlands. These communities are often exceedingly small in area, but are generally high in plant species richness, averaging 33-50 taxa per 1,000 square meters and provide habitat for nearly 60% of the vertebrates and 30% of the plant species in the area.

The upper Escalante River Sub-basin is characterized by deep, shady canyons, mesic soils, and perennial stream flows. These reaches support riparian woodlands and shrublands dominated by Fremont cottonwood, Narrowleaf cottonwood, Coyote willow, Black willow, Box elder, and Water birch with a rich understory of native forbs and perennial graminoids including Western goldenrod, Yellow monkeyflower, White virgin's-bower, willowherb, Common scouring rush, Canada wildrye, Baltic rush, Torrey's rush, and Panicled bulrush. Flooding events strongly influence the distribution of riparian vegetation by reshaping stream channels, scouring existing sand and gravel bars, and depositing new sediment. Frequent disturbance also leaves these areas susceptible to invasion by non-native trees, forbs, and graminoids. Tamarisk, Russian olive, Quackgrass, Redtop, Kentucky bluegrass, Red clover, White sweetclover, and more than 30 other non-native species have become widely established along the Escalante River and its tributaries, and in some places have displaced native vegetation.

The upper portions of the Paria River Sub-basin consist of a mosaic of shrub thickets interspersed with marshes and wet meadows dominated by graminoids and forbs. Fremont cottonwood and Blue spruce also occur sporadically along the margins of the creeks but do not form extensive stands. The major shrub species are Coyote willow, Yellow willow, Water birch, Silver buffaloberry, and Spreading rabbitbrush. Tamarisk and Russian olive occur infrequently except where the streams have been dewatered (upland shrub species are also moving into these sites). Wetter areas are dominated by dense stands of Baltic rush, Common threesquare bulrush, spikerush, Analogue sedge, Woolly sedge, and Nebraska sedge.

Intermittent streams draining the Kaiparowits Sub-basin Paria, Kanab, and lower Escalante Sub-basins originally consisted of Fremont cottonwood woodlands, Coyote or Yellow willow thickets, or open, wet alkaline meadows of Desert saltgrass, Scratchgrass, Baltic rush, and Common threesquare bulrush. In many reaches, cottonwood and willow communities have been invaded or replaced by dense stands of Tamarisk, often resulting in a decrease in overall plant species richness. Wet meadows have also been impacted by exotics, including Tamarisk, Cheatgrass, Water polypogon, and Rabbitsfoot grass.

Desert springs and seeps occur sporadically across the planning area, usually along contacts between porous sandstones and less permeable rock. Large springs and seeps are often dominated by small patches of Fremont cottonwood or Coyote willow, although these communities are often displaced by Tamarisk or Russian olive. Smaller seeps with alkaline soils are often vegetated by Baltic rush, Scratchgrass, Common threesquare bulrush, or Desert saltgrass or have become dominated by Tamarisk and Quackgrass.

Hanging gardens are one of the more unique wetland types in the Colorado Plateau region. These communities are typically associated with seeps or springs located in shady alcoves or

cliffs where cool temperatures prevent surface water from evaporating quickly. Hanging gardens are often dominated by Maidenhair fern, Helleborine, Bundle panicgrass, and Golden sedge, although 40 other plant species have been documented from them. Several rare species have been documented from hanging gardens in Glen Canyon NRA (such as Alcove death camas, Cave primrose, Zion pretty shooting star, and Canyonlands sedge), but they do not occur within the planning area.

Another uncommon wetland feature is sand seeps found in association with sand swales carved out of sandstone bedrock. Sand seeps are derived from precipitation of the current year (rather than permanent springs) and originate only in wet years at the contact between loose sand and bedrock. When moist, these sites support small communities dominated by uncommon annual or biennial forbs and graminoids, including Hairy mimetanthe, Cottonbatting cudweed, Religious daisy, and Minute rush. Larger sand seeps may support perennial plants, such as Nebraska sedge and Baltic rush. Sand seeps are most prevalent in the deep Navajo blowsands topping the Vermilion Cliffs east of Johnson Canyon.

Rangeland Health Assessments

140 springs and seeps and 444 miles of streams were assessed as part of the data collection phase of this EIS. Thirty-two of these spring and seep sites rated as either Functioning-at-Risk with a downward trend or as Non-Functioning. The most common issues that caused springs and seeps to rate below PFC were lack of water and lack of vegetative cover to protect and armor soils.

Fifteen percent of stream miles assessed were rated Non-Functioning or Functioning-at-Risk with a downward trend. The two most frequent problems by far are the lack of adequate riparian vegetation to protect streambanks and channel instability problems that presented as eroding banks and headcuts.

THREATENED, ENDANGERED, and SENSITIVE PLANTS

Three plant species listed as Endangered or Threatened under the Endangered Species Act (ESA) are found in the planning area, Jones' cycladenia, Kodachrome bladderpod and Ute ladies' tresses (Table 3-19). See Map 9 for a general location of these species. Three other federally listed species (Siler's pincushion cactus, Welsh's milkweed and Navajo sedge) are known from just outside the boundaries of the planning area.

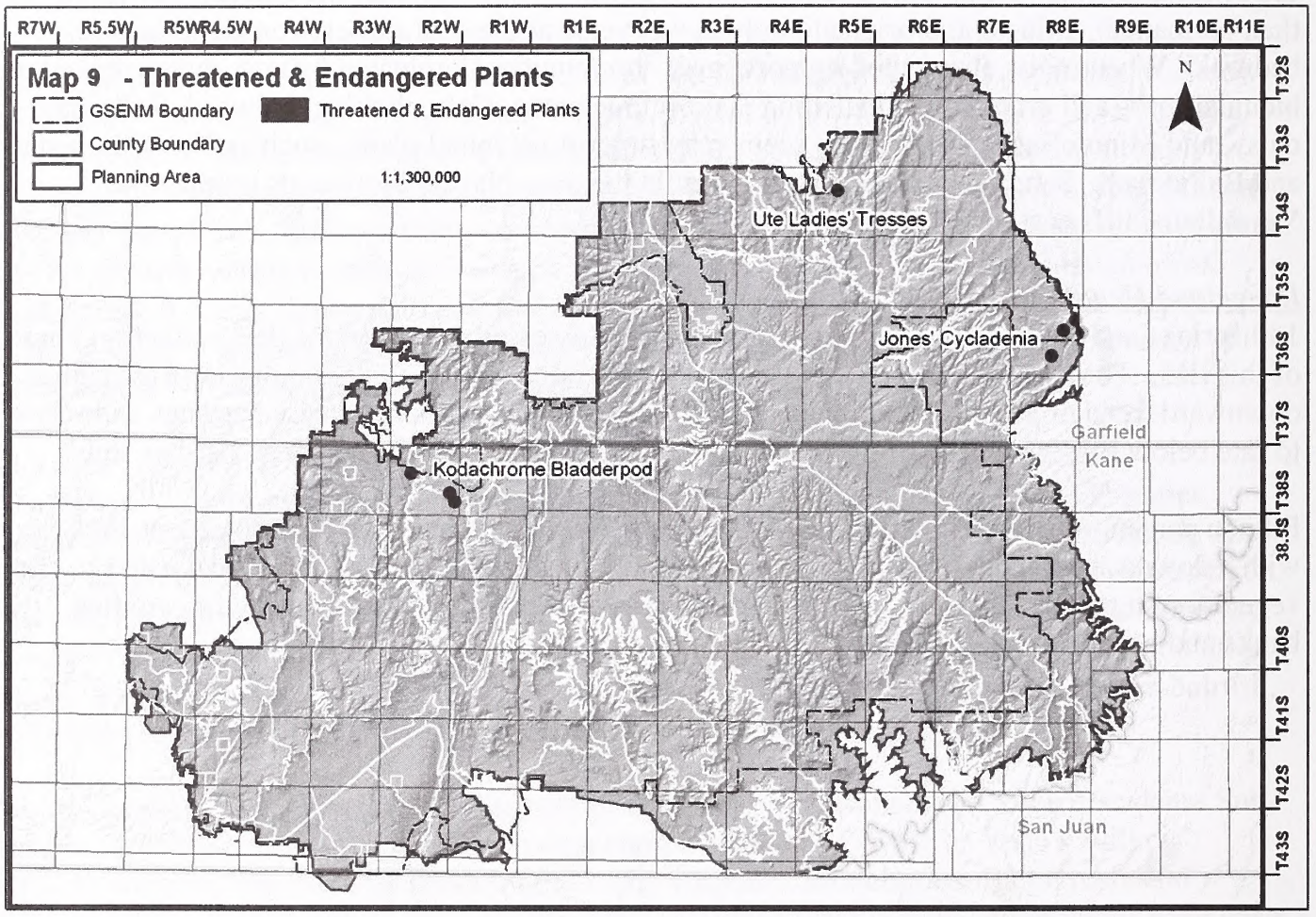


Table 3-13 Threatened and Endangered Plant Species

Species	Family	Legal Status	Comments
Jones' cycladenia *Cycladenia humilis* var. *jonesii*	Apocynaceae	Threatened	Restricted to steep, sparsely vegetated slopes of Chinle shales below sheer cliffs of Wingate Sandstone in the Circle Cliffs region of GSENM and adjacent Glen Canyon NRA and Capitol Reef NP (Death Hollow, Moody, and Wagon Box Mesa Allotments and unallotted lower reach of the Escalante River Allotment). Potentially threatened by lack of pollinators and poor seed production. Impacts from livestock grazing have not been observed due to absence of forage and water and poor accessibility of most occupied sites. UT-CDC status = Rare.
Kodachrome bladderpod *Lesquerella tumulosa*	Brassicaceae (Cruciferae)	Endangered	Restricted to barren, whitish, slate-clay knolls of the Paria River Member of the Carmel Formation on GSENM lands south of Kodachrome State Park (Dry Valley, Upper Hackberry, and Upper Paria Allotments). Listed as Endangered in 1987 due primarily to threats from off-road vehicle recreation. Not browsed by livestock, but may be trampled where animals congregate or trail. UT-CDC status = Rare.
Navajo sedge* *Carex specuicola*	Cyperaceae	Threatened	Found in seeps and springs on steep cliffs of Navajo sandstone and in hanging gardens. The surrounding vegetation is Pinyon-juniper woodland at elevations from 1740 to 1824 meters. Threats to this species include dewatering for livestock, trampling by livestock, and grazing by livestock. This species is known from the south and east of the Monument but no populations have been identified in the planning area. UT-CDC status = Rare
Siler's pincushion cactus* *Pediocactus sileri*	Cactaceae	Threatened	Known from vicinity of GSENM on BLM Kanab FO lands. Potential habitat occurs on exposures of the Shnabkaib or Middle Red members of the Moenkopi Formation north of US Hwy 89 on GSENM lands. Potentially threatened by trampling by livestock and over-collection for the horticultural trade. UT-CDC status = Rare
Ute ladies' tresses *Spiranthes diluvialis*	Orchidaceae	Threatened	Found in moist (but not flooded) stream terraces and abandoned channels along Deer Creek in the King Bench Allotment. Population has remained approximately stable since monitoring began in 1990. Site is managed as winter pasture for livestock, with cattle removed well before plants emerge in the spring or flower. Grazing at this site may be beneficial in reducing woody shrub cover from replacing open, wet meadow habitat favored by this species. UT-CDC status = Rare.
Welsh's milkweed* *Asclepias welshii*	Asclepiadaceae	Threatened	Endemic to partially stabilized to shifting red sand dunes derived from Navajo Sandstone in the Coral Pink Sand Dunes and Sand Cove/Coyote Buttes areas. Potential habitat may occur on dunes west of Johnson Canyon and at the south end of the Cockscomb. Occasionally grazed by livestock, but herbivory is not considered a substantial threat under current levels of use (US Fish and Wildlife Service 1987). UT-CDC status = Rare.

*Not currently known from GSENM, but potential habitat is present within the Monument.

Jones' cycladenia (*Cycladenia humilis* var. *jonesii*) is known from nine populations in the Circle Cliffs/Wolverine region of GSENM and adjacent areas of Glen Canyon National Recreation Area and Capitol Reef National Park. Due to poor accessibility and lack of water and forage, populations of Jones' cycladenia are not susceptible to livestock grazing.

Kodachrome bladderpod (*Lesquerella tumulosa*), listed Endangered, is restricted to sparsely vegetated whitish slate-clay outcrops of the Paria River Member of the Carmel Formation on the

east side of the Paria River southeast of Cannonville. Due to its low, matted growth form, Kodachrome bladderpod is not vulnerable to herbivory from cattle, but plants could suffer trampling mortality if grazing use is heavy or concentrated within its limited range. Demographic monitoring from 1997-2001 showed a high degree of mortality in 2000-2001, possibly from the recent drought.

One population of Ute ladies' tresses (*Spiranthes diluvialis*) occurs within the planning area in moist but not flooded terraces and abandoned stream channels in the Deer Creek watershed. The Deer Creek area is grazed by cattle during the winter but animals are removed well before flowering begins in July and August. Studies in Wyoming and Colorado have found that *S. diluvialis* populations respond favorably to reductions in competing plant cover that may arise from winter (but not summer) grazing practices. One small patch of *S. diluvialis* at the head of Deer Creek Canyon appears to be in decline due to an increase in vegetative cover.

Siler's pincushion cactus (*Pediocactus sileri*) is not known to occur within the planning area. Areas of suitable habitat have been surveyed but no populations have been located. Although this species may be impacted by trampling associated with concentrated grazing, detailed analysis of impacts will not be conducted at this time.

Navajo Sedge (*Carex specuicola)* has not been located within the planning area. While sensitive to dewatering from range improvements, no improvements will be implemented as result of this plan amendment. Future improvement implementation is proposed, but none of the proposals involve dewatering. Impacts on Navajo Sedge will be assessed in future, site specific, analysis when projects may impact it are proposed.

Under BLM Manual 6840, the State Director may designate plant species found on public lands as "Sensitive" if these species are at risk of becoming extirpated or listed as Threatened or Endangered under the ESA due to agency actions. The BLM Utah State Office last revised its official list of state Sensitive plant species in January 2003 (USDI Bureau of Land Management 2003). Presently, 16 Sensitive plant taxa are known and 2 additional species may potentially occur in the planning area (Table 3-20). The status, distribution, and threats to each of these species are summarized below. In general, most of these species are edaphic endemics restricted to sparsely vegetated sites with specialized (and often harsh) soil or bedrock characteristics.

Table 3-14 BLM Sensitive Plant Species

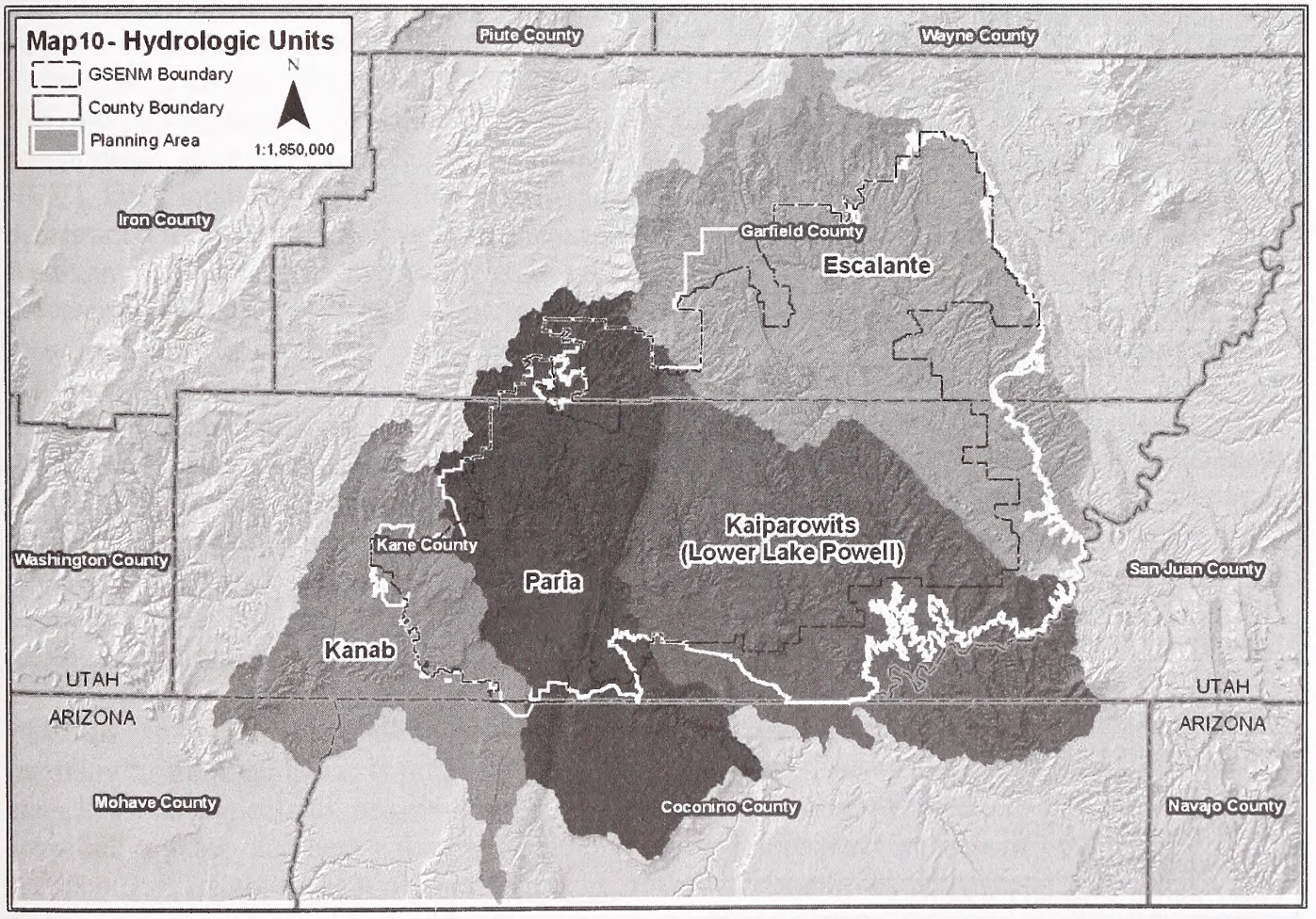
Species	Family	Comments
Atwood's pretty phacelia Phacelia pulchella *var.* atwoodii	Hydrophyllaceae	Locally abundant in wet years on gypsiferous knolls of Moenkopi Formation along the US Hwy 89 corridor and Skutumpah roads. One report from Horse Mountain on the Kaiparowits Plateau may represent var. *sabulonum.* Known from at least 8 main populations (Black Rock, Cockscomb, Cottonwood, Headwaters, Mollies Nipple, and Vermilion allotments). Populations are strongly correlated with well-developed biological soil crusts on gypsum-rich soils. Primary threats may be from soil disturbance and competition from weedy annuals. UT-CDC status = Rare.
Chinle chia Salvia columbariae *var.* argillacea	Lamiaceae (Labiatae)	Recently described Utah endemic restricted to Chinle shale barrens in and near Zion National Park planning area. Known from only 2 populations in the Kitchen Corral Wash area (Mollies Nipple allotment). Sparsely vegetated habitat attracts little use from livestock due to lack of forage and water, but could be negatively impacted by trampling. UT-CDC status = Rare.
Chinle evening-primrose Oenothera murdockii	Onagraceae	Recently described Utah endemic. Restricted to 4-5 sites on barren slopes and outwash fans of the Chinle Formation in the Kitchen Corral Wash and Paria townsite areas (Cottonwood and Mollies Nipple allotments). Habitat supports little forage and receives low use by livestock. One colony in Kitchen Corral Wash may be expanding into a disturbed two-track that exposes bare shaley soils. UT-CDC status = Rare.
Cronquist's phacelia Phacelia cronquistiana	Hydrophyllaceae	Known from 4 confirmed populations worldwide, all within Kane County, Utah. One occurrence is found in the Ford Well allotment on gypsum-rich soils of the Carmel Formation. Threats are poorly defined, but may include livestock trampling. Sparsely vegetated gypsum soils receive little livestock use. UT-CDC status = Rare.
Cutler's lupine Lupinus caudatus *var.* cutleri	Fabaceae (Leguminosae)	According to Welsh and Atwood (2002), the entire range of var. *cutleri* in Utah is limited to the vicinity of the Cockscomb. Little is currently known of the distribution, abundance, or threats to this taxon across its range in Utah, Arizona, and New Mexico. Known from at least 4-5 populations in the Cockscomb, Clark Bench, and Headwaters Allotments and in the BLM Arizona Strip Field Office's Coyote Allotment. UT-CDC status = Additional Data Needed.
Gumbo milkvetch Astragalus ampullarius	Fabaceae (Leguminosae)	Restricted to barren outcrops of the Chinle Formation in Kane and Washington counties, UT and northern Arizona. Currently known from 11 populations (Cockscomb, Cottonwood, Mollies Nipple, and Vermilion allotments) and 24 populations in southern Utah. Local populations occur primarily along the base of the Vermilion Cliffs from Flag Point to the Cockscomb. Habitat of this species has little forage or water available and receives minimal use by livestock. UT-CDC status = Watch.
Hole-in-the-Rock prairie-clover Dalea flavescens *var.* epica	Fabaceae (Leguminosae)	Not currently known, but potential habitat present in sandy blackbrush or desert shrub habitats or slickrock areas in the Escalante Canyons east of the Hole-in-the-Rock Road. This taxon may be only a minor variant of typical *D. flavescens* with an abnormally thick flower spike. UT-CDC status = Taxonomic Problems.
Kanab thelypody Thelypodiopsis ambigua *var.* erecta	Brassicaceae (Cruciferae)	Endemic to southern Utah and northern Arizona. Known from three populations in the Seaman Wash, Petrified Hollow, and Kitchen Corral Wash areas (Mollies Nipple and Vermilion allotments). Found in desert shrub and Pinyon-juniper communities on clay soils derived from Chinle shales. Potential impacts from livestock are not known. UT-CDC status = Rare.

Table 3-14 BLM Sensitive Plant Species (cont.)

Species	Family	Comments
Kane breadroot Pediomelum epipsilum	Fabaceae (Leguminosae)	Endemic to southern Kane County, Utah and adjacent northern Arizona. Known from 8-9 populations on barren outcrops of reddish clay soils derived from the Moenkopi Formation along US Hwy 89 from Seaman Wash to Kitchen Corral Wash (Mollies Nipple, Vermilion, and White Sage allotments). Appears to be tolerant of moderate surface disturbances that reduce competing vegetation cover. Does not seem to favor sites with well-developed biological soil crusts. UT-CDC status = Rare.
Lori's columbine Aquilegia loriae	Ranunculaceae	Described as a new species in 2001 and thought to be endemic. Currently known from 7 extant populations in the White Cliffs and upper Wahweap drainage (Calf Pasture, Headwaters, Swallow Park, Upper Paria, and Vermilion allotments). Occurs primarily in hanging gardens and narrow, shady sandstone canyons, many of which are inaccessible to livestock. UT-CDC status = Rare.
Paria iris Iris pariensis	Iridaceae	Known only from the type collection from West Clark Bench, on the Bunting Well Allotment. Not relocated since 1976 despite several recent attempts. Some taxonomists have questioned whether this species is distinct, or just an unusual variant of *Iris missouriensis*. Iris species in general are toxic or unpalatable to livestock and are often increasers. Loss of wetland habitat may be the primary threat to this species. UT-CDC status = Historic (presumed extinct or only known historically throughout range).
Sandloving penstemon Penstemon ammophilus	Scrophulariaceae	Widely distributed in deep Navajo sand dunes in the White Cliffs, with at least one disjunct population in Navajo dunes associated with slickrock in the Escalante Canyons area. Known from at least 12 populations in the Antone Flat, Deer Spring Point, Granary Ranch, Johnson Canyon, Locke Ridge, Mollies Nipple, Second Point, Swallow Park, and Vermilion allotments. Threats appear low due to poor accessibility of many populations and a paucity of forage and water for grazing. UT-CDC status = Rare.
Slender camissonia Camissonia exilis	Onagraceae	Small and readily overlooked annual forb restricted to gypsiferous outcrops with well-developed biological soils crusts derived from the Moenkopi and Carmel formations. Known from approximately 17 populations (Black Rock, Cockscomb, Cottonwood, Dry Valley, Ford Well, Mollies Nipple, Swallow Park, Upper Paria, Vermilion, and White Sage) in the vicinity of US Hwy 89 and the Skutumpah Road. Threatened primarily by degradation of biotic soil crust habitat and replacement by exotics. UT-CDC status = Rare.
Smoky Mountain mallow Sphaeralcea grossulariifolia *var.* fumariensis	Malvaceae	Recently described variety limited to the southern Kaiparowits Plateau and Buckskin Mountain. Found primarily on thermally-altered outcrops of the Straight Cliffs or Morrison formations. Known from only 10 main populations, 9 of which are in the Last Chance, Nipple Bench, Rock Creek-Mudholes, Upper Warm Creek, and Wiregrass allotments. UT-CDC status = Rare.
Spiny gilia Gilia latifolia *var.* imperialis	Polemoniaceae	Restricted to alluvial terraces and rocky benches derived from the Straight Cliffs Formation at the south end of the Kaiparowits Plateau. Currently known from 14 populations in the Cottonwood, Last Chance, Nipple Bench, and Upper Warm Creek allotments. Some populations are found in roadbeds through dry washes. UT-CDC status = Rare.
Tropic goldeneye Viguiera soliceps	Asteraceae (Compositae)	Annual restricted to barren gray clay flats and knolls of the Tropic shale at the south base of the Kaiparowits Plateau from Cottonwood Wash to Lake Powell. Known from 13 main populations in the Cottonwood, Coyote, Last Chance, and Wiregrass allotments. Populations may number in the hundreds of thousands during wet years but be absent in drought periods. Main threats are from habitat degradation and impacts by off-highway vehicles. UT-CDC status = Rare.
Utah spurge Euphorbia nephradenia	Euphorbiaceae	Endemic to barren gray clay slopes of the Tropic Shale in central and southern Utah. Known only from 3-4 populations at the south end of the Kaiparowits Plateau in the Cottonwood allotment. Mostly threatened by trampling and habitat degradation associated with off-highway vehicle recreation. UT-CDC status = Rare.

RIPARIAN AND WATER RESOURCES

The planning area encompasses portions of four broad hydrologic subbasins (Map 10), all of which are part of the Colorado River system. The Escalante River system flows from the Aquarius Plateau and Boulder Mountain into the upper portions of Lake Powell. Last Chance Creek and Wahweap Creek are the principal tributaries off the Kaiparowits Plateau, flowing into the main body of Lake Powell. The Paria River subbasin (including Hackberry Creek and Cottonwood Creek) extends from the Bryce Canyon-Bryce Valley area, terminating below Glen Canyon Dam near Lee's Ferry. On the extreme west side of the planning area, the Kanab Creek subbasin (includes Johnson Wash and its tributaries) drains into the Grand Canyon. Altogether, there are approximately 2,500 miles of stream channels and washes. Less than 10% of these are perennial streams and primarily include the upper reaches of the Escalante River, the Paria River, and Last Chance Creek.



Rangeland Health Standard 4 states that the BLM will comply with water quality standards established by the State of Utah.

The Utah State Division of Water Quality (the State) assesses the quality of its surface water resources to protect it for beneficial uses, including drinking, fishing, boating, irrigation, stock watering, and supporting aquatic wildlife. Water samples are collected from streams/springs on a regular basis and then analyzed to determine whether they meet numeric criteria for defined beneficial uses. Based on the results of that analysis the State defines the waters as fully supporting, partially supporting, or non-supporting of its beneficial uses. If a water body is determined to be partially supporting or non-supporting, section 303(d) of the Clean Water Act requires that the state place the waterbody on a list of "impaired" waters [(303(d) list] and prepare an analysis called a Total Maximum Daily Load (TMDL).

Table 3-15 GSENM Water Quality Monitoring Sites

Site	Storet Number
Henrieville Wash at Town	4951890
Henrieville Wash at Highway 12	4951900
Upper Valley	4951980
North Creek	4954630
Paria River at Kodachrome	4951860
Paria River at Highway 12	4951870
Escalante River at Weir	4954660
Escalante River at Calf Creek	4954240
Calf Creek at Escalante River	4954210
Deer Creek	4954080
The Gulch at Long Canyon	4954100
Sheep Creek	5994340
Willis Creek	5994350
Escalante River at Lake Powell	5952740
Coyote Gulch at Glen Canyon NRA Boundary	5994240
Escalante River above Harris Wash	5994210
Harris Wash above Escalante River	5994190
Little Valley Wash Spring	5994630
Tibbet Canyon Spring	5994560
Wesses Canyon Spring	5994580
Paria River at Highway 89	4951850
Paria River at Old Town Site	5994550
Lower Coyote Spring	5994570
Wahweap Creek	5994530
Last Chance at Road Crossing	5994520
Deer Spring Wash	5994650
Kanab Creek at Falls	4951830
Seaman Wash	5994590
Neaf Spring	5994420
Millcreek above Diversion	5994740
Thompson Creek	5994790

CHAPTER 3
AFFECTED ENVIRONMENT

Rangeland Health Standard 2 states that riparian and wetland areas are in properly functioning condition and that stream channel morphology and functions are appropriate to soil type, climate, and landform.

"Riparian" refers to vegetation and habitats that are dependent upon or associated with the presence of water. Riparian areas comprise the transition zone between permanently saturated soils and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water. Riparian areas are divided into two categories, lotic and lentic. Lotic sites have flowing water and are linear in extent, streams are an example of this category. Lentic sites have pooled or standing water, examples are springs, marshes, and wet meadows. Other examples of riparian areas include lands along perennially and intermittently flowing rivers and streams, and the shores of lakes and reservoirs with stable water levels.

The BLM has completed a Proper Functioning Condition (PFC) assessment for riparian areas within the planning area. The PFC method is a qualitative field evaluation that analyzes a riparian-wetland area's capability and potential; the PFC assessment is not an ecological rating of vegetation communities. The three components of a riparian-wetland area assessed during PFC are: (1) vegetation, (2) landforms/soils, and (3) hydrology. Based on the condition of these components, each riparian area is placed in one of four categories: Proper Functioning Condition (PFC), Functional-At-Risk (FAR), Non-Functional (NF), or Unknown. Streams and springs determined to be functioning at risk can be further subdivided by trend and contributing factors. An example of a contributing factor is diversion of water from a stream for irrigation. The dewatering of a stream or spring can reduce the vigor and continuity of riparian vegetation and result in a poor PFC rating.

Riparian-wetland areas are functioning properly when energy associated with high water flows is dissipated by adequate vegetation, landform, or large woody debris. This dissipation reduces erosion, improves water quality, filters sediment, captures bedload, aids floodplain development, improves flood-water retention and ground-water recharge, develops root masses that stabilize stream banks, provides habitat necessary for fish production and waterfowl breeding, and supports greater biodiversity. Proper functioning condition reflects the interactions among geology, soil, water, and vegetation.

PFC assessment data were used to document the factors preventing streams and springs from attaining or trending towards proper functioning condition. Causative factors were documented, such as direct impacts of range management (dewatering caused by water developments, heavy livestock grazing, and heavy livestock trampling/trailing), indirect impacts of grazing (headcutting, exotic vegetation establishment, upstream conditions, watershed conditions), and/or factors not related to range management (non-BLM water diversions, roads, recreation impacts). Multiple factors may affect a single site, since several direct impacts may occur at a given location and indirect impacts may stem from direct impacts (e.g., heavy trampling may lead to development of headcuts).

Table 3-16 Decision Area Riparian Condition Summary

Functional Status	Trend	Standard 2	Miles Evaluated (Lotic)	% of Miles	Number of Sites (Lentic)	%
Proper Functioning Condition	N/A	**PASS**	221.05	49.7	56	40.00
Functioning at Risk	Upward	**PASS**	73.07	16.4	17	12.14
	Not Apparent	**PASS**	83.33	18.7	22	15.71
	Downward	**FAIL**	35.24	7.9	31	22.14
Non Functioning	N/A	**FAIL**	32.09	7.2	14	10.00
Total			**444.78**		**140**	

PARIA RIVER SUBBASIN

The Paria River Subbasin is roughly 640,000 acres in size and drains the Grand Staircase and Kaiparowits physiographic regions. The Paria River is perennial from below the town of Cannonville downstream to below the confluence of Cottonwood Creek, intermittent to the Colorado River. The upper reaches of the Paria River are intermittent and often diverted for irrigation of agricultural lands in the Tropic/Cannonville area. A transbasin diversion from the East Fork of the Sevier brings additional irrigation water into the Paria Basin. The Paria River has a bimodal hydrograph with a moderate peak in stream flows occurring in March from snowmelt and a second peak in flows occurring in the late summer from monsoonal thunderstorms. The Paria River is an extremely flashy system. Other streams in the Paria River Subbasin that are perennial for some portion of their length include Willis Creek, Henrieville Creek, Deer Creek, and Sheep Creek.

Paria River Subbasin Water Quality

The beneficial uses in the Paria Watershed are:

- ✓ Class 2B - Protected for secondary contact recreation such as boating, wading, or similar uses,
- ✓ Class 3C - Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain,
- ✓ Class 4 - Protected for agricultural uses including irrigation of crops and stockwatering.

The State has identified the following two reaches of the Paria River as not meeting the total dissolved solids (TDS) numeric standard and therefore not supporting beneficial use Class 4. They have been placed on the 303(d) list by the State:

1. Paria River from the confluence with Rock Springs Creek to the headwaters,
2. Paria River from the Utah/Arizona border upstream to the confluence with Cottonwood Creek.

Sources of elevated levels of total dissolved solids, commonly referred to as salinity, include erosion from marine shale geology. The Paria River Subbasin does contain exposures of marine shale (Tropic Shale and Carmel Formations) in the headwaters of the watershed. The TMDL analysis conducted by the State concluded that high TDS concentrations are primarily a natural

feature of the environment and BLM-permitted activities are a minor contributor to TDS loading (UDWQ, 2006, Paria River Watershed Management Plan, Awaiting EPA approval).

Paria River Subbasin Watershed Health

A number of uplands rangeland health sites have been sampled within the Paria River Subbasin and these sites can provide insight into the overall condition of the watershed. In particular, the summary ratings for soil stability and hydrologic function are useful. The Technical Reference 1734-6, Interpreting Indicators of Rangeland Health, defines soil stability as "the capacity of the site to limit redistribution and loss of soil resources by wind and water" and hydrologic function as "the capacity of the site to capture, store, and safely release water from rainfall, run-on . . . and to recover this capacity following degradation." (pg 7). Please refer to the vegetation section for a description of the rangeland health protocol. Summary soil and hydrologic ratings for the Paria and its watersheds provide information on upland health and are displayed in the following table. A summary rating of '5' indicates that the sample site matches what is expected for that ecological site description whereas a '1' indicates extreme departure from what is expected for the sample site (see Appendix 11).

Table 3-17 Upland Rangeland Health Ratings for Sites with in the Paria River Subbasin

Watershed	Soil Stability Rating					Hydrologic Function Rating					Total Number of Assessments
	1	2	3	4	5	1	2	3	4	5	
Cottonwood	0	0	8	9	8	0	0	7	10	8	25
Middle Paria	0	0	6	18	11	0	0	6	17	12	35
Sheep Creek	0	2	11	6	2	0	1	11	6	3	21
Upper Buckskin	0	3	17	28	10	0	3	17	30	8	58
Upper Paria	0	3	13	15	7	0	4	13	15	6	38
Paria Total	0	8	55	76	38	0	8	54	78	37	177

KAIPAROWITS SUBBASIN

The Kaiparowits Subbasin comprises several watersheds that drain into Lake Powell and are very similar geologically and climatically (this subbasin is also referred to as the Lower Lake Powell Subbasin). Wahweap Creek and Last Chance Creek are the main streams in the Kaiparowits Subbasin and are perennial only along portions of their length. There has not been any gauging of streams in this area but it can be surmised from observations that stream flows slow to a trickle during summer months and yet can flash to a torrent during late summer monsoons. Of the approximately 1.1 million acres within the Kaiparowits Subbasin, approximately 743,300 acres occur within the planning area. Of the acreage within the planning area, 62.7% is administered by GSENM, 32% is administered by GCNRA, 5% is owned by the State, and 0.3% is privately owned.

Kaiparowits Subbasin Water Quality

The State Division of Water Quality has determined that the beneficial uses for the Kaiparowits watersheds are:

- ✓ Class 2B - Protected for secondary contact recreation such as boating, wading, or similar uses,
- ✓ Class 3B -, Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain,
- ✓ Class 4 - Protected for agricultural uses including irrigation of crops and stockwatering.

The State has not indicated that any of the waterbodies in the Kaiparowits Subbasin are impaired.

Kaiparowits Subbasin Watershed Health

A number of uplands rangeland health sites have been sampled within the Kaiparowits Area. Summary soil and hydrologic ratings are displayed in the following table. A summary rating of '5' indicates that the site matches what is expected for that site whereas a '1' indicates extreme departure from what is expected for the site.

Table 3-18 Upland Rangeland Health Ratings for Watersheds within the Kaiparowits Subbasin

Watershed	Soil Stability Rating					Hydrologic Function Rating					Total Number of Assessments
	1	2	3	4	5	1	2	3	4	5	
Croton Canyon	0	0	1	7	3	0	0	1	7	3	11
Last Chance Creek	0	1	1	11	6	0	0	2	11	6	19
Lower Wahweap Creek	0	3	12	9	5	1	2	11	11	4	29
Portion of Aztec Creek	0	0	3	6	2	0	0	3	6	2	11
Portion of West Canyon	0	0	1	0	0	0	0	0	1	0	1
Upper Wahweap Creek	1	5	8	12	3	1	3	10	13	2	29
Warm Creek	0	1	4	10	1	0	0	4	11	1	16
Kaiparowits Total	1	10	30	55	20	2	5	31	60	18	116

CHAPTER 3
AFFECTED ENVIRONMENT

ESCALANTE RIVER SUBBASIN

The Escalante River Subbasin is 1.3 million acres (including approximately 880,000 acres within the planning area) in size and drains from the Aquarius Plateau and Boulder Mountain to Lake Powell. As a result of the high elevation headwaters, the Escalante River has a typical snowmelt hydrograph with a peak in flows in late May or early June. The largest recorded flow at the Escalante River stream gauge near Escalante topped out at 4,550 cubic feet per second (cfs) and was caused by a monsoonal thunderstorm on August 24, 1998. At that same gauge site, the two-year flood frequency is 789 cfs and flows drop down to less than one cfs during the summer. Water is diverted above the town of Escalante into the Wide Hollow Reservoir and used for irrigation. Flows recover in the downstream direction due to inputs from Pine Creek, Death Hollow, Sand Creek, Calf Creek and Boulder Creek. Flows from Boulder Creek are also diverted near the town of Boulder for irrigation purposes. Four percent of the subbasin is privately owned lands, 0.5% is State lands, 25% are Dixie National Forest lands, 19% are Park Service lands and the remaining 51.5% are BLM administered lands.

Escalante River Subbasin Water Quality

The State Division of Water Quality (the State) has determined that the beneficial uses for the upper Escalante River (upstream from and including Boulder Creek):

- ✓ Class 2B - Protected for secondary contact recreation such as boating, wading, or similar uses,
- ✓ Class 3A - Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain,
- ✓ Class 4 - Protected for agricultural uses including irrigation of crops and stockwatering.

The remaining watersheds (the Escalante and tributaries downstream from the Boulder Creek confluence) have been assigned the following beneficial uses:

- ✓ Class 2B - Protected for secondary contact recreation such as boating, wading, or similar uses,
- ✓ Class 3C - Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.
- ✓ Class 4 - Protected for agricultural uses including irrigation of crops and stockwatering.

The upper reach of the Escalante River, from the confluence with Boulder Creek to the headwaters, has been placed on the 303(d) list based on high stream temperatures. The TMDL analysis prepared by the State indicates that causes of temperature impairment include natural hydrologic and climatic conditions, flow depletion upstream from the Monument, and altered riparian and streambank conditions (UDWQ, 2006, Escalante River Watershed Management Plan, Awaiting EPA approval).

Escalante River Subbasin Watershed Health

Summary soil and hydrologic ratings provide information on the state of upland health by subwatershed and are displayed in the following table. A summary rating of '5' indicates that

the site matches what is expected for that site whereas a '1' indicates extreme departure from what is expected for the site.

Table 3-19 Uplands Rangeland Health Ratings for Sites within the Escalante River Subbasin

Watershed	Soil Stability Rating					Hydrologic Function Rating					Total Number of Assessments
	1	2	3	4	5	1	2	3	4	5	
Boulder Creek	0	0	2	13	10	0	0	1	14	10	25
Harris Wash	0	2	3	23	10	0	0	6	27	5	38
Headwaters	0	1	0	3	3	0	1	0	2	4	7
Horse Canyon	0	6	11	25	16	0	5	7	26	20	58
Fortymile Gulch	0	0	10	5	1	0	0	4	12	0	16
Moody Creek	0	0	0	5	2	0	0	0	5	2	7
Twentyfive Mile Wash	0	0	4	12	2	0	0	3	14	1	18
Escalante Total	0	9	30	86	44	0	6	21	100	42	169

KANAB CREEK SUBBASIN

The planning area includes about 22% of the 600,000 acre Kanab Creek Subbasin, in two watersheds. The principal stream in this portion of the planning area is Johnson Canyon Wash, which enters Kanab Creek south of the Arizona/Utah Border. BLM-administered lands in this subbasin contain very little riparian vegetation, primarily around and downstream of springs.

Kanab Creek Subbasin Water Quality

The State Division of Water Quality (the State) has determined that the beneficial uses for the Upper Johnson and White Sage watersheds are:

- ✓ Class 2B - Protected for secondary contact recreation such as boating, wading, or similar uses,
- ✓ Class 3B - Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain,
- ✓ Class 4 - Protected for agricultural uses including irrigation of crops and stockwatering.

No waters in this subbasin are identified by the State as not supporting beneficial uses.

Kanab Creek Subbasin Watershed Health

A number of uplands rangeland health sites have been sampled within the Kanab Creek Subbasin and are displayed in the following table. A summary rating of '5' indicates that the site matches what is expected for that site whereas a '1' indicates extreme departure from what is expected for the site.

Table 3-20 Upland Rangeland Health Ratings for Sites within the Kanab Creek Subbasin

Subwatershed	Soil Stability Rating					Hydrologic Function Rating					Total Number of Assessments
	1	2	3	4	5	1	2	3	4	5	
Upper Johnson	0	0	1	15	0	0	0	4	11	1	16
White Sage	0	3	10	7	7	0	3	9	10	5	27
Total	0	3	11	22	7	0	3	13	21	6	43

CHAPTER 3
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BIOLOGICAL SOIL CRUST

Biological soil crusts are an assortment of cyanobacteria, green algae, lichens, fungi, or mosses that occur together on the soil surface, forming layers that can range from 1-10 cm thick. They are common in arid and semi-arid areas worldwide. Crusts on fine-textured soils often appear dark, rough, and pinnacled. Those on sand usually do not develop pinnacles and instead appear as a dark, two-dimensional layer on the surface.

BIOLOGICAL SOIL CRUST FUNCTIONS

Nutrient Uptake

Biological crust show higher concentrations of nutrients, compared to source soils, as a result of cyanobacteria (blue-green algae) fixing nitrogen. Biological soil crust also traps fine soil particles to create nutrient-rich microsites. It is known that cyanobacteria (blue-green algae) have the ability to "fix" nitrogen into a form accessible by plants. However, cryptogamic soils are not the only source of nitrogen in arid environments. Other nitrogen fixing plants found in this region are: *Oxytropis* sp., *Trifolium* sp., *Astragalus* sp., *Cercocarpus ledifolius*, *Purshia tridentata* and *Sheperdia rotundifolia*

Seed Germination and Establishment

Anderson *et al.* (1982) concluded that biological crusts are not detrimental to vascular plants, and may even enhance seedling establishment. Li *et al.* (2006) reported that disturbed crusts inproved the environment for germination for annual plants. Johansen (1993) cites studies from both sides of the debate. One study found enhanced seedling establishment, the other found reduced emergence (therefore, establishment) in the presence of cryptogamic soils. The USDA (2001) stated that soil crusts may increase or decrease the rate of water infiltration. West (1990) cited Crisp who in 1975 wrote that cryptogamic soils aided in the selection of grasses. Crisp believed that species with awns and setae (i.e. *Stipa)* had an advantage over species which were round and smooth and could be washed away as suggested by Sylla (1987). Hawkes (2004) reported higher germination in crusted vs uncrusted soils for three out of four plant species studied in a greenhouse experiment. Hawkes also found that in field studies other factors than cryptogamic soils affected germination in two of the four species. Eldridge *et al.* (2001) suggested that disturbing the soil surface (e.g. grazing and cultivation) will stimulate the cover and abundance of cryptogamic soils by increasing the amount of unvegetated sites.
It has been pointed out (Harper and Marble 1988, Johansen 1993 and Hawkes 2004) that allelopathic and secondary compounds produced by crypotgamic soils may affect seedling establishment.

Soil Stabilization

Cyanobacterial filaments weave through the top few millimeters of soil, binding soil particles together. These filaments, along with mosses and lichens, stabilize and protect soil surfaces from wind and water erosion.
Sylla (1987) included a statement from Savory and Parsons that indicated that the physical impact of animals on desert ecosystems was not detrimental to arid rangelands but was in fact desirable to hasten the advance of plant succession. This physical action, Savory and Parsons indicated, is achieved through hoof action and the break-up of algae, lichen, and moss

communities and allows for greater grass seedling success. West (1990) refers to work done by Soviet and South African ecologist who see crypotgamic soils as an indication of desertification or degraded range conditions. In the Russian study desertification in the Kara Kum Desert is attributed to the lack of livestock grazing.

Water Retention

While some feel that crypotgamic soils are a benefit to the landscape others are of the opinion that cryptogamic soils inhibit or prevent different biological functions. It is agreed that cryptogamic soils are able to bind soil particles together which can reduce soil movement, however, Verrecchia *et al.* (1995) indicated that these semi-permeable crusts increased runoff while destruction of the crust increased water infiltration. In China Li *et al.* (2006) found that disturbance of cryptogamic soils decreased surface evaporation rate by 20.3% and increased storage of plant-available water in the herbaceous rooting zone. Johansen (1993) implied that infiltration rates can either be higher or lower in uncrusted soils when compared to crusted soils. Verrecchia *et al.* (1995) found that the swelling of cyanobacterial filaments can block up to 40% of the pores in the soil and therefore limits infiltration. Certain organisms, such as *Microcoleus vaginatus*, have been found to act like a sponge and absorb up to eight times their volume in water (Belnap and Gardner 1993). This function could be significant in arid areas that experience sporadic, but heavy rainfall. It has been suggested that the absorbed water is then slowly released and made available to plants. The current knowledge on water retention and infiltration is inconclusive. Comparisons with crust-free sandy soils show higher infiltration on the crust-free soils (but at the cost of higher wind erosion rates). The NRCS has reported that biological crust can either increase or decrease the infiltration rates of soils.

Rangeland Health Assessments

Biological soil crust was evaluated at 517 upland rangeland health sites during the 2000-2003 assessment period.

SOILS

Most of the soils in the planning area are semiarid, young, and poorly developed. Chemical and biological soil development processes, such as rock weathering, decomposition of plant materials, accumulation of organic matter, and nutrient cycling, proceed slowly in this environment. In many areas, natural or geologic erosion rates are too fast to develop distinct, deep soil horizons. Most soils are less than one-half meter deep to bedrock. The deeper soils are formed in recent alluvium. Almost all of the local soils are derived from sedimentary rock. The dominant topographic features are structural benches, mesas, valley floors, valley plains, alluvial fans, stream terraces, hills, cuestas, and mountainsides.

The planning area is divided into three distinct soil regions which match the three provinces within the region: Escalante Canyons, Kaiparowits Plateau, and the Grand Staircase (see Map 11).

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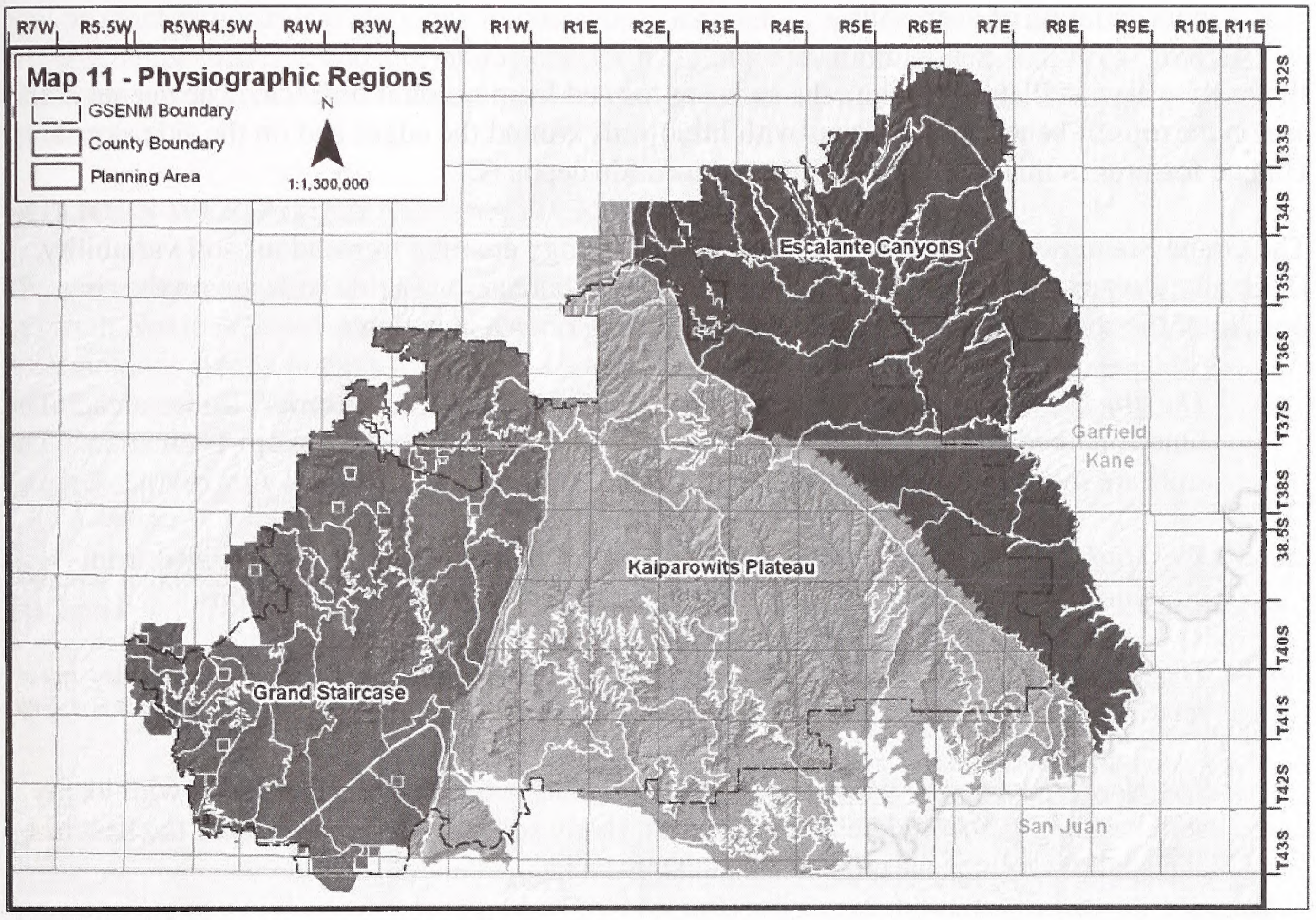

The Escalante Canyons Region has three sub-regions: the Circle Cliffs, the Canyon-Slick Rock, and the Hole-in-the-Rock.

The Circle Cliffs sub-region is predominantly Moenkopi Formation and Shinarump Member of the Chinle Formation, which form dominantly lithic soils with deeper soils around the Lampstand area and in alluvial bottoms.

The Canyon-Slick Rock sub-region is dominantly the Navajo Sandstone and Carmel Formation. Navajo Sandstone weathers into sandstone slick rock and deep sand with lithic soils around the edges of the slickrock. Sand sheets of Navajo sand dominate this area. The Carmel Formation overlies the tops of the mesas. The Carmel Formation, and a smaller component of the Kayenta Formation, primarily has lithic soils with pockets of deep eolian sand derived from Navajo Sandstone.

The Hole-in-the-Rock sub-region is a mix of fan surfaces and bedrock with overlying deep soils. The deeper soils are on alluvial fans and pediments derived from Fiftymile Mountain. Soil textures range from silt clay loam to sand. As you move towards the Escalante River, the soils become deeper sand derived from the Entrada and Navajo

formations. Of the three sub-regions, the Hole-in-the-Rock sub-region has the greatest concentration of deep soils.

In the Kaiparowits Plateau Region, the soils are formed from residual bedrock. The deeper soils are on the tops of benches or plateaus with lithic soils around the edges and on the side slopes. Unique features in this Region are the large landslide deposits.

The Grand Staircase Region has great diversity in geology creating tremendous soil variability. Generally, deeper soils are on the tread portion of the staircase and lithic soils are on the riser portion of the staircase. The unique feature in this region is a lava flow.

The Buckskin sub-region has the majority of the limestone bedrock in the area. The limestone bedrock is primarily Timpoweap Member of the Moenkopi Formation. The soils are mostly moderately deep to bedrock.

The Highway 89 Corridor sub-region is a mix of deep to shallow soils derived from alluvium and bedrock residuum from the Chinle and Moenkopi Formations.

The Vermillion Cliffs / White Cliffs (Navajo Sandstone) sub-region is dominated by relatively productive deep sands.

The North / Northwest White Cliffs sub-region has predominately deep soils with loamy soils residing in the middle of the benches, sandy soils towards the edges of the benches, and shallow soils at the edge of the escarpments.

The Northwest Gray Cliffs sub-region northwest of the Gray Cliffs the majority of the soils are lithic, formed in residium from bedrock. Large alluvial fan remnants and stream terrace remnants are also present in this sub-region. These are characterized by having deeper, older soils, some with thick petrocalcic horizons.

Complete soil data is contained in the Grand Staircase-Escalante National Monument Soil Survey. This information contains soil series descriptions, map unit descriptions, interpretations, and a detailed soils map.

SOIL MANAGEMENT AND SOIL PRODUCTIVITY

Soils in arid and semiarid regions are particularly critical to sustaining ecosystems because they can be more vulnerable to degradation from a number of natural and artificially induced disturbances. Management practices may affect the ability of the various soils to maintain productivity by influencing disturbances such as displacement, compaction, erosion, alteration of organic matter and soil organism levels. When soil degradation occurs in semiarid regions, natural processes are slow to return to site productivity. Soil bulk density (mass per unit volume), porosity, organic matter content, hydraulic conductivity, moisture content, nutrient content, and soil temperature are affected to various degrees by surface disturbance. In turn, these factors affect soil-water interactions, productivity, nutrient cycling, water holding capacity, and soil erosion rates.

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Soil productivity varies widely due to characteristics such as soil depth, nutrient status, available water holding capacity, and site characteristics including elevation, aspect, and slope gradient. The most productive soils for forage production are found in valley bottoms, drainage bottoms, and terraces.

NOXIOUS WEEDS AND NON-NATIVE PLANTS

There are nineteen plant species on the Utah State Noxious Weed List, under Section 4-17-3 of the Utah Noxious Weed Act, seven have been found in the planning area (Table 3-22). There are other noxious weeds in the surrounding area that threaten to invade the planning area. One additional species (Whorled milkweed) is also listed as noxious by Kane County.

Table 3-22 Noxious Weed Species Identified In or Near the Planning Area

Species	Family	Legal Status	Comments
Whorled milkweed Asclepias subverticillata	Asclepiadaceae	Kane County Noxious	Native species found primarily along semi-disturbed roadsides and rangelands in the US Hwy 89 corridor. Poisonous to livestock but not especially palatable (Whitson et al. 2002).
Hoary cress Cardaria draba	Brassicaceae (Cruciferae)	UT State Noxious	Infestations have been documented along the Skutumpah Road and in the vicinity of Cannonville (Ecosphere Environmental Services 1998). Seeds are spread by wind, along waterways and irrigation systems, on vehicles and machinery, and in hay and crop seed. Small infestations spread by rhizomes, which are underground stems capable of producing shoots (Sheley& Petroff. 1999).
Russian knapweed, Hardheads Centaurea repens (*Acroptilon repens*)	Asteraceae (Compositae)	UT State Noxious	Widely established along US Hwy 89, UT SR 12, Cottonwood Road, Hole-in-the Rock Road, and along the Paria River. It is allelopathic, very competitive, and continuously fills in as others perennial plants are overgrazed or eliminated by disturbances.
Field bindweed (Wild morning glory) Convolvulus arvensis	Convolvulaceae	UT State Noxious	Established in disturbed roadsides along US Hwy 89, UT SR 12 and the Johnson Canyon, Skutumpah, Cottonwood, Hole-in-the-Rock, and Seaman Wash Roads.
Bermuda grass Cynodon dactylon	Poaceae (Gramineae)	UT State Noxious	Reported from riparian habitats in Alvey Wash and Rock Springs Creek. It is widely established in warmer regions of the West and Southwest, where it is frequently used as a pasture or lawn grass (Whitson et al. 2002).
Quackgrass Elymus repens (*Agropyron repens, Elytrigia repens*)	Poaceae (Gramineae)	UT State Noxious	Widely distributed, especially along roadsides, wet meadows, and riparian areas. Quackgrass is a desirable hay and forage species but is pernicious weed in moist environments, including cultivated fields and rangelands (Whitson et al. 2002).
Scotch thistle Onopordum acanthium	Asteraceae (Compositae)	UT State Noxious	Common along Johnson Canyon, Skutumpah, and Kitchen Corral Roads and becoming established in Lick Wash and Deer Springs Wash (Ecosphere Environmental Services 1998, Welsh and Atwood 2002). Sharp spines on this species deter livestock, and presumably wildlife, from grazing (Sheley & Petroff. 1999).
Johnson grass Sorghum halepense****	Poaceae (Gramineae)	UT State Noxious	Not yet widely established, but known from small colonies along US Hwy 89 east of Kanab and the switchbacks of UT SR 12 east of Escalante (Ecosphere Environmental Services 1998, Welsh and Atwood 2002). Plants form hydrocyanic acid when frosted or under moisture stress, making the plant toxic to livestock (Whitson et al. 2002).

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As of summer 2005, 98 non-native plant taxa have been documented, accounting for 10% of the total local flora. The total number of local non-native species is relatively low compared to other floras of western North America. A list of additional Non-native plant species of management concern are found in Table 3-23.

Riparian habitats are especially vulnerable to invasion and replacement of native vegetation by non-natives. Of the 348 riparian sites assessed between 2000 and 2003, Tamarisk (*Tamarix* sp.) was the most common exotic (238 sites). Yellow clover (*Melilotus* officianalis) was also common (130 sites), as was Cheatgrass (*Bromus tectorum*)(112 sites). Russian olive (*Eleagnus* angustifolia) was present at 97 sites.

In upland sites, the dominant invasive non-native is cheatgrass. Of the 639 upland sites in the rangeland assessment survey, 344 had cheatgrass. In 74 of those sites, it was a dominant species. Russian thistle (*Salsola pestifer)* is also a common pest in many disturbed sagebrush types.

Table 3-23 Non-native Plant Species of Management Concern

Species	Family	Comments
Jointed goatgrass Aegilops cylindrica	Poaceae (Gramineae)	Troublesome agricultural pest, especially where wheat is cultivated. Found along Johnson Canyon Road and in vicinity of Kanab and Escalante.
Pale amaranth Amaranthus albus	Amaranthaceae	Less common than its weedy (but native) cousin Prostrate pigweed (*A. blitoides*), but becoming established along disturbed roadsides along US Hwy 89, the Johnson Canyon Road, and other smaller roads. This plant is a prolific seed producer and the seed can be spread great distances when mature wind-blown plants break off and tumble along the ground.
Burdock Arctium minus	Astraceae (Compositae)	Known presently from a single spring at the base of Fiftymile Ridge, but has high potential to become established in riparian areas throughout the Escalante River drainage. The burs can become entangled in the hair of livestock allowing seed to be distributed to new areas (Whitson et al. 2002).
Common oats Avena fatua var. sativa	Poaceae (Gramineae)	Recently documented near cabin on Fiftymile Mountain (Lake Allotment), probably originating from hay or horse manure. A palatable species, but could become established and crowd out other edible native species in moist meadow habitats (Whitson et al. 2002).
Bassia Bassia hyssopifolia	Chenopodiaceae	Currently of limited distribution, but could become widespread, especially in disturbed sites with saline clay soils.
Soft brome Bromus hordeaceus (*B. mollis*)	Poaceae (Gramineae)	An invasive winter annual, first discovered east of Kitchen Corral Canyon in 2001 (Welsh and Atwood 2002). It is only palatable in the early stages of growth before seeds dry in the spring.
Japanese brome Bromus japonicus	Poaceae (Gramineae)	Presently known just from the Deer Creek drainage east of Boulder, but potentially could spread to other riparian areas. It is only palatable in the early stages of growth before seeds dry in the spring (Whitson et al. 2002).
Red brome Bromus rubens	Poaceae (Gramineae)	Invasive winter annual that has become well established in desert shrub communities in the Kaiparowits Plateau area. May out compete other grasses and forbs for early season moisture and space and its fine fuels may increase fire frequency in sagebrush and Pinyon-juniper communities. Red Brome is spread short distances by wind. Animals (wild and domestic) carry it in their feces, hooves, hair, feathers, and tails. Humans may also transport brome seeds in vehicles and clothing (Sheley & Petroff. 1999).

Table 3-23 Non-native Plant Species of Management Concern (cont.)

Species	Family	Comments
Cheatgrass, Downy brome Bromus tectorum	Poaceae (Gramineae)	Invasive and well-established winter annual found throughout in nearly all vegetation types. May out compete other grasses and forbs for early season moisture and space and its fine fuels may increase fire frequency in sagebrush and Pinyon-juniper communities. Cheatgrass is spread short distances by wind. Animals (wild and domestic) carry cheatgrass in their feces, hooves, hair, feathers, and tails. Humans may also transport cheatgrass seeds in vehicles and clothing (Sheley & Petroff. 1999).
Ravennagrass Saccharum ravennae	Poaceae (Gramineae)	Known from scattered inlets along Lake Powell in Glen Canyon NRA. Forms dense stands that choke out other native wetland vegetation, as well as Tamarisk.
Bull thistle Cirsium vulgare	Asteraceae (Compositae)	Widespread, especially in wet meadows and riparian areas. Only exotic *Cirsium* known in area (all others are native and several are local endemics). Sharp spines on all three species deter livestock, and presumably wildlife, from grazing (Sheley& Petroff. 1999).
Poison hemlock Conium maculatum	Apiaceae (Umbelliferae)	Poisonous species currently known just from the Deer Creek drainage, but could spread to other perennial streams. Poison-hemlock usually behaves as a biennial that reproduces solely by seed. Despite its prolific seed production, it doesn't have a well developed mechanism for long distance seed dispersal, it simply drops its seed close to the parent plant (Sheley & Petroff. 1999).
Barnyard grass *Echinochloa crusgalli*	Poaceae (Gramineae)	An important crop pest, this species is mostly restricted to perennial streams, rivers, or springs.
Russian olive Elaeagnus angustifolia	Elaeagnaceae	Abundant along perennial streams and springs. Most fruits remain on trees until distributed by animals, especially birds (DiTomaso & Healy. 2003), but plant tends to crowd out native cottonwoods and willows, depriving cavity-nesting birds of habitat.
Halogeton Halogeton glomeratus	Chenopodiaceae	Becoming established on fine-textured clay soils along Henrieville Creek and Warm Creek. Halogeton is not an extremely competitive plant, but it readily invades disturbed or over-grazed areas where livestock congregate. It is readily grazed at times, and is responsible for thousands of livestock poisonings (Whitson et al. 2002). Livestock consume Halogeton, but the seeds are destroyed in the rumination process.
Rabbit barley Hordeum murinum	Poaceae (Gramineae)	Winter annual found commonly in towns surrounding the area, but becoming established at the old Paria townsite and possibly other sites along the US Hwy 89 corridor. Awns may cause irritation to livestock. Readily disseminated by long-awned florets.
Summer-cypress Kochia scoparia	Chenopodiaceae	Invasive forb found commonly in towns surrounding the area and now confirmed for Fiftymile Bench. While it is considered an objectionable weed, kochia is readily grazed by livestock (Whitson et al. 2002).
Dalmatian toadflax Linaria dalmatica (*L. genistifolia* ssp. *dalmatica*)	Scrophulariaceae	Infrequently documented along US Hwy 89. Cattle will sometimes casually browse flowering shoots. Occasional cases of mild poisoning have been reported for cattle, but the toadflaxes are usually avoided by cattle, and such cases are rare (Sheley & Petroff. 1999).
Horehound Marrubium vulgare	Lamiaceae (Labiatae)	Abundant along roadsides, especially in Grand Staircase region. The calyx of each flower surrounds the fruit and develops a whorl of small hooked spines, forming a characteristic cluster of bur like structures in each leaf axil (Whitson et al. 2002).
Yellow sweet-clover Melilotus officinalis	Fabaceae (Leguminosae)	Widely cultivated along roadsides to prevent soil loss. Can be toxic to livestock, during early growth stage plants are consumed by livestock.
Bur buttercup Ranunculus testiculatus	Ranunculaceae	Quickly becoming one of the most widely distributed annual forbs. Frequently associated with disturbed soils around roads, stock trails, corrals, and waterholes. The burs can become entangled in the hair of livestock allowing seed to be distributed to new areas.

Table 3-23 Non-native Plant Species of Management Concern (cont.)

Species	Family	Comments
Cultivated rye Secale cereale	Poaceae (Gramineae)	Has escaped along Johnson Canyon Road, US Hwy 89, and at old Paria townsite. It is only palatable in the early stages of growth before seeds dry in the spring.
Tumbling mustard Sisymbrium altissimum	Brassicaceae (Cruciferae)	Well established as a weed in towns and spreading along disturbed roadsides on Hwy 89 and Johnson Canyon. The plant often breaks off at soil level when mature and scatters seed as it tumbles in the wind (Whitson et al. 2002).
Black nightshade Solanum nigrum	Solanceae	Primarily a pest of cultivated crops, this species is occasionally found in moist sites. The green (immature) fruit and foliage contain toxic alkaloids (Whitson et al. 2002).
Spiny sow-thistle Sonchus asper	Asteraceae (Compositae)	Found primarily in wetland areas and disturbed roadsides. Fruits are reddish brown, flattened and with 3 to 5 ribs on each face, with a cluster of fine white hairs attached to the upper end promoting wind dispersal (Whitson et al. 2002).
Salt-cedar, Tamarisk Tamarix chinensis (*T. ramosissima, T. pentandra*)	Tamaricaceae	Originally introduced as an ornamental, tamarisk has spread along perennial or ephemeral wetlands, roadsides, and dry washes (especially in saline sites). Large quantities of seed are produced that are wind dispersed.
Small-flowered salt-cedar Tamarix parviflora	Tamaricaceae	Closely related to salt-cedar and may interbreed with it in North America, but apparently far less common. Large quantities of seed are produced that are wind dispersed.
Yellow salsify Tragopogon dubius	Asteraceae (Compositae)	Widespread on roadsides, riparian areas, and sagebrush grasslands. The flower head produces a "puffball" like seed head similar to a dandelion, but larger. The puffballs are composed of numerous umbrella like structures (pappus) attached to seeds (achenes), enabling them to travel great distances with the wind (Whitson et al.2002).
Puncture vine, Goathead Tribulus terrestris	Zygophyllaceae	Becoming more widely established along roadsides. The spiny burs attaches to the hair of animals, the bottom of shoes, and punctures bicycle tires.
Siberian elm Ulmus pumilus	Ulmaceae	Recently documented along switchbacks on UT SR 12 and in Sand Creek on the Boulder Mail Trail. Readily disseminated by wind-borne seeds and capable of colonizing large portions of the canyon country between Escalante and Boulder.
Woolly mullein Verbascum thapsus	Scrophulariaceae	Established along Johnson Canyon Road and infrequent on US Hwy 89. Prolific seed production makes long-term control difficult. Livestock will not eat the plant because of its woolliness.

The analysis of livestock and exotic species interactions in Chapter 4 will focus on introduction and spread mechanisms.

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WILDLIFE

The lands within the planning area provide a complex array of habitats for thousands of separate species ranging from the smallest of insects to large mammals. The BLM has funded numerous extensive multi-year survey projects to inventory and study wildlife species in order to provide a more complete understanding of this area of the Colorado Plateau. Results to date have produced an expansion to the list of previously known species for this area.

There are 82 verified mammalian species within the area, along with 21 species questionably present, 4 introduced species reported, and 6 currently extirpated species (Flinders and Rogers 2002), (Alston and Flinders 2000), (Flinders et al, 1998). There are also approximately 243 bird species, 20 different fish (McAda el al , 1977), (Mueller et al, 1999), (Fridell et al, 2004), more than 1,900 invertebrates (Bosworth and Oliver 1998), (Griswald and Messinger 2003), (Baumann and Nelson 2003), (Vinson 2002), and 29 species of reptiles and amphibians (Oliver 2003), (Graham 2003), including 1 salamander, 4 frogs and toads, 13 lizards, and 11 snakes. The list of invertebrate species will increase as collection and classification work continues.

Each species, or suite of species, within the planning area requires a specific set of habitat conditions in order to meet their particular needs for survival and reproduction. Different plant community seral stages are also important in providing habitat requirements. As seral stages move from one state to another, habitats are occupied by different wildlife species. For example, different seral stages of a sagebrush/grassland plant community provide habitat for the nesting and foraging requirements of a number of neotropical and upland birds. Some may require a more open sagebrush canopy with a greater percentage of grasses and forbs in the understory, while others would need a higher percentage of shrub canopy closure for nesting and protection from predators. For these and other reasons, it is usually important to provide for a mosaic pattern of various seral stages of healthy plant communities composed of native species across the landscape in order to accommodate the needs of all wildlife. This mosaic pattern is normally provided by natural disturbance regimes, such as fire, insect infestations, drought, and fluctuations in climatic patterns. Please refer to the Vegetation section of this chapter for a more detailed discussion of the vegetation types in the area.

Some animals use the planning area as migratory habitat, others are year round residents, while still others use the area seasonally. The Monument also contains small areas of specialized habitat that only a few species are adapted to use, for example some aquatic invertebrates and reptiles, such as the Glen Canyon chuckwalla. A complete list of wildlife species found within the planning area is located in Appendix 9.

BIRDS

The bird species of Utah have been identified for protection in several different ways. Bird species can be federally listed, as Endangered or Threatened (and birds on that list will be addressed in the separate section on "Threatened and Endangered Wildlife Species"). They can be state listed on the State of Utah Sensitive Species and Partners in Flight Priority Species list (Parrish et al, 2002). Birds which migrate outside of the continental United States are protected by the Migratory Bird Treaty Act. Utah BLM maintains its own list of species of concern, with

most classified as "BLM Sensitive Species. In addition to its nationwide list, the U.S. Fish and Wildlife Service has published regional lists of "Birds of Conservation Concern", with the planning area is falling within the Southern Rockies-Colorado Plateau conservation region.

Those lists (Appendix 9) contain sixty bird species which either are afforded special protections, or are of conservation concern. Not all of those species are present, or have suitable habitat within the planning area. The following twenty five species (listed by associated habitat type) have the potential to occur within the planning area, and may be impacted by changes in livestock management or vegetation management activities:

Aspen dependent species

Williamson's Sapsucker

State Species of Special Concern

This sapsucker is rare in the planning area with only three birds noted on surrounding federal lands in the past 25 years. It nests primarily in ponderosa pine and in aspen components of mixed-conifer forests, and often places nest cavities in aspen trees in stands adjacent to open ponderosa pine or mixed-conifer forest. Nest substrate preferences appear to be live aspen (with some decay) or aspen snags, followed by conifer snags. It requires large diameter trees for nesting. Fire can create snags for nesting.

Pinyon-Juniper dependent species

Black-throated Gray Warbler

This warbler is relatively common in the planning area. Its primary breeding habitat is Pinyon-juniper woodlands with secondary breeding habitat as lowland riparian. Lowland riparian is also used substantially during migration. Preferred breeding habitat includes dry oak slopes, pinyon, junipers, and Pinyon-juniper woods, open mixed woods, and dry coniferous and mixed woods with a brushy understory.

Gray Vireo

This vireo is relatively uncommon in the planning area, and is an obligate of semiarid mature, relatively weed-free Pinyon-juniper, juniper, or oak woodlands that are relatively "open" with a shrubby under story. Woodlands with moderate to steep slopes appear to be a critical factor, while elevation does not appear to be a critical factor as long as the preferred habitat type is present. Proximity to water is not essential.

Pinyon Jay

This jay is common in the area, with a range tied primarily to the distribution of Pinyon-juniper woodlands. They typically nest in Pinyon-juniper woodlands but will also nest in ponderosa pine forests. Large flocks (up to 250 individuals) nest communally in traditional breeding areas.

Virginia's Warbler

This warbler is relatively common in the planning area, and primary breeding habitat consists of oak with secondary breeding habitat of Pinyon-juniper woodlands. It typically requires scrubby hillsides with well developed herbaceous or woody understory. Lower mountain habitats with dense stands of Gambel's Oak and relatively high slope are preferred for

breeding, although mountain mahogany, riparian areas, ponderosa pine forests, and Pinyon-juniper woodlands, all with shrubby understories are also used for breeding.

Ponderosa Pine and Douglas Fir dependent species

Flammulated Owl

This owl is relatively rare, with approximately 20 records in the area over the past 15 years. It prefers old-growth or mature ponderosa pine, apparently due to the presence of large broken-top and lightning-damaged snags and trees for nesting cavities, large cavities excavated by Northern Flickers and other woodpeckers, open structure of trees and understory for foraging, and high prey availability. They will utilize other habitats with similar structure, such as open mixed-conifer and aspen forests. Key habitat features seem to be the presence of large trees and snags, scattered clusters of shrubs or saplings, clearings, and a high abundance of nocturnal arthropod prey. Territories are often on ridges or dry mid-slope areas.

Grace's Warbler

This warbler is extremely rare in the planning area with one record of a bird at low elevation, probably migrating. It frequents high mountain ranges from southern Nevada, southern Utah, and southwestern Colorado south to Nicaragua, with nests in mountain forest (tall ponderosa pine). Indications are that high mature stands of tall pines are preferred for nesting.

Lewis's Woodpecker

State Species of Special Concern

This woodpecker is uncommon in the planning area, with only one bird noted in 2003. Major habitat consists of open park-like Ponderosa Pine forests. Attracted to burned-over Douglas Fir, mixed conifer, Pinyon-juniper, riparian and oak woodlands, but is also found in the fringes of pine and juniper stands, and deciduous forests, especially riparian cottonwoods. Areas with a good understory of grasses and shrubs to support insect prey populations are preferred. Dead trees or stumps are required for nesting. Wintering grounds are over a wide range of habitats, but oak woodlands are preferred. Woodpeckers tend to be habitat specialists.

Northern Goshawk

BLM Sensitive Species

This raptor is a rare and localized resident in the planning area. In the southwest it primarily uses ponderosa pine and mixed conifer forests, although use of other forest types has also been documented, while in the west, it nests in both deciduous trees (e.g., cottonwood and aspen) and conifers.

Desert Shrub/Sagebrush Grassland dependent species

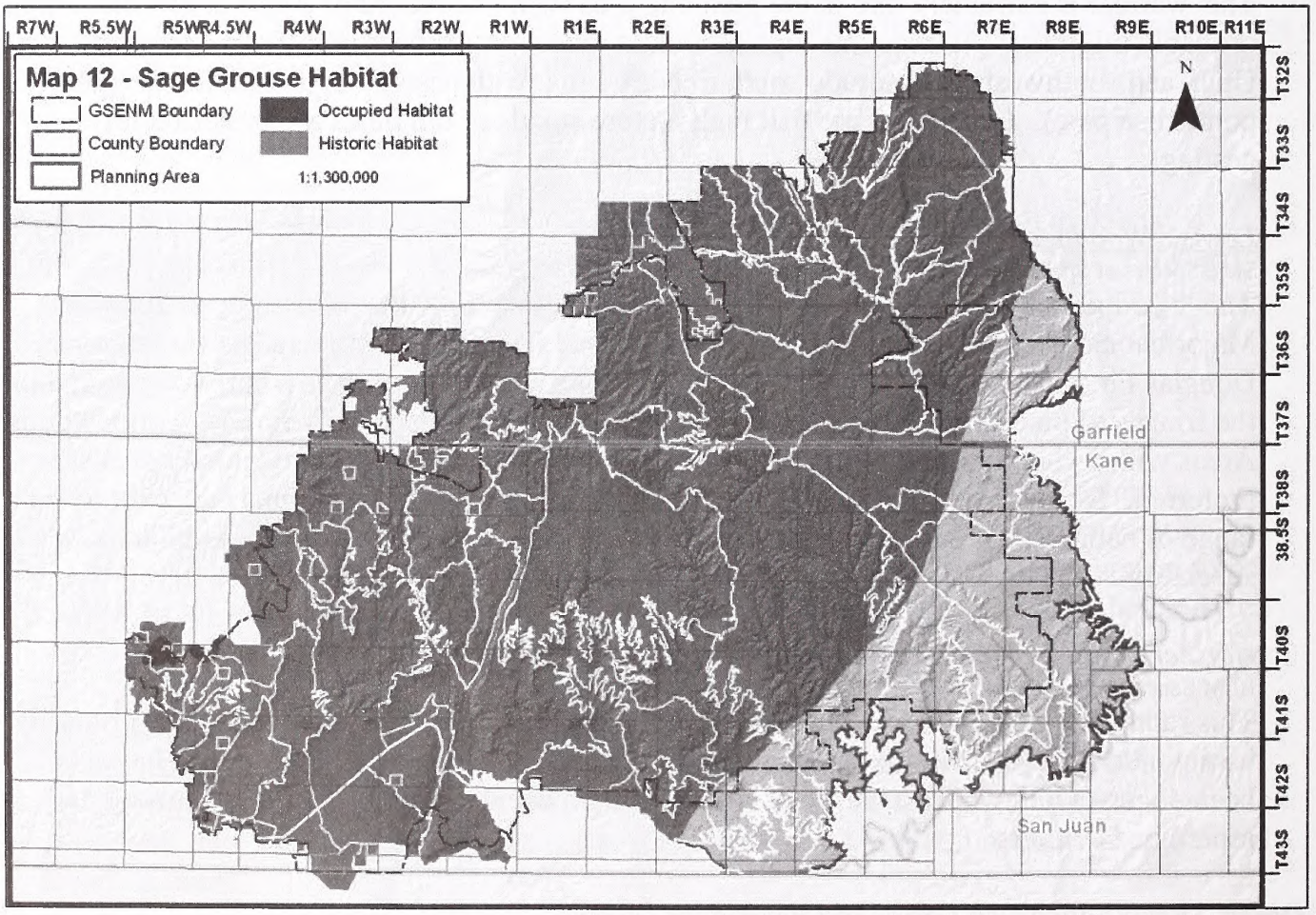
Brewer's Sparrow

This sparrow is a relatively common summer resident in the area, and may be a shrub steppe obligate species. However, it may also be found in high desert scrub (greasewood) habitats, particularly where these habitats are adjacent to shrub steppe, and can also breed in large sagebrush openings in Pinyon-juniper habitat or coniferous forests. Breeding habitats are

usually dominated by big sagebrush. Nesting and foraging areas are usually in patches, or individual shrubs that are taller than the surrounding vegetation. These areas also tend to have a greater percentage of live shrub growth, less bare or rock-covered ground, and greater canopy coverage than surrounding patches.

Sage Grouse
BLM Sensitive Species

Sage grouse occurs only in the sagebrush and sagebrush steppe ecosystems and sagebrush habitats are essential for its survival. Important habitat (Map 12) includes: strutting grounds, water sources (springs, seeps, creeks, and livestock water developments), wet meadows, forb-dominated meadows, and south and west-facing ridges and slopes where grouse are known to winter. Sage Grouse build their nest on the ground in the concealment of sagebrush or other plants. Diet consists of flowers and buds of various forbs, grasses, and almost exclusively on the evergreen leaves of sagebrush in the winter.



Sage grouse are year-round residents in the planning area. Particular areas are used only during certain seasons of the year. There remains one active breeding site near the boundary of the planning area. There are at least two historic inactive leks (breeding areas) within the

planning area on private lands. These breeding areas have been subjected to other agricultural uses (cultivation and intensive livestock grazing use) which have displaced sage grouse. Public lands within the planning area still support sage grouse during brood rearing and winter use.

Sage Sparrow

This sparrow is a relatively uncommon permanent resident in the planning area. It is considered a shrub steppe obligate species. Breeding Sage Sparrows prefer semi-open habitats with evenly spaced shrubs 1-2 m high. Vertical structure, habitat patchiness, and vegetation density may be more important in habitat selection than specific shrub species, however; Sage Sparrows are closely associated with big sagebrush throughout most of their distribution. They are often missing from what appears to be suitable habitat, so other unknown habitat characteristics may be important.

Grassland and Meadow/Sagebrush Grassland dependent species

Black Rosy-Finch (winter only)

Considered a rare winter migrant, with no known records of sightings, this species is a high elevation bird, breeding beyond timberline in barren, rocky, or grassy areas. The breeding habitat is secure.

Burrowing Owl

State Species of Special Concern

This owl is an uncommon summer resident with roughly 30 sightings in past 25 years. It is predominantly associated with prairie dog towns and ground squirrel populations which provide burrows and reduced adjacent vegetation, but it can also found along washes, near water tanks, or corrals on rangelands. Nesting burrows created by other species.

Ferruginous Hawk

State Threatened Species

This hawk is an uncommon permanent resident with about 15 sightings during the past 25 years, mostly on West Clark Bench. It breeds in flat and rolling terrain in grassland or shrub steppe, and avoids high elevations, forest and narrow canyons. Because of strong preference for elevated nest sites, cliffs, buttes, and creek banks are usually present. During winter, it uses farmlands, grasslands, and other arid lands where lagomorphs, prairie dogs, and other major prey items are present.

Northern Harrier

Relatively common in planning area, this species has a large home range. It breeds in a wide array of habitats, but typically prefers large tracts (250 acres) of wetlands with dense vegetation.

Short-eared Owl

State Species of Special Concern

This owl may be a rare permanent resident with no records of sighting. It breeds and forages in grasslands, prairies, wetlands, and croplands. Large blocks of suitable habitat (250 ac) seem necessary to support breeding pairs. Nest on the ground, usually on a dry site, often elevated on a small hummock.

Swainson's Hawk
This hawk is an uncommon summer resident in the planning area with 5 sightings in the past 15 years. It prefers open grassland or open fields which have a scattering of taller trees or trees along a riparian corridor for roosting, nesting, and perching. Require shorter grass species or crops for foraging.

Riparian dependent species

Blue Grosbeak
BLM Sensitive Species
This grosbeak is relatively uncommon within the area. It uses contiguous and linear riparian areas from about 0.8 hectares to hundreds of hectares in size with young to old-growth trees if vegetation is dense to moderately dense. Foraging habitat includes weedy fields and brushy areas after breeding, and before migration.

Broad-tailed Hummingbird
This hummingbird is probably most common as a migrant in the planning area at higher elevation Its primary Utah breeding habitat is lowland riparian with secondary breeding habitat as mountain riparian. It requires stream side areas adjacent to open patches of meadows or grasses with good quantities of wild flowers available throughout the breeding season.

Common Yellowthroat
State Species of Special Concern
This bird is an uncommon riparian breeder in area, with birds detected on point counts and captured in mist nests. Its preferred habitats include marshes, riparian areas, brushy pastures, and old fields.

Lucy's Warbler
This warbler is an uncommon riparian breeder, with birds detected on point counts and captured in mist nests. It needs mesquite, cottonwood, or willow trees for nesting cavities, and substrates for verdin nests, which are subsequently used by Lucy's warblers.

Peregrine Falcon
State Endangered Species
This falcon is rare and localized in the area, with several nesting pairs being monitored. It breeds on cliffs and rock outcrops from 1370m to more than 2740m (4,500-9,000 ft) in elevation. Most commonly choose cliffs that lie within Pinyon-juniper and ponderosa pine zones, but this choice probably depends on the nature and location of the cliffs rather than an attraction to these habitats. They select a ledge that has a wide view and plentiful prey in the area. Most eyries (nest sites) are within a mile of water. It hunts in adjacent open meadows, forested tree top areas, around lakes and rivers, and shrub steppe. Early records suggest that they once nested in somewhat more accessible spots, but now they tend to choose cliffs higher than 60 m (200 ft) in undisturbed areas.

Prairie Falcon

This falcon is a common permanent resident in the area with approximately 45 records in the past 45 years with several nest sites located. It breeds on cliffs and rock outcrops, and hunts in adjacent open areas such as grasslands and shrub steppe.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is found locally as a winter resident, roosting in large trees and hunting in the adjacent areas. The bald eagle was removed from the list of threatened and endangered species on June 28, 2007.

Yellow-billed Cuckoo

State Threatened Species

There are no records of Yellow-billed Cuckoo for the area, and it is extremely rare in Utah. Nesting habitat is classified as dense lowland riparian characterized by a dense sub-canopy or shrub layer (regenerating canopy trees, willow or other riparian shrubs) with 100 meters (333 ft) of water. Overstory in these habitats may be either large, gallery-forming trees or developing trees. Nesting habitats are found at low to mid-elevations (2500-6000 ft) in Utah. Cuckoos may require large tracts of contiguous riparian nesting habitat. Riparian habitat loss is the primary reason for decline of this species. Riparian habitat corridors are important for dispersal and migration even where not suitable for nesting. Yellow-billed cuckoos are listed as threatened on the Utah State Sensitive Species List and the western population of the cuckoo is classified as a Candidate for Federal listing.

BATS

Despite recent advances in research in the last decade, bats are still one of the less understood wildlife species in the world lacking information on many aspects of natural history. Given the close proximity of different habitat types within the planning area, and the ability of flying bats to move great distances, many bat species probably migrate seasonally among habitat types. Unfortunately, because of the cryptic nature of bats and the lack of technology to track movements, even small scale seasonal movements are poorly understood. Capture records of many studies infer that such movements do occur, but details of habitat use by bat species are limited. Advances in technology in the last decade have increased knowledge on day-roost habitat characteristics, but limited knowledge is known about foraging habitat in any detail.

Bat studies conducted during the summers of 1997, and 2003-2005 showed that 16 of the 19 Utah species were present within the area. Additional bat surveys for known and suspected species are ongoing across the planning area. The following bat species are classified as being State of Utah and BLM Sensitive Species: Allen's lappet-brow (big-eared) bat, big free-tailed bat, fringed myotis, spotted bat, and Townsend's big-eared bat. Only these species will be carried forward for analysis (Table 3-24).

Table 3-24 Bat Species Brought Forward for Analysis

Common Name	*Species*
Multiple Habitat Bats	
California myotis	*Myotis californicus**
Western small-footed myotis	*Myotis ciliolabrum**
Long-eared myotis	*Myotis evotis**
Little brown bat	*Myotis lucifugis*±*
Arizona myotis	*Myotis occultus*±*
Fringed myotis	*Myotis thysanodes**†
Long-legged myotis	*Myotis volans**
Yuma myotis	*Myotis yumanensis**
Allen's Lappet-brow bat	*Idionycteris phyllotis**†
Pallid bat	*Antrozous pallidus**
Mexican free-tailed bat	*Tadarida brasiliensis**
Tree-roosting Bats	
Western red bat	*Lasiurus blossevillii*†
Hoary bat	*Lasiurus cinereus**
Silver-haired bat	*Lasionycteris noctivagans**
Cliff-roosting Bats	
Western pipistrelle	*Pipistrellus hesperus**
Spotted bat	*Euderma maculatum*†
Pocketed free-tailed	*Nyctinomops femorasaccus*
Big free-tailed bat	*Nyctinomops macrotis**†
Western mastiff bat	*Eumops perotis* ‡
Cave-roosting Bats	
Cave myotis	*Myotis velifer*
Townsend's big-eared bat	*Corynorhinus townsendii**†

* Confirmed on Monument through mist-netting capture.
‡ Confirmed on Monument through acoustic monitoring.
† State Sensitive Species
± One or both may be on the Monument. Determination still pending further research.

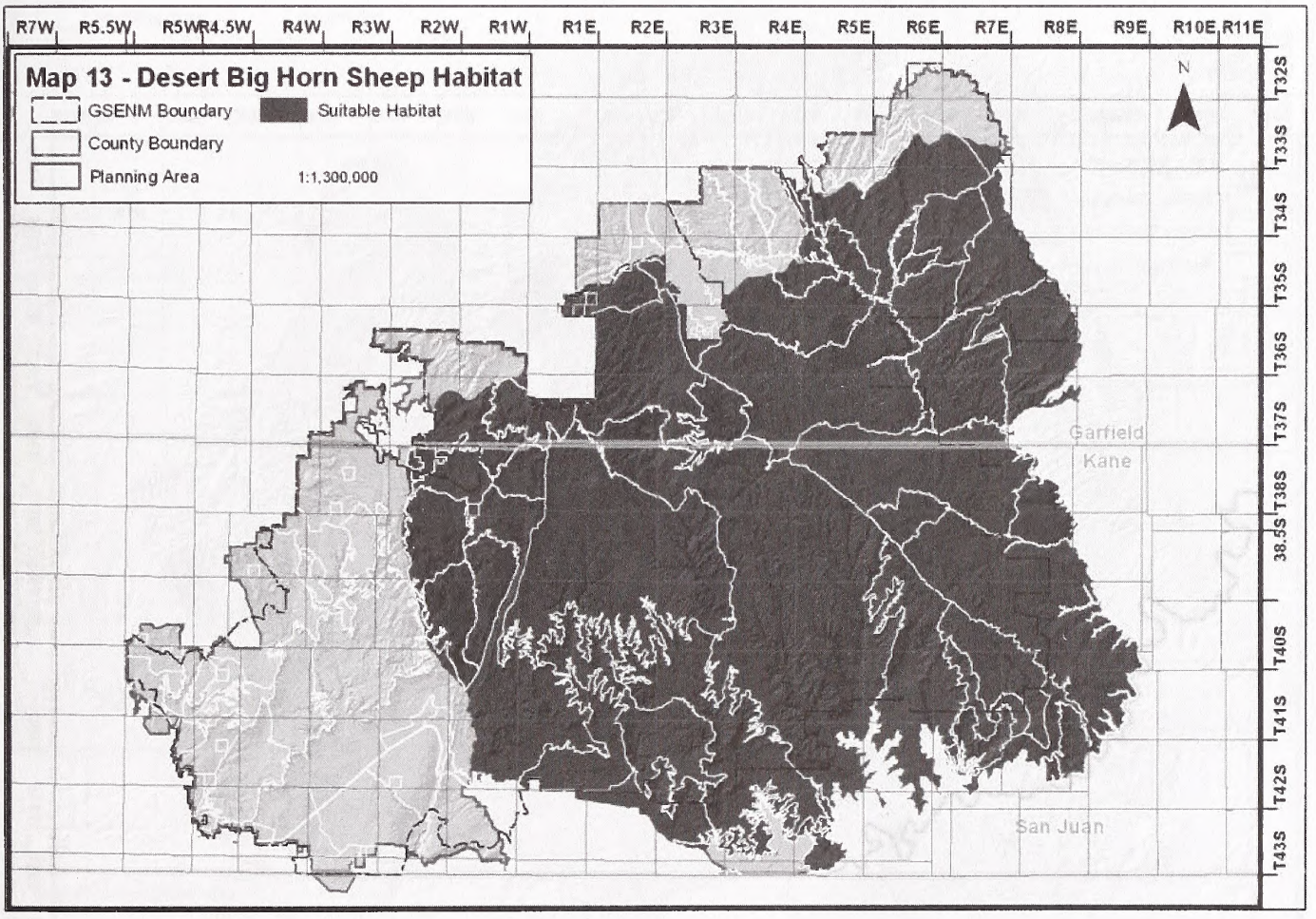
GAME SPECIES

Game animals provide an important recreation and economic benefit through hunting and wildlife viewing. Game populations in the area include the Paunsaugunt mule deer herd and desert bighorn sheep. Elk and pronghorn antelope currently have smaller, but increasing population numbers. None of these animals have achieved their population goals as described within the Utah Division of Wildlife Resources (DWR) Species Management Plans. Sagebrush, desert shrub, and grasslands provide habitat for these animals. The sagebrush habitat type was determined to have the highest percentage of non-functioning (10-13%) or functioning at risk (34-47%) sites for soil, hydrologic, and biotic integrity indicators within the planning area.

Desert Bighorn Sheep

Since 1980, bighorn sheep (*Ovis Canadensis nelsoni*) have been reintroduced by the UDWR and BLM. In 1999, 21 desert bighorn sheep were trapped and removed from Arizona and then transported and released into vacant but historically occupied habitat on the southern end of the Kaiparowits Plateau. In 2000, 20 more sheep were trapped and released. Twenty additional

sheep were trapped and released in 2006. Many of these sheep were fitted with radio transmitters in order to study their movements and reproductive success (Alston 2000). Typical habitats occupied are xeric desert grasslands in mountain and canyon associations. Rocks and cliffs are important habitat attributes (Map 13). Diet consists mainly of grasses with some shrubs and forbs mixed in.

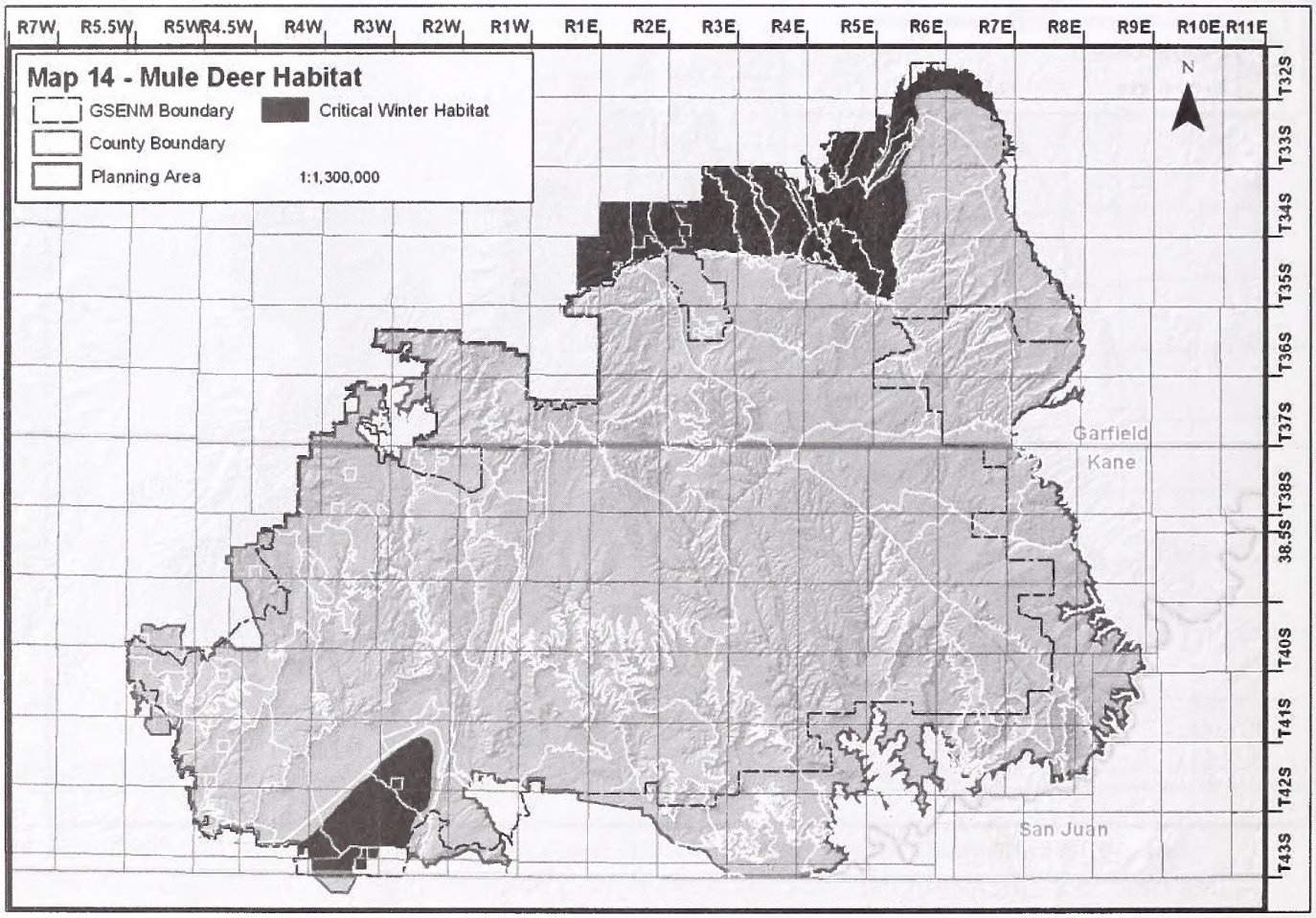


Mule Deer

The Buckskin Mountains provide critical wintering habitat (Map 14)for the Paunsaugunt mule deer herd. DWR includes these deer in Wildlife Game Management Unit 27. Other areas serve as important spring and fall migration corridors for this herd between their wintering on the Buckskin Mountains and summer grounds on the Paunsaugunt Plateau north of the Grand Staircase. This migration route is generally defined by the area between Kanab Creek and the Paria River. The grazing allotments affected by the migration corridor within the planning area include Coyote, Deer Spring Point, Flood Canyon, Ford Well, Johnson Lakes, Locke Ridge, Mill Creek, Second Point, Sink Holes, Timber Mountain, and White Sage. The allotments that the majority of these deer winter on include Five Mile, Mollies Nipple, and Vermilion. Additionally,

a portion of the Kaibab deer herd uses the extreme southern portion of the Buckskin Mountains as important wintering habitat. The majority of this herd are year-round residents of Arizona.

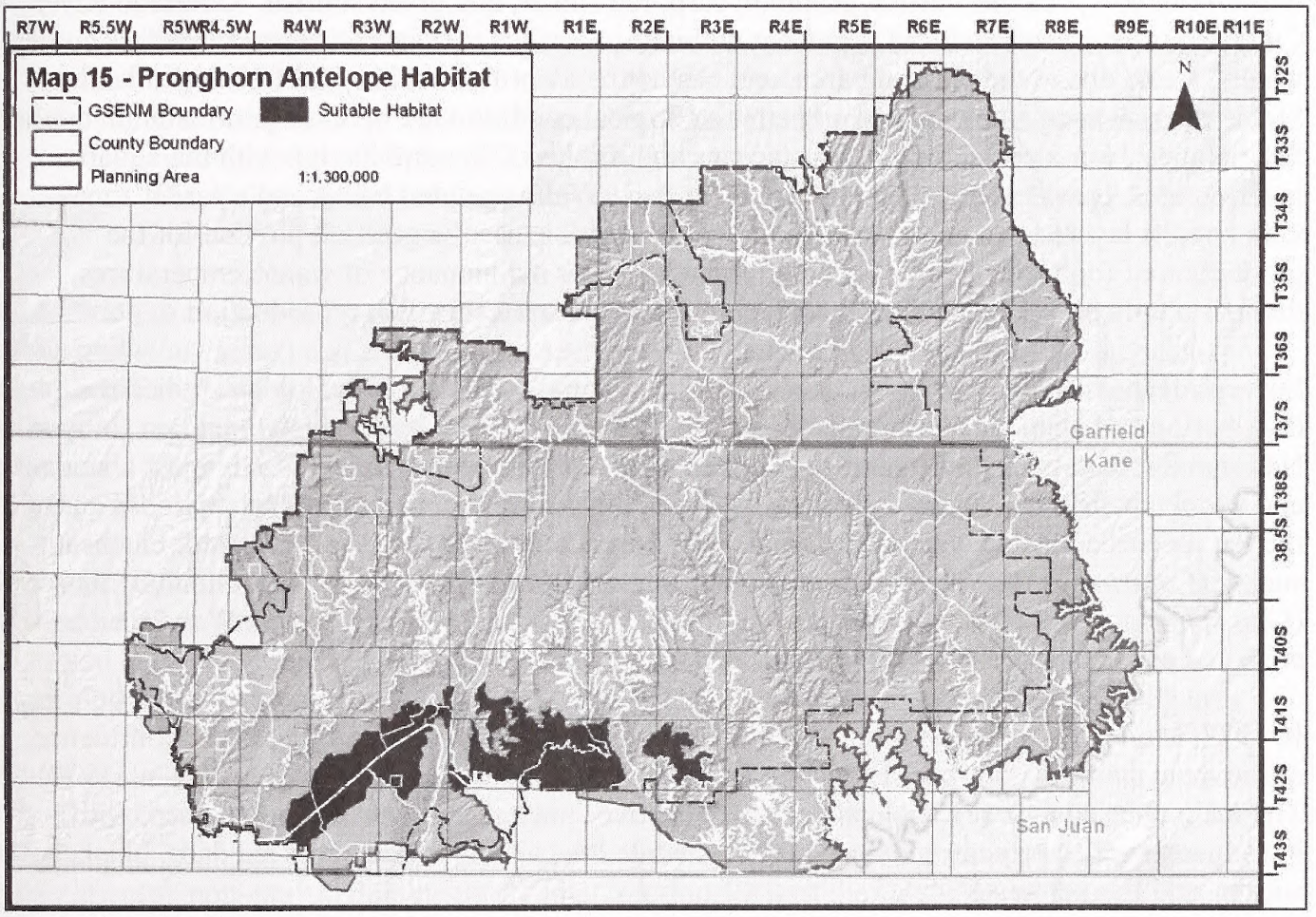
The area north of the Escalante River provides critical wintering habitat. This area encompasses the Upper Valley, Main Canyon, Wide Hollow, Pine Creek, Calf Creek, Boulder Creek, and Steep Creek drainages. This area also serves as a main corridor between the Dixie National Forest to the north, the Escalante River and its tributaries and the Escalante Desert and Canaan Peak.



Pronghorn Antelope

Twenty-two pronghorn antelope (*Antilocapra americana*) were reintroduced into the East Clark Bench area in 1970 (Smith and Beale, 1980). In 1999, approximately 100 pronghorn antelope were trapped on Parker Mountain near Loa, Utah, with 75 animals subsequently released on local public lands in the East Clark Bench area with the remainder released on adjacent State of Utah lands. This effort was repeated in 2000 with 60 more animals released into historic habitat on the south end of the planning area and 83 additional animals released in 2004. There are currently about 200 pronghorn antelope within the planning area. It is the goal of the UDWR and BLM to continue these reintroductions until target populations, per approved State of Utah

species management plans, are reached. Pronghorn antelope prefer open sagebrush grassland habitats. They primarily feed upon shrubs with a heavy reliance on forbs in the spring months.



Upland Game Birds

The two most common upland game birds inhabiting the planning area are chukar and wild turkey. Chukar are found on rocky, grassy, or brushy slopes as well as in canyons and drainages. Turkey are found in a variety of habitats which include woodlands, oak brush, pine groves, canyons, and riparian areas and are present within these cover types over the entire planning area. These birds feed on a variety of seeds, forbs, insects, fruits, nuts, and acorns. Access to water sources is critical. Additionally, turkey need roost trees, such as large ponderosa pine or cottonwood that are adjacent to foraging areas.

FISH AND AQUATIC SPECIES

Fish habitat in the planning area provides for both warm and cold water species. The two river systems are the Paria and Escalante Rivers. The Paria River is characterized as a warm water system, while the Escalante River drainage has both warm water and cold water habitats. Four native fish species have been identified during recent fish inventories: speckled dace (state

sensitive), flannelmouth sucker (state sensitive, covered by Conservation Agreement), bluehead sucker (state sensitive, covered by Conservation Agreement), and roundtail chub (state sensitive, covered by Conservation Agreement) (Fridell, et al. 2003, 2004). Speckled dace is the most abundant native species. Six non-native species have been identified including, brown trout, fathead minnow, channel catfish, common carp, red shiner, and green sunfish. Colorado River Cutthroat trout (state sensitive) is present within the Escalante River drainage, but prefers cooler waters, found above the planning area, and has not be identified within BLM managed lands. Stable riparian conditions in good or better ecological condition are necessary to maintain quality fish habitat. Non-insects, such as crustaceans and mollusks, in combination with the aquatic invertebrates, provide critical food sources for fish. Well vegetated banks and riparian zones with a multi-layered canopy of woody and non-woody riparian vegetation provide for the production of food such as aquatic invertebrates, proper maintenance of water temperatures, dissipation of energy from storm runoff events, and substrates for fish reproduction.

Surveys of the Escalante River's fishery have been completed. In 1974, Holden studied the distribution and abundance of the fishes in 48 miles of the Escalante River within Glen Canyon National Recreation Area (Holden and Irvine1975). Of the species collected, the most abundant and widely distributed was an introduced species, the red shiner (*Cyprinella lutrensis*). Four of the ten species collected were natives and were fairly common where they occurred: bluehead sucker (*Catostomus discobolus*), flannelmouth sucker (*Catostomus latipinnis*), roundtail chub (*Gila robusta robusta*), and speckled dace (*Rhinicthys osculus*). The two suckers and the chub are listed as Utah State Sensitive species.

In 1977, McAda et al primarily surveyed the tributaries (a majority located near the confluence of the main stem) of the upper Escalante River above Glen Canyon NRA (McAda et. al. 1977). The main river contained a high percentage of native species, mostly suckers and dace, with introduced species present in minor numbers, while the tributaries had speckled dace, bluehead sucker, and flannelmouth sucker.

In 1998, Mueller et al repeated Holden's 1974 study along 12 miles of the lower river. Mueller found, similar to Holden, that the upper six-mile section still contained a predominantly native species community while the lower six-mile section (near Lake Powell) was predominantly introduced species (Mueller et al 1999). Further fishery studies are ongoing.

THREATENED AND ENDANGERED WILDLIFE SPECIES

The consultation process with Fish and Wildlife Service (FWS) under section 7 of the Endangered Species Act was initiated by letter on July 26, 2000. A list of threatened and endangered species to be analyzed was provided by the FWS on November 26, 2000. The lists of federally listed threatened, endangered, and candidate species for Kane and Garfield counties were consulted. Only those species that have been detected in the project area as a result of survey work, or lie within historic ranges of these species were included. Some species were extensively surveyed for with no individuals detected, e.g., fish species. These species were not added to those in the consultation letter. A subsequent consultation letter was sent on April 22, 2003. A response was received on April 22, 2003. FWS has identified four endangered and

threatened animal species and one candidate species, with potential to occur within the planning area. Those species are:

1 The California Condor (*Gymnogyps californicus*), listed as endangered on March 11, 1967.
2 The Mexican Spotted Owl (*Strix occidentalis lucida,*), listed as threatened on March 16, 1993.
3 The Southwestern Willow Flycatcher (*Empidonax traillii extimus*), listed as endangered on February 27, 1995.
4 The Yellow-billed cuckoo (*Coccyzus americanus*), candidate for listing, July 25, 2001 (FWS finding in Federal Register).

In addition to the above listed species, the federally endangered Colorado pikeminnow (*Ptychocheilus lucius*) and razorback sucker (*Xyrauchen texanu*) are native to the adjacent Colorado River system, but not identified in the planning area. The Escalante River and its tributaries are not considered by the Fish and Wildlife Service as habitat for these fish (Yvette Converse, FWS per. Comm., September 2002.). Surveys have been conducted on the Escalante River, a tributary to the Colorado River, and no federally listed fish were recorded.

Peregrine Falcons nest and breed in the area, but as a result of their nationwide recovery, are no longer listed as Threatened or Endangered. Utah Prairie Dogs are of concern on Bryce Canyon National Park, and the Dixie National Forest, but suitable prairie dog habitat has not been identified in the planning area and no individuals have been documented in the planning area.

California Condor

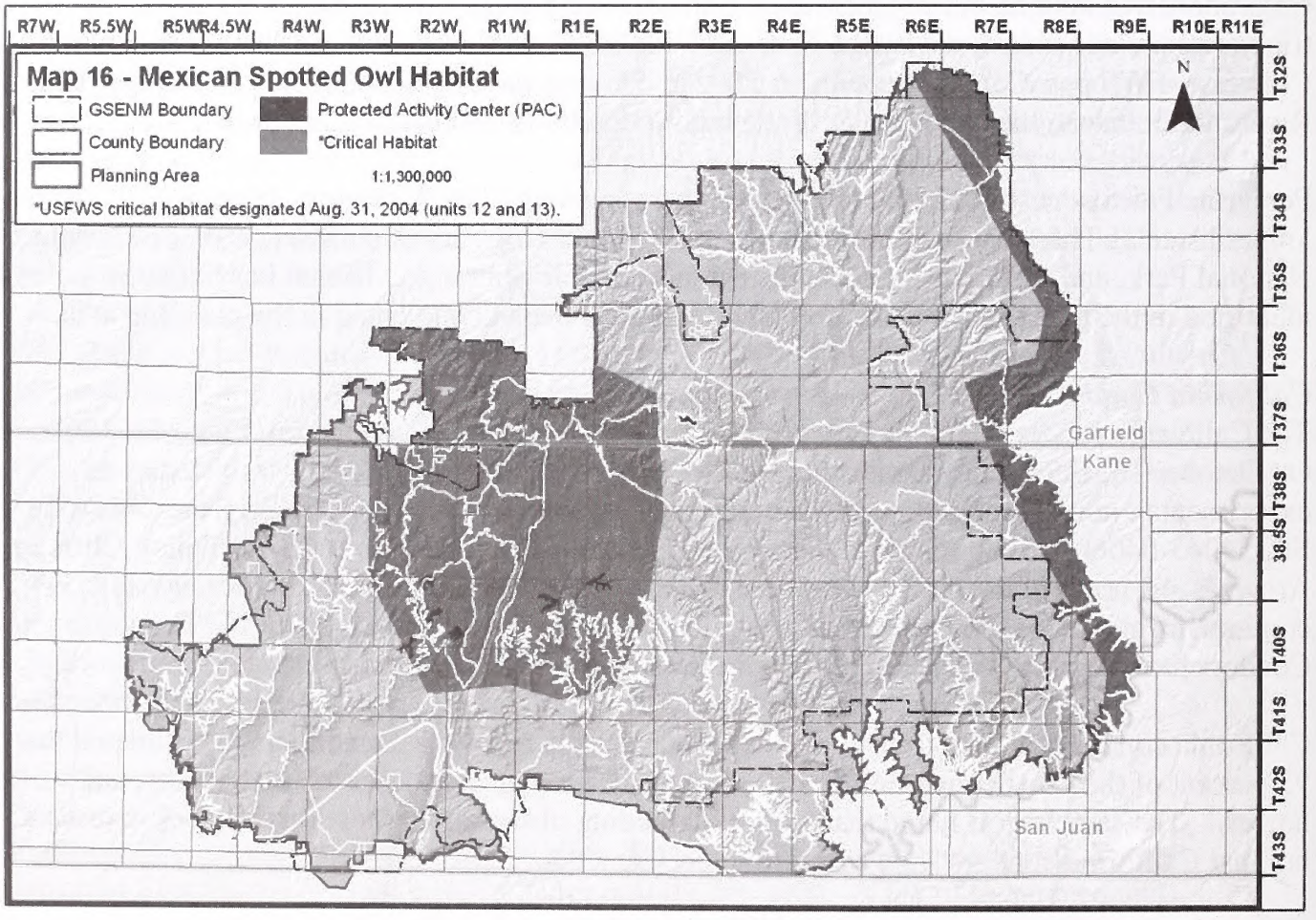
The California condor (*Gymnogyps californicus*) was listed as endangered on March 11, 1967. On October 16, 1996, a population destined for release in northern Arizona was listed as an experimental, non-essential population under Section 10(j) of the Endangered Species Act (61 FR, 54043-54060). Six birds were released on December 12, 1996, from the Vermilion Cliffs in Arizona, just north of the Grand Canyon and south of the planning area. Condor releases continue from that location. The total northern Arizona releases exceed 60 birds. These Condors have been sighted locally, but none have nested within the planning area.

California condors are opportunistic scavengers, with the recovery plan citing an "estimated that 95 percent of their diet consisted of cattle, domestic sheep, ground squirrels, mule deer, and horses." The same report noted that half of all feeding observations were on livestock carcasses, but that California condors showed a strong preference for mule deer.

Mexican Spotted Owl

The Mexican spotted owl (*Strix occidentalis lucida*) was listed as a threatened species on March 16, 1993 (58 FR, 14248-14271). The primary reasons cited were historic alteration of habitat by silvicultural management for even-aged timber stands, and the threat of this practice continuing. Additional habitat was vulnerable to loss by catastrophic wildfire (U.S. Fish and Wildlife Service 1995).

Critical Habitat was designated on August 31, 2004 (69 FR, 53181-53298). Unit CP-12, Kaiparowits Plateau, overlaps the planning area, and covers 434,480 acres within the planning area (Map 16). Three levels of habitat are designated; protected areas, restricted areas and "other forest and woodland types." Protected areas include Protected Activity Centers (PACs), and all areas in mixed-conifer and pine-oak types with slopes greater than 40 percent, and no recent silvicultural activity. Along with the currently designated PACs, portions of the Oak woodland and Ponderosa pine/Douglas fir communities (see Vegetation discussion) within the planning area may qualify as protected, "Protected areas can also include steep-walled canyon habitat." The latter two types of protected habitat (woodlands and steep canyons) require the presence of nesting and roosting sites. Within the planning area the known nesting/roosting sites are already protected by PACs.



A recovery plan was adopted in December 1995, but it focused on habitat of non-canyon dwelling birds. On the Colorado Plateau, Mexican spotted owls tend to select narrow, steep walled canyons as preferred nesting and roosting sites. They often nest within the canyon walls in small clefts, cracks, and depressions and make use of the canyons and adjacent uplands as foraging habitat. The Recovery Plan is in the process of being revised to address the particular

habitat needs of owls that inhabit canyons. The local BLM has several years of survey data. Survey work for Mexican spotted owl within suitable or potentially suitable habitat is on-going (Willey, D.W., 2001). Several pairs of Mexican spotted owls have been identified as permanent residents. The existing recovery plan establishes PACs around known spotted owl nest territories. There currently are seven PACs in the planning area, all within the northern and western portions of the Kaiparowits Plateau.

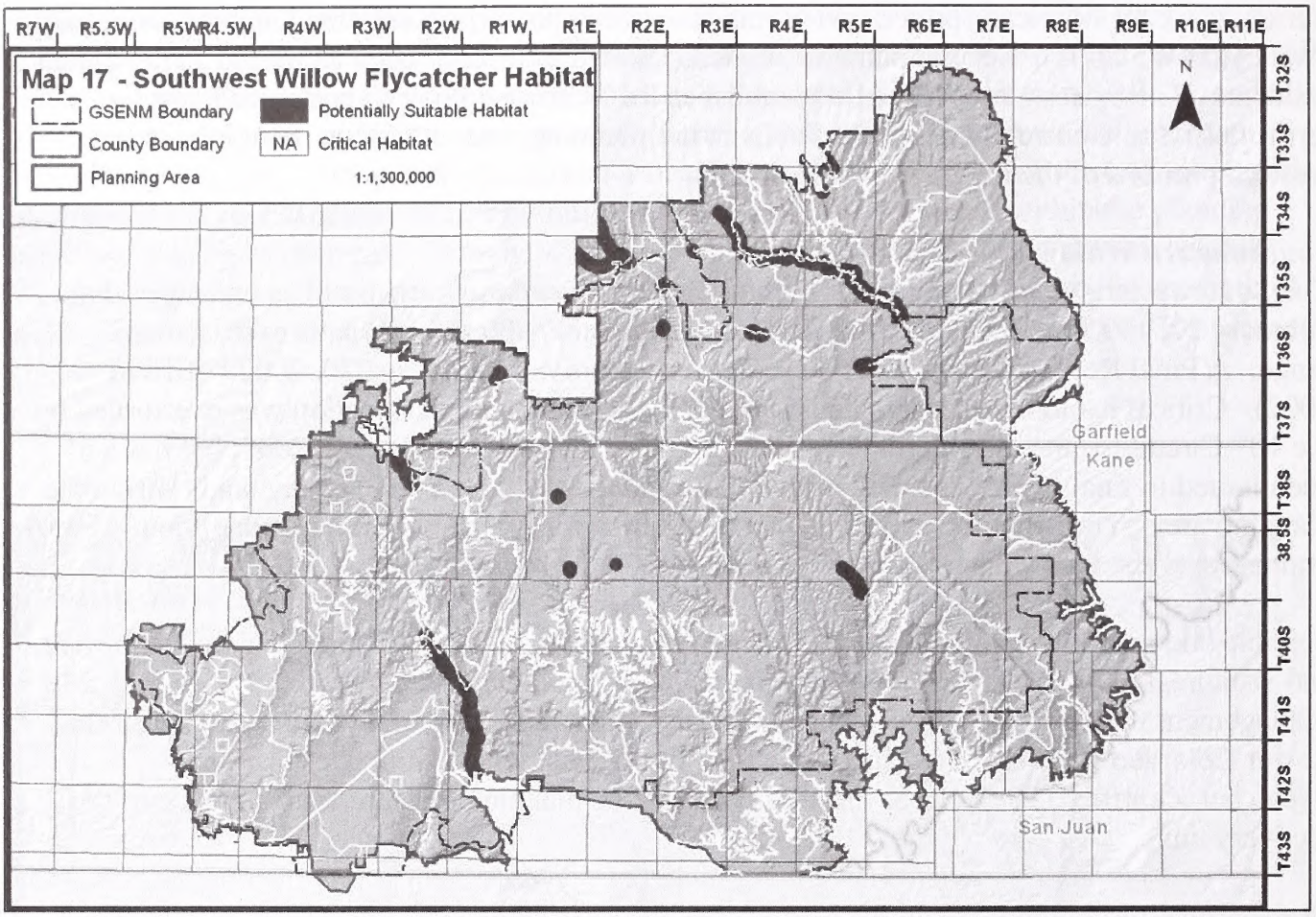
Southwestern Willow Flycatcher

The Southwestern willow flycatcher (*Empidonax traillii extimus*) was listed as endangered on February 27, 1995 (60 FR, 10695-10715). Approximately 900 to 1100 pairs exist across its range. A Final Recovery Plan for this species was approved on August 30, 2002 (USFWS 2002). Critical habitat was designated on July 22, 1997, but that designation was overturned by the 10th Circuit Court. A revised designation was proposed on October 12, 2004, but has not been issued in final form. The new proposed designation does not include any lands within the planning area. The proposed critical habitat in Utah is within the Virgin River and Muddy River drainages, to the west of, and lower in elevation than, the planning area.

Suitable and potentially suitable habitat has been designated within the planning area (Map 17), and is addressed by the Recovery Plan. The planning area includes portions of the Powell Management Unit of the Upper Colorado Recovery Unit, and Virgin Management Unit of the Lower Colorado Recover Unit. Ironically, the four populations of southwestern willow flycatcher identified (by the Recovery Plan) within the planning area are found outside of the recovery units.

The southwestern willow flycatcher breeds in dense riparian habitats in southwestern North America, and winters in southern Mexico, Central America, and northern South America. Its breeding range includes extreme southern portions of Utah. Migrants may occur in non-riparian habitats or in riparian habitats not suitable for breeding. This bird breeds in relatively dense riparian tree and shrub communities associated with rivers, swamps, and other wetlands. The Recovery Plan is to increase and improve occupied, suitable, and potential breeding habitat; increase metapopulation stability; minimize threats to wintering and migration habitat; and track recovery progress. Multiple year surveys recently have been completed within suitable or potentially suitable habitat (Utah Division of Wildlife Resources 2001). In 1997, Peterson and O'Neill (1997) found Southwestern willow flycatchers in both the Paria and Escalante riparian river corridors. In addition, a habitat suitability model has been created and ground tested for potentially occupied habitat (Callahan and White 2002). No nesting pairs have been detected through either the surveys or modeling effort.

The Recovery Plan identified specific river reaches for recovery efforts. Locally this consists of the Paria River below the confluence with Cottonwood Wash, which is recognized as having "substantial recovery value" with "currently or potentially suitable habitat" (USFWS 2002).



Yellow-billed Cuckoo

Federal Register of July 25, 2001 (Vol. 66, No. 143) stated the findings of FWS that a petition to list the western continental populations of the Yellow-billed cuckoo was warranted, but precluded by higher priority listing actions. The species was added to the candidate for listing list. Western Yellow-billed cuckoos breed in large blocks of riparian habitats dominated by woodlands comprised of cottonwoods and willows. Dense understory vegetation is an important component in these areas for nest site selection. This bird over-winters in Central and South America. Based upon historical accounts, the Yellow-billed cuckoo was generally uncommon to rare along river bottoms of the arid and semi-arid portions of Utah.

Yellow-billed cuckoo have not been found in surveys within the planning area. Suitable habitat may exist within the planning area. The proper mix of riparian woodland plant species is present, however, the area is at the margins of potential habitat, being both higher in elevation, and cooler in winter than currently occupied habitat in neighboring states. Impacts on yellow-billed cuckoo will be assessed along with other riparian dependent species under "*Migratory/Special Status Bird Species*" in the Environmental Impacts chapter.

Kanab Ambersnail

Populations of the federally endangered Kanab amber snail (*Oxyloma haydeni kanabensis*) are found outside this planning area. Potential habitat within all three physiographic provinces was surveyed throughout the planning area in 1999 with no snails detected (Meretsky 2000) and (Meretsky and North 2002). There are no known records for this snail within the planning area.

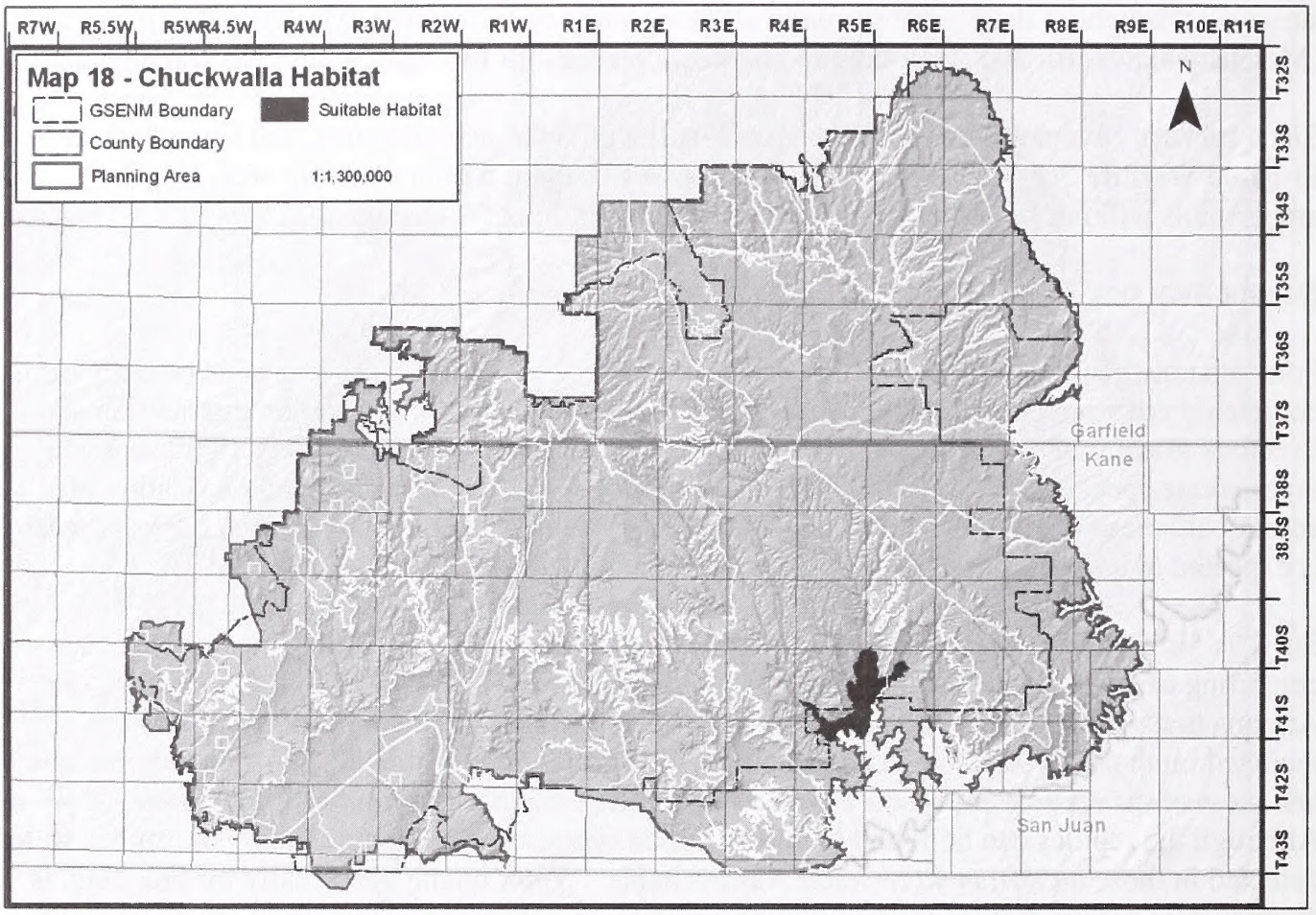
Since surveys have not located Kanab ambersnail within the planning area, and since the U.S. Fish and Wildlife Service has not identified potential habitat within planning area, Kanab ambersnails will not be addressed in the Environmental Impacts chapter.

OTHER SPECIES

Four separate general population, terrestrial and aquatic, invertebrate surveys have recently been completed covering all habitat types to determine species presence, population distribution and livestock grazing impacts on populations. Through this process approximately 2,000 separate invertebrate species were collected and classified to date. Identification and classification of additional invertebrates collected during these surveys are yet to be accomplished. This process is expected to add additional species to the current database.

Surveys for reptiles and amphibians were conducted during 1999-2002, and found 29 species consisting of 1 salamander, 4 frogs and toads, 13 lizards, and 11 snakes. Of these species, the Arizona toad, common chuckwalla (Map 18), and desert night lizard were detected and are included on the state sensitive list for occurrence within the project area. All of the amphibians and most of the reptiles are found in greater abundance in close proximity to water sources. Although the reptiles can be found in all vegetation types, a higher concentration of reptiles were detected in those areas that were water was available. Water quality, especially for breeding, is an important habitat feature for reptiles and amphibians. With the exception of the chuckwalla, the effects to riparian resources between the alternatives would describe the habitat qualities for the state sensitive species. These species benefit the most from high quality riparian conditions. The chuckwalla is the only herbivorous lizard found within the project area. This lizard is dependent upon vegetative conditions that are in good ecologic condition.

Small mammalian trapping surveys of all classes of mammals were completed between 1999 and 2001with 17 small mammal species trapped and identified and another 17 species present based upon sightings, spotlighting, or biologist reports. Pygmy rabbits are classified as a state sensitive species. Surveys have not detected this species in the project area and suitable habitat for them lies outside of this area. Consequently, they will not be discussed further.


Map 18 - Chuckwalla Habitat
GSENM Boundary
Suitable Habitat
County Boundary
Planning Area
1:1,300,000
N
R7W
R5.5W
R5W
R4.5W
R4W
R3W
R2W
R1W
R1E
R2E
R3E
R4E
R5E
R6E
R7E
R8E
R9E
R10E
R11E
T32S
T33S
T34S
T35S
T36S
T37S
T38S
38.5S
T40S
T41S
T42S
T43S
Garfield
Kane
San Juan

CHAPTER 3
AFFECTED ENVIRONMENT

CULTURAL RESOURCES

Cultural resources are the physical indications left behind by prehistoric peoples as well as those left by historic explorers, pioneers, settlers, and inhabitants of the planning area into the first half of the 20th century. Also included are Traditional Cultural Properties, or sites that hold importance to the history and current practices of one or more cultural groups. Cultural resources are protected under several Federal laws and regulations, including the National Historic Preservation Act, the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, and the Code of Federal Regulations at 36 CFR 800.

CULTURE HISTORY

Local culture history is most conveniently divided into six major periods: the Paleo-Indian, Archaic, Early Agricultural, Formative, Post-Formative, and Euro-American. The following is a brief description of the life ways and cultures that define these periods.

Paleo-Indian

The Paleo-Indian Period is generally considered to represent the first human inhabitants of the project area. Temporally, this period runs from about 11,500 years before present (B.P.) to approximately 9,000 B.P. As a life way, available information suggests that people concentrated on big-game hunting (such as mammoth, bison, camel, and horse) and probably lived in small, family oriented, highly mobile groups. Artifacts most commonly associated with the Paleoindians are the Clovis, Folsom, and Plano diagnostic projectile points. Paleo-Indian sites are rare and none are known from the project area. Fluted Clovis and Folsom-like points are occasionally found on the southern Colorado Plateau and Arizona Strip, but these are most often found as isolated artifacts and in surface contexts.

Archaic

The Archaic Period on the southern Colorado Plateau extended from the close of the Paleoindian Period, about 9,000 B.P., to about 2,000 B.P. and is generally associated with climatic warming and drying. The Archaic Period is usually viewed as a widespread, generalized hunting and gathering life style practiced by small, mobile groups. Most researchers have divided the Archaic into three distinct intervals; the early, middle, and late Archaic, with each defined by diagnostic projectile points.

Archaic sites are well represented within the area. Diagnostic projectile points from the early and middle intervals are relatively scarce, but they are occasionally found. Late Archaic types, such as Gypsum points, are relatively common, indicating that all microenvironments within this area were in use by that time. A buried late Archaic residential site has been tentatively identified in an alluviated canyon bottom in the Grand Staircase physiographic province. Rock art diagnostic of at least the late Archaic, such as the Barrier Canyon and the Glen Canyon Linear styles, is not unusual in the area.

Early Agricultural

This period has also been referred to as the Basketmaker II period, and marks the era characterized by the introduction of agriculture but pre-dating the use of ceramics. In the

planning area this, starts at the close of the Archaic Period and lasts until about 400 A.D. Sites within this time period are difficult to identify because the botanical evidence from this period rarely survives in open sites. Sheltered sites, such as alcoves, have a better chance of preserving perishable materials such as pollen and organic artifacts, but controlled excavation is necessary to recover these materials in a context that will allow reliable analysis. Without such analysis and perishable artifacts, sites from this period are often difficult to discern from earlier Archaic sites. At least one rock art site near Kanab has been attributed to the Basketmaker II period.

It was during the Early Agricultural Period that cultivation of maize and squash was introduced, but even the methods of introduction are in question. In a recent review of the Basketmaker II period north of the Anasazi area, it was concluded that the Fremont adopted agriculture through diffusion, but that it is quite possible that it was introduced to the southern Colorado Plateau through immigration of agriculturalists. Recent studies indicate that in Basketmaker II times, much of the daily diet of area inhabitants consisted of maize. The rise of agriculture and the evolution of a Puebloan life style are key concerns to archaeologists in the southwest, making the Early Agricultural Period perhaps one of the most important and least understood cultural periods.

Formative Period

The Formative Period is characterized by permanent or semi-permanent dwellings, a heavy reliance on agriculture and domesticated crops, and the production of ceramics. Within the planning area two distinct Formative Period cultures are recognized: the Virgin Anasazi and the San Rafael Fremont. The Virgin Anasazi were centered around the Virgin River basin in southwestern Utah, northeastern Arizona, and the adjacent portions of Nevada. Their sites are found primarily across the lower portions of the Grand Staircase physiographic area, with a few sites found as far as the western margins of the Kaiparowits Plateau. The local branch of the San Rafael - Fremont were found surrounding the upper Escalante River drainage in the northeastern portion of the planning area, in the Escalante Canyons physiographic province, and the eastern margin of the Kaiparowits Plateau.

The two groups shared several important traits, including architecture, agriculture, and ceramics. There were also marked differences in their adaptations that clearly distinguish the two cultures. The Virgin Anasazi were agriculturalists who practiced residential mobility. Full-time farmers, they apparently moved farmsteads frequently in response to changing conditions possibly including resource (e.g. firewood) availability, condition of arable lands, insect infestations, and short and long term climatic fluctuations. Such a life style resulted in the characteristic accretional pattern to the Virgin architecture, as farmsteads and structures were repeatedly occupied, abandoned, re-occupied, and modified. It has been proposed that the Fremont, by contrast, practiced seasonal mobility, moving into the watered valley bottoms in the summer to farm, and then returning to the uplands in the winter to take advantage of resources such as big game and firewood. On-site storage for excess food supplies is a hallmark of Anasazi sites. Fremont residential sites lack on-site storage, but isolated granaries are common in remote canyon locations. Both the Fremont and Anasazi cultures had disappeared from the area by the early 1200s.

There is indication in the Fiftymile Mountain area of the Kaiparowits Plateau of possibly a third agricultural group, the Kayenta Anasazi. The differences between the sites on Fiftymile Mountain and the Virgin sites to the west and the previous Fremont sites are great enough that some consider these sites as representing a distinct adaptation.

Post-Formative

This period covers the time from the collapse of the agricultural system and the depopulation of the area by the Anasazi and Fremont cultures, to the arrival of the first Euro-Americans in the early 1500s. This period reflects the return to an Archaic-like hunting and gathering lifeway. In the planning area, this runs from the arrival of the Numic speaking (a.k.a. Paiute) hunter-gatherers shortly after the disappearance of the Anasazi and Fremont until about 1500 A.D., when indirect influences from Spanish settlement to the south were probably felt. The inhabitants at this time period are referred to as the Southern Paiute. Archaeological evidence from the Grand Canyon and the Glen Canyon area shows Paiute presence by the late 1200s and early 1300s, but firm evidence of contact between the earlier horticulturalists and the Paiute is so far lacking.

The hallmark of the Paiute lifeway was mobility. Seasonal movements were dictated by the availability of resources and were marked by extreme flexibility. Family groups would aggregate into larger bands in response to late summer pinyon nut harvests, communal rabbit drives and big game hunts, and then split again into smaller extended family units and disperse in the winter to their base camps. Surplus foods were cached and recovered as necessary later. Horticulture was practiced on a very limited basis. Gardens might be planted in the spring and left unattended until harvest time, or tended by older persons while the balance of the band was gone on hunting and foraging expeditions. Architecture was limited to brush shelters, lightly constructed in the summer and heavier and more durable in the winter. Basketry was highly developed, and although some ceramic vessels were constructed, their use remained secondary. Heavy items such as metates might be cached at various locations. Diagnostic Paiute artifacts include Paiute Brownware ceramics, specific styles of basketry, and Desert Side-notched projectile points. Recent studies have shown that most of the obsidian found in and around the area originated in the Great Basin, and may be attributed to Paiute and Archaic use of the landscape.

Euro-American

The first well-documented direct contact between the local Numics and Europeans occurred with the explorations of the Spanish Franciscan friars Francisco Atanasio Dominguez and Silvestre Velez de Escalante in 1776. Other Euro-American explorers, trappers, and settlers followed shortly thereafter, and influences and pressures on the Paiutes and their traditional lifeways increased. The Historic period begins about 1850 A.D. with the arrival of Mormon settlers.

Native American Tribes including the Paiute, Navajo, and Hopi currently make use of the project area lands for traditional spiritual activities, hunting and gathering, and access to Traditional Cultural Properties.

CHAPTER 3
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THE ARCHAEOLOGICAL RECORD

There are more than 4,000 archaeological and historical sites recorded within this planning area, the majority of which are considered eligible to the National Register of Historic Places. This represents only a small fraction of the archaeological and historical sites within this same area. Although extensive, cultural resource surveys have covered only about 3% of the more than two million acres involved in the planning area. Within Glen Canyon National Recreation Area (GCNRA), site densities of up to 108 sites per square mile have been recorded. In some areas within GSENM site densities of up to 70 sites/square mile have been recorded. An estimation of the total number of cultural resource sites found within the planning area would be speculation at this point, but it is safe to assume that there are thousands of sites that have not yet been identified.

SITE TYPES

Impact agents can vary greatly depending on a variety of factors, but are also largely influenced by site type. Following is a list of major site categories and potential impacts to these sites.

Alcoves and Rock Shelters

These locations are generally found in the walls of vertical or near-vertical rock faces in bedrock exposures, but can also be found under large talus boulders. Sites found in such locations can be almost any type of prehistoric site, and also a variety of historic sites. Alcoves and shelters offer the best natural protection from the elements and can, therefore, preserve otherwise perishable artifacts and organic materials for thousands of years. Prehistoric peoples often made use of these locations. The resulting sites can be complex and cover large time spans.

Architectural Sites

Sites of this type can be found both in open settings as well as rock shelters and alcoves. Sites in this category include any site with constructed architectural features such as pit houses, granaries, storage cists, surface dwellings, pueblos, room blocks, and storage structures. These sites can be either masonry, jacal (stick or timber framing with mud plaster walls), or a combination of both.

Historic Sites

Historic sites are those that are at least 50 years old and can include a wide variety of types. Within this project area, the majority of historic sites are related to livestock and ranching activities, but include mining, transportation, exploration, and homesteading themes as well.

Open sites

This category includes sites that are found in open settings, unprotected by alcoves or overhangs, and generally exposed to the elements. This may include sites such as, but not limited to, lithic and ceramic scatters; hearths; roasts; architectural, structural and habitation sites; middens; prehistoric and historic camps; historic trails; roads; can scatters; cabins; and dumps.

Rock Art

This is a not uncommon site type within the project area, with examples spanning from archaic to historic times. Petroglyphs (design elements pecked or incised into the rock surface) and pictographs (design elements painted onto the rock surface) are the two basic forms of rock art. Both are usually found on vertical rock faces (either on cliffs, ledges, or boulders) but are occasionally found on horizontal surfaces as well. Inscriptions left by settlers and pioneers as well as Native American drawings dating from the historic period are considered sites as well.

Traditional Cultural Properties

These are locations associated with beliefs and practices of a surviving culture and people and are important to both the history and current practices of those peoples. Such sites may not be readily apparent to members of other cultures, and may not have associated artifacts or features that can aid identification. Sites of this type can be subject to various forms of impact, but may be especially susceptible to unintentional impacts by those who do not or cannot recognize these locations as Traditional Cultural Properties.

RECREATION

OVERALL RECREATION SETTING

The planning area offers a range of recreational opportunities and exploration. Located in rural southern Utah, it was one of the last places in the continental United States to be mapped. Even today, the region remains one of the least developed and populated areas within the State. Most of the area lies within the boundaries of Garfield and Kane counties, whose combined populations total < 0.5% of the population of Utah.

The overall topography is a mixture of high desert plateaus, mesas, buttes, terraces, towering cliff faces, and rugged, rocky, desert canyons. Water can be scarce, especially during the hot summer months.

With the exception of U.S. Highway 89, Utah State Route 12, paved portions of the Burr Trail, and a short section of Johnson Canyon, vehicle access is via dirt roads. Many locations within the planning area are reached by lengthy journeys on rough 4-wheel-drive roads.

RECREATION USE ACTIVITIES

Encompassing a combined total of approximately 2.3 million acres of scenic, high-plateau canyon country, the planning area provides a wide range of opportunities for diverse recreational activities. Examples include: front country vehicle touring, backpacking, backcountry vehicle touring, off-highway vehicle (OHV) driving, mountain biking, horseback riding, hunting, fishing, photography, rock-hounding, hiking, orienteering, exploring, snowshoeing, cross-country skiing, motorized boating, vehicle camping, water skiing (Lake Powell), swimming, non-motorized boating, scientific pursuit (archeology, geology, paleontology, astronomy, botany and wildlife study), visiting historic/cultural sites, technical rock climbing, and canyoneering (both non-technical and technical).

RECREATION USE AREAS AND USE LEVELS

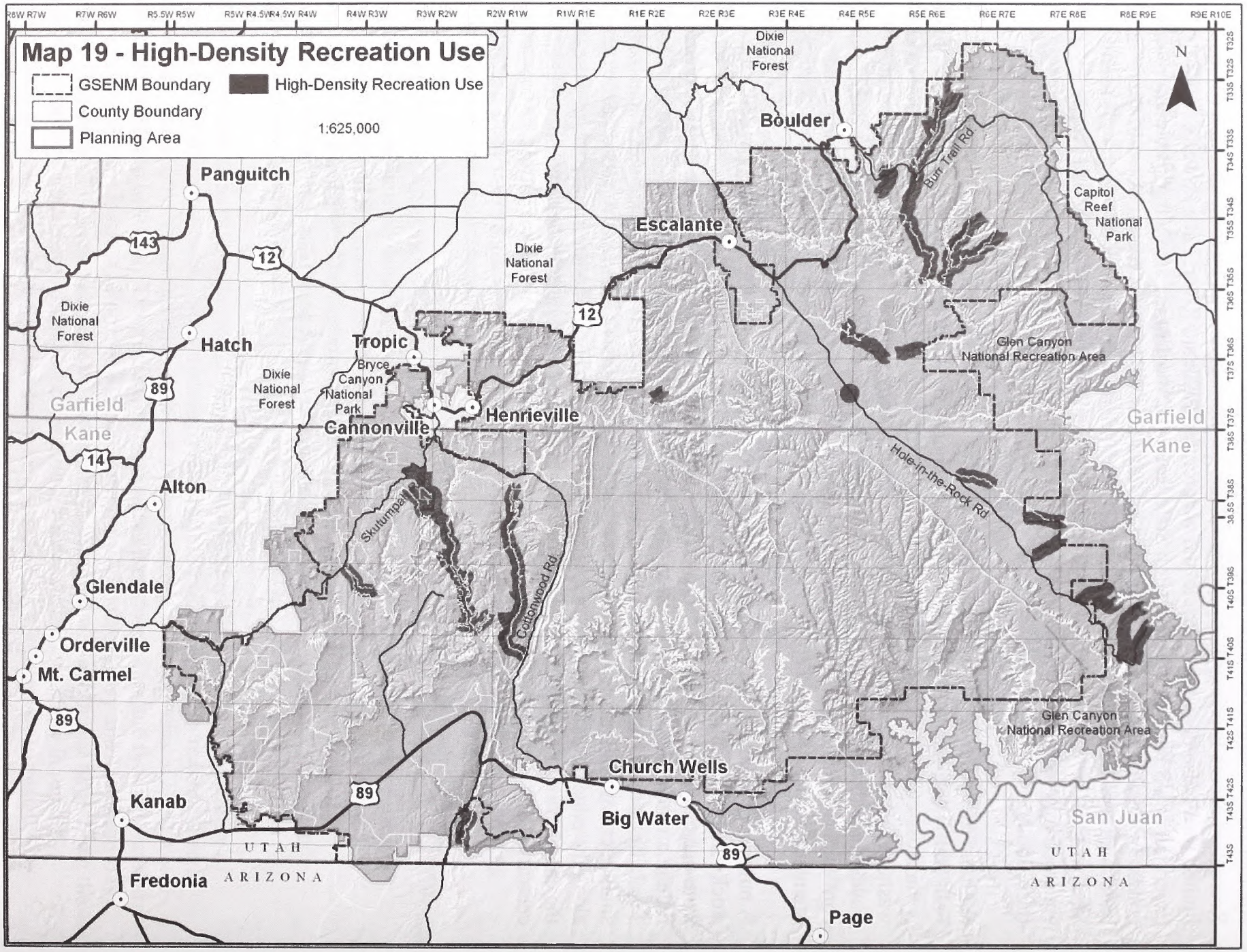
The recreation use activity areas, as well as use levels, generally correspond to three distinct physiographic provinces, known as the Grand Staircase, the Kaiparowits Plateau, and the Canyons of the Escalante. The Canyons of the Escalante receives the highest level of recreational use activity, the Grand Staircase area the second highest, and the Kaiparowits Plateau the least (Map 19).

A key factor that appears to influence all recreational use and use levels is the availability of water in this arid environment. Not surprisingly, the majority of the area's recreational users (particularly backcountry users) tend to seek out and concentrate their activities in areas where water resources can be found. Desert canyons with riparian environments and flowing water are the most popular destinations. Portions of Lake Powell's Warm Creek Bay and Wahweap Bay receive thousands of boaters who recreate in these bays, many of whom camp at large along the shoreline. Isolated upland springs attract recreation activity as well, especially in remote backcountry areas, such as the Fiftymile Mountain portion of the Kaiparowits Plateaus.

Another consideration that influences recreation use (and level of use) is ease of access. Recreation access is primarily by motor vehicle, on horseback, and by foot, although some limited travel also occurs by bicycle and watercraft (Escalante River, Lake Powell). With the exception of US Highway 89 and Utah State Route 12, most of the area's transportation routes consist of rough, rugged, and (oftentimes) un-maintained desert dirt roads. Some of the backcountry routes require many hours of driving across rugged and demanding 4 x 4 roads. Visitors must be well prepared with good maps, vehicles in good condition, and properly equipped for emergencies, including being stranded on muddy or damaged roads (heavy rains, flash floods).

With the exception of one developed front country trail (Calf Creek Recreation Area, Lower Falls trail) there are no developed trails. The majority of backcountry foot and horseback travel is via cross-country routes, both overland, and desert canyons (wet canyon hikes as well as dry washes). Most backcountry users tend to use desert canyons or washes as their main routes of travel. In addition to the increased potential for water, desert canyons provide relatively convenient, delineated routes of travel, especially for less experienced hikers lacking good orientation skills.

A number of upland, cross-country routes are located throughout the area, including historic stock trails and abandoned historic transportation routes. The majority of these routes travel from one canyon (water source) to another. Unlike the desert canyons, these overland routes require a much higher degree of cross-country orientation/navigation knowledge and experience. Typically, as these routes climb up out of the canyon bottoms, they are oftentimes delineated by small sections of constructed trail (piled rocks, chipped "steps", remnants of wood or rock fence along the edge of the route), that are reasonably easy to follow. However, once the trails reach the canyon rim, they often times disappear into a maze of braided trails, with no discernable central path.


Map 19 - High-Density Recreation Use
GSENM Boundary
High-Density Recreation Use
County Boundary
Planning Area
1:625,000
N
Panguitch
Hatch
Tropic
Bryce Canyon National Park
Cannonville
Henrieville
Escalante
Boulder
Capitol Reef National Park
Burr Trail Rd
Glen Canyon National Recreation Area
Hole-in-the-Rock Rd
Alton
Glendale
Orderville
Mt. Carmel
Kanab
Fredonia
Church Wells
Big Water
Page
Skutumpah
Cottonwood Rd
Dixie National Forest
Garfield
Kane
San Juan
UTAH
ARIZONA
143
12
89
14

Canyons of the Escalante

Historically and currently, the majority of recreation use takes place in the well publicized region known as the Canyons of the Escalante. The Canyons of the Escalante can be described as the area that extends east from Fiftymile Bench (from the base of the Straight Cliffs), across a large expanse of Navajo and Wingate sandstone carved deeply by the Escalante River system, ending at the Circle Cliffs and Waterpocket Fold. The Canyons of the Escalante is bounded on the North by the Aquarius Plateau, dominated by 11,000' Boulder Mountain, and on the south by Lake Powell.

The main feature of the area is the canyon system carved by the Escalante River and its tributaries. The Escalante River was the last major river system to be mapped in the continental United States. The headwaters of the river begin high in the mountains, cascading off the southern flank of the Aquarius Plateau; and then winding their way through a maze of interconnected canyons, before emptying into Lake Powell. Although remote in character, the moderately easy access, coupled with an abundance of water, makes the Escalante River system and surrounding slick rock country an ideal hiking, backpacking, and occasional horseback riding destination. Not surprisingly, this region has the greatest concentration of authorized commercial recreational use within the area of concern.

Utah State Route 12, which traverses the Escalante Canyons, is an All American Road—the highest designation within the National Scenic Byway system. The scenic driving opportunities on SR 12 and the Burr Trail (both paved routes) are world-class. Unpaved routes of the physiographic region, including the historic Hole-in-the-Rock Road and the Wolverine Loop Road, are highly scenic as well, and along with associated spur roads, provide access to most of the region's trailheads.

During spring run-off following winters of above-average snowfall, the Escalante River is navigable by small, non-motorized watercraft (primarily kayaks). Other than Lake Powell, it is the only navigable waterway within the area of concern.

The majority of the Escalante River trailheads are located within the boundaries of the Monument. The majority of the river destination points are located in the Glen Canyon NRA.

The Dixie National Forest (and the Box-Death Hollow Wilderness Area) bounds the area to the north. This high mountain environment attracts visitation and offers a full range of recreation activities and a cool respite from the hot sun for tired desert hikers. The Box-Death Hollow Wilderness Area has been publicized in numerous commercial hiking guide publications and attracts a number of recreational users. Recreationists who start trips outside the planning area in upper Death Hollow usually continue into lower Death Hollow, which is within the planning area.

Kaiparowits Plateau

The Kaiparowits Plateau is bounded on the east by the 42-mile long Straight Cliffs (Fiftymile Mountain), and on the west by the jagged double edge of the East Kaibab Monocline—more commonly known as the Cockscomb. With notable exception of its contact with Lake Powell, the Kaiparowits Plateau is the wildest, most arid, and remote part of the area, with a few isolated

springs, and only a handful of creeks. As such, it receives the least overall amount of visitor use. Although the Plateau has sometimes described as a "stony, desiccated maze of canyons," it is also a land of forested level benches and thousand- year old juniper trees.

Recreational and educational interest is high in this region due to the ongoing research and discovery of new and interesting fossils. Educational and recreational opportunities relating to fossil resources in the Kaiparowits region include university and natural history museum surveys and excavations, public tours to excavation sites, and unstructured individual exploration.

The Kaiparowits is largely undeveloped the exception of some of the most remote and demanding 4 x 4 roads, rugged and un-maintained (historic) stock trails, and isolated livestock improvements (troughs, fences, permittee cabins, etc.).

The majority of visitor activity is from sightseers navigating the demanding 78-mile long Smoky Mountain road (#300) between the small towns of Escalante and Big Water (Highway 89). Scenic and remote, this 6-8 hour drive provides an adventure in itself, as the road travels north-south through the isolated middle of the Kaiparowits Plateau. The primary backcountry use activities for the Kaiparowits Plateau are day hiking, backpacking, horseback riding, and hunting (deer, bighorn sheep).

The Kaiparowits Plateau offers outstanding opportunities for primitive recreation. This is particularly true of the plateau portion of Fiftymile Mountain; in general the area extending south from Window Wind Arch to Navajo Point (a popular destination point providing spectacular views of Lake Powell). Access is by foot/horseback from secondary trailheads located along the Fifty Mile Bench. The topography is a mixture of high desert plateaus, open meadows, steep ridges, as well as rugged and steep desert canyons. Water is available at several isolated springs, helping provide for an island of green in the midst of red and yellow canyon lands. Vegetation ranges from moderately dense juniper forests trees to open grassy meadows. Occasional stands of aspen can be found near water sources (Pleasant Grove, Steer Canyon, and Pinto Mare Canyons). Some of the more notable canyons located in the area include: Second Blackburn Canyon, Steer Canyon, Pinto Mare, Lake Draw and Lake Canyon, Georgie Hollow, Harry Cowles Draw, Pool Hollow, Tank Hollow and Tank Hollow Canyon, Elbow Hollow, Spencer Canyon, and Trail Hollow.

Portions of Glen Canyon National Recreation Area lie within the southern portion of the Kaiparowits Plateau, including Lake Powell, which receives several thousand visitors each year (mostly boating enthusiasts, but recreational hikers as well). Several bays (Wahweap, Warm Creek, Padre, Last Chance, Rock Creek), as well as several hundred miles of Lake Powell shoreline provide for easy boat access. Overnight boat campers often take the opportunity to hike some of the numerous canyons and plateaus located along the shoreline.

The Grand Staircase

The Grand Staircase receives the second highest level of recreational use. Bounded in the east by the Cockscomb, and in the west by Utah State Highway 89, the Grand Staircase is comprised of a succession of Chocolate, Vermilion, White, Gray, and Pink cliffs and terraces that rise 3,500 feet (south to north) in elevation. (The north rim of the Grand Canyon serves as the bottom step

of the geological staircase, while the pink cliffs of Bryce Canyon National Park serve as the top riser.) Into this staircase of cliffs and terraces, the Paria River and its tributaries have carved a landscape of isolated mesas, valleys, and buttes. The southern portion of the Grand Staircase region includes portions of the Vermilion Cliffs National Monument, as well as portions of the renowned Paria Canyon-Vermilion Cliffs Wilderness Area. The Paria Canyon-Vermilion Cliffs Wilderness Area is one of the most popular destination points in southern Utah and attracts hikers from around the world. It is known for the unique rock formation called "The Wave", the spectacular 37-mile long Paria River Canyon, and 16-mile long Buckskin Gulch hikes.

In the frontcountry, two popular scenic transportation routes (Skutumpah and Cottonwood Road) as well as portions of US Highway 89 and Utah State Route 12, provide easy access to the interior of the Grand Staircase. These scenic drives feature several short, roadside hikes, as well as points of interest, and attract the majority of visitors. For the more adventurous, a number of backcountry 4 x 4 routes provide challenge and access to the more remote areas of the region along with opportunities for seclusion and overnight camping.

The majority of backcountry users within the Grand Staircase region concentrate their activities in the Paria and Hackberry Canyons where water can be found. Other backcountry use includes a series of little known upland overland routes (historic stock trails). As with the Canyons of the Escalante, most of these historic stock trails travel from one canyon (water source) canyon to another and are still used today by livestock.

General Recreation Use/Livestock Conflicts

Conflicts between recreation use and livestock (including livestock management) primarily occur in primitive backcountry settings, involving visitors seeking a primitive, natural, backcountry experience. Frontcountry recreational visitors have few conflicts with livestock. Most frontcountry visitors do not spend any appreciable time in the presence of livestock or their immediate effects (feces, urine, flies), particularly those engaged in auto touring.

Some visitors appreciate being able to see livestock and/or their management, such as calves playing in a meadow, cattle drives, or wranglers on horseback. There are numerous commercial "Dude Ranches" located throughout the west, including the Kanab and Escalante areas, where for a fee, visitors can spend time on a working ranch, learning to ride horses, and generally assisting with livestock management.

CHAPTER 3
AFFECTED ENVIRONMENT

SOCIO-ECONOMIC

INTRODUCTION

Socioeconomics can typically be discussed in terms of social setting, economic setting, and the relationship between them. Each of the components of socioeconomics is relevant to both the general activity of grazing as well as the specific settings of the Grand Staircase-Escalante National Monument (GSENM), and Kane and Garfield Counties.

GENERAL METHODOLOGY

Social and economic analysis traditionally involves gathering relevant and available data to prepare a report describing the socioeconomic characteristics of a given area. While this is always an important step in understanding a community and its setting, we took an additional step to help us understand and document the conditions in Kane and Garfield Counties by collaborating with the counties' citizens and other interested parties.

With the assistance of the Sonoran Institute[1], economic strategy workshops were held in both Kane and Garfield Counties. Their purpose of the meetings were two-fold: 1) to provide easily accessible, impartial information to aid successful planning, and 2) provide an effective means of bringing community members and land use planners together to achieve better results. Participants in the workshops consisted of local residents, business owners, elected officials, public land managers, government employees, and scientists. These participants were asked to comment on the data presented here, as well as provide supplemental data and observations based on their own perceptions and values. The results of these two workshops have been incorporated into this baseline socioeconomic description, and are used to further describe and interpret the data and trends in the region.

This social and economic assessment relies upon quantitative, qualitative and participatory data. The Sonoran Institute's Economic Profile System (EPS) has played a central role in gathering and analyzing these data. EPS is an automated system for developing customized socioeconomic profiles for any region in the western U.S. based on data from the 2000 Census, the Bureau of Economic Analysis, and the Bureau of Labor Statistics. EPS automatically and efficiently accesses these data sets to produce socioeconomic profiles containing tables and figures that illustrate long-term trends in population, employment, and personal income by industry, average earnings, business development, commuting patterns, and agriculture, as well as retirement and other non-labor income. Appendix A shows the results of the EPS analysis for both Kane and Garfield Counties. Appendix B provides summaries of the Kane and Garfield County community meetings.

[1] The Sonoran Institute's mission is to "work with communities to conserve and restore important natural landscapes in Western North America, including the wildlife and cultural values of these lands. The Institute's efforts create lasting benefits, including healthy landscapes and vibrant livable communities that embrace conservation as an integral element of their economies and quality of life" (Sonoran Institute 2005).

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HISTORY, CULTURE, AND CHANGE

The history and culture of the communities, surrounding the Grand Staircase-Escalante National Monument are as unique as the regions landforms. Here, the cultural identity of both communities and citizens are tightly linked to the past. This historical background is provided to better understand the events and people that settled this remote region, carving an identity shaped by a strong religious foundation and a utilitarian view of the land.

THE 1840S THROUGH THE PRESENT DAY

When the first Euro-Americans arrived in the region of today's GSENM, the Southern Paiute, Utes, and Navajos used portions of the Monument, practicing lifestyles that had evolved over centuries. Although Spanish expeditions in the late 1700s had begun to introduce European culture and beliefs, Native Americans maintained a semi-traditional way of life until Mormon settlers arrived in the mid-1800s. Indeed, the arrival of settlers and widespread livestock grazing removed many of the plants and grasses essential to Native American foraging habits. Resources were depleted and streams were dammed or rerouted, forever altering the landscape and a way of life.

To Mormon settlers, the isolation of Deseret – the vast arid region claimed by Brigham Young, president of the Church of Jesus Christ of Latter Days Saints (LDS or Mormons) – was seen not only as a place to escape persecution, but also as an alternative to mainstream American culture. The region allowed seclusion and protection for the Saints, a refuge from unwanted social change and a sanctuary from non-LDS "Gentiles" in a world with values not in line with Mormon doctrine. Mormon ideology did not separate church from state, and in dozens of newly established communities, Mormon settlers oftentimes placed community welfare above that of the individual.

As settlements prospered, communities in southern Utah exported minerals, cotton, livestock, and dairy products. As Cedar City and St. George grew, settlers began to move eastward in search of more rangelands for grazing and well-watered areas for farming. Within the Monument region specifically, the most important economic activity was sheep and cattle grazing, with some dairy operations.

In 1864, frustrations between Mormon settlers and Native American tribes mounted and led to the Black Hawk War – resulting in the abandonment of Mormon settlements from Kanab through Long Valley. By 1867, however, settlers were able to initiate peace, and many towns were subsequently resettled while new ones established.

In 1869, John Wesley Powell embarked on his legendary exploration of the Colorado River. Based on his work, Powell successfully lobbied Congress to fund a second expedition in 1871. The second expedition expanded its focus to the Colorado Plateau watershed, and began charting this last unmapped and most remote region of the continental United States. Powell's work in mapping and describing the geology, flora and fauna of the region set the scientific standard for the time. Expedition members were the first whites to visit the confluence of the Dirty Devil and Escalante Rivers, and experience the topographic mystery of the Henry Mountains. In 1875, Powell's survey crew was in Potato Valley, where they encountered four Mormons from Panguitch searching for a site to establish a settlement with more favorable climate. Almon

Thompson, Powell's brother-in-law, "[a]dvised the Saints to call the place Escalante," thus the name given to the present day community of Escalante (Anderson and Anderson 1996).

While Mormon culture and traditions remained strong, the growing influx of "Gentiles" became difficult to ignore. Tens of thousands of people headed for California during the Gold Rush, with more arriving once the transcontinental railroad was completed through Utah in 1869. Pressures from new migrants with different and oftentimes competing cultural values grew, but there was little that Mormons could do to stave off the movement of new migrants seeking their fortunes in the West. Throughout these changes, communities in southern Utah remained connected to this concept of the frontier and their significance as a spiritual people. It has been this spirituality that has allowed them to retain the cultural core that many of their ancestors worked so hard to establish.

Still, the communities surrounding today's Monument remained isolated in terms of their worldview, sense of community, and spiritual life. The growth of the region provided economic opportunities that proved irresistible to Mormon and non-Mormon alike, and ranches sprang up in remote locations beyond established towns. New people with new ideas arrived, and the isolation that had for so long protected the Saints was no longer a deterrent to the outside world. The area was now well mapped so that obstacles to progress could be avoided. Improved access and economic integration led more and more ranchers to raise livestock for growing regional markets. Over time, small operators could not compete and succumbed to larger outfits.

By the late 1800s, the effects of unregulated grazing were becoming difficult to ignore on public lands. In response, a number of laws and regulations emerged in the early decades of the 20th Century that regulated uses on public lands. In 1906, grazing fees were imposed on USDA Forest Service lands – a policy that reduced grazing pressures because some ranchers could not afford the fees. As allotments were identified, new fences emerged, limiting what was once communal access to rangelands. At the same time, the newly passed Antiquities Act of 1906 led to the designation of a host of national monuments – many of which would later become national parks.

World War I greatly expanded the market for livestock, and operators from outside the area moved in. At the end of the war, however, the market crashed, only to be followed a decade later by the Great Depression. In 1934, continued degradation of public rangelands lead to the passage of the Taylor Grazing Act, which regulated grazing in an unprecedented way – greatly impacting the main livelihood of people in the region and changing the life of the cowboy forever (Cassidy and Truman 1998). Under the law, a newly created Division of Grazing, operated by local grazing advisory boards, was charged with dividing lands into districts. Smaller operators suffered the most, and with the implementation of the "commensurate property" rule, were all but forced off the range (Muhn and Stuart 1988). Soon afterwards, public lands would be removed from homesteading as well.

By the end of the war, growing cultural and economic integration was having profound effects on rural southwest Utah. In 1946, the Grazing Service was combined with the General Land Office to form the Bureau of Land Management (BLM) – a new organization with a philosophy of decentralization and "multiple use." Although grazing and farming had sustained many

southern Utah communities for decades, other economic activities began to emerge. Mining, logging, tourism, and movie-making each played a role in the decades before and after World War II. Some of these would later surpass grazing as drivers of economic growth.

By the 1950s – a century after the first Mormons had arrived in Utah – the region's physical and cultural fabric had been altered, first by settlement and the railroads, then by overuse and regulation, two world wars, and the rise of television, phones, the automobile, and interstate highway transportation systems. These events unalterably reduced the isolation of once-remote communities.

In the 1960s, Lake Powell was created by the construction of Glen Canyon Dam on the Colorado River – a project that was to have a profound influence on communities near the Monument. The idea for a dam originated in 1916, but came to fruition 50 years later under the Eisenhower Administration. Glen Canyon City (now Big Water) emerged on the Utah side of the dam – a boomtown fueled by new markets for electricity, water, and water-based recreation. Such rapid development strained the infrastructure of Kane County, and sparked an influx of new residents and tourists that continues to this day.

In 1964, the BLM reorganized to better integrate multiple use concerns for wildlife, recreation, and soil and water resources into the Agency's traditional programs of range, forestry, and minerals management (Muhn and Stuart 1988). Large scale land use planning was institutionalized – a development that could threaten existing uses like grazing since other uses would now be given much greater consideration in the planning process.

This review of past settlement and land use helps explain the unique social and cultural landscape of the region that exists today. Indeed, the region's uniqueness has largely stemmed from the importance of land for sanctuary and subsistence. Grazing, as a way of life, was practiced by almost every Mormon pioneer to some degree. Indeed, on most lands it was the only economic use available. And although things have changed over the last 150 years, it is still this vision that has become the "tradition" of the region. This concept of ranching – perhaps especially today – is closely tied to the desire for an enduring connection to the land, and the craving for isolation in a society where solitude is increasingly difficult to find. Also important is the genuine concern for raising a family in a simpler environment, along with a strong sense of ownership of the public lands.

Today, Mormon society remains close knit and dedicated to a vision of religious conviction, family values, and hard work. Within this context, ranching is more than a livelihood – it is a vehicle through which families can pass down a multi-generational lifestyle (and may explain why many ranching families hold multiple jobs in order to remain solvent). The remoteness and isolation of the region fosters this unchanging sense of the past. In fact, it is this very thing that is priceless, and is oftentimes what visitors to the Monument are seeking as well.

When the Monument was designated in 1996, underlying fears about persecutions of the past emerged in surrounding Mormon communities. And as the first Monument to be placed under the jurisdiction of the BLM, no existing template for reference existed. Questions about how the Monument would implement a multiple use mandate were widespread. Even with a planning

team composed of federal, state, and local government employees, fears remained. Battles over RS2477 road issues continue without resolution. Rangeland health, the current issue of concern, is being analyzed through an extensive process in cooperation with Kane and Garfield Counties. Many bridges remain to be built between the past and the present to forge a sustainable future for the region and its residents. This grazing plan amendment is one important step in that process.

TRADITION AND CHANGE IN SOUTHERN UTAH

While the region in and around the Monument once represented an expanse of opportunity to gain wealth from the land through farming, logging, mining, grazing, and other extractive industries, rural communities today are struggling with economic transition and, in many cases, decline.

Across the West, these once vibrant economic sectors are declining in absolute and/or relative terms as many commodity prices fall in the face of increased global production and competition. In some areas, diminished job prospects has had a profound demographic impact on communities, where younger workers have left rural counties for improved employment opportunities and higher wages in rapidly growing urban areas. Oftentimes, residents that remain in these rural counties must engage in multiple employment pursuits in order to enhance or even maintain household income.

Several forces are rapidly altering this socioeconomic fabric of communities and the natural resource based economy of southern Utah: (1) a relative or absolute decline in the economic contribution of many traditional resource uses like agriculture, grazing, forestry, and mining; and (2) a rapidly growing tourism-based service economy spurred by national and international recognition of southern Utah's scenic beauty and cultural and scientific resources.

Many of southern Utah's extractive industries are declining relative to other economic sectors due to a number of factors:

- The region's remoteness and aridity make grazing, agriculture and timber harvesting economically marginal due to high costs and low productivity.
- Limited access to markets threatens to further erode the profitability of these traditional, resource-based economic sectors.
- Globalization, reduced trade barriers, and inexpensive energy exacerbate these challenges by allowing market penetration by suppliers from areas with more productive lands, lower wages, and fewer environmental constraints.
- Large percentages of southern Utah counties are under public ownership and administered by various agencies of the federal government, which have tended to restrict traditional uses on public lands in order to protect environmental quality and foster the development of recreation and tourism.

In contrast to the decline of traditional economic sectors, southern Utah's recreation and tourism industries are fast-growing and hold the potential to expand and diversify the economic base of many rural communities in the region. Tourism's growth stems from a number of factors. These include:

- internationally recognized natural, scientific, and scenic resources;

- cultural resources (e.g., archeological sites from the Fremont and Anasazi cultures, to more recent ghost towns and pioneer settlements);
- a large number of state- and nationally-designated parks and protected areas;
- historically inexpensive and abundant energy;
- accessibility to international tourists via Salt Lake and Las Vegas international airports; and
- accessibility to domestic tourists from Las Vegas, Colorado, the West Coast, Arizona, and Utah's own rapidly growing Wasatch Front.

Travel and tourism, broadly defined, has become one of Utah's largest economic sectors. Indeed, in 2004, over 17.5 million domestic and international travelers visited the state, spending an estimated $5 billion (GOPB 2005). Businesses supporting these visitors accounted for over 100,000 jobs, or roughly 10% of all non-agricultural jobs in the state. Large portions of these visitors are attracted to Utah's national parks and other areas of scenic beauty. National park visits more than doubled between 1984 and1996, although visitation has actually fallen somewhat since then; and despite Utah's international reputation as a premier ski destination, visits to the state's national parks in 2003 exceeded that of skiing by nearly 60% (e.g., 5.4 million national park visitors vs. 3.4 million skier visits).

The shifting balance between resource extraction and tourism-based development is clearly present in Garfield and Kane Counties, the home of Bryce Canyon, Zion, Capital Reef and Canyonlands National Parks; two wilderness areas, four state parks; much of Lake Powell and the Glen Canyon National Recreation Area; and the BLM's 1.9-million-acre Monument. In addition, Utah's Highway 12, a major east-west travel corridor north of the Monument, is nationally recognized as a Scenic Byway and one of 20 All-American Highways.

Southern Utah and surrounding areas have long been popular for their scenic attractions, and conservation efforts date back nearly a century. For example, portions of the Grand Canyon were first protected in 1908, followed by Zion in 1909, and Bryce in 1924. In fact, national park proposals were first considered for the Monument's Escalante River canyons as early as the 1930s, during the Roosevelt Administration. Today, visitors from around the world flock to the region. For example, over 900,000 people visited Bryce Canyon National Park in 2003, making it the second most-visited Utah national park behind Zion. Furthermore, visitation at Canyonlands National Park, while lowest among Utah parks, is growing twice as fast as the state's other four national park destinations (i.e., Bryce, Zion, Arches, and Capitol Reef). While the economic recession and terrorist attacks of 2000 and 2001 have dampened both international and domestic tourism in the area, recent rebounds suggest a return to more robust growth in this increasingly important sector of the Utah economy.

Table 3-25 Visitation to Utah Parks and Scenic Areas, 2004

Protected Area	Size (acres)	Annual Visitation
Arches National Park	73,233	746,414
Bryce National Park	35,840	1,025,763
Canyonlands National Park	337,570	372,963
Capitol Reef National Park	254,251	569,707
Glen Canyon National Recreation Area	1,254,306	2,127,265
Grand Staircase-Escalante National Monument	1,900,000	572,000
Kodachrome Basin State Park	4,000 (est.)	58,616
Zion National Park	146,590	2,729,258
Total	**4,005,790**	**8,205,951**

Source: Governor's Office of Planning and Budget 2005.

In some rural areas, the niche once filled by declining traditional economic sectors has been replaced or even exceeded by a growing service sector, especially in "gateway" communities near scenic protected areas where natural amenities are conducive to recreation and tourism. Indeed, one study found that from 1970 through 1996, the population growth of non-metropolitan counties in the U.S. that rated high on six natural amenity factors grew by an average of 125%, compared to an average growth rate of just 1% among counties that rated low on those same measures. Also important has been the in-migration of retirees to rural areas–including many of these gateway communities–where investment income and transfer payments often combine to create a major new source of economic stimulus.

Facing these dynamics, many rural areas are attempting to seek a middle ground that recognizes the contributions that both traditional and newly emerging economic sectors might offer a region. Indeed, if one views the extractive and amenity-based economies as the extremes of a continuum, then each end of the spectrum clearly has its own advantages and disadvantages.

For example, while tourism-based job growth in gateway communities may provide a host of economic opportunities, these new jobs may be part-time or seasonal, and wages are often low when compared to those of traditional extractive industries. On the other hand, the well-paying jobs traditionally associated with many extractive industries are oftentimes subject to "boom and bust" cycles of their own, which may run counter to community needs for stability. In reality, each end of the spectrum presents challenges and opportunities to the long-run economic growth and stability of rural communities.

REGIONAL IDENTITY WORKSHOPS FACILITATED BY THE SONORAN INSTITUTE

A series of workshops with the Sonoran Institute engaged a cross-section of Kane and Garfield County stakeholders to express their values and identity. Through these meetings, it was apparent that like many areas of the West, the communities surrounding the Monument do not share a single regional identity, but instead exhibit a broad diversity of views. For example, when it comes to public land management resident opinions ranged from favoring policies of strict environmental preservation to those leading to large-scale resource extraction.

One common theme that emerged through the meetings is that locals feel that they should have more say in what happens on public lands, particularly given their predominance in the study area, and the traditional economic and cultural ties that have long existed between these lands and local residents. There is also a general perception that communication between public land managers and local residents could be improved.

Another common theme that arose in the Garfield and Kane County workshops is that tourism needs to be better promoted, and that the Monument should have an active role in the process. Residents of both counties identify visual resources as a primary tourism generator and express their desire to maintain this attraction. However, with this said, commentary also included from both counties the concern that most of the tourism based jobs are low paying and seasonal in nature, and that more needs to be done to promote higher wage positions and year-round employment opportunities.

GARFIELD COUNTY

Demographic Characteristics

Table 3-26 shows the trends in Garfield County's population from 1990 and 2000. The county's overall population grew by 16% between 1990 and 2000, for a total 2000 population of 4,735 persons. Since 1970, the county's population grew slower than the Utah average, but slightly above the national rate.

Table 3-26 Population of Garfield County, By Sex and Age, 1990 and 2000

	1990		2000		% Chg (1990–2000)	% Chg per Year (1990–2000)
	Number	% Total	Number	% Total		
Population	3,980		4,735		19%	1.9%
Male	2,031	51%	2,421	51%	19%	1.9%
Female	1,949	49%	2,314	49%	19%	1.9%
Under 20 years	1,530	38%	1,674	35%	9%	0.9%
65 years and over	556	14%	667	14%	20%	2.0%
Median Age			*33.8*			

Source: Bureau of Census, US Department of Commerce, 2000.

Although the overall population has increased across all age categories, the youth population has declined in percentage terms when compared to the 1990 census. The median age is up 8% to 33.8 years from 1990 to 2000, slightly younger than that national median age of 35.3 years, but older than the Utah median of 27.1. Members of the Baby Boom generation (age 40 to 54 in 2000) had increased 5% during the same period. The retirement age population has held stable during this period, remaining at 14% of the total population -- substantially higher than the state average of 9%. While recreational opportunities, a favorable climate, and ready access to extensive protected areas may be attracting Baby Boomers to the region, at the same time younger residents are leaving to earn college degrees or pursue improved job opportunities.

County residents are 95% white. Approximately 2.9% are Hispanic or Latino (of any race), followed by 1.8% American Indian. Home ownership is relatively high: roughly 80% of non-vacant homes are owner-occupied, while 20% are renter occupied. For comparison, the Utah average is 71.5% owner-occupied. Finally, in testament to the region's tourist economy, nearly 35% of the county's 2,767 housing units are held for seasonal, recreational or other uses.

Economic Characteristics

County-level employment and income data are described below for Garfield County, as well as a more specific discussion of the characteristics of the county's agricultural sector.

Employment

Table 3-27 shows employment change by industry between 1980 and 2000, including full-and part-time jobs. Total employment for the period grew 25%, with a total of 766 new jobs added to the county's job market. Expressed on a jobs-per-worker basis, the employment situation slightly improved: from 1.23 jobs per person in 1980 to 1.29 jobs per person in 2000.

Table 3-27 Employment by Industry in Garfield County, Changes from 1980 to 2000

	1980	% Total	2000	% Total	New Employment	% of New Employment
Total Employment	***2,330***		***3,096***		***766***	
Wage and Salary Employment	1,850	79.0%	2,302	74.0%	452	59.0%
Proprietors' Employment	480	21.0%	794	26.0%	314	41.0%
Farm and Agricultural Services	284	12.0%	374	12.0%	90	12.0%
Farm	279	12.0%	366	12.0%	87	11.0%
Agricultural Services	5	0.2%	8	0.3%	3	0.4%
Mining	339	15.0%	59	2.0%	-281	NA
Manufacturing (incl. forest products)	258	11.0%	162	5.0%	-96	NA
Services and Professional	599	26.0%	1,785	58.0%	1,187	155.0%
Transportation & Public Utilities	95	4.0%	161	5.0%	66	9.0%
Wholesale Trade	5	0.2%	7	0.2%	2	0.0%
Retail Trade	222	10.0%	364	12.0%	142	19.0%
Finance, Insurance, and Real Estate	58	2.0%	113	4.0%	55	7.0%
Services (Health, Legal, Business, Others)	219	9.0%	1,140	37.0%	921	120.0%
Construction	415	18.0%	132	4.0%	-283	NA
Government	435	19.0%	584	19.0%	149	19.0%

Agricultural Services include soil preparation services, crop services, etc. It also includes forestry services, such as reforestation services, and fishing, hunting, and trapping. Manufacturing includes paper, lumber and wood products manufacturing.

Source: Bureau of Census, US Department of Commerce, 2000.

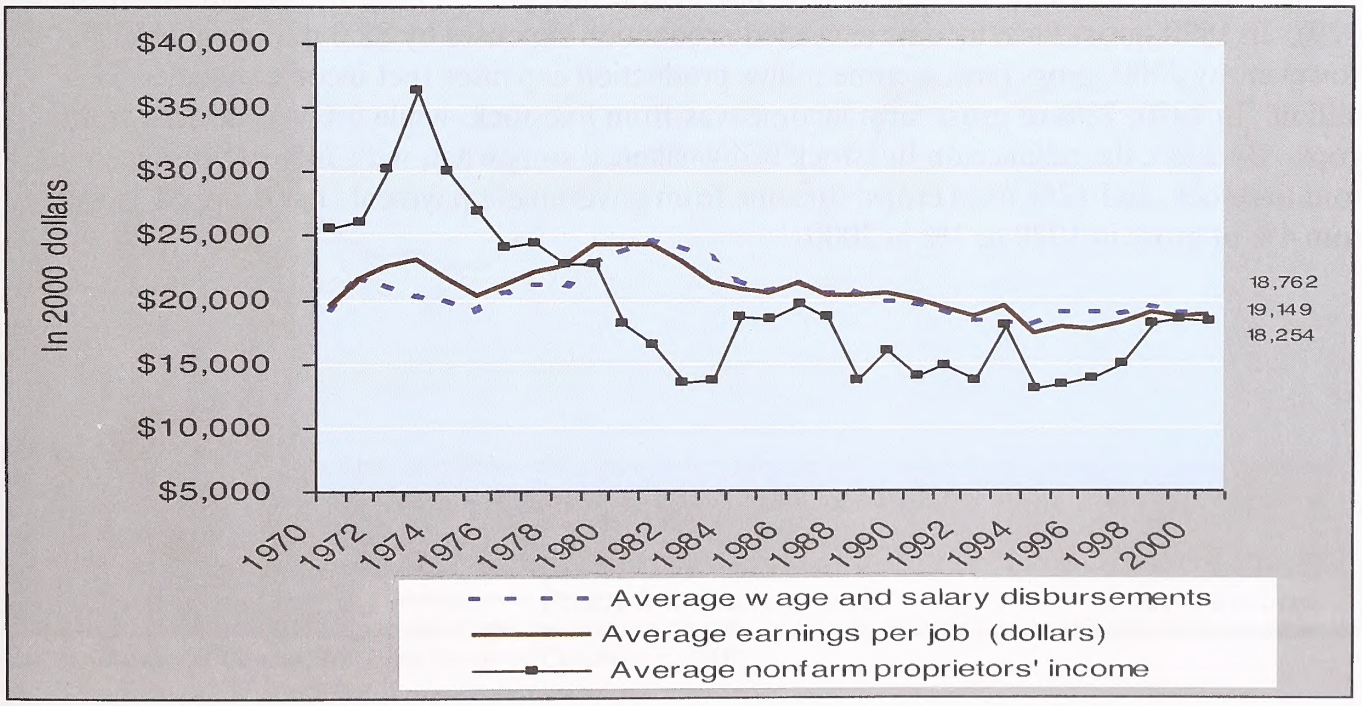
Employment data reveal a shift from Mining, Manufacturing, and Construction jobs, to an increase in the Service and Professional sectors. For example, in 1980, the largest employment sector was the Services and Professional category, comprising 26% of the total jobs. Government jobs were the second largest sector, comprising 19% of the total market, followed closely by Construction (18%). By 2000, 1,187 new jobs in the Services and Professional sector were created, increasing the total percentage for this sector to 58%—an increase of 123%. In 2004, 40% of the county's non-farm jobs were in the leisure and hospitality industry, the highest share of any Utah county (Utah Department of Workforce Services 2005). By contrast, Mining jobs decreased by 281 between 1986 and 2000.

Farming and Agricultural Services positions increased by 32% between 1980 and 2000, with a total of 90 new positions created. Within this area of the economy, the Farming sector created 87 positions, while Agricultural Services created 3 new positions. Farm and Agricultural Services has been consistent in comprising approximately 12% of total county employment during this period.

Income

Average wages per job, in "real" or inflation-adjusted dollars, have fallen from $19,452 per year in 1970, to $18,762 per year in 2000–a drop of 3.5%. This wage rate for the county is far below the state and national averages of $29,203 per year and $36,316 per year, respectively. In 2000, wage and salary comprised 53% of labor income, an increase of 40% from 1990. Other labor income, consisting primarily of payments by privately administered benefit plans, comprised 9% of personal income, an increase of 37% from 1990. Proprietors' income accounted for 8% of total personal income, compared to 12% in 1990. From 1990 to 2000, proprietors' income decreased by 9%.

Table 3-28 Wages and Income in Garfield County, 1970–2000



Source: Bureau of Census, US Department of Commerce, 2000.

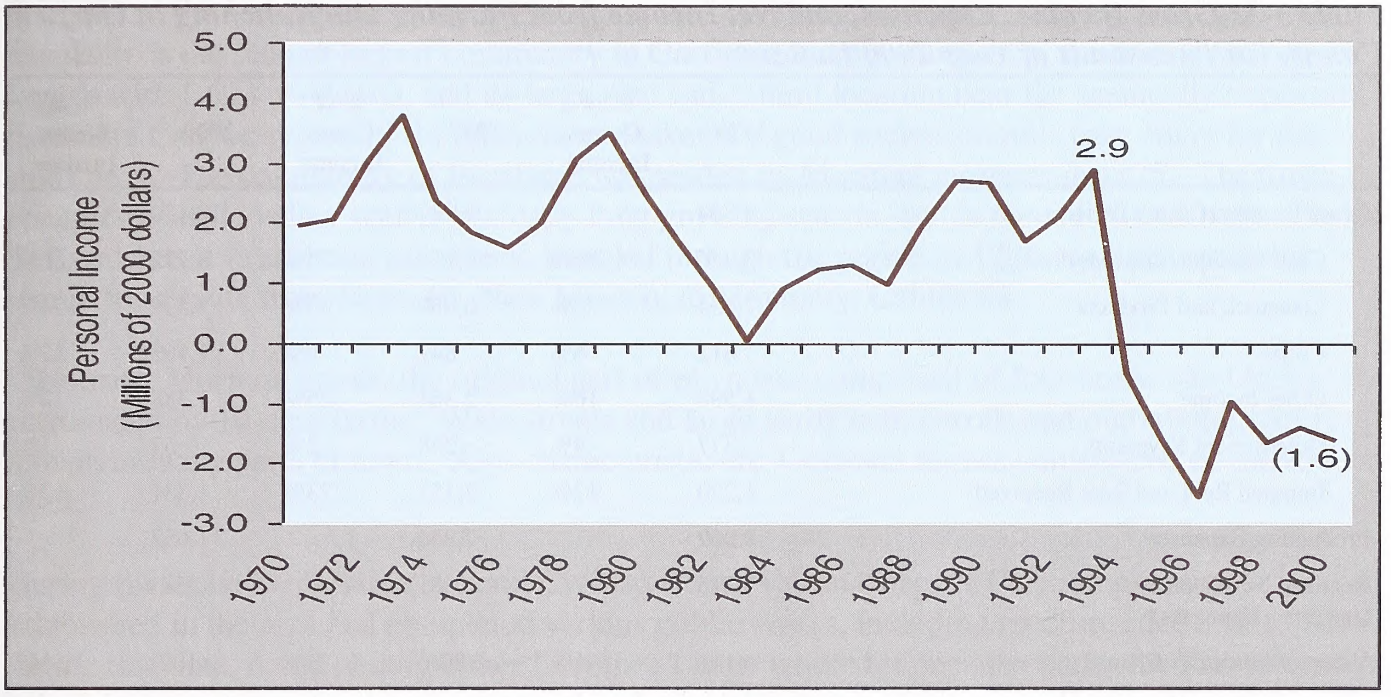
In many parts of the West, non-labor income (i.e., income from dividends, interest, rent, and transfer payments) has become an increasingly important component of rural economies. For example, in Garfield County, non-labor income comprised 37% of total personal income in 2000, second only to the Services and Professional sector at 40%. Moreover, this category of income has increased nearly 60% since 1980. The growth in non-labor income reflects increased in-migration of retirees (along with their lifelong accumulated assets), as well as increased affluence among the already well off through preferential federal and state tax policies enacted over the last two decades. Indeed, the degree of income and wealth concentration in the U.S. today rivals levels not seen since the late 1920s. For rural economies, it is ironic that these non-labor sources of income appear to be independent or even counter-cyclical with labor income, and may provide a degree of economic stability—especially in rural areas heavily dependent on seasonal tourism.

Finally, it is important to note the high degree of seasonality in the Garfield County job market. For example, in 2001 the unemployment rate varied from a low of 4.1% during the summer months, to a high of over 21% during winter months, when many tourist facilities are closed for the season. The overall unemployment in Garfield County is 9.2%, higher than the state and national averages of 4.4% and 4.8%, respectively. Such a high degree of seasonal employment undoubtedly creates hardship for county residents, who must struggle to earn as much as possible during the tourist season in order to survive prolonged periods of unemployment during winter months.

Agriculture

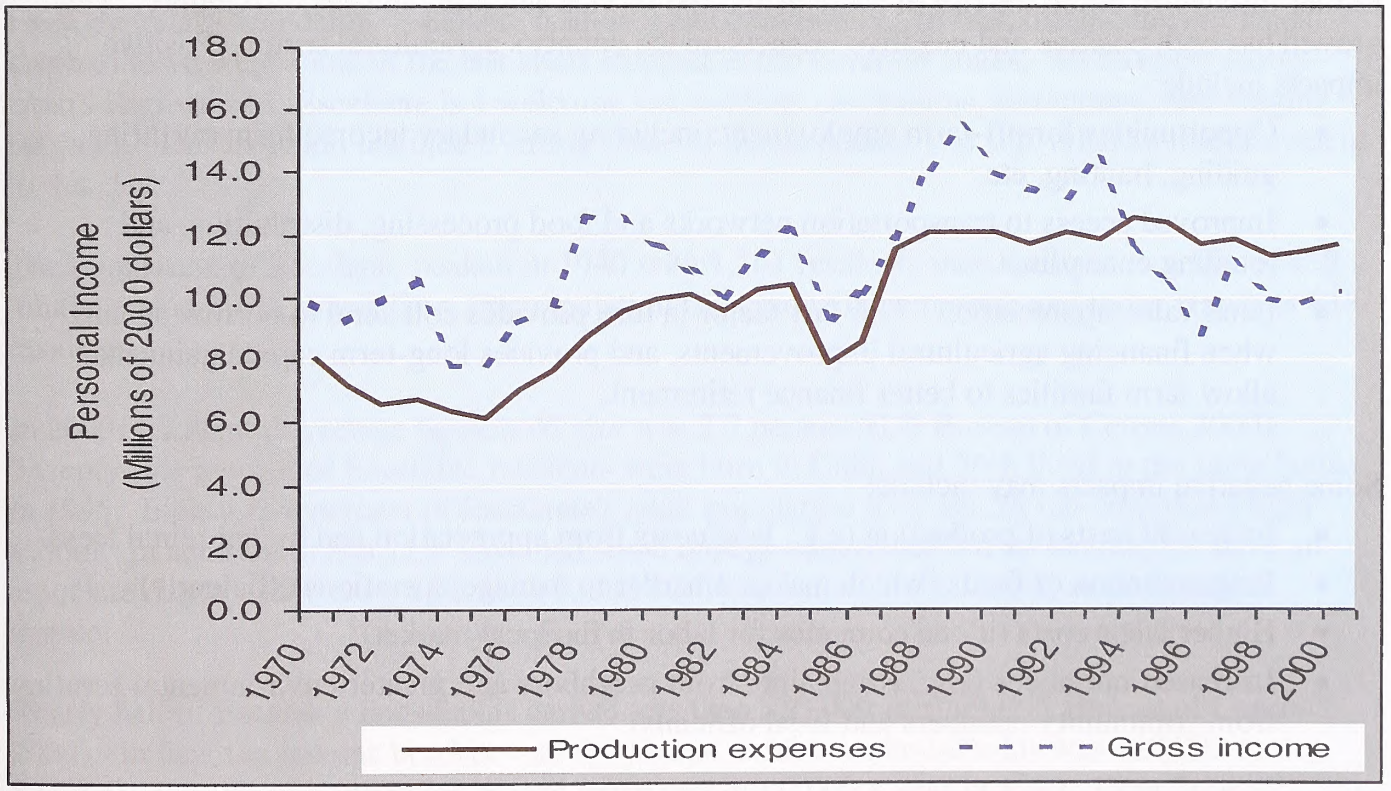
Although the number of agricultural jobs has increased over the last 20 years, the economic contribution of the sector in Garfield County has declined dramatically since 1970. For example, the total net income of farms in Garfield County peaked at approximately $4.0 million in 1974. Net income has fluctuated since, with total net income dropping in 2000 to -$1.6 million (Table 3-29). In 1970, gross farm income exceeded production expenses by $2.0 million (Table 3-30). However, by 2000, gross farm income minus production expenses (net income) equaled $1.5 million. In 1970, 78% of gross farm income was from livestock, while 6% was derived from crops. By 2000, the reliance on livestock had weakened somewhat, with 74% of gross income from livestock, and 12% from crops. Income from government payments has dropped as well, from 4% of gross in 1970 to 1% in 2000.

Table 3-29 Personal Income from Agriculture in Garfield County, 1970–2000



Source: Bureau of Census, US Department of Commerce, 2000.

Table 3-30 Gross Income and Expenditures for Agriculture in Garfield County, 1970–2000



Source: Bureau of Census, US Department of Commerce, 2000.

Table 3-31 Gross Income, Expenses, and Net Income from Farming and Ranching in Garfield County (in Thousands of Year 2000 Dollars)

	1970	% of Gross Income	1985	% of Gross Income	2000	% of Gross Income
Gross Income (Cash + Other)	9,844		9,287		10,120	
Cash Receipts from Marketing	8,246	84%	6,926	75%	8,732	86%
Livestock and Products	7,634	78%	6,080	65%	7,539	74%
Crops	612	6%	847	9%	1,193	12%
Other Income	1,598	16%	2,361	25%	1,388	14%
Government Payments	377	4%	208	2%	57	1%
Imputed Rent and Rent Received	1,220	12%	2,153	23%	1,331	13%
Production Expenses	8,069		7,856		11,652	
Realized Net Income (Income - Expenses)	1,775		1,431		(1,532)	
Value of Inventory Change	111	1%	(206)	-2%	(102)	-1%
Total Net Income (incl. corporate farms)	***1,953***		***1,224***		***(1,634)***	

Source: Bureau of Census, US Department of Commerce, 2000.

Earlier discussion noted the rise of tourism and the service economy in Garfield County. This growth has both positive and negative impacts on the county's agricultural sector. Positive impacts include:

- Opportunities for off-farm employment, including secondary income form outfitting, guiding, hunting, etc.
- Improved access to transportation networks and food processing, distribution, and retailing enterprises.
- Land value appreciation. This last factor in turn provides collateral to borrow against when financing agricultural improvements, and provides long-term capital gains that allow farm families to better finance retirement.

Some negative impacts may include:

- Increased costs of production (e.g., land costs from appreciation and higher rental fees).
- Fragmentation of fields (which makes it harder to manage operations efficiently).
- Higher labor costs (if one competes for labor in the local market).
- Increased nuisances (e.g., complaints from neighbors and greater environmental scrutiny from community members and local officials).

Moreover, some agricultural lands may be taken out of production or used for marginally economic "ranchettes" and "weekend ranchers." In sum, the overall effects of these pressures are likely to be mixed and indeterminate.

CHAPTER 3
AFFECTED ENVIRONMENT

A Profile of the Community of Escalante

Escalante is the second largest community in Garfield County (Panguitch, the county seat, is the largest with 1,623 residents), and its large size and central location near the scenically important Escalante Canyon region of the Monument makes it a good socioeconomic case study for the study area. The community of Escalante was settled by Mormon pioneers in 1875. The town occupies a fertile valley with a relatively long growing season, and is named after Silvestre Velez de Escalante, a Franciscan priest who traveled through the region in 1776 in an unsuccessful search for a route from Santa Fe, New Mexico, to Monterey, California.

Like many Mormon towns, the original part of town was comprised of four home-site blocks surrounded by 10-acre farms. Wide streets and large yards with corrals and outbuildings still remain in many parts of town. Also characteristic are Victorian homes constructed of native brick.

During the Great Depression, several Civilian Conservation Corps (CCC) camps were established in the area and completed various public works, including much-needed roads. Also during this time, noted photographer Dorothea Lange worked in the area under the Farm Security Administration, documenting both social and natural features of the area. During World War II, residents migrated out of the region either to join the armed forces, or to support the war effort in various urban centers. Throughout these changes, the community's traditional natural resource economy based on farming, timber harvesting, grazing, and mining continued.

Even by today's standards, Escalante is an isolated community. In fact, the Monument lands south of town were some of the last areas mapped in the lower 48 states. To travelers along Utah's Highway 12, Escalante is a welcome site, with its gas stations, restaurants, and lodging facilities. This isolation instilled a strong sense of independence and self-reliance that is evident to this day.

The population of Escalante peaked in 1940 with 1,161 residents then declined to a low of 638 inhabitants in 1970. Since then, the population has gradually increased, and today stands at 818 residents.

In 2000, Escalante's average household size was 2.7 persons (US Bureau of Census 2000). Seventy-one percent of Escalante residents were born in Utah, and 56% lived in the same house in 1995. Eighty-five percent of Escalante's adult population over age 24 has completed high school. In addition to this 21% have had some college experience but no degree, 5% have an associate degree, 15% have a bachelor's, and 8% have a master's, doctoral, or professional degree.

Nearly half of Escalante households earned less than $30,000 in 1999 (US Bureau of Census 2000). In fact, the income bracket with the largest number of households was $20,000 to $24,999. Just 2% of households earned more than $100,000 a year in 1999. Over 70% of household income was derived from wages, salary, or self-employed income. This was followed by Social Security income (10.7%) and retirement income (10.3%). Interest, dividend, or net

rental income comprised just 5.2%. Ninety-five percent of Escalante residents worked within the county, 69% of them in town.

Like many communities with active tourism sectors, seasonal jobs compose a large part of the local job market. While 61.5% of residents worked 50–52 weeks per year, 26.7% worked less than 40 weeks. These part-time workers experienced lower median incomes than full-time workers. In fact, in 1999, 11% of Escalante residents had income levels below the official poverty line. The highest poverty rates were experienced by Native American residents (100%) and single parent households.

The town has seen a steady increase in home construction over the last 30 years. For example, from 1940 to 1969, the town added an average of 18.3 new homes per decade. Between 1970 and 2000, the 10-year average has been 54.3 new homes per decade, a nearly three-fold increase. Despite this growth, nearly 15% of Escalante's housing units are vacant and are either for sale or rent. Roughly 10% are vacant and held for seasonal, recreational or other use. Escalante's median home value in 2000 was $100,600. In comparison, median household income was $32,143 in 1999, resulting in a Housing Affordability Index of 125, which suggests that the median family could afford the median home. The average Affordability Index for the county was 157, meaning that housing in Escalante is more expensive than the average home in the county.

Since the Monument was designated 1996, real estate values have appreciated, and there has been a noticeable increase in new residents acquiring and restoring the town's historic brick homes. The community also is home to one of Utah's fastest-growing native plant societies, and newer residents have been instrumental in implementing an ambitious native plants project along the town's one-mile Main Street.

KANE COUNTY

Demographic Characteristics

Kane County's population in 2000 was 6,065. The county experienced a 17% population increase between 1990 and 2000, and has grown by 149% since 1970. In fact, since 1970, the county's population has grown faster than both the state and national averages. While Kane County's under-20 youth population declined in both absolute and percentage composition during the 1990s, it is still relatively high, at 32%. The population of those 65 years and older experienced a 41% increase and, as of 2000, comprised 17% of the County's total population. Like Garfield County, Kane County's population is growing older. The median age of Kane County residents increased from 30.8 to 39.1 between 1990 and 2000. The Baby Boomer age group (age 40 to 57) in 2000 was up 6% (492 residents), while the under-20 age group experienced a 4% decline during the same period. The 65 and older age group grew by 41% (295 individuals). Like Garfield County to the north, Kane County is overwhelmingly white (96%). The Hispanic or Latino (of any race) composition is 2.6%, with American Indians comprising 1.6% of the county's population.

Table 3-32 Population of Kane County, by Sex and Age, 1990 and 2000

	1990		2000		% Chg (1990–2000)	% Chg per Year (1990–2000)
	Number	% Total	Number	% Total		
Population	5,169		6,046		17%	1.7%
Male	2,605	50%	2,997	50%	15%	1.5%
Female	2,564	50%	3,049	50%	19%	1.9%
Under 20 years	2,019	39%	1,936	32%	-4%	-0.4%
65 years and over	715	14%	1,010	17%	41%	4.1%
Median Age			*39.1*			

Source: Bureau of Census, US Department of Commerce, 2000.

Economic Characteristics

Employment

From 1982 to 2000, 2,393 new jobs were created in Kane County (Table 3-33). Wage and Salary employment grew by 175% during this period, increasing from 1,075 positions to 2,966 positions. In 2000, the Services and Professional sector represented the largest sector of employment in Kane County at 55% of the total job market, dropping from 62% in 1982. However, this sector saw an increase of 1,196 jobs, and accounted for 50% of the new jobs created since 1982. The fastest growing categories in this sector are Services (which include health, business, legal, engineering, and management services), representing 24% of total employment, and Retail Trade, representing 20% of total employment. The second largest employment sector in Kane County is Government jobs, with 708 employees. The majority of growth in government employment has been with state and local governments.

Table 3-33 Employment by Industry in Kane County, Changes from 1982 to 2000

	1982	% Total	2000	% Total	New Employment	% of New Employment
Total Employment	*1,599*		*3,992*		*2,393*	
Wage and Salary Employment	1,075	67.0%	2,966	74.0%	1,891	79.0%
Proprietors' Employment	524	33.0%	1,026	26.0%	502	21.0%
Farm and Agricultural Services	164	10.0%	322	8.0%	158	7.0%
Farm	156	10.0%	185	5.0%	29	1.0%
Agricultural Services	8	0.5%	137	3.0%	129	5.0%
Mining	44	3.0%	5	0.1%	-39	NA
Manufacturing (incl. forest products)	75	5.0%	376	9.0%	301	13.0%
Services and Professional	989	62.0%	2,185	55.0%	1,196	50.0%
Transportation & Public Utilities	107	7.0%	99	2.0%	-8	NA
Wholesale Trade	26	1.6%	41	1.0%	15	1.0%
Retail Trade	393	25.0%	804	20.0%	411	17.0%
Finance, Insurance, and Real Estate	55	3.0%	267	7.0%	212	9.0%
Services (Health, Legal, Business, Others)	408	26.0%	974	24.0%	566	24.0%
Construction	66	4.0%	396	10.0%	330	14.0%
Government	261	16.0%	708	18.0%	447	19.0%

Agricultural Services include soil preparation services, crop services, etc. It also includes forestry services, such as reforestation services, and fishing, hunting, and trapping. Manufacturing includes paper, lumber and wood products manufacturing.

Source: Bureau of Census, US Department of Commerce, 2000.

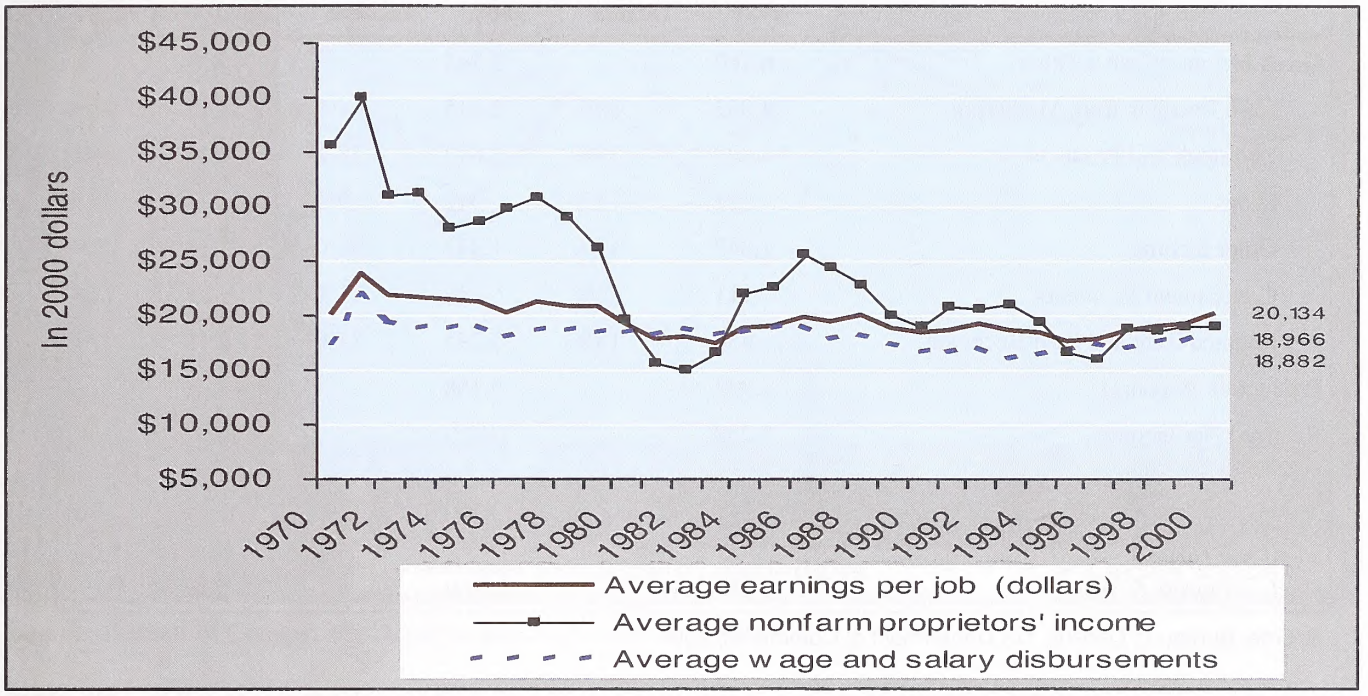
Farm and Agricultural services experienced a 96% increase in new employment from 1982 to 2000, with 158 new positions. Despite this growth, the sector's percentage of overall employment dropped from 10% to 8%, and the 158 new positions represent 7% of the total number of jobs created since 1982. Within this economic grouping, the farm sector increased by 29 positions, while dropping from 10% to 5% of total employment in the county. Agricultural Services grew from 8 positions (or 0.5% of the total job market) in 1982, to 137 positions (or 3% of the job market) in 2000. These positions represented 5% of the new employment opportunities in Kane County for this time period. Of the county's new jobs created since 1982, 1,891 positions (79%) are considered wage and salary employment. Proprietors' employment grew by 96% during the same period, totaling 1,026 new opportunities. Proprietors' employment represented 26% of the total employment in 2000, down 7% from 1982.

Income

Adjusted for inflation, average earnings per job in Kane County increased just $100 between 1970 and 2000, (from $20,034 to $20,134 in constant 2000 dollars) an increase of just 0.5% for the 30-year period (Table 3-34). Non-labor income decreased from 1982 to 2000 by 5%, having

a detrimental impact on the average earnings in Kane County. From 1990 to 2000, consumer services accounted for 16% of new income in the county, while producer services just 5%.

Table 3-34 Wages and Income in Kane County, 1970–2000



Source: Bureau of Census, US Department of Commerce, 2000.

Agriculture

Since 1970, income from farming and ranching has fluctuated, and has struggled since 1980 to regain or surpass its 1970 levels. In 1970, 79% of gross farm income was from livestock, while 2% was from crops. By 2000, 69% of gross income was from livestock, and 6% from crops. Income from government payments has dropped from 2% of gross in 1970 to 1% in 2000. The total net income has decreased, declining 81%, from $1.2 million in the 1970s, to $0.2 million in 2000 (Table 3-35).

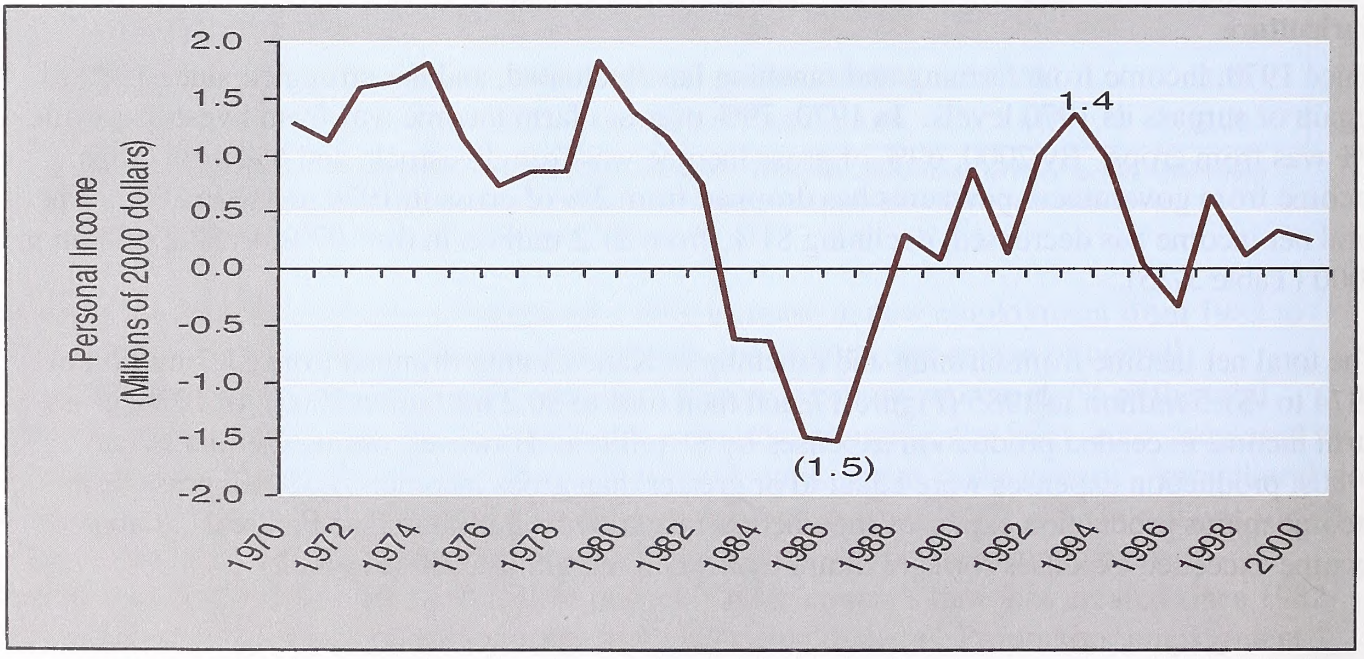
The total net income from farming and ranching in Kane County dropped from $1.7 million in 1974 to -$1.5 million in 1985 (Figure 1), and then rose to $0.2 million in 2000. In 1970, gross farm income exceeded production expenses by $1 million. However, during the mid to late 1980s, production expenses were equal to or greater than gross income. By 2000, gross farm income minus production expenses (net income) equaled $0.3 million (see Figure 2). Gross income exceeded expenses for agriculture by a small margin in 2000 (Figure 2).

Table 3-35 Gross Income, Expenses, and Net Income from Farming and Ranching in Kane County (in Thousands of Year 2000 Dollars)

	1970	% of Gross Income	1985	% of Gross Income	2000	% of Gross Income
Gross Income (Cash + Other)	6,160		3,745		4,853	
Cash Receipts from Marketing	4,953	80%	2,415	64%	3,618	75%
Livestock and Products	4,842	79%	2,072	55%	3,341	69%
Crops	111	2%	342	9%	277	6%
Other Income	1,047	17%	1,333	36%	1,236	25%
Government Payments	111	2%	40	1%	25	1%
Imputed Rent and Rent Received	936	15%	1,293	35%	1,211	25%
Production Expenses	4,922		5,168		4,593	
Realized Net Income (Income - Expenses)	1,238		(1,423)		260	
Value of Inventory Change	111	2%	(82)	-2%	25	1%
Total Net Income (incl. corporate farms)	***1,283***		***(1,504)***		***238***	

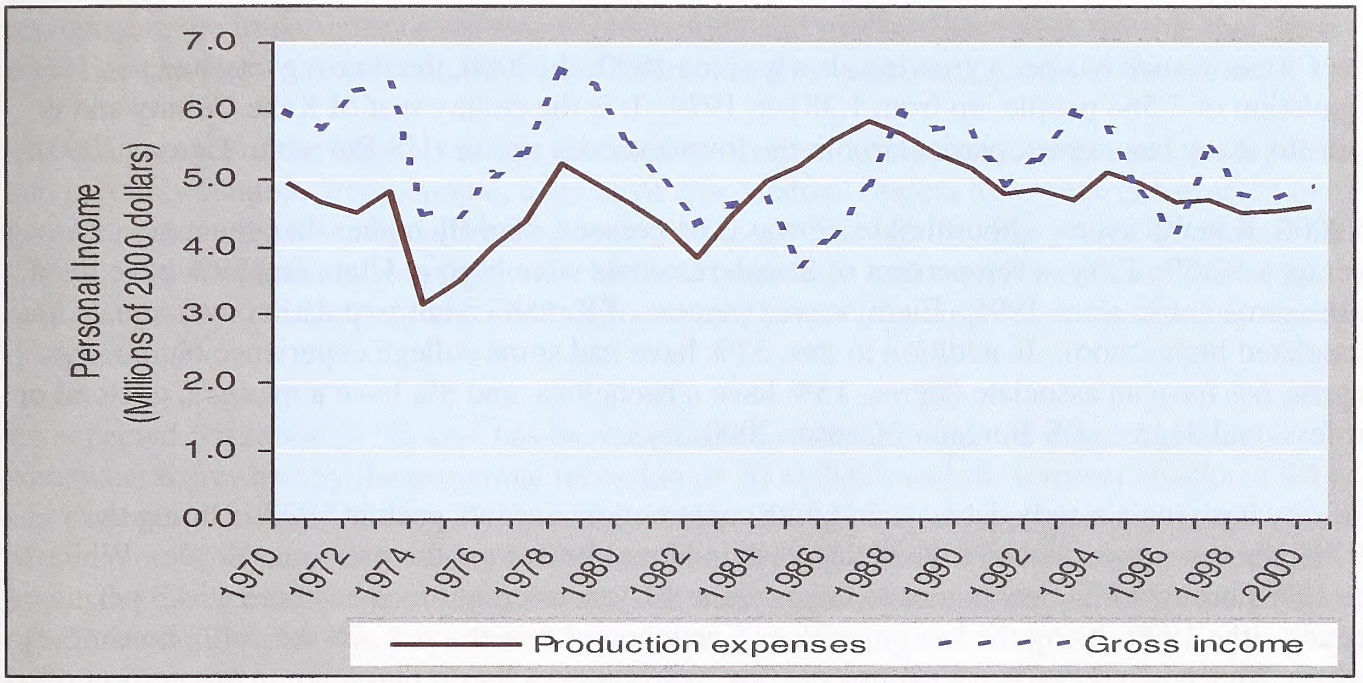
Source: Bureau of Census, US Department of Commerce, 2000.

Table 3-36 Personal Income from Agriculture in Kane County, 1970–2000



Source: Bureau of Census, US Department of Commerce, 2000.

Table 3-37 Gross Income and Expenditures for Agriculture in Kane County, 1970–2000



Source: Bureau of Census, US Department of Commerce, 2000.

A Profile of the Community of Kanab

Kanab, Utah, is located on the southwest border of the Monument, and is home to the Monument headquarters. Kanab is the oldest and most populous city in Kane County. Its proximity to the Monument and the services that it offers makes Kanab an important "Gateway" to the Monument.

The name "Kanab" comes from the Native American word for a willow basket used to carry an infant on a mother's back. The city is known as a sort of oasis in the desert, with its tree-lined streets surrounded by stunning redrock landscapes. Settlement of the region was slow due to its isolated location and troublesome terrain. The first settlers arrived in 1858, beginning a decade of unsuccessful colonization primarily due to conflicts with Native Americans. It wasn't until 1870 that serious colonizing efforts began. The area was considered prime for cattle grazing, but the extension of Mormon dominion into northern Arizona was equally important.

Since its beginning, Kanab has always been a cattle town. However, beginning in the 1920s, hundreds of films were filmed in and around Kanab because of its attractive scenery and favorable climate. The first, Dead Coach in 1922, starred Tom Mix with the Vermilion Cliffs as a backdrop. Since then (and to varying degrees), the movie industry has provided welcome economic relief to the city. The construction of Glen Canyon Dam in 1956 also proved to be a boost to the economy, as well as local population.

Tourists from all over the world come to enjoy the wonders of the surrounding landscape. The town is in very close proximity to the Kaibab National Forest and Grand Canyon, Bryce, and Zion National Parks, as well as the Monument, BLM lands, Lake Powell and other scenic

landscapes. Because of its location, Kanab is also known as "Park Central," and tourism has become a welcome and viable industry in and around the city.

The City of Kanab has been growing slowly since 1870. In 2000, the thriving city had a population of 3,564 people, up from 1,381 in 1970. It is the county seat of Kane County and is home to many businesses, particularly in the tourist service sector (US Bureau of Census 2000).

In 2000, Kanab's average household size was 2.64 persons, slightly higher than the national average of 2.59. Fifty-seven percent of Kanab residents were born in Utah, and 59% have lived in the same house since 1995. Eighty-seven percent of Kanab's adult population over age 24 has completed high school. In addition to this, 32% have had some college experience but no degree, 6% have an associate degree, 15% have a bachelor's, and 8% have a master's, doctoral or professional degree (US Bureau of Census 2000).

The city has seen a steady decrease in home construction since its peak in 1970. During the 1970s, the town experienced a 400% increase in homes built from the previous decade. While the 1970s brought 424 new homes to the city, the 10-year average since has been 154.3 per decade—the 1990s being the lowest, with 115 new homes constructed. Of the 1,492 housing units in Kanab, nearly 90% are occupied, with 20% being used as rental units. Four percent of housing units are vacant for seasonal, recreational, or occasional use. In the surrounding areas of Kane County, many homes have been built in higher-elevation forests as vacation homes. Indeed, the County reports that nearly 75% of property tax notices are sent to addresses located outside of the County (US Bureau of Census 2000).

Seventy-four percent of households in 1999 earned less than $30,000. In fact, the income bracket with the largest number of households was $25,000 to $30,000. Just 3% of households earned more than $100,000 in 1999. Approximately 69% of household income was derived from wages, salaries, or self-employment income. This was followed by Social Security income (11.1%), retirement income (9.8%), and interest, dividends, or net rental income (6.3%). The median household income in 1999 was $35,125. This combined with Kanab's median home value of $106,100, results in a Housing Affordability Index of 136, which suggests that the median family can afford the median house (US Bureau of Census 2000).

Like Escalante, seasonal jobs comprise a large part of the local job market. While 59.1% of residents worked 50–52 weeks per year, 31.2% worked less than 40 weeks. These part-time workers experienced lower median incomes than full-time workers. In 1999, 6% of Kanab residents had incomes below the poverty line. The highest poverty rates were experienced by Native American residents, at 45% (US Bureau of Census 2000).

GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT

The Monument was established in 1996 by Executive Order, and is part of the BLM's National Landscape Conservation System (NLCS). The NLCS includes 15 national monuments, along with wilderness areas, national conservation areas, wild and scenic rivers, national scenic and historic trails, and wilderness study areas. A resource management plan for the Monument was completed in 1999 (BLM 2004). The plan outlined a management strategy designed to protect the Monument's many historic and scientific resources by: (1) retaining the region's remote and

undeveloped character, and (2) providing opportunities for research. Other emphases within the Plan include fostering economic development in communities around the Monument, and recognizing the importance of the area for recreation and tourism, as well as the role that these activities can play in generating direct and indirect income and employment in the region.

The designation of the Monument has attracted much new development to the area, both publicly and privately funded. For example, a series of new visitors' centers have been constructed in gateway communities surrounding the Monument (e.g., Cannonville, Big Water, Escalante, and Kanab). New restaurants, campgrounds, bed and breakfasts, and motels have also arrived in anticipation of increased tourism, and home and land prices have appreciated noticeably since designation.

As expected, visitation to the area has increased since 1996, although the effect has been somewhat dampened by the economic recession of 2000-2001, and the terrorist attacks of 9/11. For example, between October 2002 and September 2004, 1,241,161 people visited the Monument. This number includes everything from driving through the Monument, to people requesting backcountry recreation permits. The most popular recreational activities were (in this order) driving for pleasure, hiking/walking, viewing, picnicking and camping. The number of backcountry and car camping permits issued have been on the rise since 2001 as well. During FY 2002 (October 1, 2001 through September 30, 2002), 2,128 backcountry permits and 918 car camping permits were issued. Over the next fiscal year, those numbers rose to 2,444 backcountry permits and 1,465 car camping permits.

But tourism is not without its costs. For example, the financial burden borne by local communities for services like solid waste disposal, water development, police and fire protection, and search and rescue efforts may outpace the growth of local revenues. Indeed, local business owners have voiced frustration that expensive motor homes and SUVs pass through town without stopping to make a purchase. This phenomenon may be due to the high number of international visitors that are reluctant to make large purchases that would need to be shipped home. (In fact, one local proprietor noted how U.S. license plates are popular souvenirs because they take up little room in a suitcase.) Another explanation may simply be that visitors typically come to the area to experience the scenery and outdoors, not to shop, but to make a few purchases locally.

A reliance on tourism may pose other risks as well. For example, while tourism can clearly play an important role in economic diversification, areas may become so heavily "tourism-dependent" that they can be as vulnerable to downturns as places dependent on more traditional, resource-based, extractive economies. Indeed, the effects of economic recession and 9/11 on visitation have added another element to the cyclical seasonality often seen in tourist economies. And as noted above, employment opportunities associated with amenity-based growth tend to be in lower wage-service sector industries, often on a part-time or seasonal basis, with lack of opportunity for advancement and few, if any, benefits. Indeed, as described above, Garfield County's wage rate is roughly half the national average.

In some parts of southern Utah, studies of resident perceptions of tourism-based economic activity show a tendency for residents to express skepticism if not outright dissatisfaction with

the social and economic impacts of tourism in their communities. It is suggested that some rural residents balk at working in amenity-based occupations not only due to low wages and limited benefits, but also because they consider these jobs to be inconsistent with the cultural traditions and values associated with more traditional rural occupations such as logging, mining, and agriculture. In many areas, these traditional land uses are increasingly seen as incompatible with a growing tourism economy. This has happened in communities around the Monument, where tension between grazing use and recreation has emerged, especially in riparian areas that are valuable to both user groups.

Local communities faced with the dynamics of a changing economic base can respond in a number of ways. For example, many residents desire a return to the traditional, resource-based economies that have sustained their communities in the past and have an aversion to transitioning to an amenity-based economy. The conservative, rural composition of many small Utah communities often leads to conflict over land use between locals, "newcomers," and public land managers.

A second response is to embrace the emerging amenity economy by engaging in supporting service industries like food and lodging, outfitting and guide services, etc. A third approach seeks to exploit emerging niche markets while still relying on traditional extractive uses by, for example, tailoring activities to be compatible with the region's emerging focus on visual amenities. Indeed, the desire to maintain traditional resource-based economic activities may spur efforts to identify niche markets like environmentally certified agricultural produce, beef, and forest products.

How communities respond to these changes, and the collective successes and failures that follow, will largely determine the long-run economic viability of a region. In the case of southern Utah, the region has strong opportunities for amenity-based economic growth and diversification due to the area's internationally renowned scenic, recreational, scientific, ecological and cultural resources, many of which have been protected as national parks, monuments, and recreation areas. Moreover, the ability of southern Utah's communities to capture the economic gains from recreation and tourism are aided by a spirit of self-reliance, the state's highly urbanized and educated population, and ready access to a host of other population centers due to the region's proximity to two international airports (i.e., Salt Lake City and Las Vegas).

CHAPTER 4
ENVIRONMENTAL IMPACTS

OVERVIEW

This chapter presents the environmental consequences of the five alternatives described in Chapter 2 (Alternatives) to the resources detailed in Chapter 3 (Affected Environment). The impacts of each alternative are portrayed separately, and compared with the baseline conditions given in Chapter 3, with the exception of socio-economic impacts. Since the analysis of economic impacts is highly dependent upon model selection, those impacts are presented along with an analysis of the modeling methods used.

Alternative A would continue existing management. Alternative B would modify livestock management, but with no reductions in stocking levels or permitted active use. Alternative C, the Management Preferred Alternative, would make allotment specific changes to allotments which fail to meet one or more Rangeland Health Standards (hereafter referred to as Standards). Alternative D would suspend active grazing on allotments which fail to meet either of the upland health Standards. Alternative E would suspend active grazing on all allotments which fail to meet Standards, both upland and riparian.

Impacts were assessed on a landscape scale. Many of the allotment specific proposals involve discrete actions, with site specific impacts (see Appendix 1 for details), but the majority of those specific, localized actions are future proposals, and would not be implemented as a result of this proposed planning level determination. Many of those proposals, such as fences or water developments, were carried forward into this analysis to determine the gross level impacts of differing strategies of range management. They would not be approved as part of this decision process, and would require further site specific analysis if and when their implementation is proposed.

None of the impacts analyzed in this EIS rise to the level of significance unless specifically stated.

For this analysis, BLM staff and interdisciplinary team collaborators have used existing data, current methodologies, and professional judgment. Mitigation measures, such as the proposed design requirements for future range improvements were incorporated into the analysis.

There is a considerable redundancy in this section. Many impacts were similar across alternatives or across allotments. Rather than forcing the reader to cross reference impacts, it was decided to repeat them for the sake of continuity and readability.

ANALYSIS ASSUMPTIONS AND GUIDELINES

Short term impacts and direct impacts are used synonymously and refer to impacts that are immediate or would occur in a short time frame (generally five years or less) following implementing EIS decisions.

Long term impacts and indirect impacts are used synonymously and refer to impacts that would occur in long time frame (generally more than five years) following implementing EIS decisions.

CHAPTER 4
ENVIRONMENTAL IMPACTS

All management actions would be in accordance with applicable laws, regulation, policy, and guidance.

GENERAL EFFECTS EXPERIENCED UNDER ALL ALTERNATIVES

CULTURAL RESOURCES

Livestock and grazing related improvements can have adverse effects on cultural sites through several different methods. The direct impacts of cattle on sites generally results from hoof action on artifacts, features, and cultural sediments, the creation of trails through sites, destruction of standing walls at architectural sites, and abrasion to rock art panels. Indirect impacts such as increased erosion and deflation result from trail creation and use as well as the degradation of the vegetative cover. Stock-related range improvements can also impact sites. Impacts can be direct (e.g. the construction of a corral on an archaeological site) or indirect (e.g. the placement of a salt lick or water trough in an area that will concentrate stock use at cultural sites).

The effects of livestock on archaeological sites have been documented. Osborn et al. (1987) note and quantify the damage to both ceramic and lithic artifacts, finding that ceramics suffer worse than do lithics from trampling activities. They also note displacement of artifacts. A following paper (Osborn and Hartley) details similar conclusions noting artifact breakage, displacement, and changes in artifact visibility. Gifford-Gonzales et al (1985) also tracked vertical and horizontal artifact displacement as a result of trampling. Roney (1977) established a control plot and introduced obsidian "artifacts" and documented both major and minor damage as well as horizontal displacement. He also noted that the cattle-induced edge damage could easily be mistaken for cultural modification, while Binford (1981) makes a similar observation concerning bone artifacts and trampling. Broadhead (1999) also noted artifact movement within only two weeks of monitoring a constructed "archaeological" site. Gann (1988) looked at the effects of cattle and grazing activities on surface artifacts, and found that the resulting breakage and displacement alters the interpretation of sites by increasing the sherd count and decreasing the ability of an archaeologist to identify the ceramic style. He directly connected cattle impacts by noting a negative correlation in ceramic sherd size and proximity to areas where cattle frequent. Gann also notes that cattle are drawn to certain browse species common on archaeological sites, hastening erosion at these sites.

The most common observation in studies conducted by the above researchers is that lithic and ceramic artifacts are broken and modified through trampling, and that artifacts are displaced both horizontally and vertically within the site. In a review of grazing related impacts to archaeological sites, Cinnamon (1986) lists impacts noted at several National Park administered areas throughout the Southwest. These include trampling, rubbing on and damage to/destruction of standing historic and prehistoric sites, erosion, and changes in historic vegetation. All of the forms of impacts described above have been observed locally. The rare standing masonry walls of open pueblo-era sites within the EIS area are found at locations that are inaccessible to cattle. Direct local observation has disclosed impacts to rock art sites, where cattle fecal material has been found spattered across rock art panels at some sites and where abrasion is erasing both pictographs and petroglyphs at other sites.

Alcoves and Rock Shelters

Unfortunately, the visibility of these settings makes them relatively obvious and the well-preserved condition of these sites makes them a target for looters. The protection from the elements offered by these settings also draws livestock, thus making shelters and overhangs a focus of livestock use and increasing the levels of stock-related impacts. Recent monitoring by archaeologists has documented extensive livestock use of rock shelters on the Kaiparowits Plateau and elsewhere, including at least one archaeological site where more than 50 cm (20") of cattle dung covers the floor of the shelter.

Architectural Sites

These sites are susceptible to a wide variety of impacts, as previously described above, and are especially prone to damage from looters due to their high visibility and from the impacts of cattle on standing walls and rubble mounds.

Historic Sites

These sites are found across the project area, and are generally subject to the same impacts as prehistoric sites. Most historic sites are open, but alcoves and shelters were used as well.

Open sites

Sites in this category may be subject to, and susceptible to, the widest variety of impacts. Natural weathering and erosion begin acting on these sites as soon as they are created. Prehistoric sites in this category are often the least obvious sites and consequently are the most prone to accidental disturbance by man.

Rock Art

While natural weathering and impacts from livestock take a toll on sites of this type, vandalism is by far the most serious threat.

BIOLOGICAL SOIL CRUST

While it is acknowledged that livestock impact crusts, evaluating the nature of that impact is more problematic. There are two schools of thought on the relationship between crusts and rangeland productivity. The first cites studies which confirm the ability of biological crusts to prevent erosion, increase nutrients, and increase water retention. From this perspective, the safeguarding of crusts is necessary to soil formation and retention, and the prevention of disturbance is necessary. The second school of thought notes studies which show that biological crusts suppress plant germination and decrease water retention. They accept that crusts decreased erosion, but cite evidence that erosion is eventually mitigated through plant establishment. It has even been suggested that degraded rangelands have been replaced by biological crusts, through the process of desertification. Less water retention and reduced vegetation equate to long term loss of range productivity. From this perspective, livestock impacts on crust mimic that of natural herbivory, and as such aid in the restoration of rangelands by introducing sites where water is retained, and plants can become established.

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ENVIRONMENTAL IMPACTS

RECREATION

Competition for Use of Space

Competition for use of space is the most common conflict between backcountry recreationists and livestock. For recreationists, this conflict can result from either the immediate presence of livestock, or in their absence, the physical effects of livestock activity (especially additive effects). Competition for use of space occurs most often in desert canyons, particularly riparian canyons, where both recreationists and livestock tend to focus their activities. The majority of backcountry recreationists use riparian canyons (as well as desert washes) as their main routes of travel. In addition to the increased potential for water and cooler green environment, desert canyons provide relatively convenient routes of travel. Use competition decreased in the Escalante River corridor after its closure to livestock in 1994; however, with increased recreation use in side canyons, tributaries and box canyons, conflict between recreationists and livestock is increasing.

One example of competition for use of space is locating a suitable backcountry campsite. In some popular recreation areas (The Gulch, Lower Hackberry Canyon, Upper Paria River) the cumulative effects of grazing activity (soil compaction, manure build-up, loss of vegetation) have made it difficult to locate a campsite that has not been impacted by livestock activity. This is particularly true for backcountry users trying to find shelter beneath a shade tree (cottonwood or juniper) where the ground is often times compacted and littered with cow manure. Livestock seek these locations as well for resting or bedding areas. In many cases, it is necessary to clear the ground of manure in order to pitch a tent or lay out a sleeping bag.

Another example of competition for use of space results when backcountry users and livestock have encounters on the trail. Livestock behavior can vary considerably during these encounters ranging from quiet curiosity to a frightened run. The range of behavior seems to largely depend on the topography and availability of avenues of escape. Human behavior can play a part as well, and can either exacerbate or decrease the conflict. In general, the gentler the terrain and the more open the route of travel, the more calm livestock behave when encountering backcountry recreationists. Under these circumstances, livestock have many options for avoiding human contact. In contrast, encounters in canyon environments can result in the unintentional herding of livestock by hikers and equestrians. This is particularly true for steep-walled and narrow canyons where livestock have few options for escaping human contact. Such situations could conflict with the values and expectations of backcountry recreationists.

The competition of the use of space could increase stress levels for both backcountry recreationists and livestock and also could increase the risk of an injury. For example, instead of enjoying a trip through a scenic narrow canyon (a major recreational attraction for the area of concern), hikers and equestrians must instead focus on how to get around livestock. The recreational experience could be depreciated by having to hike with livestock and/or manure in a canyon. Those seeking solitude or the opportunity to observe wildlife could have their experience depreciated as well. Some hikers, concerned for their safety, could be displaced and choose to recreate elsewhere.

Competition for Use of Water Resources

Although water is a relatively scarce resource, competition for physical access to water is generally not an issue. The primary issue is the impacts that occur when livestock pollute the water source with their manure.

An additional issue is the sediment that gets stirred up by livestock walking through and standing in water sources. This behavior makes it difficult for those hikers who use a water filter to purify their water, as filters are quickly clogged by suspended sediment. While these conflicts occur most often at small, isolated springs, they can be an issue as well along extended water courses, as backcountry recreationists seek undisturbed portions of stream flow (absent of manure, and turbidity) to filter their water.

Reduced Natural Appearing/Aesthetically Pleasing Environment

Some backcountry recreationists, particularly those seeking a primitive and natural recreation experience, have a conflict with the immediate presence of livestock and the physical effects of their activity.

Some specific examples of the physical effects of livestock grazing activity (direct and indirect) that decrease the overall naturalness of the environment, and which can adversely affect the recreation experience include:

Multiple Trailing and Other Surface Impacts

As livestock go about the pursuit of food and water, multiple trails are created. Some hillside trails can be quite prominent and form an unnatural terraced appearance. Livestock create multiple trails along and adjacent to riparian areas as well in their ongoing search for food and water. These effects are particularly noticeable in areas that are repeatedly grazed year after year. Even though some of these effects can be produced by wildlife (deer, elk, big horn sheep, etc.), they differ in character and intensity and are an intrinsic part of the natural environment.

Deceased Livestock

The Gulch Outstanding Natural Area and Buckskin Gulch (Paria Canyon-Vermilion Cliffs Wilderness Area) are both popular recreation use areas that have repeated incidence's of dead livestock along the hiking corridor. In The Gulch, livestock sometimes die in the watercourse, contaminating the water downstream.

Range Improvement Projects

The presence of range improvement projects (RIPs), such as corrals, loading chutes, barbed wire fencing, developed springs (plumbing/metal ring tanks), historic range camps, and stock ponds can contribute to a decreased natural appearance and aesthetically pleasing recreation environment. Encountering range improvement projects is more likely to be an issue for backcountry recreationists seeking a primitive recreation experience, than for frontcountry recreationists who are oftentimes vehicle sight-seeing. On the other hand, some recreationists, especially those interested in western culture, could appreciate RIPs.

Barbed wire fences and gates can be particularly problematic for both range and recreation management. This is true for both frontcountry and backcountry settings. In frontcountry settings, there are many locations where barbed wire fences and gates intersect roads. Many of these barbed wire gates are difficult to open/close, especially for the inexperienced user. Opening/closing these gates requires pulling/stretching the gate across the road between two anchor posts. Securing the gate is accomplished by placing a loop, or wrap of wire, around one of the anchor posts while maintaining constant tension. Sometimes the effort can be quite challenging. The result is that some visitors are unable to open some gates and are forced to change their plans. At other times, they are able to open a gate but not able to close it. This is problematic for livestock operations as well as recreationists.

Much of the above explanation applies to backcountry settings as well. An example is a backcountry recreationists (hiker or equestrian), who while hiking or riding, encounters a barbed wire fence. Depending on the physical ability of the user, crossing barbed wire can prove to be a challenge, and in some cases, can even result in injury. Fencing restricts travel on horseback to gated routes. Some fences have been vandalized by users who sometimes resort to cutting several strands of wire or even an entire section of fence to accommodate easy passage. The same applies to difficult to open/close barbed wire gates, which are occasionally installed in the short sections of drift fence across desert canyons and washes. In many cases, the gates are simply left open by users which is problematic for livestock management.

Range Management Activity

Some recreational users enjoy observing range management activity, such as feeding, herding, or cattle roundups. These activities are an integral part of western culture and have been chronicled in or have provided a central role for Western films. For some (particularly foreign visitors), being able to observe this type of activity first-hand is a lifetime highlight. Much of this activity takes place in frontcountry settings and along backcountry transportation routes.

On the other hand, some recreationists do not appreciate range management activity when it intrudes into the backcountry setting. Many backcountry users actively seek out primitive recreation experiences in order to escape the sights, sounds, and activities of daily human commerce.

ALTERNATIVE A – NO ACTION

LIVESTOCK GRAZING

There would be no change in the amount of livestock grazing use authorized as compared to current active use and no change in resource conditions. No allotments would be closed to livestock grazing. There would be no direct or indirect impacts to Livestock Grazing because there will be no change in current Livestock Grazing management.

CHAPTER 4
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Changes to existing management would be limited to those short-term adjustments commonly associated with on-going allotment administration such as requests for change of season of use, modification to pasture rotation use, voluntary non-use, transfers and temporary non-renewable use.

Rangeland Health Standards

Nine allotments would continue to fail to meet Rangeland Health Standards: Collet, Death Hollow, Ford Well, Soda, Mollies Nipple, Rock Creek-Mudholes, School Section, Upper Paria, and Vermilion. With rangeland projects considered on a case-by-case basis and while specific localized management changes would be proposed in response to the results of the Standards evaluations, it is uncertain whether these lands would make progress towards meeting Standards. The determination that an allotment was not meeting Standards was made by addressing the overall condition of the allotment, not small, site specific, failures. Without corrective management actions, some additional allotments which were evaluated as meeting Standards, even though specific areas within them did not, would likely fail to meet Standards in future assessments.

Compliance with the BLM's range management regulations, which require a response by the next grazing seasons to Evaluations and Determinations that find Standards are not being met due to existing grazing management, would not occur.

Allotment Specific Consequences

Circle Cliffs

Under the No Action Alternative no changes would be made to remedy the conflict between hikers and livestock. The season of use (Nov. 1-March 31) could still overlap the heavy use period for hikers (March 15-Nov.1). There would be no additional impacts to permittees on the Circle Cliffs Allotment.

Clark Bench

No change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates or resource management from current conditions. Trend would remain static to upward on the four monitored trend locations. The allotment has the potential to fail the riparian Standard at Calf Spring should the permittee decide to resume grazing at the allowed level of active use. Recommendations for future changes to prevent damage to Calf Spring would come through meetings with permittees and the BLM.

Collet

(Uplands and Riparian did not meet)

No change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates or resource management from current conditions. The allotment should continue to fail to meet the Standards for both upland and riparian areas. Recommendations for future changes would come through meetings with permittees and the BLM.

Coyote

No change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates or resource management from current conditions. The allotment

should continue to fail to meet the Standards for upland areas. Failed seedings would eventually be restored, but as a low priority. Recommendations for future changes would come through meetings with permittees and the BLM.

Trend would remain downward on the winter use pastures, leaving an overall downward trend on the ten monitoring sites.

The allotment would continue to fail Standards on four of the seventeen Rangeland Health Indicator sites.

Death Hollow
(Riparian did not meet)
No change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates or resource management from current conditions. Until the springs are fenced and the road is altered from its current course through Wolverine Spring, this allotment should continue to fail to meet the Standards for riparian areas. With some cattle remaining into mid-May, and without additional fencing to keep cattle from high recreational use areas on the allotment, conflicts between livestock and recreational uses would continue in Little Death Hollow and on Wolverine Creek. Recommendations for future changes would come through meetings with permittees and the BLM.

Trend on this allotment is downward. However, it is drought, not livestock that is causing the decline in desirable species (see Appendix 1).

Ford Well
(Riparian did not meet)
No change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates or resource management from current conditions. The allotment should continue to fail to meet the Standard for riparian areas. Recommendations for future changes would come through meetings with permittees and the BLM.

Soda
(Uplands and Riparian did not meet)
No major change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates or resource management from current conditions. The allotment should continue to fail to meet the Standards for riparian areas, but some improvement is expected toward reaching upland Standards. Recommendations for future changes would come through meetings with permittees and the BLM.

Currently trend is monitored at seven locations and appears to be static to slightly upward.

King Bench
No change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates, or resource management from current conditions. No other range related issues are present since The Gulch is rated at PFC and all upland sites that pasture are meeting the standards.

Lake
No major change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates or resource management from current conditions. While recommendations for future changes would come through meetings with permittees, the BLM, and GCNRA.

Trend in this allotment is based on four photo plot sites. The allotment is static to slightly upward overall, and should continue upward.

Last Chance
No change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, grazing dates or resource management from current conditions. Management changes must be done through individual environmental assessments and resulting decisions (such as fencing individual riparian areas that are impacted by livestock). Trend is down because of severe drought (loss of seeded species).

Mollies Nipple
(Uplands and Riparian did not meet)
No change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates or resource management from current conditions. The allotment should continue to fail to meet the Standards for both upland and riparian areas. Recommendations for future changes would come through meetings with permittees and the BLM.

Trend would continue to be downward under this alternative.

Rock Creek-Mudholes
(Riparian did not meet)
No change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates or resource management from current conditions but would be reauthorized based upon the past permit. Removal of the wild cattle from this allotment has improved conditions and trend appears to be upward. Recommendations for future changes would come through meetings with permittees, the BLM, and GCNRA.

Trend within the allotment is monitored at seven different locations. Based on the most recent trend information, trend appears to be static to slightly upward. Under current management trend is expected to continue upward.

School Section
(Uplands did not meet)
No change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates or resource management from current conditions. The allotment failed to meet the Standards for upland areas. Recommendations for future changes would come through meetings with permittees and the BLM.

Under this alternative, the long-term trend would continue to decline in 352 acres of the old seeding. The other sites that make up the remainder of the vegetative site on the allotment would remain in a static to upward trend.

Upper Paria
(Uplands and Riparian did not meet)
No change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates or resource management from current conditions. The allotment may continue to fail Standards for upland and riparian areas under this alternative. Recommendations for future changes would come through meetings with permittees and the BLM.

Trend would remain static under this alternative.

Vermilion
(Uplands and Riparian did not meet)
No change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates or resource management from current conditions. The allotment may continue to fail Standards for both upland and riparian areas under this alternative. Recommendations for future changes would come through meetings with permittees and the BLM.

Trend on this allotment is static, and would continue static.

Willow Gulch
No change is anticipated from this alternative, as there is no immediate change in grazing preference, dates or resource management from current conditions.

The Lower Calf Creek Falls Pasture would remain closed to grazing maintaining the 1964 decision.

Of the six upland sites rated, all six met Standards, while the one riparian reach rated as "Proper Functioning Condition". It is expected that impacts from this alternative would not diminish the resource and it would continue to meet Standards in the future. Overall trend would be upward or static depending on the ecological site.

VEGETATION

There will be no direct impacts to vegetation as a result of this alternative. Indirect impacts are described for each plant community below.

Aspen
Under the No Action alternative, aspen stands would continue to regenerate, based on 2007 analysis.

Evergreen forest
Evergreen forest plant communities currently receive light use and minimal impacts from livestock grazing. These impacts would likely continue under the No Action alternative. Potential for indirect negative impacts may occur from increased livestock use as adjacent plant communities reach capacity and grazing is shifted onto Evergreen Forest communities.

Oak woodland
Impacts of the No Action alternative may include an eventual degradation in the health of this plant community or a potential site conversion to Pinyon-juniper woodland. These impacts would be the result of indirect impacts on adjacent plant communities. If range conditions continue to deteriorate under this alternative, grazing pressure in adjacent Sagebrush-grasslands and Pinyon-juniper woodlands may favor an increase in juniper recruitment. Juniper expansion from these communities may reach into Oak Woodland, particularly if competition is reduced from grazing pressure. Progress would not be made towards achieving DPC for Oak woodlands.

Pinyon-juniper woodland
Impacts on Pinyon-juniper communities would include continued degradation to understory vegetation that would result in a loss of grass and forb components and an increase in the amount of dead and decadent shrubs. In areas where late spring grazing regimes are present, replacement of cool season grasses with warm season grasses could continue. This plant community may also receive indirect impacts as a result of reduced forage in adjacent Sagebrush-grasslands. Pinyon-juniper woodlands typically experience light grazing but as resources are diminished in adjacent Sagebrush-grasslands, Pinyon-juniper woodlands could receive an increase in use and subsequent reductions in cover and desirable species. Progress would not be made towards achieving DPC for Pinyon-juniper woodlands.

Ponderosa pine/Douglas-fir
Under the No Action alternative, Ponderosa Pine/Douglas-fir communities would receive marginal impacts. Because this is a relatively uncommon community type with limited grazing pressure, no direct impacts are expected. Indirect impacts may occur if adjacent cover types reach carrying capacity and grazing pressure is shifted onto Ponderosa pine/Douglas-fir communities.

Blackbrush
Impacts on Blackbrush communities under the No Action alternative may include further degradation with respect to understory cover and shrub diversity. Other current impacts that would continue include exotic species invasion, replacement of cool season grasses with warm season grasses. Continued grazing pressure may cause an increase in blackbrush density and a reduction of understory species, making the community more susceptible to weed invasion. No provisions would be made for achieving DPC.

Desert shrub
Under the No Action alternative, Desert shrub communities would likely continue with currently observed trends towards increased cover of exotic species and shifts in species composition. Although the Desert shrub type contains many different assemblages of plant species with differing responses to grazing, some general impacts can be expected. Many of the impacts are

long-term in nature and include a decrease in overall shrub and grass cover (particularly of palatable species such as bud sagewort, fourwing saltbush, and winterfat). Many of the Desert shrub communities in the Monument are at a threshold state where continued impacts from grazing my cause a shift in biotic integrity from functioning to Non-Functioning. No progress would be made toward achieving DPC for this community type.

Grassland and Meadow

The No Action alternative would primarily impact Grassland and Meadow communities that are functioning at risk or failing to meet Standards. Prolonged grazing without changes in management would continue current problems at these sites such as invasion of exotics, shifts in species composition, and increases in bare ground. Subject to elevation, climate, and soils, grasslands may be susceptible to conversion to mixed Desert shrub, Sagebrush, or Pinyon-juniper grasslands. Continued grazing pressure within these shrub-grasslands can result in a decrease in grass composition, or invasion by annual grass species. Disturbed grassland sites may become overtaken by cheatgrass, red brome, or other annual exotic grasses or forbs. As the results of the biotic indicators in the Rangeland Health Assessments show, these effects have been seen on the Monument. No progress would be made toward achieving DPC for Grassland and Meadow communities.

Mountain shrub

Impacts associated with the No Action alternative to Mountain shrub communities are not expected to be substantial. Because of the relative scarcity of this cover type in the Monument, it does not receive much grazing pressure. All sites sampled for rangeland health were functioning normally and would likely continue to function normally unless indirect influences from adjacent plant communities occurred.

Sagebrush-grassland

The No Action alternative would likely have the greatest impact to the Sagebrush-grassland community type. While Sagebrush-grasslands are composed of several different types of sagebrush, some general impacts associated with continued grazing can be noted. Continued levels of grazing may reduce the vigor and reproductive capability of edible shrubs (such as Fourwing saltbush) while favoring less palatable species like rubber rabbitbrush, big sagebrush, and broom snakeweed. A decrease in grasses may occur and this, coupled with an increase in shrubs, may facilitate pinyon and juniper invasion. This occurs through an increase in the cover of nurse shrubs necessary for woodland establishment. On some soil types and topographic positions, increased Pinyon and Juniper densities in Sagebrush-grasslands can result in decreased understory cover and species richness, and make these sites more vulnerable to soil loss from erosion (West and Young 2000).

Seedings

Under the No Action alternative, seedings may continue to experience downward trends with only temporary closures following rehabilitation measures. Many of the seedings have experienced recent mortalities in seeded species, particularly with crested wheatgrass, and if not rested or rehabilitated may become dominated by exotic species. With the loss of forage species in seedings, grazing pressure may be increased on shrub species or on adjacent plant communities.

Wetlands/Riparian

Although a relatively small component of the Monument, riparian cover types would receive continued impacts under the No Action alternative. Many riparian areas would continue to have water developments inside the riparian zone which would continue to negatively impact vegetation through concentrated use and trampling. Erosion control measures would not be implemented where needed resulting in the draining of riparian areas and loss of wetland vegetation. Canyons would continue to receive concentrated use which would degrade riparian vegetation. Under this alternative no rest would be given to riparian vegetation in several pastures resulting in little improvement to riparian vegetation. With no improvements in native riparian communities, exotic species would remain and continue to spread. Densities of Russian olive and Tamarisk may reach uncontrollable levels in many reaches. Impacts described here would be both direct and indirect.

THREATENED, ENDANGERED AND SENSITIVE PLANT SPECIES

Many of the special status species found in the Monument are edaphic endemics that are restricted to sparsely vegetated sites with specialized soil or bedrock characteristics. These are often harsh sites that provide little forage for livestock and are frequently inaccessible because of steep slopes. Because of these habitat features, most special status plant species receive little to no impacts from livestock grazing. Potential does exist for indirect negative impacts as a result of habitat degradation from invasive weed species from adjacent habitats and loss of pollinators that rely on the health of the surrounding vegetation. Indirect impacts are the most likely influences on special status plant populations under the No action alternative.

Current threats to the Kodachrome bladderpod are mainly related to off-road vehicle use but trampling by livestock is a possibility. No provisions would be made for protecting this species under the No Action alternative. The population status would remain the same or potentially decline. Approximately 599 acres of habitat are occupied by the Kodachrome bladderpod in the Dry Valley, Upper Hackberry and Upper Paria allotments. The population size and condition would remain the same or decrease as a result of ongoing threats.

Ute ladies' tresses has a restricted distribution (King Bench Allotment, Deer Creek) in the planning area and is managed in a manner that generally encourages the growth of the species. Winter grazing benefits this species by removing competing plant cover. Approximately 49 acres of riparian habitat is occupied by Ute ladies' tresses. Under the No Action alternative, current grazing practices would continue, which would maintain the population at its' current levels.

Jone's cycladenia would remain unchanged. Several sites are known of this species within the planning area. The site occupies approximately 36 acres of steep, remote habitat in the Moody allotment that is inaccessible to livestock. No change to this population is anticipated under this alternative.

RIPARIAN AND WATER RESOURCES

Watershed Health

Grazing management would not be modified, except on a site-specific basis. Degraded hydrologic conditions in dominant plant communities would remain static or continue to degrade as vegetative and soils resources continue to be impacted by livestock grazing. Cover of shrubs, grasses, and litter would remain depressed, resulting in increased runoff. Plant communities with relatively high infiltration rates, such as aspen, oak woodlands, grasslands, and Sagebrush-grasslands, would be susceptible to conversion to communities with lower infiltration rates. Seedings would continue to deteriorate and would be vulnerable to high rates of runoff. Upland hydrologic conditions governing infiltration and runoff would not improve in the six allotments (for 473,323 acres or 21% of the planning area) not meeting Standard 1.

Riparian Proper Functioning Condition

Under this alternative, BLM's policies regarding riparian areas would still be carried out, therefore we would anticipate that riparian restoration would occur resulting in positive direct and indirect impacts to riparian communities.

Water Quality

Current trends in upland and riparian areas would continue, and some upland areas would continue to deliver runoff and sediment to streams. Because the primary sources of total dissolved solids (TDS) are marine shales ('badlands') that are naturally highly erosive and receive light grazing pressure, grazing would continue to have negligible or minor indirect or direct impacts on TDS and salinity.

Using tools contained in the Riparian Toolbox, offsite water and shutoff valves would reduce the magnitude and duration of dewatering which may reduce water temperatures in some spring-fed streams.

SOILS

The soils resource would improve the least under Alternative A of any of the alternatives and the direct and indirect impacts as discussed below would continue. Livestock management would continue at the present authorized use levels with minimal, if any, changes to grazing permit terms and conditions. Currently closed areas would remain closed to livestock grazing, but no additional closures would be proposed. The current conditions on most allotments exhibit less vegetative diversity, particularly grasses and forbs, than would be expected for native rangelands. This contributes to a deficiency in the amount of litter and an increase in the percent of bare ground. A lack of litter increases overland flow exacerbating erosion. Authorized use at this level is not expected to result in the increased protective cover of residual vegetation and litter resulting in reduced areas of bare soil.

Soil health including micro-organism populations, infiltration, aggregate stability, porosity, plant nutrients, litter accumulation, organic matter, woody material accumulation most likely would not be enhanced.

Management activities would retain the existing emphasis on avoiding and/or mitigating detrimental compaction, wind and water erosion.

Existing and proposed uses would receive standard monitoring to detect any unacceptable soil erosion and compaction.

Soil disturbance would be minimized during management activities including vegetation management projects (i.e., mechanical harvest of Pinyon-juniper, seed bed preparation, and drilling seed), but no new measures would be instituted for soil protection. Surface disturbance that would cause loss of litter and the organic matter layer would be avoided on a site specific basis.

Under the "No Action Alternative" there would be no strategy for ensuring that eroding land rehabilitation would be a priority, with less of an emphasis on improving conditions in areas where there is a lack of ground cover, gullies, rills, and sheet erosion.

Current requirements do not necessitate that management ignited fire (prescribed fire) be low intensity fire that would only result in light soil heating, preventing undesirable chemical and physical alteration of the soil, including hydrophobic soils.

NOXIOUS WEEDS AND NON-NATIVE PLANTS

An indirect impact would occur because this alternative makes no major changes in grazing intensity or location, there will likely be a gradual increase in noxious and/or exotic species spread. This negative impact may rise to the level of significance if noxious weeds and non-native plant levels are not controlled.

Currently closed allotments would not experience any livestock dispersed increase in noxious and/or exotic species.

WILDLIFE

In this alternative, current livestock grazing practices and management strategies would continue. Direct and indirect impacts are described below for specific species.

Impacts on Migratory/Special Status Bird Species of Concern

The utilization standards (either 50% or 60%) established in the Management Framework Plans would be continued. These standards would maintain cover and a seed source from grass and grasslike species. Continuation of existing management would maintain or benefit bird species populations which respond well to the current (human impact altered) plant communities. Bird species which have been negatively impacted by historical plant community changes will continue to experience those negative impacts.

Monitoring data has verified that several of the rangeland seedings within the planning area are failing rangeland health standards. Seeding restoration is ongoing, and would continue under this alternative, but as a low priority. The lack of surface cover would have a positive impact on

birds that prefer that habitat, but those which require cover would continue to avoid these areas. Birds which require structural diversity would continue to avoid seedings.

On allotments with repeated growing season grazing use, ground nesting birds and nests would be subject to potential livestock trampling. Many ground nesting birds are migratory.

Repeated growing season grazing within specific plant communities, such as aspen, would continue to have impacts. Recurrent growing season use results in the selective, repetitive removal of palatable plant species, with a resultant modification in the overall composition of the plant community, and in some cases, a loss of protective cover. Specific examples include; a reduced understory of forbs in Pinyon-juniper woodlands, a reduction of perennial grasses in Sagebrush-grassland communities, a lack of juvenile recruitment in Aspen stands, or a change in structure in Mountain shrub communities.

Most changes to community composition have already occurred, as a result of over a century of livestock use. Impacts are most notable, and best understood, within the two communities where grass is a dominant component, specifically the Sagebrush-grassland and Grassland Meadow communities (10% of planning area). On a regional scale, historical herbivory has been identified as having a negative impact on Sage grouse and Sage sparrow. There has been a loss of understory grass and forb cover at nesting sites, leading to an increased susceptibility to predation. These impacts would continue under this alternative.

Within the Pinyon-juniper community, changes in community structure may have had a negative impact on Virginia Warbler, Black-throated Grey Warbler and Grey Vireo, since these birds require open woodlands with a shrub understory. Many of these woodlands have become closed canopy and lack an understory. This alternative would not modify that condition. (It should be noted that fire regime changes and invasive annuals are additional causal factors within this community, and both have postulated ties with grazing.) The lack of structural variety has also assisted other species, specifically the Pinyon Jay, which prefers large contiguous stands of mature trees.

On June 28, 2007 the Bald Eagle was removed from the list of Threatened and Endangered species but will continue to be regulated by the National Bald Eagle Management Guidelines, The Bald and Golden Eagle Protection Act, and The Migratory Bird Treaty Act. Impacts to this species are minimal with some impacts being increased food source in the form of carrion from dead cattle and in the loss of some cover for ground dwelling prey species. Recruitment of potential roosting trees may be affected by grazing practices in riparian areas.

Under this alternative the recovery of some riparian areas may be suppressed due to growing season use by livestock. This would retard establishment of woody species, and would continue negative impacts on riparian dwelling bird species which need structural diversity, such as Blue Grosbeak or Common Yellowthroat. As with other impacts under this alternative, most of the change has already occurred.

Impacts on Bats

Under this alternative there would be little to no change on bat roosting or foraging habitat in all habitats, or on water availability. Impacts on the overall composition of the plant community such as reduced understory of forbs and perennial grasses results in limited habitat for the insect prey community and the overall quality of bat foraging habitat. Suppressed recovery of riparian communities, a lack of juvenile recruitment in Aspen stands, and limited structure in Mountain shrub communities limit the availability of roosting habitat for riparian and tree-roosting bat species.

Table 4-1 Summary of Impacts on Bats

HABITAT TYPE	Non-riparian, Roosting	Non-riparian, Foraging	Riparian, Roosting	Riparian, Foraging	Open water, Foraging & Drinking
BAT SPECIES	Fringed myotis, Allen's lappet-brow bat, spotted bat, big free-tailed bat, Townsend's big-eared bat	Fringed myotis, Allen's lappet-brow bat, spotted bat, big free-tailed bat, Townsend's big-eared bat	Western red bat	Western red bat	Fringed myotis, Allen's lappet-brow bat, spotted bat, big free-tailed bat, Townsend's big-eared bat , Western red bat
IMPACTS	Little to no change in impacts on bat roosting habitat in cliff, cave, non-riparian tree and multiple habitats.	No change from existing impacts expected.	No change from existing impacts expected.	No change from existing impacts expected.	No change from existing impacts expected. Current water availability to bat species for drinking should remain unchanged.

Impacts on Game Species

Desert Bighorn Sheep

Under this alternative, ninety three percent (1,512,509 acres) of suitable Desert Bighorn habitat would continue to be grazed under existing terms and conditions. Impacts on Bighorns would continue, in the form of competition for grass, and competition for water. The later is of concern since Bighorn sheep tend to avoid water sources when livestock are present. Seven percent of Bighorn habitat would continue to be unavailable for livestock use, and would have no potential for livestock related conflicts.

Mule Deer

No changes in impacts on Mule Deer are expected under this alternative. Mule deer compete with livestock for browse, especially during the winter season, and that competition would continue. Livestock prefer grasses and forbs, but during winter, when both lack nutritional value, will shift their consumption to woodier species. Improved livestock management, specifically actions which shift livestock use from the growing season to dormant seasons may have an impact by increasing livestock browse use.

Pronghorn

No change in impacts on pronghorn are anticipated under this alternative. All suitable pronghorn habitat would continue to be grazed by livestock under current management. Competition for forbs during the early growing season would continue.

Sage Grouse
Impacts on Sage grouse would remain unchanged under this alternative. Impacts on occupied habitat would remain unchanged under all alternatives. Sage grouse currently occupy habitat on Black Rock and Pine Point allotment, and both allotments meet existing utilization standards, show good trend, and meet Rangeland Health Standards.

Impact on historical, but unoccupied, habitat would continue. Those impacts are primarily on brood rearing habitat. Sage grouse brooding habitat normally consists of areas of dense cover (which reduces predation), and near riparian zones (which provides food in the form of forbs and insects). Where currently lacking, understory cover would not increase under this alternative. Riparian areas with low or lost functionality would continue to provide poor brood rearing habitat.

Impacts on Fish and Aquatic Species
Under this alternative grazing management would continue largely unchanged and there would be no provisions to prevent consecutive spring season of use by livestock in riparian or upland areas. Herbaceous utilization standards would remain at 50 to 60 percent of current year's growth. Utilization on woody riparian species would not be lowered to 40 percent of current year's leader growth. Riparian areas would continue to be subject to livestock grazing during spring and summer. These conditions could impact the long-term recovery and health of riparian habitats with resultant impacts on fish and aquatic species which depend on them.

Impacts on Threatened and Endangered Wildlife Species
Mexican Spotted Owl
Habitat conditions in Mexican Spotted Owl critical habitat would remain unchanged. The three grazing guidelines in the Recovery Plan are being followed, and would continue to be followed under this Alternative, with the proviso that few riparian restoration projects have been identified for implementation of the riparian recovery guideline. Currently nine percent of the Mexican Spotted Owl habitat within the planning area is not used by livestock, and that would be continued.

Southwestern Willow Flycatcher
No change in Southwestern Willow Flycatcher habitat would occur under this alternative. Currently forty seven percent of Southwestern Willow Flycatcher habitat is open to livestock grazing, and fifty three percent is closed. Livestock would have continued access to riparian areas on the Paria River segments of their habitat, so little willow (or other shrub sized species) recovery would occur. (The Escalante River portions of Southwestern Willow Flycatcher suitable habitat are closed to grazing, and would have no changes in impacts.) Cottonwood Allotment, which contains most of the suitable habitat identified in the Recovery Plan, is currently grazed during the growing season, which means that the selective reduction of preferential browse would continue, with a continued and gradual net loss of willows and other shrub and tree species within riparian areas. Since these flycatchers depend on a dense riparian habitat of shrubs and trees, there would be no improvement in Southwestern Willow Flycatcher habitat or numbers under this alternative.

Existing utilization standards for current year's growth of grasses and shrubs would be continued under this alternative. While these standards would not increase available habitat, they would prevent new damage to them in that livestock browsing on riparian shrubs would be terminated prior to reducing shrub mass. The existing utilization standards are higher than those proposed under Alternatives C through E within suitable habitat, so there would be less habitat protection under this alternative.

Cultural Resources

Cultural resources would be managed under existing guidelines, and without the proposed Cultural Resources Protocol (Appendix 3) under the no action alternative. Site specific impacts on cultural sites would be mitigated when identified, with individual protective measures designed for each locale. While no new grazing is anticipated under this alternative, and with no redistribution of grazing intensity, existing impacts on cultural sites from indirect impacts (such as erosion) would continue. Additional direct impacts (such as trampling or rubbing of structures) would continue, but no new or cumulative effects are anticipated, since this alternative continues an existing use at an existing level of use. Under this alternative no cultural resource specific, grazing-related monitoring and research program would be initiated, so this alternative offers less protection to cultural site than the action alternatives.

Recreation

Conflicts between recreational users and livestock would remain as they are for the short-term, and would likely worsen over the long-term, as recreational use increases while resource conditions decline under the no action alternative.

ALTERNATIVE B

LIVESTOCK GRAZING

Implementing Alternative B would result in limited changes in authorized livestock grazing. No allotments would be closed to livestock grazing. Initially 76,507 AUMs would be authorized. The impacts would be both direct (short-term) or indirect (long-term) based upon the allotment descriptions found below.

Retention of the Phipps Pasture as a forage reserve would leave the status of the area unchanged.

Closure of the Antone Flat (currently unalloted) and Little Bowns Bench (currently a forage reserve) allotments and the Wolverine Pasture (currently a forage reserve) would have no impact as these areas are not used for livestock grazing and no AUMs are authorized within them.

For the remaining 73 allotments that meet Standards, changes to existing management would be minimal as they would be limited to those short-term adjustments commonly associated with on-going allotment administration such as requests for change of season of use, modification to pasture rotation use, voluntary non-use, transfers and temporary non-renewable use.

Allotment Specific Consequences

Circle Cliffs
Under this alternative livestock would be prevented from using the Upper Gulch Pasture of the Circle Cliffs Allotment after March 15. This would alleviate much of the conflict in the Upper Gulch. It would, however, require a change in management of the rest of the allotment. Cutting short the period of time that the Upper Gulch Pasture could be used would require changes to stocking rates and rotational schedules for the rest of the allotment. The changes resulting from altering the Upper Gulch Pasture may impact the permittees ability to properly use the rest of the allotment, since it would require the 15 days in the Upper Gulch Pasture to be made up in some other pasture of the allotment. This issue, compounded with the failed reseedings and increased elk use, may require future changes to stocking rates. A thorough allotment evaluation, which involves production measurements, may need to be completed. If an evaluation is necessary, and if changes to stocking rate are deemed necessary, reductions to stocking rates may be swallowed up in relinquishments on allotments nearby, should there be any offered.

Clark Bench
Livestock numbers would increase, but the season of use would be shortened by 30 days in the spring, resulting in no change to AUMs. Shortening the season of use by one month would improve the long-term trend on all four trends studies by increasing the number and percent cover of perennial grasses in each of the studies. The trend would improve because the perennials would be able to set seed every year as long as there is sufficient soil moisture remaining once livestock are removed from the allotment. The shortened season of use would allow for improved riparian stability on the dike at the Calf Spring impoundment as a result of enhanced vegetative cover. This would also move the functioning rating towards Proper Functioning Condition.

Establishing the Dive Pasture would reduce the utilization in the heavier used areas in Clark Bench because cattle would not be staying in the Clark Bench Pasture the entire season. The new pasture would improve cattle distribution especially in the new pasture by keeping the cattle in Dive longer then under current management.

Collet
(Uplands and Riparian did not meet)
Under this alternative rangeland conditions would be improved as compared to the "no action" alternative. While livestock numbers would not change, distribution would change due to fencing, water developments, and restoration projects. The exclusion of livestock from Right Hand Collet Canyon would help restore the riparian areas there through rest, but would result in a modified livestock rotation, since only two pastures would then be available for grazing. The spring rest requirement (GRAZ-2), along with the revised rotation would increase the upland rating for the allotment. Further improvement would result after the installation of a gap fence to create three pastures. Since the installation of these gap and exclusion fences is subject to funding, it is anticipated that the reduction of impacts would be phased in over the life of the plan. Considering the amount of time required for the environmental impacts assessment, funding, and construction of these projects recognition of on the ground gains would be slow. Once in place, riparian and upland areas would progress toward meeting Standards with a net increase in desirable species, litter, and soil retention; however, exotic and undesirable species would continue to be present.

Coyote
Under this alternative there would be no permanent AUM reduction, temporary non-use of 588 AUMs would be effective during restoration. Restoration activities would address the problems on Sand Gulch and Five Mile Pastures by increasing the percent cover and reducing the amount of overland flows within the old seedings. This would result in reduced soil erosion and more forage production in these two pastures. Long-term trend in these pastures would improve through increased number and density of perennial grasses once the new seeded plant species become established. The trend in the winter pastures would remain downward until recovery from the effects of the drought has been realized.

Permittees would be impacted by not being able to use 588 AUMs while these pastures are rested resulting in a short-term, significant, negative impact. In the long-term there would be a positive impact because there would be more forage available than is currently available. Currently the pastures receive infrequent use. After restoration is completed permittees would be able to use them at least once a year under a pasture rotation, which would also reduce grazing pressure on the pastures within the allotment which do not require restoration.

Death Hollow
(Riparian did not meet)
Livestock numbers would increase, but the season of use would be shortened by six weeks in the spring, resulting in no change to AUMs. Under this alternative cattle-recreational user conflicts would be diminished as compared to the "no action" alternative since cattle use would end on March 31 instead of the May 15. This alternative would not change livestock active preference. In order to achieve riparian Proper Functioning Condition, shared water exclosures would be constructed to allow for better protection of riparian resources, spring fences would be

developed. It is anticipated that this would reduce erosion and increase desirable vegetative cover, community, and litter throughout the allotment. Since the installation of structural improvements, such as fences, is subject to funding, it is anticipated that the reduction of impacts would be phased in over the life of the plan.

Currently grazing is authorized from November 1st through May 15th. Grazing would end approximately six weeks sooner, the off date being March 31st, which would reduce grazing pressure on perennial grasses during the early growing season. The rest would also assist in the recovery of riparian areas which are not proposed for exclosures.

Ford Well
(Riparian did not meet)
The authorized active use on the allotment would remain the same as in Alternative A. Ford Well and Old Corral Springs are located on the allotment and was rated as "Functioning At Risk", which led to the allotment failing to meet Standards. This alternative would propose the reconstruction of a structural range improvement in order to achieve PFC and to meet the Standards. Spring protection fences would be constructed or improved, which would allow the riparian area to enlarge to its potential, reduce the hoof action and trailing of cattle in the riparian area, reduce cattle use on and improve the riparian vegetation composition, age class distribution, vigor, and percent cover.

Soda
(Uplands and Riparian did not meet)
Under this alternative rangeland conditions would be improved as compared to the "no action" alternative. While livestock numbers would not change, distribution would change due to fencing, water developments, and restoration projects. Once in place, riparian and upland areas would progress toward meeting standards. Combining Fortymile Ridge Allotment and Soda Allotment would still be considered, as would the development of a revised rotation strategy to incorporate the pastures gained from Soda Allotment.

Water developments would be constructed to allow for better protection of riparian and upland resources. It is anticipated that this would reduce erosion and increase desirable vegetative cover, community, and litter throughout the allotment. Riparian areas which do not meet Standards should improve with a net increase in desirable species, litter, and soil retention, however, exotic and undesirable species would continue to be present. Since the installation of structural improvements is subject to funding, it is anticipated that the reduction of impacts would be phased in over the life of the plan. Considering the amount of time required for the environmental assessment, funding, and construction of these projects, recognition of on the ground gains would be slow.

Long-term trend would continue to be static to slightly upward.

King Bench
No change in impacts is anticipated from this alternative, as there is no immediate change in grazing preference, dates, or resource management from current conditions. No other range related issues are present since The Gulch is rated at PFC, and most upland sites in that pasture are meeting the standards.

Lake

This alternative would not change livestock numbers, but livestock distribution and use periods would change. Fences would be constructed to protect springs and reaches allowing for better protection of riparian resources. Since the installation of structural improvements is subject to funding, it is anticipated that the reduction of impacts would be phased in over the life of the plan. Considering the amount of time required for the environmental assessment, funding, and construction of these project, on the ground gains would be slow, but once in place, riparian areas would progress toward PFC with a net increase in desirable species, litter, and soil retention.

Trend in the Lake Allotment is based on four photo plot sites. The allotment is static to slightly upward overall, and with the changes in livestock distribution and structural range improvements, trend should continue upward.

Last Chance

Impacts would be the same as analyzed in Alternative A

Mollies Nipple

(Uplands and Riparian did not meet)

The authorized active use would remain at 3,862 AUMs in this Alternative. This is the same as in the No Action Alternative.

The permitted season of use would remain 12 months with approximately 30 days being spent on private ground at Nipple Ranch and deferring use on the transition pastures by using two in the fall and two in the spring and alternating the sequence on a yearly basis. This would allow rest during the growing season for both warm and cool season forage species. This would change how the livestock operator rotates his cattle through the different pastures on the allotment. Two of the five transition pastures, Jenny Clay, Blue Spring, Telegraph, Mine Spring and Rockhouse Pastures would be rested every year during the growing season April and May, and two would be used in the fall approximately October and November.

The change in the season of use would benefit the cool season grasses by providing these plants periodic rest during the critical growing period which occurs during the months of April and May. This change would also improve the vigor of the perennial grass species. The grass species, especially the cool season grasses, would increase in number and percent cover as a result of this change.

Restoration of the old seedings and the areas of sagebrush die off in the Rockhouse and Mine Spring Pastures would increase the amount of forage for livestock as compared to what is currently available in these degraded areas. Restoration activities, once successfully completed, would restore the number and percent cover of cool season grasses. Resting the pastures where restoration actions are implemented would impact the pasture rotation for a minimum of two and possibly up to five years. The length of the rest period would depend on when the new seedings meet restoration objectives.

The combination of season of use change and restoration work would allow the allotment to start making progress toward meeting Standards. The combination of both actions would increase the

number and percent cover of perennial grasses, increase ground cover, reduce overland flow by water, and reduce plant mortality. Restoration would not immediately increase biological crusts.

The trend would improve first due to the deferred rest these pasture would receive during the critical growing period for grass species and secondly due to restoration activities in the Rockhouse, Mine Spring, Blue Spring, Jenny Clay and Telegraph Pastures, which would increase the number and percent cover of perennial grass species in these pastures.

Spring protection fences or redesigning of the water developments would increase the percent cover of the riparian vegetation, improve vigor, diversify age-classes and reduce or eliminate altogether, hoof action and trailing of livestock. Once the protection fences are constructed cattle would not be a contributing factor to not meeting standards.

The proposed Buckskin Gulch fence would eliminate the recreational/livestock conflict in lower Buckskin Gulch. There would be no decrease in active use from the construction of the fence. Restricting livestock use in Buckskin Gulch would assist in moving this area towards meeting Standards.

Since the installation of structural improvements is subject to funding, it is anticipated that the reduction of impacts would be phased in over the life of the plan. Considering the amount of time required for the environmental assessment, funding, and construction of this project, on the ground gains would be slow.

Rock Creek-Mudholes
(Riparian did not meet)
There would be no change in active use, grazing would be reauthorized at current levels. Fencing and restoration of riparian sites would be a priority. It is anticipated that this would reduce erosion and increase desirable vegetative cover, community, and litter throughout the allotment. This would be verified by monitoring. Since the installation of structural improvements is subject to funding, it is anticipated that the reduction of impacts would be phased in over the life of the plan. Once in place, riparian areas would progress toward PFC, however exotic and undesirable species would continue to be present.

Trend within the allotment will improve under this alternative.

School Section
(Uplands did not meet)
Under this alternative rangeland conditions would be improved as compared to the "no action" alternative. While livestock active use, number of livestock or season of use would not change, Rangeland Health would improve upon completion of the seeding restoration activities planned for in this alternative. Restoration activities would be completed as funding becomes available. Considering the amount of time required for the environmental assessment, funding, and implementation of the restoration activities on the ground gains would be slow until the activities are completed. Upon completion of the restoration activities there would be a decrease in undesirable species such as Russian thistle, cheatgrass and other annuals and increase of perennial grasses.

The long-term trend would improve upon completion of restoration activities especially in the 352 acres of the old seeding. The other sites that make up the remainder of the vegetative site on the allotment would remain in a static to upward trend.

Upper Paria
(Uplands and Riparian did not meet)

Under this alternative rangeland conditions would be improved as compared to the "no action" alternative, which would result from temporary reduction of cattle numbers, temporary changes in season of use, and adaptable rotation strategies. An active Grazing Association oversees this allotment and one of the impacts from this alternative would be the nurturing of trust and a working relationship between the BLM and grazing permit holders. This grazing association has demonstrated a willingness to work with the BLM for the protection and enhancement of resources in the past and it would be beneficial to both parties and the resource to continue this relationship.

Rehabilitation actions would result in an increase in hydrological function and desirable species. As resource goals are met, the grazing levels would be restored in direct relationship to sustainable levels of available forage. Once a balance is achieved, proper socking rates would be identified on a more permanent basis that satisfies both resource objectives and the economic sustainability of the permittees. Restoration and revised livestock management, combined with continued involvement of grazing association members in adjusting annual stocking rates and utilization levels for the allotment/pastures would achieve satisfactory progress toward meeting Standards during the life of this plan. The other upland sites that are not located in seedings would also benefit from this course of action as the amount of cattle on the ground during the grazing season would relate directly to available forage on a yearly basis. This would greatly reduce overuse of desirable species while giving perennial grasses a chance to produce seed, build, and store the necessary carbohydrates for plant survival and production reserves. Increased litter would aid in dispersing overland flow and decrease erosion in areas determined to have poor hydrological function.

Riparian sites impacted by grazing would also show improvement under the above course of action. However, the major factor behind three reaches of Willis Creek, one reach of Henrieville Creek and one reach of Little Creek ranking as "Non-Functional" were diversions and ditches, and these areas would most likely not reach PFC since these impacts are beyond the authority of BLM to control. Private water use also impacted several riparian sites rated "Functioning At Risk" such as Willis Creek, Heward Canyon, and Sheep Creek; however through a combination of structural improvements and management methods discussed above stream bank vegetative cover, plant vigor, and stream morphology would improve under this alternative.

Overall trend would be upward or static depending on the ecological site. Mid and late seral species would most likely increase, represented by recruitment of perennial cool-season grasses in upland sites.

Vermilion
(Uplands and Riparian did not meet)
The active use on the allotment would remain at 2,849 AUMs. The season of use would be changed approximately April 15th through May 20th and then from June 1st through February 28th.

Changing the season of use so that cattle are not authorized during the active growing period for grass species would have a beneficial impact to the cool season grasses, especially in the seedings located in Fossil Wash, Seaman Wash, Government Reservoir and the three RCA Pastures. The cool season grasses in these pastures would be allowed to set seed every year in each of the pastures instead of being grazed every year in some pastures and other every other year in others.

Restoration activities proposed for this alternative would address the Rangeland Indicators that were not meet on the allotment. The soil erosion problem would be corrected with the seeding of perennial grasses and the initiation of erosion control structures and activities. These actions would reduce the gullying and rills formation, overland water flow, infiltration, and bare ground, while increasing perennial grass cover and correcting low annual production, litter and reproductive potential. Restoration activities would improve Rangeland Health by allowing the water retention to increase, resulting in an increase in the ground cover percentage by perennial grasses. Erosion control activities would slow the flow of water across the landscape decreasing soil loss. The pastures would not be closed until restoration is funded, and would continue to fail the soil and biotic Standard until restoration work is approved.

Restoration activities would impact the livestock operator in that after reseeding, pastures would not be available for grazing for a minimum of two years and possibly more. This closure would require a change in pasture rotation while the season of use for the allotment would be shortened until all of the restoration objectives are met for the restoration efforts.

Since the installation of structural improvements is subject to funding, it is anticipated that the reduction of impacts would be phased in over the life of the plan. Considering the amount of time required for the environmental assessment, funding, and construction of these project, on the ground gains would be slow.

Growing season rest would result in a slightly upward trend.

Willow Gulch
Same as Alternative A.

VEGETATION

There will be no direct impacts to vegetation as a result of this alternative. Indirect impacts are described for each plant community below.

Aspen
Under Alternative B, aspen stands would continue to regenerate, based on 2007 analysis and slowly progress towards DPC standards.

Evergreen forest
Evergreen forest plant communities currently receive light use and minimal impacts from livestock grazing. These impacts would likely continue under Alternative B. Potential for indirect impacts may occur as adjacent plant communities reach capacity and grazing is shifted onto Evergreen forest communities.

Oak woodland
Changes in distribution as a result of range developments and growing season rests would assist this community in reaching DPC parameters. Many of the Oak woodland communities in the Monument are functioning and would continue to function under this alternative with improvements in overall health occurring over time. Oak woodlands would receive a lower priority for monitoring under this alternative and changes in community structure or invasion by juniper may go undetected.

Pinyon-juniper woodland
Impacts on Pinyon-juniper woodlands would include slight to moderate improvements in understory species cover and diversity. With no changes in stocking rates, these improvements would likely occur slowly, with incremental changes over time. Progress would be made towards achieving DPC for this community. The specific criteria outlined in the DPC for Pinyon-juniper woodlands would create higher priorities for restoration activities in this cover type. A more diverse age structure and greater diversity of understory species would be achieved and maintained over time with this alternative. The timeframe for achieving results would not be accelerated but gradual improvements would occur over time.

Ponderosa pine/Douglas-fir
Under Alternative B, Ponderosa Pine/Douglas-fir communities would receive marginal impacts. Because this is a relatively uncommon community type with limited grazing pressure, no substantial impacts are expected. Slight improvements to community health may occur as a result of growing season rest requirements implemented in the "Management common to all" measures. Indirect impacts may occur if adjacent cover types reach carrying capacity and grazing pressure is shifted onto Ponderosa pine/Douglas-fir communities. This cover type would likely receive a lower priority for monitoring and shifts in community composition may go undetected.

Blackbrush
Under Alternative B, Blackbrush communities would experience gradual improvements to community health and may slowly progress towards achieving DPC. Blackbrush communities are not particularly resilient and improvements to vegetation cover and diversity may be slow at best under this alternative. Growing season rest would allow some of the native species to recover but complete recovery and reaching DPC objectives may not be possible without more substantial modifications to livestock management. Sites that were determined to have a moderate departure from the reference area have the best chance to show improvements to soil erosion, and species composition. Shifts in composition from cool season grasses to warm season grasses may be irretrievable without season use modifications. Sites that are not functioning would be prioritized for monitoring under this alternative but overall improvements in this plant community are expected to be slow.

Desert shrub
Under Alternative B, desert shrub communities would show some gradual improvements in overall vegetation cover and biological soil crust cover. Changes in species composition may be longer term in nature under this alternative. These communities would not likely be prioritized for restoration under this alternative and would not likely receive the inputs necessary to cause a shift in species composition. Progress towards DPC would be gradual. Soil loss and erosion have been identified as impacts on this community and changes in distribution and growing season rest would result in improvements over time to these factors which would be a positive impact. Desert shrub communities often occur in dry low elevation sites, often with saline soils, and as such are naturally slower to recover from disturbance than other communities. With this alternative, changes would also occur slowly because most of the desert shrub communities would not receive high priority for monitoring. As a result, sites that are at a threshold state may not receive corrective measures soon enough to adjust management.

Grassland and Meadow
Grassland and Meadow communities would benefit from the improved distribution and growing season rest measures associated with Alternative B. Improvements to this community would include a long-term increase in total vegetation cover and subsequent decrease in the amount of bare ground. Reduced surface resistance to erosion is a concern in some grassland sites and growing season rest would allow increases in vegetation cover and litter to improve these conditions. Under this alternative, changes in species composition (increased diversity and frequency of desirable and appropriate species) may not be detectable for many years unless the community is prioritized for more substantial changes in management or restoration.

Mountain shrub
Impacts associated with Alternative B to Mountain shrub communities are not expected to be substantial. Because of the relative scarcity of this cover type in the Monument, it does not receive much grazing pressure. All sites sampled for rangeland health were functioning normally and would likely continue to function normally unless indirect influences from adjacent plant communities occurred.

Sagebrush-grassland
Alternative B would bring improved conditions to a large number of acres of Sagebrush-grassland. As with other community types, the changes would be gradual with initial increases in total vegetation cover and decreases in bare ground. Longer term changes may be expected for shifts in species composition and overall diversity. The competitiveness of native grasses against invaders such as cheatgrass may be increased slightly with changes associated with range improvements. Sagebrush-grassland sites would receive higher prioritization for monitoring under this alternative which may generate restoration plans or more substantial changes to management in order to reach DPC. Livestock management changes under this alternative would not prevent or control the spread of juniper in Sagebrush-grasslands but monitoring may identify areas to prioritize for treatment. Specific seral stage percentages outlined in the DPC would not be achieved in a timely fashion with grazing season rest and changes in distribution as the sole measures for improving community health.

Seedings

Under Alternative B, seedings that do not meet standards or have experienced plant mortalities would continue to be grazed until restoration activities are initiated. While this may provide some measure of weed control, soil conditions would continue to deteriorate which would ultimately reduce chances for successful restoration. Important post restoration provisions for achieving success criteria, adjusting stocking rates to reflect forage available, and generating a general management plan are not provided under this alternative. Restored seedings would therefore have limited chances for long-term persistence under this alternative. Seedings would make slow progress toward achieving and maintaining DPC.

Wetlands/Riparian

The proposed fences around riparian areas and improvements to water developments would result in immediate increases in the total vegetation cover with subsequent increases in the amount of litter, diversification of age classes of woody species, and potential expansion of riparian zones to match site potential. Changes in species composition and structure for herbaceous species may be observed in the short-term with more moderate to longer term changes to woody species composition. Where they exist, exotic species such as tamarisk and Russian olive would continue to be strong competitors with native tree and shrub species without proactive management and control of these plants.

THREATENED, ENDANGERED AND SENSITIVE PLANT SPECIES

Many of the special status species found in the Monument are edaphic endemics that are restricted to sparsely vegetated sites with specialized soil or bedrock characteristics. These are often harsh sites that provide little forage for livestock and are frequently inaccessible because of steep slopes. Because of these habitat features, most special status plant species receive little to no direct impacts from livestock grazing. Potential does exist for negative, indirect impacts as a result of habitat degradation from invasive weed species from adjacent habitats and loss of pollinators that rely on the health of the surrounding vegetation.

Under this alternative, a positive impact would occur as a result of improved habitat conditions associated with rangeland improvements may ensure the health of adjacent special status plant populations over the long-term. Indirect impacts are the most likely influences on special status plant populations under Alternative B.

Threats to Kodachrome bladderpod are mainly related to off-road vehicle use but trampling by livestock is a possibility. Impacts on Kodachrome bladderpod would be reduced as a result of the language in VEG-5 (Chapter 2) which prevents trampling through placement of salt blocks, supplements, and water away from Kodachrome bladderpod populations. This species occupies approximately 600 acres within the Dry Valley, Upper Hackberry, and Upper Paria allotments. Under this alternative, roughly 585 acres of the occupied habitat (98% of population) would remain unchanged and approximately 14 acres of habitat (2% of population) would experience improvements as a result of changes in grazing management (timing of use). Under this alternative, Kodachrome bladderpod populations would remain the same or show improvements in size and extent.

Ute ladies' tresses have a restricted distribution (King Bench Allotment, Deer Creek) in the planning area and are managed in a manner that generally encourages the growth of the species. Winter grazing benefits this species by removing competing plant cover. Approximately 49 acres of riparian habitat is occupied by Ute ladies' tresses. Under Alternative B, current grazing practices would continue where this population is located, which would maintain the population at its' current levels.

Under Alternative B, Jone's cycladenia would remain unchanged. Several sites are known of this species within the planning area. The site occupies approximately 36 acres of steep, remote habitat in the Moody allotment that is inaccessible to livestock. No change to this population is anticipated under this alternative.

RIPARIAN AND WATER RESOURCES

Watershed Health

The net effect of the proposed grazing management changes in allotments not meeting the Riparian and/or Upland Standards would be a slight to moderate reduction in the severity of impacts on upland hydrologic processes. Slight to moderate improvements in understory cover would occur in dominant vegetation types, causing commensurate reductions in runoff. These impacts would occur slowly, since grazing would continue in degraded allotments and there would be minimal net reductions in use, although the initiation of growing season rest would cause some immediate improvements. Continued grazing pressure would cause already degraded seedings to deteriorate further and be vulnerable to high rates of runoff. Monitoring may not be adequate to identify and respond to changes in plant communities that are undergoing conversion to less hydrologically desirable communities or are reaching threshold states. The design and location of restoration projects would likely focus on habitat improvement, and any watershed benefits would be coincidental.

In the long-term, upland hydrologic conditions governing infiltration and runoff would improve slightly too moderately in the six allotments (473,323 acres or 21% of the planning area) not meeting Standard 1. Excessive runoff from uplands would continue in the short-term, and to a lesser degree, in the long-term.

Riparian Proper Functioning Condition

The Riparian Toolbox would be implemented on a site specific basis at riparian areas that are not attaining or trending towards Proper Functioning Condition. Emphasis would be placed on reducing livestock impacts on riparian areas through the use of range improvements, such as exclosure fences and off-stream water developments. Active erosion control and treatment of invasive exotic species would occur, but not on a widespread or systematic basis.

Riparian systems on all allotments would benefit from the initiation of growing season rest every other year. Bank stability would increase as a result of less frequent trampling and increased vegetation cover, and sediment delivery from adjacent uplands to stream channels would decrease as a result of enhanced sediment capture by vegetation.

Retrofitting existing water developments to reduce dewatering would increase the extent, diversity, and vigor of native riparian plants in the short-term, and would improve stream channel conditions in the long-term (via increased bank stability and large wood recruitment).

Management changes in allotments failing Upland Standards would cause slight benefits in riparian areas, as five of the six allotments failing Standards 1 and/or 3 also fail Standard 2. Long-term reductions in runoff from uplands would cause reduced rates of headcutting and channel widening, thereby allowing for maintenance and establishment of riparian communities. Depending on how rotations are scheduled and season of use is changed, utilization of herbaceous and woody riparian vegetation could be either decreased or increased. Riparian areas in functioning condition are more likely to respond positively to rest-rotation grazing, whereas the condition of areas that are functioning-at-risk or non-functional may remain static, slightly improve, or degrade.

Under this alternative (as well as Alternatives C, D, and E) maintenance of new and existing riparian fences would be critical to meeting riparian objectives. When constructed and maintained, these fences would reduce herbivory and trampling (the most common causes of riparian degradation in lentic systems), and would also slow the rate of headcut development and migration.

Riparian areas in allotments where temporary or permanent changes in grazing management are to be implemented immediately (Collet, Mollies Nipple, and Vermilion) would begin improving quickly, although installation of fences would be required to ensure sustained long-term recovery. Management changes in allotments failing only the riparian Standard would improve riparian areas incrementally over the life of the plan, since the fences emphasized in this alternative would only be constructed as funding allows.

Erosion control projects would avert reductions in the extent or functionality of a limited number of riparian areas. The benefits of these projects would be greatest in functioning-at-risk systems where fences are repaired or installed to control grazing and trampling.

Riparian vegetation treatments to remove invasive exotics would occur on a limited basis. If successful, these treatments would increase recruitment of willow and cottonwood. They would thereby maintain or restore important ecological (e.g., habitat) and physical (e.g., large wood recruitment and bank stability) functions.

Water Quality

In the short-term, areas vulnerable to erosion would continue to receive livestock use, however because of management changes runoff and erosion from degraded allotments would be reduced. Because the primary sources of total dissolved solids (TDS) are marine shales ('badlands') that are naturally highly erosive and receive light grazing pressure, grazing would continue to have a negligible or minor impact on TDS and salinity. Limited implementation of erosion control projects could be used in streams and meadows to reduce the downstream transport of saline soils derived from eroding uplands.

Livestock use around springs would be reduced as a result of range improvements and growing season rest.

Reducing the magnitude and duration of dewatering would improve water temperatures in some spring-fed streams. Livestock grazing would continue to affect woody riparian species that provide stream shading, although impacts would be reduced relative to current conditions as a result of repair and installation of fences. Changes in season of use could affect stream shading. Channel incision and widening (and attendant increases in solar radiation inputs and water temperature) would continue, although recovery of riparian vegetation, as well as a limited program of erosion control, would allow channels to stabilize over time.

SOILS

The goal of this alternative is to make progress towards Standards using current range management techniques, with minimal stocking adjustments. Grazing management would be modified only as necessary to begin the process of making progress towards meeting Standards in areas not now meeting Standards and to meet the goals and objectives of the land use plan. The current conditions on most allotments exhibit less vegetative diversity, particularly grasses and forbs, than would be expected for native rangelands. This contributes to a deficiency in the amount of litter and an increase in the percent of bare ground. A lack of litter increases overland flow exacerbating erosion. The undefined time frame towards achieving Standards in this alternative makes it the least favorable, with exception of Alternative A, for the improvement and maintenance of the soils resource.

Management would encourage the growth of species with high root production and a mix of species with different rooting depths and patterns increasing micro-organism populations, infiltration, aggregate stability, porosity, plant nutrients, erosion prevention, organic matter, and resilience to compaction. Management would maintain near-surface roots, plant litter, and vegetation to reduce the susceptibility of soils to compaction by helping to cushion impacts.

Soil health including micro-organism populations, infiltration, aggregate stability, porosity, plant nutrients, litter accumulation, organic matter, woody material accumulation would be maintained.

Management activities would avoid and/or mitigate detrimental compaction, wind and water erosion. Existing and proposed uses would be constantly monitored to detect any unacceptable soil erosion and compaction.

Soil disturbance would be minimized during management activities including rangeland improvement projects (i.e. mechanical harvest of Pinyon-juniper, seed bed preparation, and drilling seed). When possible, only designated trails and roads would be used. Surface disturbance that would cause loss of litter and the organic matter layer would be avoided. Where appropriate, eroding land would be rehabilitated with an emphasis on improving conditions in areas where there is a lack of ground cover, gullies, rills, and sheet erosion.

NOXIOUS WEEDS AND NON-NATIVE PLANTS

Since this alternative makes no major changes in grazing intensity or location, there will likely be a gradual increase in Noxious and/or invasive species spread. This negative impact may rise to the level of significance if noxious weeds and non-native plant levels are not controlled.

Successful restoration and vegetation treatment projects aimed at improving vegetation health and cover would result in a decrease in noxious and invasive plant species. Soil disturbance due to fence building and pipeline extension has potential to increase weed spread but, the improvements would result in localized impacts. Replacing water catchments won't create new disturbances but, will evenly disperse livestock which will likely increase the distribution of Noxious and/or invasive species. Rest and an improved rotation would reduce Noxious and/or invasive plant species dispersal by livestock. The overall result would be a positive, indirect impact.

WILDLIFE

In this alternative, limited changes to livestock grazing practices and management strategies would occur. Direct and indirect impacts are described below for specific species.

Impacts on Migratory/Special Status Bird Species of Concern

This alternative would correct problems identified by monitoring through active livestock management. Emphasis would be placed on improving distribution and timing of livestock use, along with the construction of range improvements necessary to provide better control and distribution.

Seeding restoration (0.25% of planning area) would be a high priority. With the proposed plan level requirements for species selection in restoration (VM-9 through 12), the restored seedings would have a greater diversity of plant types and species, and would include native species. This change would have a positive impact on birds, since the failed seedings usually consist of monotypic stands of introduced grass species. Restoration would result in greater plant variety and an increase in habitat diversity, with a positive impact on grassland dependent bird species; especially in locations which currently have little surface cover as a result of seeding failure. There would be an increase in desirable habitat for ground nesting migratory birds which require nesting or protective cover. The small number of bird species which require exposed ground, such as horned larks or killdeer, would be impacted by restoration actions.

Season of use changes, growing season rest (GRAZ-2) and improved livestock distribution from fences and revised pasture rotations, would result in changes in vegetative composition. Livestock engage in selective herbivory, and improved management would change vegetative composition through the recovery of species which are selectively grazed or browsed. This recovery would increase habitat niches for bird species, and would reduce the impacts of grazing on those bird species which have been negatively impacted by past grazing practices. The rate of recovery would vary by vegetation type, with rapid response in forb or grass dominated types (especially in early seral vegetation dominated by annuals), and less response in late seral types such as Blackbrush or Pinyon-juniper.

Upland areas which have experienced a loss of biological diversity or loss of soil productivity would show little or no recovery. Some sagebrush-grasslands, and many pinyon-juniper woodlands fall into this category. Other plant communities, such as blackbrush, which have been invaded by annuals, would also see little change under this alternative. In both cases, bird species numbers and diversity would remain low.

Growing season rest would reduce trampling impacts on migratory ground nesting birds, since the growing season overlaps the nesting season.

Range improvements which protect riparian areas, either through exclusion or by redirecting livestock, would improve the structure and density of riparian vegetation, and benefit riparian dependent species. The net increase in water availability from new range improvements would also have a positive impact on bird species.

Table 4-2 Impacts on Birds by Habitat Type

Habitat Type (% land)	Bird Species	Impacts
• Aspen (0.02 %)	• Williamson's sapsucker	Growing season rest, along with new rotation, would aid the reproduction and regeneration of these stands by reducing the grazing of aspen sprouts and seedlings.
• Pinyon-Juniper (41.7 %)	• Black-throated gray warbler • Gray vireo • Pinyon jay • Virginia's warbler	Pinyon-Juniper habitats in unsatisfactory condition would likely remain so with slight improvement. Food sources (seeds and insects) for birds would remain diminished as a result.
• Ponderosa Pine-Douglas Fir (1.1 %)	• Flammulated owl • Grace's warbler • Lewis's woodpecker • Northern goshawk	Current impacts from season of use and grazing intensity would continue.
• Desert Shrub (7.20 %) • Sagebrush-grassland (8.22 %)	• Brewer's sparrow • Sage sparrow • Sage grouse	Habitats that are failing Standards would show improvement over 20 years. Degraded sagebrush areas would not be recovered, but the recovery of some grasses and forbs is expected in Sagebrush-grasslands.
• Grassland & Meadow (1.7 %) • Sagebrush-grassland (8.22 %)	• Black rosy-finch • Burrowing owl • Ferruginous hawk • Northern harrier • Short-eared owl • Swainson's hawk	Areas would make progress towards meeting the habitat Standards. Current impacts on bird habitats would continue in most areas.
• Riparian (0.51 %)	• Blue grosbeak • Broad-tailed hummingbird • Common Yellowthroat • Lucy's warbler • Peregrine falcon • Prairie falcon • Yellow-billed cuckoo • Bald eagle	Riparian areas currently not meeting Standards or are in a downward trend would see modest change over the next 10 to 20 years. Livestock management would only be minimally altered under this alternative. Riparian dependent bird habitats would see the least positive change.

Impacts on Bats

Under this alternative there would be little to no change on non-riparian bat roosting habitat. Improvements should be seen in non-riparian and riparian foraging habitat. Increased vegetative ground cover would result in an increased diversity of understory plant and insect prey species in both non-riparian and riparian foraging habitats resulting in the development of better quality foraging habitats over time. Reduced grazing pressure should also increase the recovery of riparian communities, resulting in the development of better quality roosting habitat (i.e. large cottonwood trees) over time. Range improvement design standards would increase the availability of water for bats in existing water locations.

Table 4-3 Summary of Impacts on Bats

HABITAT TYPE	Non-riparian, Roosting	Non-riparian, Foraging	Riparian, Roosting	Riparian, Foraging	Open water, Foraging & Drinking
BAT SPECIES	Fringed myotis, Allen's lappet-brow bat, spotted bat, big free-tailed bat, Townsend's big-eared bat	Fringed myotis, Allen's lappet-brow bat, spotted bat, big free-tailed bat, Townsend's big-eared bat	Western red bat	Western red bat	Fringed myotis, Allen's lappet-brow bat, spotted bat, big free-tailed bat, Townsend's big-eared bat , Western red bat
IMPACTS	Little to no impacts on bat roosting habitat in cliff, cave, non-riparian tree, and multiple habitats.	Minor changes to stocking rates and exclusionary range improvements would result in less grazing pressure in foraging habitats. Increased vegetative ground cover results in increased diversity of understory plant and insect prey species in foraging habitat. Most current impacts would see slow positive change over 20 years.	Exclusionary range improvements could result in less grazing pressure in riparian or roosting habitat, resulting in development of better quality roosting habitat (i.e. large cottonwood trees) over time.	Exclusionary range improvements could result in less grazing pressure in riparian foraging habitat, resulting in development of better quality foraging habitat over time. This would include more diverse riparian vegetation that would support a greater diversity of insect prey	Range improvement design standards would increase the availability of water through the installation of "wildlife friendly" water improvements.

Impacts on Game Species

Desert Bighorn Sheep

Only thirty six percent (585,816 acres) of suitable Desert Bighorn habitat would be retained in existing management under this alternative. This means under this alternative conflicts for forage and water, between livestock and Bighorns, would be reduced over sixty four percent of the planning area. Fifty five percent (896,468 acres) of suitable habitat would receive improved management, mainly in the form of growing season rest, and improved distribution. These changes would improve Bighorn habitat by increasing the amount of available forage, mainly in the form of grass. It would also reduce the presence of livestock, with a positive benefit to Bighorns in that they avoid water sources with livestock. Eight percent (125,630 acres) would not be open to grazing, and would experience no competition for use.

The seeding restoration activities proposed under this alternative would have a positive impact on Bighorns by providing additional forage in the form of grass. Structural improvements, in the form of water developments would provide additional sources of water for Bighorns, and improve livestock distribution (and fewer livestock-Bighorn conflicts at water sources).

Mule Deer

Sixty percent (26,226 acres) of Critical Mule Deer winter habitat would have modified livestock management under this alternative. Since the majority of change in management consists of growing season rest, there would be little change in impact in winter use areas. Better livestock distribution would provide more forage, with a proportional reduction in incidental winter browsing, which would benefit Mule Deer.

This alternative also proposes new range improvements. Water developments would increase habitat availability to Mule Deer, which would be a positive impact, but better livestock distribution would come at the cost of more fencing, and fences have a potential to impede deer movements.

Pronghorn

All suitable Pronghorn habitat would continue to be available to livestock under this alternative, but impacts on Pronghorn would be reduced through changes in grazing management. Growing season rest would be required (GRAZ-2). This rest period would make forbs available for consumption early in the season, when Pronghorn prefer them over shrubs. Spring forb availability is also critical to fawn rearing success, since lactating antelope use forbs heavily.

Structural range improvements are proposed under this alternative. New water developments would increase the availability of browse for Pronghorns by increasing their distribution. Fences are also proposed, and they may impact Pronghorn since they impede movement.

Sage Grouse

As was noted in the No Action alternative, impacts on occupied Sage grouse habitat are identical under all alternatives.

Under this alternative, impacts would improve 53% of potential habitat (953,173 acres) as a result of changes in livestock management. Habitat improvement is probable on another seven

percent (132,238 acres) as a result of removing livestock impacts. Changes in management consist of growing season rest, and improved distribution. The growing season rest would have the strongest impact, since it would prevent the removal of cover (through consumption) during the nesting and early brood rearing season. There also would be no competition between livestock and Sage grouse for forbs during the period when Sage grouse consume forbs. Growing season rest, along with improved distribution, would assist in riparian recovery, which would be beneficial to Sage grouse. Sage grouse nests and young would be susceptible to trampling impacts upon the resumption of grazing.

Impacts on Fish and Aquatic Species

Under this alternative rangeland conditions would essentially be the same as under Alternative A. Some minor changes in livestock grazing could be done to bring range and riparian conditions within regulatory compliance over a 20 year time period. However, current levels of livestock use would continue to be authorized under this alternative. There would be no special criteria applied to riparian area use by livestock. This would result in the slowest rate of recovery in riparian areas not currently meeting Standards or with a downward trend. Consequently, habitat conditions for fish and aquatic species in degraded areas would show the least amount of recovery over time as compared to actions taken under Alternatives C, D, and E. Fish and aquatic species would benefit from exclusionary riparian fencing and water developments proposed under this alternative in certain limited areas.

Impacts on Threatened and Endangered Wildlife Species

Mexican Spotted Owl

Changes in grazing management would impact almost half (49%) of the Mexican Spotted Owl Critical Habitat within the planning area under this alternative. These changes consist primarily of growing season rest, or a changed livestock rotation scheme. Both approaches would increase plant vigor, especially with grasses and forbs, which should have a positive impact on rodent and small animal populations, which in turn increases the prey population available to Mexican Spotted Owls.

The active use of the "riparian toolbox" in riparian restoration would improve the conditions of riparian areas. The Recovery Plan guidelines include "implement management strategies that will restore good conditions to degraded riparian habitat as soon as possible".

Southwestern Willow Flycatcher

Under this alternative, range improvements and growing season rest would encourage riparian recovery. Of the forty seven percent of Southwestern Willow Flycatcher existing and potential habitat open to grazing, ninety four percent would be subject to improved management, including growing season rest. Along with this, utilization standards would be imposed on allotments with suitable habitat for Southwestern Willow Flycatcher. The net impact of these measures would be improvement in habitat and possible increased bird numbers.

Within Cottonwood Allotment, range improvements are proposed that would attract livestock away from riparian areas suitable for Southwestern Willow Flycatcher use. While this proposal would aid in the recovery of woody species, the recovery would not be total since livestock would still have access to those areas. Growing season rest would also be initiated on the

allotment, and at a minimum, livestock use would be removed from flycatcher habitat during the willow growing season. Again, this would encourage the recovery of species such as willows, which would increase the suitability of riparian habitat for Southwestern Willow Flycatcher use.

Utilization standards on shrubs within Southwestern Willow Flycatcher habitat would remain at 40%, affording the same level of protection as in the No Action alternative. (Under this Alternative, utilization standards are only applied in Southwestern Willow Flycatcher habitat.)

CULTURAL RESOURCES

The implementation of the Cultural Resources Protocol (see Appendix 3) is common to all action alternatives. Under this and other action alternatives grazing related impacts on cultural resource sites would be identified on a site-specific basis, and appropriate mitigation measures would be implemented as necessary. In addition, the cultural resources research and monitoring component of the Protocol would provide the opportunity for in-depth research into grazing related impacts on cultural resource sites, use of appropriate mitigation measures, and the effectiveness of these measures, as well as provide for cultural resource inventory in areas where grazing related impacts are likely but the site density and character is unknown. This component is important in that research and monitoring regarding grazing related impacts would lead to a better understanding of the situation, and eventually better and more effective management practices.

This alternative emphasizes reduction of range impacts through the use of range improvements such as fencing, water developments, and forage restoration to lessen stock concentrations and increase overall stock dispersal. Although modern range management practices are generally designed to direct livestock away from sensitive resources, for cultural resources this could be a double-edged sword; while lessening impacts on sites where stock have traditionally concentrated, it will encourage stock dispersal into areas that have seen little stock use (and consequently little grazing related impacts on cultural resource sites). This underscores the necessity for cultural resource inventories in areas that have not seen such inventories and cannot be accurately archaeologically characterized, a need addressed in the Cultural Resources Protocol. This alternative would require the construction of numerous range improvements, adding to the potential for new disturbances at documented and undocumented cultural resource sites.

All the action alternatives are designed to achieve the same end rangeland health goals, it is more a question of by which methods these goals are achieved and the timeframe in which these goals are achieved through the various alternatives. Alternative B is considered the least dramatic in range management changes, and would take the longest to achieve the desired results. Cultural resource sites, under this alternative, would remain unprotected by vegetation recovery for longer than in the following action alternatives.

This alternative would provide only a relatively small amount of immediate protection for cultural resource sites, in addition to those outlined in the Cultural Resources Protocol which is common to all alternatives. For the most part, ongoing grazing related impacts on cultural resource sites would continue, with only a slight reduction in grazing pressures as a result of

minimal AUM reductions. Implementation of the cultural resources Protocol will provide more protection in the long run, but immediate relief from grazing related impacts on cultural resource sites would be less under this alternative than under the other action alternatives.

RECREATION

Some conflicts between recreational use and livestock grazing would be reduced, while others would likely remain the same or increase under this alternative.

Recreational access problems relating to range developments (access through fences) would be reduced by incorporating the proposed "Standard Requirements and Design Restrictions on Range Improvements" (see *Standard Operating Procedures* [SOPs], Appendix10). Additional requirements providing for recreational foot and horse access through fences would further reduce conflicts.

Changes in Seasons of Use under this alternative would reduce the overlap between the high recreational use season (mid-March through June, and September through November) and a grazing season in certain allotments.

The Upper Gulch Pasture of Circle Cliffs Allotment would be grazed only spring or fall of every other year. In years when spring grazing would occur, the season of use would end no later than March 15, which is also the typical start of the spring high recreational use season. Conflicts relating to competition for space in the Upper Gulch would be greatly reduced under this alternative.

The season of use for livestock grazing in Clark Bench Allotment would be cut back by one month in the spring, with the end of the grazing season being March 31 rather than April 30. Conflicts with recreational use would be reduced during the highest recreational use period of the spring under this alternative. Any individual pasture would be grazed at most every other year, either spring or fall, further reducing conflicts in off-grazing years. Additionally, by the creation of The Dive Pasture, there would be reduced livestock use of the Paria Canyon-Vermillion Cliffs Wilderness, further reducing opportunities for conflict on the allotment.

Death Hollow Allotment would have a season of use with less overlap onto the high recreational use season. Some livestock grazing has been authorized from April 1 through May 15; under this alternative all livestock grazing would end no later than March 31. Furthermore, fencing livestock out of the head of the narrows of Little Death Hollow would eliminate problems with hikers inadvertently herding livestock into the narrows. This would eliminate most recreational conflicts in this allotment.

The creation of Buckskin Pasture in Mollies Nipple Allotment would largely resolve recreational conflicts at the head of the narrows of Buckskin Gulch. The pasture would be utilized by livestock during December, January and February. These are low recreational use times, so level of conflict would be low.

Since this alternative emphasizes the use of range improvements (fencing, water developments and seedings), there would be an overall reduction of "natural appearing" landscapes. Recreational users expecting natural appearing landscapes would be negatively impacted. Impacts would be greatest in popular hiking areas, particularly among hikers who had experienced a place before range developments went in. Impacts on individual recreational users would be high, even in lightly visited areas, in landscapes to which they have developed an attachment. Due to the localized scope of this impact it does rise to the level of significance.

This alternative does not address many areas where conflict is high or has high potential. Conflicts arising from confrontations between livestock and recreational users in narrow canyons are not addressed in this alternative, other than in Buckskin Gulch (Mollie's Nipple Allotment) and the head of Little Death Hollow (Death Hollow Allotment). The Gulch in King Bench Allotment, the Paria River in Cottonwood Allotment, Devil's Garden in Upper Cattle Allotment, Horse Canyon Spring area of Big Bowns Bench Allotment, the slot canyons in Dry Fork of Coyote Gulch in Lower Cattle Allotment, and the narrows of Lick Wash all either have high levels of conflict, or have a potential for high levels of conflict if grazing is returned to areas where grazing has been temporarily suspended or has been in non-use. Conflict in these areas would likely increase as recreational use increases.

ALTERNATIVE C – MANAGEMENT PREFERRED

LIVESTOCK GRAZING

Temporary suspensions of livestock grazing in all or portions of three allotments (Coyote, Mollies Nipple, and Vermilion) would make 1,927 AUMs unavailable. These suspensions, while temporary, would require adjustments to grazing operations in these allotments, primarily the closure of pastures during rest and restoration (impacts more specifically described below). In order to adjust, permittees would be forced to reduce livestock numbers, feed livestock off-site and/or procure replacement pastures. The schedule of restoration activities and lifting of the temporary suspensions are dependent on funding available and successful establishment of desirable species.

Adjustments to livestock grazing practices in the remaining six allotments that did not meet Standards would have minimal impacts on overall grazing authorizations. There would be allotment specific adjustments to implement season of use modifications, to limit consecutive year grazing use during the spring growing season and to implement modified pasture rotations.

Retention of the Phipps Pasture as a forage reserve would leave the status of the area unchanged.

Closure of the Antone Flat (currently unalloted) and Little Bowns Bench (currently a forage reserve) allotments and the Wolverine Pasture (currently a forage reserve) would have no impact as these areas are not used for livestock grazing and no AUMs are authorized within them.

For the remaining allotments that meet Standards, changes to existing management would be minimal as they would be limited to those short-term adjustments commonly associated with on-

going allotment administration such as requests for change of season of use, modification to pasture rotation use, voluntary non-use, transfers and temporary non-renewable use.

The impacts identified under Alternative C would be both direct (short-term) or indirect (long-term) based upon the allotment descriptions found below.

Allotment Specific Consequences

Circle Cliffs

Same as Alternative B.

Clark Bench

Same as Alternative B.

Collet

(Uplands and Riparian did not meet)

Under this alternative rangeland conditions would be improved as compared to the "no action" alternative. While livestock numbers would not change, distribution would change due to fencing, water developments, and restoration projects. The exclusion of livestock from Right Hand Collet Canyon would help restore the riparian areas there through rest, but would result in a modified livestock rotation, since only two pastures would then be available for grazing. The spring rest requirement (GRAZ-2), along with the revised rotation would increase the upland rating for the allotment. Further improvement would result after the installation of a gap fence to create three pastures. Since the installation of these gap and exclusion fences is subject to funding, it is anticipated that the reduction of impacts would be phased in over the life of the plan. Considering the amount of time required for the environmental impacts assessment, funding, and construction of these projects recognition of on the ground gains would be slow. Once in place, riparian and upland areas would progress toward meeting Standards with a net increase in desirable species, litter, and soil retention however exotic and undesirable species would continue to be present.

Coyote

The total preference would remain the same for the allotment, but 588 AUMs (29%) of active use would be temporarily suspended for seeding restoration, reducing the useable AUMs from 2044 to 1,456 AUMs until all restoration is completed in the Five Mile and Sand Gulch Pastures. Restoration of the vegetative community would result in the establishment of perennial grasses, resulting in higher vegetative cover and lower erosion. The temporary suspension of 588 AUMs is expected to last approximately 5 to 10 years.

The restoration activities would reduce the available AUMs for the short-term but in the long-term there would be more forage for livestock then is currently available in these two pastures. Restoration success and seed species selection would determine future forage availability and how many of the suspended AUMs would be restored from suspension.

Reducing active use on the allotment, along with restoring the plant community on two pastures, would result in a static or upward trend on the allotment as a result of the increase in the number of perennial grass species and percent cover. Restoration would also reduce overland flow of water and reduce soil erosion in these two pastures.

The restoration activities would move the Five Mile and Sand Gulch Pasture toward meeting Standards.

The temporary reduction of active use has a short-term potential for a significant negative impact on the livestock operations, including economic value, belonging to the permittee. In the long-term, forage conditions should improve resulting in a positive impact.

Death Hollow
(Riparian did not meet)
This alternative is similar to Alternative B in that it would not change active preference, but livestock distribution would change as a result of fencing cattle out of riparian areas and improving water developments. A higher priority would be given to riparian on this allotment as compared to Alternatives A or B. In order to achieve riparian Proper Functioning Condition, shared water exclosures would be constructed to allow for better protection of riparian resources, spring fences would be developed. It is anticipated that this would reduce erosion and increase desirable vegetative cover, community, and litter throughout the allotment. Fences are also proposed to restrict livestock access to Little Death Hollow and Wolverine Creek Narrows to reduce impacts on recreational use. Since the installation of structural improvements, such as fences, is subject to funding, it is anticipated that the reduction of impacts would be phased in over the life of the plan. Current trend on this allotment is slightly downward, and that because of the past drought (see Appendix 1 for allotment details).

Grazing would be reauthorized at the current level, however grazing duration would change. Currently grazing is allowed from November 1st through May 15th. Grazing would end approximately six weeks sooner providing an off date of March 31st, which would reduce grazing pressure on perennial grasses during the early growing season.

Ford Well
(Riparian did not meet)
The active use on the allotment would remain unchanged. Ford Well spring was rated as "functioning at risk" with a downward trend, which led to the allotment failing to meet Standards. This alternative proposes the reconstruction of a structural range improvement in order to achieve PFC and to meet the Standards. To do this, the existing spring protection fence would be reconstructed, which would allow the riparian area to enlarge to its potential, reduce the hoof action and trailing of cattle in the riparian area, reduce cattle use on and improve the riparian vegetation composition, age class distribution, vigor, and percent cover. The protection fence would eliminate livestock as one of the contributing factors as to why the riparian area is not meeting Standards.

Soda
(Uplands and Riparian did not meet)
This alternative would not change livestock active use. Combining the Fortymile Ridge Allotment and Soda Allotment would result in moving the Soda Allotment towards meeting upland standards. Methods from the "riparian toolbox" would be used to achieve or continue to achieve riparian standards.

Water developments would be constructed to allow for better protection of riparian and upland resources. It is anticipated that this would reduce erosion and increase desirable vegetative cover, community, and litter throughout the allotment. Riparian areas which do not meet Standards should improve with a net increase in desirable species, litter, and soil retention; however, exotic and undesirable species would continue to be present. Since the installation of structural improvements is subject to funding, it is anticipated that the reduction of impacts would be phased in over the life of the plan. Considering the amount of time required for the environmental assessment, funding, and construction of these projects, recognition of on the ground gains would be slow.

Trend on the Soda allotment is monitored at seven locations. Long-term trend appears to be static to slightly upward and would continue.

King Bench

This alternative addresses the livestock conflict with hikers in The Gulch. It would involve dividing the current King Bench Pasture into two pastures; namely, Deer Creek Pasture and King Bench Pasture (King Bench Pasture would include The Gulch), bringing the total to three pastures, the third being the existing Horse Canyon Pasture. This alternative would ensure that livestock could not use The Gulch after February 28th. Livestock distribution is not a concern with respect to meeting Standards, but it is because of the before mentioned conflict. This proposal would require that cattle use the area in a proposed Deer Creek Pasture more than they currently do under the existing two pasture system. The three pasture system would also reduce the number of days that cattle would be in the Gulch which would reduce the conflicts between recreation and livestock grazing in The Gulch. An important consideration would be the grazing pressure added to Deer Creek and the Proposed Deer Creek Pasture. Deer Creek has been identified as having heavy recreational use, nearly as heavy as the Gulch. Increasing livestock in the proposed Deer Creek Pasture would increase the conflict between livestock and hikers along Deer Creek, and could possibly affect riparian functioning condition along Deer Creek. Also, the proposed Deer Creek Pasture would concentrate cattle on the Burr Trail increasing the possibility of livestock related vehicle accidents and complaints by users of the Burr Trail. Another consideration to creating the Deer Creek Pasture and adding improvements to King Bench is that it would involve constructing more fencing and water improvements in the vicinity of The Gulch, which is currently in a WSA, in addition to it being an Outstanding Natural Area. Maintenance and construction of the fences poses other problems as well. Since most of the drainages in the Monument are subject to annual intense flash floods, improvements, if possible, must be engineered properly. Maintenance would have to be completed frequently, and maintenance responsibility has not been discussed for these proposals. This proposal would negatively impact the operator, in the long-term since more effort must be exerted to move cattle and keep cattle in a third pasture. Also, if any maintenance of the proposed improvements should fall upon the operator, then additional long-term, negative impacts would occur accordingly.

Lake
Impacts would be the same as analyzed in Alternative B.

Last Chance
Impacts would be the same as analyzed in Alternative B.

Mollies Nipple
(Uplands and Riparian did not meet)
The active use on the Mollie Nipples allotment would be temporarily reduced from 3,862 to 3,307 AUMs, a 15% reduction of 555 AUMs. Upon completion of seeding restoration, and achieving Standards, the allotment has a potential of 3,862 AUMs, but the final quantity may change, subject to the determination of a new allotment evaluation.

The deferred season of use in the Jenny Clay, Blue Spring, Telegraph, Mine Spring, and Rock House pastures would give the forage species periodic rest from livestock grazing during the critical growing period. It would also improve the vigor of the perennial grasses and shrub species. Nipple Pasture would be split into two separate pastures, and a deferred rest rotation system implemented

The temporary non-use, initiating a deferred rest on transition, and the divided Nipple Pasture would benefit perennial grasses and allow for their recovery. Restoration work would restore failed seedings. These changes would move the allotment toward meeting Standards.

The deferred rest system of grazing in the Jenny Clay, Blue Spring , Rockhouse, Mine Spring, and Telegraph pastures while restoration is completed would impact the pasture rotation on the allotment, in that two of the four pastures would not be included in the rotation for at least two growing seasons. The deferment and rest of the two treated pastures would improve the trend slightly in the direction of a static trend instead of the current downward trend. The reseeding would result in a stronger trend recovery. The existing perennial grasses on these pastures would be healthier than under Alternative A or B, but their current condition prevents full recovery without physical intervention.

Once all objectives of the restoration activities are met in the treated pastures, active use would be restored on reassessment. More forage would be available for livestock upon completion of the restoration than is available presently, however, re-assessment would be completed to determine if the historical level of 3,862 AUMs could be achieved since that level was determined using healthy crested wheatgrass seedings. The restored seedings would be a mixture of grass species, including natives, and may not produce as much forage as the old monotypic crested wheatgrass seedings.

Restoration activities would allow Blue Spring, Telegraph, Mine Spring, Jenny Clay and Rockhouse pastures to move in the direction of meeting Standards and would increase ground cover of perennial shrubs and forbs annual production and litter. They would decrease overland flows, pedestalling, litter movement, and plant mortality on the restoration areas.

Nipple Pasture would be split into two separate pastures, and a deferred rest rotation system implemented. This would have a beneficial impact to the perennial grasses in the pasture, since

it would improve cattle distribution throughout the existing Nipple Pasture by forcing cattle to use areas such as Wildcat Ridge and Deer Trail. Perennial grasses would be able to set seed each year which would increase the number and percent cover in the pasture. The deferred rotation in Nipple Pasture would also ensure that the cool season and warm season grasses would not be grazed the same time period in two consecutive years. This would improve long-term trend for perennial grass in the summer pastures. In order to fully implement a two pasture rotation in the Mollie Nipples allotment additional water locations would be needed in the pasture. The trend in the Nipple Pasture would improve sooner in Alternative C then it would under either Alternative A or B.

The long-term trend on the allotment would be moving in an upward direction within 5 to 10 years. The completion of the restoration activities in the seeded pastures and also the construction of the fences proposed would result in an upward trend on perennial grasses.

The proposed spring protection fences or redesigning of the water developments would increase the percent cover of the riparian vegetation, improve vigor, diversify age-classes and reduce or eliminate altogether, hoof action and trailing of livestock. Once the protection fences are constructed cattle would no longer be a contributing factor to not meeting standards. The riparian areas would be able to attain Proper Function Condition within 5 years after construction of the fences.

The proposed Buckskin Gulch fence would eliminate the recreational/livestock conflict in lower Buckskin Gulch. There would be no decrease in active use from the construction of the drift and spring protection fences. Restricting livestock use in Buckskin Gulch would assist in moving this area towards meeting Standards. This fence would also eliminate direct livestock use at the seep in Buckskin Gulch allowing it to attain or move toward PFC.

Since the installation of structural improvements is subject to funding, it is anticipated that the reduction of impacts would be phased in over the life of the plan. Considering the amount of time required for the environmental impact assessment, funding, and construction of this project on the ground gains would be slow at best.

The temporary reduction of active use has a short-term potential for a significant negative impact on the livestock operations, including economic value, belonging to the permittee. In the long-term, forage conditions should improve resulting in a positive impact.

Rock Creek-Mudholes (Same as Alternative B)
(Riparian did not meet)
Impacts would be the same as analyzed in Alternative B.

School Section
(Uplands did not meet)
Impacts would be the same as analyzed in Alternative B.

Upper Paria
(Uplands did not meet)
Impacts would be the same as analyzed in Alternative B.

Vermilion
(Uplands and Riparian did not meet)
The total preference would remain the same for the allotment, but 784 AUMs (28%) of active use would be temporarily suspended for seeding restoration, reducing the useable AUMs from 2,849 to 2,065 AUMs. Upon completion of seeding restoration, and achieving Standards, the allotment has a potential of 2,849 AUMs, but the final may change, subject to the determination of a new allotment evaluation.

The season of use would be changed to April 16th through May 20th and then from June 1st through February 28th.

The modified deferred rest pasture rotation in the Government Reservoir, Fossil Wash, Old Paria, RCA, 1, RCA 2, RCA 3, Petrified Hollow, Seamen Wash and Clark Ranch pastures would give the forage species periodic rest from livestock grazing during the critical growing period. It would also improve the vigor of the perennial grasses and shrub species.

The temporary suspension of AUMs, initiating a deferred rest pasture rotation and dividing the Nephi Pasture would benefit perennial grasses and allow for recovery. Restoration work would restore failed seedings. These changes would move the allotment toward meeting Standards.

The modified deferred rest system of grazing in the Fossil Wash, RCA 1, and 3, Government Reservoir, Old Paria, Petrified Hollow, and Clark Ranch pastures while restoration is completed would impact the pasture rotation on the allotment, in that two of the seven pasture would not be available to be graze at any one time when restoration activities are initiated.

Once objective of the restoration activities are met in the treated pastures, active use would be restored on reassessment. More forage would be available for livestock upon completion of the restoration than is available presently, however, reassessment would be completed to determine if the historical level of 2,852 AUMS could be achieved since that level was determined using healthy crested wheatgrass seedings. The restored seeding would be a mixture of grass species, including natives, and may not produce as much forage as the old monotypic crested wheatgrass seedings.

The modified deferred rest grazing system would improve the trend slightly in a static to upward direction, instead of the current trend of static to downward. The reseedings would result in a stronger trend recovery. The existing grasses in the treated pastures would be healthier than under the existing grazing season and system, but the current condition of these pastures prevents full recovery without physical intervention.

Unlike Alternative B, this alternative proposed subdividing Nephi Pasture into three pastures, along with creating a three pasture rotation would improve cattle distribution within that pasture. Cattle would not congregated around the existing water locations but be dispersed throughout each of the new pastures. Future water developments in Nephi Pasture would ensure the implementation of the pasture rotation, improve cattle distribution and also encourage cattle to disperse away from the existing water location.

There are five springs located in the Nephi Pasture. Two of these springs have been rate as Non-Functioning and one has been rated as "functioning at risk. Future range improvements, which include fences, and additional water development would improve the riparian-wetland plant vigor, increase ground cover, reduce hoof action, encourage wood species recruitment, and improve the age class distribution of riparian vegetation, under this alternative.

Utilization of forage by livestock would be less in the areas closer to the springs on Nephi pasture because a three pasture rotation on Nephi Pasture on Nephi Pasture improves cattle distribution.

Long-term trend should improve to upward on all of the allotment within 5 to 10 year from the implantation of this alternative. There would be an increase of cool season grasses in the seeded pastures due to restoration and growing season rest during the months of March, April and May. The reduction in the active use would also contribute toward improving trend.

Pasture restoration, a stocking rate reduction, along with improved distribution and growing season rest would result in improved rangeland health. Standards would be met under this alternative in a 5 to 10 year time period.

The temporary reduction of active use has a short-term potential for a significant negative impact on the livestock operations, including economic value, belonging to the permittee. In the long-term, forage conditions should improve resulting in a positive impact.

Willow Gulch
Same as Alternative A.

VEGETATION

There will be no direct impacts to vegetation as a result of this alternative. Indirect impacts are described for each plant community below.

Aspen
Based on 2007 analysis, aspen communities would slowly progress towards DPC standards through growing season rest and improved distribution. Fencing aspen stands to allow regeneration would continue to improve.

Evergreen forest
Evergreen forest plant communities currently receive light use and minimal impacts from livestock grazing. These impacts would likely continue under Alternative C. Potential for indirect impacts may occur as adjacent plant communities reach capacity and grazing is shifted onto Evergreen forest communities.

Oak woodland
Changes in distribution as a result of range developments and growing season rests would assist this community in reaching DPC parameters. Many of the Oak woodland communities in the Monument are functioning and would continue to function under this alternative with

improvements in overall health occurring over time. Although Oak woodlands would receive a lower priority for intensive monitoring under this alternative, regular monitoring would occur to verify that sites are functioning normally.

Pinyon-juniper Woodland

Impacts on Pinyon-juniper woodlands would include slight to moderate improvements in understory species cover and diversity. A more diverse age structure and greater diversity of understory species would be achieved and maintained over time with this alternative, particularly in areas where use was traditionally high. For areas that received light or no use, some decreases in plant cover and diversity may be expected with this alternative, since efforts to better spread livestock use across a given pasture or allotment through range improvements would increase use of areas not previously impacted. In general, progress would be made towards achieving DPC for this community. The specific criteria outlined in the DPC for Pinyon-juniper woodlands would create higher priorities for restoration activities in this cover type. The emphasis on research oriented restoration under this alternative would benefit the community type overall and help guide restoration of Pinyon-juniper woodlands throughout the Monument. The rate for achieving results would be more accelerated than in Alternatives A and B as a result of timeframes established for achieving restoration success and pre-restoration monitoring protocols and success criteria.

Ponderosa pine/Douglas-fir

Under Alternative C, Ponderosa Pine/Douglas-fir communities would receive marginal impacts because this is a relatively uncommon community type with limited grazing pressure. Slight improvements to community health may occur as a result of growing season rest requirements implemented in the "Management common to all" measures. Indirect impacts may occur if adjacent cover types reach carrying capacity and grazing pressure is shifted onto Ponderosa pine/Douglas-fir communities. Although this cover type would likely receive a lower priority for intensive monitoring, routine monitoring would be conducted to ensure that sites are properly functioning.

Blackbrush

Blackbrush communities would experience gradual improvements to community health and may slowly progress towards achieving DPC. Blackbrush communities are generally not particularly resilient and improvements to vegetation cover and diversity may be slow at best under any alternative. Growing season rest would allow some of the native species to recover but complete recovery and reaching DPC objectives may not be possible without more substantial modifications to livestock management. Sites that were determined to be functioning at risk have the best chance to show improvements to soil erosion and species composition. Shifts in composition from cool season grasses to warm season grasses may be irreversible without season of use modifications. Sites that are Non-Functioning would be prioritized for intensive monitoring under this alternative but overall improvements in this plant community are expected to be slow at best.

Desert Shrub

Under Alternative C Desert shrub communities would show some moderate improvements in overall vegetation cover and biological soil crust cover. Changes in species composition may be

longer term in nature. Changes in distribution associated with range improvements would increase vegetation cover in areas heavily used but may result in decreases in areas that are currently lightly used. This may cause some sites that are at threshold conditions to deteriorate and may reduce functioning at otherwise intact sites. Overall reductions in AUMs may mitigate this impact in some allotments. Progress towards DPC would be accelerated under this alternative. Soil loss and erosion have been identified as impacts on this community and changes in distribution and growing season rest would result in localized improvements over time to these factors. Desert shrub communities typically occur in dry low elevation sites, often with saline soils, and as such are naturally slower to recover from disturbance than other communities. With this and all alternatives, degradations can occur rapidly if not closely monitored and improvements would occur slowly.

Grassland and Meadow

Grassland and Meadow communities would benefit from the improved distribution and growing season rest measures associated with Alternative C. Improvements to this community would include a long-term increase in total vegetation cover and subsequent decrease in the amount of bare ground. Changes in distribution associated with range improvements may cause reductions in vegetation cover and possible species composition shifts in areas that previously received light use. This would result in improvements to areas that typically received relatively heavy use. Stipulations for monitoring would help document any detrimental impacts on grasslands. Reduced surface resistance to erosion is a concern in some grassland sites and growing season rest would allow increases in vegetation cover and litter to improve these conditions. Under this alternative, changes in species composition (increased diversity and frequency of desirable and appropriate species) may not be detectable for many years unless the community is prioritized for more substantial changes in management or restoration.

Mountain shrub

Impacts associated with Alternative C to Mountain shrub communities are not expected to be substantial. Because of the relative scarcity of this cover type in the Monument, it does not receive much grazing pressure. All sites sampled for rangeland health were functioning normally and would likely continue to function normally.

Sagebrush-grassland

Alternative C would bring improved conditions to a large number of acres of Sagebrush-grassland. As with other community types, the changes would be gradual with initial increases in total vegetation cover and decreases in bare ground. Longer term changes may be expected for shifts in species composition and overall diversity. The competitiveness of native grasses against invaders such as cheatgrass would be increased with seasonal rest. Sagebrush-grassland sites would be receive higher prioritization for monitoring under this alternative and would have a greater potential for reaching DPC. Livestock management changes under this alternative would not prevent or control the spread of juniper in Sagebrush-grasslands but monitoring may identify areas to prioritize for treatment. Changes in community structure would be identified much earlier with the monitoring criteria under this alternative. Therefore, sites that are at or near threshold states for recovery would receive modifications to grazing or restoration efforts at a stage where restoration is most effective.

Seedings

Under Alternative C, seedings that do not meet Standards could experience grazing on a case by case basis as per monitoring and assessments by specialists. This would ensure that standards for plant cover and composition set in the DPC for seedings are achieved. In some seedings where weeds are an issue, weeds may gain a stronger foothold when grazing pressure is removed. While removing grazing prior to restoration would stabilize soils, competition with exotic species would increase for seeded species. Seedings would make slow to moderate progress toward achieving and maintaining DPC.

Wetlands/Riparian

The proposed fences around riparian areas and improvements to water developments would result in immediate increases in the total vegetation cover with subsequent increases in the amount of litter, diversification of age classes of woody species, and potential expansion of riparian zones to match site potential. Changes in species composition and structure for herbaceous species may be observed in the short-term with more moderate to longer term changes to woody species composition. Where they exist, exotic species such as tamarisk and Russian olive would continue to be strong competitors with native tree and shrub species without proactive management and control of these plants. Alternative C emphasizes restoration and research activities in riparian areas which would lead to substantial improvements in native species cover and overall extent in many degraded riparian areas.

THREATENED, ENDANGERED AND SENSITIVE PLANT SPECIES

Many of the special status species found in the Monument are edaphic endemics that are restricted to sparsely vegetated sites with specialized soil or bedrock characteristics. These are often harsh sites that provide little forage for livestock and are frequently inaccessible because of steep slopes. Because of these habitat features, most special status plant species receive little to no direct impacts from livestock grazing. With improved distribution of livestock, grazing impacts may occur closer to special status species than previously occurred. Potential does exist for indirect impacts as a result of habitat degradation from invasive weed species from adjacent habitats and loss of pollinators that rely on the health of the surrounding vegetation. In general, the focus on restoration and research under this alternative would indirectly improve habitat conditions for special status plants. Therefore, indirect impacts are the most likely influences on special status plant populations under Alternative C.

Threats to Kodachrome bladderpod are mainly related to off-road vehicle use but trampling by livestock is a possibility. Impacts on Kodachrome bladderpod would be reduced as a result of the language in VEG-5 (Chapter 2) which prevents trampling through placement of salt blocks, supplements, and water away from Kodachrome bladderpod populations. This species occupies approximately 600 acres within the Dry Valley, Upper Hackberry, and Upper Paria allotments. Under this alternative, roughly 585 acres of the occupied habitat (98% of population) would remain unchanged and approximately 14 acres of habitat (2% of population) would experience improvements as a result of changes in grazing management (timing of use). Under this alternative, Kodachrome bladderpod populations would remain the same or show improvements in size and extent.

Ute ladies' tresses has a restricted distribution (King Bench Allotment, Deer Creek) in the planning area and is managed in a manner that generally encourages the growth of the species. Winter grazing benefits this species by removing competing plant cover. Approximately 49 acres of riparian habitat is occupied by Ute ladies' tresses. Under Alternative C, current grazing practices would continue where this population is located, which would maintain the population at its' current levels.

Under Alternative C, Jone's cycladenia would remain unchanged. One site is known of this species within the planning area. The site occupies approximately 36 acres of steep, remote habitat in the Moody allotment that is inaccessible to livestock. No change to this population is anticipated under this alternative.

RIPARIAN AND WATER RESOURCES

Watershed Health

Management changes on five of the five of the six allotments not meeting one or both of the upland Standards would include using rest, rotational grazing systems, changes in season of use, and temporary and permanent stocking adjustments. The net effect of the proposed changes would be a moderate reduction in the severity of impacts on upland hydrologic processes. Moderate improvements in understory cover would occur in seedings and dominant vegetation types, causing commensurate reductions in runoff.

Beneficial impacts would occur more quickly under this alternative than under Alternative B, because use would be reduced immediately in certain areas, but over a much smaller area than under Alternatives D and E. Certainty of achieving objectives would be increased relative to Alternative B, because of monitoring and associated changes in livestock management. In addition, increased monitoring and prioritization of Sagebrush-grassland and Pinyon-juniper plant communities would increase the effectiveness of management actions designed to restore desired vegetation conditions, thereby potentially benefiting hydrologic conditions as well.

In the long-term, upland hydrologic conditions governing infiltration and runoff would improve moderately in the five allotments not meeting Standard 1. Excessive runoff from uplands would continue in the short-term, and to a certain degree (less than Alternatives A and B, more than Alternatives D and E), in the long-term. Beneficial impacts would be strongest in areas where grazing is suspended, where restoration occurs, and where proposed grazing management strategies are successful.

Riparian Proper Functioning Condition

This alternative places a priority on restoring rangeland and riparian condition while providing research opportunities in restoration and monitoring. The Riparian Toolbox emphasizes repair and installation of range improvements (fences and water developments), but also accommodates modification of grazing management to meet riparian objectives. Active erosion control and treatment of invasive exotic species would be prioritized, but would occur on a limited basis and would not be the preferred method of restoring degraded riparian areas.

Retrofitting existing water developments to reduce dewatering would increase the extent, diversity, and vigor of native riparian plants in many riparian areas in the short-term, and would improve stream channel conditions in the long-term by increasing bank stability and large wood recruitment. If constructed and maintained, fences (proposed in many allotments) and off-stream waters would reduce herbivory and trampling in riparian areas, and would also slow the rate of headcut development and migration. Under this alternative (as well as Alternatives B, D and E), maintenance of new and existing riparian fences would be critical to meeting riparian objectives.

Riparian systems on all allotments would benefit from the initiation of growing season rest every other year. Bank stability would increase as a result of less frequent trampling and increased vegetation cover, and sediment delivery from adjacent uplands to stream channels would decrease as a result of enhanced sediment capture by vegetation.

Management changes in allotments failing upland Standards would cause slight benefits in riparian areas, as five of the nine allotments failing Standards 1 and/or 3 also fail the riparian standard. Long-term reductions in runoff from uplands, coupled with the eventual repair or installation of range improvements, would cause reduced rates of headcutting and channel widening, thereby allowing for maintenance and establishment of riparian communities. Changing seasons of use to provide rest from grazing during spring would benefit both upland and riparian plant communities by allowing periods of re-growth prior to summer storms. Riparian areas in functioning condition are more likely to respond positively to rest-rotation grazing, whereas the condition of areas that are functioning-at-risk or non-functional may remain static, or improve slightly.

Management changes on three allotments failing only the riparian Standard (as well as in certain other allotments where the riparian standard is met but there are areas of concern) would emphasize improved range management and exclosure fences, as well as creation of off-stream water sources. Management changes would include reducing use of pastures with degraded riparian areas, suspending or eliminating grazing, changing the season of use to minimize impacts on desired riparian vegetation, and, potentially, allocating relinquished AUMs to watershed resources.

Management changes in allotments failing the riparian Standard would benefit some areas immediately, while other areas would improve incrementally over the life of the plan, since range improvements would only be constructed as funding allows. Riparian areas in allotments where temporary or permanent changes in grazing management are to be implemented immediately would begin improving more quickly, although installation of fences would be required to ensure sustained long-term recovery. Monitoring and associated requirements for remedial action would ensure that progress is made towards reducing livestock impacts on riparian areas.

Erosion control projects would avert reductions in the extent or functionality of a limited number of riparian areas. The benefits of these projects would be greatest in functioning-at-risk systems where fences are repaired or installed to control grazing and trampling. Headcuts are a common cause of riparian areas not achieving or trending towards PFC, and failure to prioritize and

address headcuts in a timely manner would reduce the likelihood of recovering systems that are functional-at-risk.

Riparian vegetation treatments to remove invasive exotics would occur on a limited basis, although over a broader area than under Alternative B. These treatments could increase recruitment of willow and cottonwood and would thereby maintain or restore important ecological (e.g., habitat) and physical (e.g., large wood recruitment and bank stability) functions.

Water Quality

In the short-term, many areas vulnerable to livestock-induced erosion would continue to receive livestock use, although livestock management in these areas would change as described in Chapter 2. Because of upland management changes runoff and erosion from degraded allotments would be reduced. Because the primary sources of total dissolved solids (TDS) are marine shales ('badlands') that are naturally highly erosive and receive light grazing pressure, grazing would continue to have a negligible or minor impact on TDS and salinity. Limited implementation of erosion control projects could be used in streams and meadows to reduce the downstream transport of saline soils derived from eroding uplands.

Livestock use around springs would be reduced as a result of range improvements and growing season rest. Riparian protections would be a higher priority under this alternative than under Alternative B.

Reducing the magnitude and duration of dewatering would improve water temperatures in some spring-fed streams. Livestock grazing would continue to affect woody riparian species that provide stream shading, although impacts would be reduced relative to current conditions as a result of improved grazing management and repair and installation of fences. Channel incision and widening (and attendant increases in solar radiation inputs and water temperature) would continue, although recovery of riparian vegetation, as well as a limited program of erosion control, would allow channels to stabilize over time. Under this alternative, increased priority on riparian restoration and use of monitoring-based triggers to ensure movement towards PFC would result in quicker and more widespread reductions in livestock-related stream heating.

SOILS

The soils resource would improve more readily under Alternative C than Alternative A and B and less than Alternatives D and E. Rangeland Health Standards would be achieved by allotment specific modification of grazing management with minimal grazing suspensions and adjustments. This would make progress towards improving soil health slower than Alternatives D and E.

Forage made available through a voluntary relinquishment could be made available to other qualified applicants, used to mitigate conditions in allotments not meeting Standards through a transfer of use, reallocated for other resource needs, or considered for placement in forage banks. This would aid in increasing protective cover of residual vegetation and litter resulting in reduced areas of bare soil.

Management would encourage the growth of species with high root production and a mix of species with different rooting depths and patterns increasing micro-organism populations, infiltration, aggregate stability, porosity, plant nutrients, erosion prevention, organic matter, and resilience to compaction. Management would maintain near-surface roots, plant litter, and vegetation to reduce the susceptibility of soils to compaction by helping to cushion impacts.

Vegetation composition and diversity would maintain or increase soil organic matter making the soil more resistant to compaction.

The protective cover of plants and litter would decrease amount of bare soil and increase soil aggregate stability, organic matter, and water infiltration.

Soil health, including; micro-organism populations, infiltration, aggregate stability, porosity, plant nutrients, litter accumulation, organic matter, and woody material accumulation would be maintained.

Management activities would avoid and/or mitigate detrimental compaction, wind and water erosion.

Soil disturbance would be minimized during management activities including rangeland improvement projects (i.e. mechanical harvest of Pinyon-juniper, seed bed preparation, and drilling seed). When possible, only designated trails and roads would be used. Surface disturbance that would cause loss of litter and the organic matter layer would be avoided.

Where appropriate, eroding land would be rehabilitated by improving ground cover thereby reducing gullies, rills, and sheet erosion.

Detrimental impacts on soils would be avoided or mitigated with an emphasis on soils with a high risk of degradation. Vegetative manipulation and soil disturbing projects would be appropriate for the soil series within the project area to ensure success of the project.

NOXIOUS WEEDS AND NON-NATIVE PLANTS

One allotment would not experience any livestock dispersed Noxious and/or invasive plant species.

With temporary non-use or suspension of livestock grazing in all or portions of three allotments for restoration efforts would decrease the spread of Noxious and/or invasive plant species by livestock. Successful restoration and vegetation treatment projects aimed at improving vegetation health and cover would result in a decrease in Noxious and invasive plant species. Soil disturbance due to fence building, pipeline extension, and developing water catchments has potential to increase weed spread but, the improvements would result in localized impacts. Water catchments will evenly disperse livestock which will likely increase the distribution of invasive species.

WILDLIFE

Impacts on Migratory/Special Status Bird Species of Concern

Alternative C, places an emphasis on a mix of active and passive modifications to livestock grazing management. Active changes would include vegetation restoration, season of use changes, growing season rest, and the installation of range improvements. Passive modifications would include reductions in stocking rate (through AUM changes or pasture/allotment changes), along with long-term rest in several small areas.

This alternative places an emphasis on rehabilitating failed seedings, along with requirements (VM 9 through 12) for a more diverse seed mix. The failed seedings were usually single species stands of non-native grasses. Restoration would result in greater plant variety and an increase in habitat diversity, with a positive impact on grassland dependent bird species; especially in locations which currently have little surface cover as a result of seeding failure. There would be an increase in desirable habitat for ground nesting migratory birds which require nesting or protective cover. The small number of bird species which require exposed ground, such as horned larks or killdeer, would be negatively impacted by restoration actions.

Season of use changes, growing season rest (GRAZ-2) and improved livestock distribution would result in changes in vegetative composition. Livestock engage in selective herbivory, and improved management would change vegetative composition through the recovery of species which are selectively grazed or browsed. This recovery would increase habitat niches for bird species, and would reduce the impacts of grazing on those bird species which have been negatively impacted. The rate of recovery would vary by vegetation type, with rapid response in forb or grass dominated types (especially early seral vegetation dominated by annuals), and less response in late seral types such as Blackbrush or Pinyon-juniper.

Upland areas which have experienced a loss of biological diversity or loss of soil productivity, would show little or no recovery. Some Sagebrush-grasslands, and many Pinyon-juniper woodlands fall into this category. Other plant communities, such as Blackbrush, which have been invaded by annuals would also see little change under this alternative. In both cases, bird species numbers and diversity would remain low.

This alternative proposes pasture rest which would assist in the recovery of shorter lived, rapidly reproducing, plant species, such as grasses and forbs. This would result in an increase in structural diversity and cover. Strongest recovery (and positive impacts on bird species) is expected in communities which normally have a high percentage of grasses and forbs, such as the Grassland-meadow community.

The spring growing season for range vegetation overlaps the nesting season of migratory birds. Growing season rest would reduce trampling and nest disturbance impacts on migratory birds that nest on the ground and near the ground in shrubs and trees.

Range improvements which protect riparian areas, either through exclusion or by redirecting livestock, would improve the structure and density of riparian vegetation with a positive impact

on riparian dependent species. The net increase in water availability from new range improvements would also benefit bird species.

Table 4-4 Impacts on Birds by Habitat Type

Habitat Type (% land)	Bird Species	Impacts
• Aspen (0.02 %)	• Williamson's sapsucker	Changes in season of use and grazing intensity would have long-term benefits to natural regeneration of aspen stands.
• Pinyon-Juniper (41.7 %)	• Black-throated gray warbler • Gray vireo • Pinyon jay • Virginia's warbler	Slight positive change in Pinyon-Juniper habitats over 20 years due to improvements in livestock distribution and season of use patterns. Pinyon and Junipers may increase since encroachment into shrublands would receive little treatment. This could positively affect Pinyon-Juniper dependent bird species.
• Ponderosa Pine-Douglas Fir (1.1 %)	• Flammulated owl • Grace's warbler • Lewis's woodpecker • Northern goshawk	Benefits to nesting and foraging birds would result from changes to season of use by livestock in areas with small stands of mature trees, especially old snags.
• Desert Shrub (7.20 %) • Sagebrush-grassland (8.22 %)	• Brewer's sparrow • Sage sparrow • Sage grouse	Progress in condition class would be slow. Some desert shrub and sagebrush areas would be restored which would benefit neotropical bird migrants using these areas. Long-term grazing pressures would not decrease appreciably, but better management would reduce concentrated impacts.
• Grassland & Meadow (1.7 %) • Sagebrush-grassland (8.22 %)	• Black rosy-finch • Burrowing owl • Ferruginous hawk • Northern harrier • Short-eared owl • Swainson's hawk	Growing season rest would bring positive response from grasses and forbs. Minor changes to stocking rates in important breeding bird areas would have a positive impact. Emphasis on range improvements could result in less grazing pressure in sagebrush and grassland areas. Most current negative impacts would see slow positive change over 20 years.
• Riparian (0.51 %)	• Blue grosbeak • Broad-tailed hummingbird • Common Yellowthroat • Lucy's warbler • Peregrine falcon • Prairie falcon • Yellow-billed cuckoo • Bald eagle	Exclusionary fences around riparian areas would benefit bird habitats. Spring rest would modify current negative riparian impacts and aid habitat recovery rates.

Impacts on Bats

Under this alternative there would again be little to no change on non-riparian bat roosting habitat. More intensive monitoring of livestock use could result in more rapid recovery of understory plant communities, and riparian recovery. More rapid recovery should be seen in non-riparian and riparian foraging habitat. Increased vegetative ground cover would result in an increased diversity of understory plant and insect prey species in both non-riparian and riparian foraging habitats resulting in the development of better quality foraging habitats over time. Reduced grazing pressure should also increase the recovery of riparian communities, resulting in the development of better quality roosting habitat (i.e. large cottonwood trees) over time. Range improvement design standards would increase the availability of water for bats in existing waters, as well as the development of new water locations.

Table 4-5 Summary of Impacts on Bats

HABITAT TYPE	Non-riparian, Roosting	Non-riparian, Foraging	Riparian, Roosting	Riparian, Foraging	Open water, Foraging & Drinking
BAT SPECIES	Fringed myotis, Allen's lappet-brow bat, spotted bat, big free-tailed bat, Townsend's big-eared bat	Fringed myotis, Allen's lappet-brow bat, spotted bat, big free-tailed bat, Townsend's big-eared bat	Western red bat	Western red bat	Fringed myotis, Allen's lappet-brow bat, spotted bat, big free-tailed bat, Townsend's big-eared bat, Western red bat
IMPACTS	Little to no impacts on bat roosting habitat in cliff, cave, non-riparian tree, and multiple habitats.	Rest and moderate reductions in active livestock use would benefit recovery of foraging habitat for sensitive bats. More intensive monitoring could result in additional changes to livestock management aiding in more rapid recovery of understory plant and insect prey species.	High priority for annual riparian monitoring, and management change requirement after failure to move towards PFC within four years leads to improved riparian roosting habitat.	High priority for annual riparian monitoring, and management change requirement after failure to move towards PFC within four years leads to improved riparian roosting habitat.	Range improvement design standards would increase the availability of water through the installation of "wildlife friendly" water improvements. This alternative also proposed the creation of new water developments, with positive impacts on these species.

Impacts on Game Species

Desert Bighorn Sheep

Under this alternative, only thirty percent (486,969 acres) of Desert Bighorn suitable habitat would continue with existing management. On thirty two percent (514,151 acres), grazing management would be modified by requiring growing season rest and improved distribution. This would reduce competition between livestock and Bighorns for forage. Livestock stocking levels would be reduced on twenty eight percent (463,534 acres), again with a positive impact through reduced forage competition. Livestock conflicts would not occur on ten percent (166,049 acres) since they would not be authorized for livestock use.

The seeding restoration activities proposed under this alternative would have a positive impact on suitable Bighorn habitat by restoring forage, but in areas which receive little Bighorn use. Structural improvements, in the form of water developments would provide additional sources of water for Bighorns, and improve livestock distribution (and fewer livestock-Bighorn conflicts at water sources). Some of the riparian protective exclosure may have a negative impact to Bighorns, but this would be subject to exclosure design.

Mule Deer

Fifty nine percent (25,701 acres) of Critical Mule Deer winter habitat would receive reduced livestock stocking under this alternative. This would have a positive impact on Mule Deer in the form of reduced competition for browse in winter use areas. Along with the stocking changes, there would also be changes in livestock distribution, which would provide more forage, with a proportional reduction in incidental winter browsing. This would also be a positive impact on Mule Deer.

This alternative also proposes new range improvements. Water developments would increase habitat availability to Mule Deer, which would be a positive impact, but better livestock distribution would come at the cost of more fencing, and fences have a potential to impede deer movements.

Restoration of rangeland seedings would reintroduce a forb component into areas which have lost most of their forbs. This would have a positive impact, since deer browse forbs.

Pronghorn

The impacts on Pronghorn under Alternative C are identical to those in Alternative B. All suitable Pronghorn habitat would continue to be available to livestock under this alternative, but negative impacts on Pronghorn would be reduced through changes in grazing management. Growing season rest would be required (GRAZ-2), with a positive impact. This rest period would make forbs available for consumption early in the season, when Pronghorn prefer them over shrubs. Spring forb availability is also critical to fawn rearing success, since lactating females use forbs heavily.

Structural range improvements are proposed under this alternative. New water developments would increase the availability of browse for Pronghorns by increasing their distribution. Fences are also proposed, and they may have a negative impact on Pronghorns since they impede Pronghorn movement.

Sage Grouse

As was noted in the No Action alternative, impacts on occupied Sage grouse habitat are identical under all alternatives.

Under this alternative, there would be changes in livestock management consist of growing season rest, and improved distribution on thirty two percent (584,939 acres) of historical habitat. The growing season rest would have the strongest impact, since it would prevent the removal of cover (through consumption) during the nesting and early brood rearing season. There also would be no competition between livestock and Sage grouse for forbs during the period when Sage grouse consume forbs. Growing season rest, along with improved distribution, would assist in riparian recovery, which would have a positive impact on Sage grouse. An additional twenty two percent (388,681 acres) would receive reduced stocking along with improved management, with similar, but more pronounced, benefits. In most cases, the positive impact from growing season rest is not total, in that Sage grouse brood will still be susceptible to predation and trampling impacts upon the resumption of grazing, but to a lesser extent, since the highest risk of mortality occurs early in the season.

Eleven percent of historical habitat (191,097 acres) would have livestock impacts removed. While the positive impacts are similar to those from reduced stocking or growing season rest, there is an additional benefit in that trampling impacts will not take place. Dead or cured plant material will also remain in place, since winter livestock use would not occur, which would increase nesting cover, and further reduce the potential for predation.

Impacts on Fish and Aquatic Species

Access to the spring in Buckskin Gulch by livestock would have better control through the construction of a fence. Livestock use would be monitored and restricted as needed in the area between upper and lower Calf Creek Falls. These two projects would be of benefit to the aquatic systems in these areas. On several allotments, measures would be taken to lessen impacts on riparian areas by modifying season of use, pasture division fences, and fencing access to springs by livestock. All of these projects would have a positive affect on riparian resources. Progress toward meeting riparian health Standards would have a 20 year time line under this alternative.

Impacts on Threatened and Endangered Wildlife Species

Mexican Spotted Owl

Under this alternative, livestock grazing would be removed from Mexican Spotted Owl Protected Activity Centers during breeding and nesting seasons. Changes in grazing management (31% of the Mexican Spotted Owl Critical Habitat within the planning area), along with stocking reductions (13% of area) and existing areas where livestock have been removed (9% of area) would benefit Mexican Spotted Owls.

Plant vigor, especially with grasses and forbs, should increase as a result of either the rest or seasonal removal of livestock. This improvement in plant health should have a positive impact on rodent and small animal populations, which in turn increases the prey population available to Mexican Spotted Owls.

The active use of the "riparian toolbox" in riparian restoration would improve the conditions of riparian areas. The Recovery Plan guidelines include "implement management strategies that will restore good conditions to degraded riparian habitat as soon as possible".

Southwestern Willow Flycatcher

Under this alternative, range improvements and growing season rest would encourage riparian recovery. Along with this, utilization standards would be imposed on allotments with suitable habitat for Southwestern Willow Flycatcher. Livestock use in allotments with potential or suitable Southwestern Willow Flycatcher habitat will be restricted to between September 1st and March 15th. The net impact of these measures would be a strong improvement in riparian habitat and an eventual increase in bird numbers.

Within Cottonwood Allotment (which contains most of the habitat addressed in the Recovery Plan), range improvements would exclude livestock from the Paria River. The Paria River and Cottonwood drainage portions of the allotment would be used a separate pasture dedicated to trailing and emergency use, and any use would be subject to the winter only restriction. Taken together these actions would remove all livestock related impacts in this allotment from the

stream corridor area, which would improve the suitability and extent of riparian habitat used by Southwestern Willow Flycatcher.

In addition to allotment specific changes on Cottonwood Allotment, and winter season grazing requirements on all other allotments with suitable habitat, stricter utilization standards would also be set on riparian plants, protecting plant recovery. Taken together, these measures would result in improved riparian habitat and benefits to Southwestern Willow Flycatcher.

CULTURAL RESOURCES

The implementation of the Cultural Resources Protocol (see Appendix 3) is common to all action alternatives. Under this alternative grazing related impacts on cultural resource sites would be identified on a site-specific basis, and appropriate mitigation measures would be implemented as necessary. In addition, the cultural resources research and monitoring component of the Protocol would provide the opportunity for in-depth research into grazing related impacts on cultural resource sites, use of appropriate mitigation measures, and the effectiveness of these measures, as well as provide for cultural resource inventory in areas where grazing related impacts are likely but the site density and character is unknown. This component is important in that research and monitoring regarding grazing related impacts would lead to a better understanding of the situation, and eventually better and more effective management practices.

This alternative emphasizes modifications to livestock management, such as changes in season of use and more rotations of livestock through pastures, plus range improvements where necessary. For cultural resources, this is an improvement over Alternative B in that less on-the-ground improvements will be needed to keep livestock from concentrating in certain areas, and vegetation will have an opportunity to re-establish (thus lessening erosion) through seasonal use changes.

Temporary closures and AUM suspensions would only benefit cultural resources in that the source of grazing related impacts would be, at least temporarily, lessened or removed. By allowing the recovery of vegetative cover, these temporary AUM reductions would have the effect of reducing erosion. Erosion, either directly or indirectly caused by grazing pressures at cultural resource sites, can be a major factor in the deterioration of these sites. Allowing the recovery of vegetation on these sites would generally slow the effects of erosion and help protect the sites. Livestock reductions would also benefit cultural resource research by providing a scientific control regarding grazing related impacts; the conditions and impacting agents at similar sites in similar settings could be directly compared between areas open to grazing and areas closed to grazing. Again, this would lead to better management practices in the future.

This alternative would provide for a greater amount of immediate relief from grazing related impacts on cultural resource sites than Alternative B, but less immediate protection that following Alternatives D and E. Although the action alternatives are designed to achieve the same end rangeland health goals, it is more a question of by which methods these goals are achieved in the various alternatives. Recovery of vegetation is an important factor in lessening overall impacts on cultural resource sites. In general, the faster an alternative leads to vegetative recovery, the better that alternative will be for cultural resources. This alternative would

promote vegetation recovery faster than Alternative B, but would lag behind when compared to the following Alternatives D and E.

RECREATION

Most conflicts between recreational use and livestock grazing would be reduced or eliminated under this alternative.

Recreational access problems relating to range developments (access through fences) would be reduced by incorporating the proposed "Standard Requirements and Design Restrictions on Range Improvements" (see *Standard Operating Procedures* [SOPs], Appendix 10). Additional requirements providing for recreational foot and horse access through fences would further reduce conflicts.

Changes in Seasons of Use under this alternative would reduce the overlap between the high recreational use season (mid-March through June, and September through November) and a grazing season in certain allotments.

The Upper Gulch Pasture of Circle Cliffs Allotment would be grazed only spring or fall of every other year. In years when spring grazing would occur, the season of use would end no later than March 15, which is also the typical start of the spring high recreational use season. Conflicts relating to competition for space in the Upper Gulch would be greatly reduced under this alternative.

The season of use for livestock grazing in Clark Bench Allotment would be cut back by one month in the spring, with the end of the grazing season being March 31 rather than April 30. Conflicts with recreational use would be reduced during the highest recreational use period of the spring under this alternative. Any individual pasture would be grazed at most every other year, either spring or fall, further reducing conflicts in off-grazing years. Additionally, by the creation of The Dive Pasture, there would be reduced livestock use of the Paria Canyon-Vermilion Cliffs Wilderness, further reducing opportunities for conflict on the allotment.

Death Hollow Allotment would have a season of use with less overlap onto the high recreational use season. Some livestock grazing has been authorized from April 1 through May 15; under this alternative all livestock grazing would end no later than March 31. Furthermore, fencing livestock out of the head of the narrows of Little Death Hollow would eliminate problems with hikers inadvertently herding livestock into the narrows. This would eliminate most recreational conflicts in this allotment.

One of the locations of highest conflict between recreational use and livestock grazing is the portion of the King Bench Pasture of King Bench Allotment that contains The Gulch, which is a very popular destination for hikers, backpackers and equestrians. Most of The Gulch on this allotment is designated as an Outstanding Natural Area, and there is an expectation among recreational users that it should be an outstanding, natural-appearing landscape. Because The Gulch supplies the only reliable water for most of the pasture, the livestock tend to concentrate use in the canyon bottom, which is also where recreational use is concentrated. Under this alternative the season of authorized use would be reduced by one month in the spring, ending no

later than February 28th, rather than March 31st, and spring grazing would occur only every other year. This would greatly reduce conflicts relating to competition for space by eliminating the presence of livestock during the spring season of high recreational use. It would also improve the natural appearance of vegetation in the canyon by allowing for an extra month of un-grazed spring growth. However, this would only somewhat reduce conflicts relating to access to clean water, because while there would be no livestock present during the high recreational use season, there would still be relatively fresh livestock feces concentrated around the stream in years of spring grazing use, especially during the early part of the recreational season.

Since much of the forage in the pasture is on King Bench itself (above the canyon), development of water catchments and/or repair of the existing water development on the bench would provide the opportunity to keep livestock mostly out of the canyon except for trailing purposes. If water sources are successfully developed then most recreational conflicts with authorized livestock use would be eliminated.

The creation of a new "Deer Creek" Pasture in the King Bench Allotment would be necessary to achieve reduction of conflict in The Gulch. It is possible in this alternative that new conflicts could arise in Deer Creek. Monitoring for increasing conflict would be necessary. Mitigation measures would need to be taken if monitoring indicated an increase in conflict.

The exclusion of livestock from the slot canyons of Dry Fork of Coyote Gulch (Dry Fork Narrows, Peek-a-boo, Spooky and Brimstone) in Lower Cattle Allotment would eliminate recreational conflicts related to inadvertent herding of livestock and the resulting unpleasant confrontations in the constricted areas.

The creation of Buckskin Gulch Pasture in Mollies Nipple Allotment, and designating the portion of the pasture east of House Rock Valley Road as closed to livestock use in the high recreation season would eliminate conflicts with recreational use related to competition for water and space.

In Upper Cattle Allotment, the exclusion of livestock from the visitor facilities (parking, toilet and picnic area) and rock formations of Devil's Garden would eliminate conflicts with recreational use in those areas.

ALTERNATIVE D

LIVESTOCK GRAZING

Implementing Alternative D would result in the temporary suspension of livestock grazing in all or portions of seven allotments for restoration purposes and as a result of not meeting upland Rangeland Health Standards. Temporarily suspending livestock grazing in Collet, Soda, Mollies Nipple, School Section, Upper Paria, Vermilion allotments that do not meet upland Standards and portions of Coyote allotment would make 13,076 AUMs unavailable. These suspensions, while temporary, would require adjustments to grazing operations in these allotments (impacts more specifically described below). Adjustments for some livestock operators could be significant, as described in detail below, and may affect their ability to continue to operate. In order to adjust, permittees would be forced to reduce livestock numbers, feed livestock off-site and/or procure replacement pastures. The schedule of restoration activities and lifting of the temporary suspensions are dependent on funding available and successful establishment of desirable species. It would be unrealistic to expect that funding would be available to restore all allotments at the same time so the temporary suspension for some allotments could exceed five years.

Site specific riparian restoration of springs and reaches in Death Hollow, Ford Well, and Rock Creek-Mudholes allotments would have minimal impacts on overall grazing authorizations. With protection, recovery of these areas is expected to be fairly rapid. There would be allotment specific adjustments to implement season of use modifications to limit consecutive year grazing use during the spring growing season and to implement modified pasture rotations.

Closure of the Big Bowns Bench Allotment would eliminate 750 AUMs. This would have minimal impacts as this allotment has not been grazed since 1999 due to unfavorable conditions. Closure of the Antone Flat (currently unalloted) and Little Bowns Bench (currently a forage reserve) Allotments and the Wolverine Pasture (currently a forage reserve) would have no impact as these areas are not used for livestock grazing and no AUMs are authorized within them.

Retention of the Phipps Pasture as a forage reserve would leave the status of the area unchanged.

For the remaining allotments that meet Standards, changes to existing management would be minimal as they would be limited to those short-term adjustments commonly associated with on-going allotment administration such as requests for change of season of use, modification to pasture rotation use, voluntary non-use, transfers and temporary non-renewable use.

Allotment Specific Consequences

Circle Cliffs

The impacts would be the same as analyzed in Alternative B.

Clark Bench

The impacts would be the same as analyzed in Alternative B.

Collet
(Uplands and Riparian did not meet)
This alternative would implement temporary grazing suspension until Standards are met, with a reduction of 97 AUMs of active preference. Before the reauthorization of grazing would be allowed, a new Allotment Evaluation would need to be completed. The negative impacts of the proposed reduction in this alternative would be more noticeable than in the preceding alternatives since the entire allotment would be rested until Standards are met. Total rest from grazing would increase plant vigor by allowing increased carbohydrate storage. Seed development and dispersal would increase, as would total vegetative cover and plant litter, leading to decreased erosion. Complete recovery is not anticipated due to the presence of invasive annual grasses, as well as historical changes in the plant community.

Trend in this allotment is not apparent. No long-term trend sites have been established. Monitoring data is lacking. Trend would be part of the priority data collected on the allotment, as well as Ecological Site Inventory and Proper functioning Condition information.

The temporary suspension of active use would have a significant negative impact on the permittee's livestock operations, and may have a negative impact on the permittee's finances. In the short-term this impact cannot be mitigated. In the long-term it is anticipated that rangeland health would be restored and grazing would return.

Coyote
The impacts would be the same as analyzed in Alternative C.

Death Hollow
(Riparian did not meet)
The impacts would be the same as analyzed in Alternative C.

Ford Well
(Riparian did not meet)
The impacts would be the same as analyzed in Alternative C.

Soda
(Uplands and Riparian did not meet)
This alternative would implement temporary grazing suspensions until Standards are met, with a reduction of 2,798 AUMs of active preference. Before the reauthorization of grazing would be allowed, a new Allotment Evaluation would need to be completed. The negative impacts of this alternative would be more noticeable than in the preceding alternatives since the entire allotment would be rested until Standards are met. Total rest from grazing would increase plant vigor by allowing increased carbohydrate storage. Seed development and dispersal would increase, as would total vegetative cover and plant litter, leading to decreased erosion. Complete recovery is not anticipated due to the presence of invasive annual grasses, as well as historical changes in the plant community. Those impacts would be corrected through plant community restoration. The BLM would still consider combining the Fortymile Ridge Allotment with the Soda Allotment.

High priority would be placed on fences and water improvements to assist in the better distribution of livestock. Water developments would be constructed to allow for better protection of riparian and upland resources. Range improvements would reduce erosion and

increase desirable vegetative plant cover, community, and litter throughout the allotment by redistributing grazing impacts, and lessening grazing intensity. Since the installation of structural improvements is subject to funding, it is anticipated that the reduction of impacts would be phased in over the life of the plan. Considering the amount of time required for the environmental assessment, funding, and construction of these projects, recognition of on the ground gains would be slow.

Trend on the Soda allotment is currently monitored at seven locations. Long-term trend appears to be static to slightly upward. With the total suspension of grazing trend should continue to be upward and part of the priority data collected on the allotment, as well as Ecological Site Inventory and Proper Functioning Condition information.

The temporary suspension of active use would have a significant negative impact on the permittee's livestock operations in the short-term, and may have a negative impact on the permittee's finances. In the long-term, proposed restoration actions would mitigate this impact.

King Bench
The impacts would be the same as analyzed in Alternative C.

Lake
The impacts would be the same as analyzed in Alternative B.

Last Chance
The impacts would be the same as analyzed in Alternative A.

Mollies Nipple
(Uplands and Riparian did not meet)
This alternative would implement temporary grazing suspensions until Standards are met, with a reduction of 3,862 AUMs of active preference. Before the reauthorization of grazing would be allowed, a new Allotment Evaluation would need to be completed. Upon achieving Standards, and the resumption of grazing, the allotment has a potential of 3,862 AUMs, but the final quantity may change, subject to the determination of the new evaluation.

The impacts of this alternative would be more noticeable than in the preceding alternatives since the entire allotment would be rested until Standards are met. Total rest from grazing would increase plant vigor by allowing increased carbohydrate storage. Seed development and dispersal would increase, as would total vegetative cover and plant litter, leading to decreased erosion. Complete recovery is not anticipated due to the presence of invasive annual grasses, as well as historical changes in the plant community. Those impacts would be corrected through plant community restoration.

Once it has been determined that Standards are met, most active use would be restored. Restoration work would be required on Blue Spring, Telegraph, Mine Spring, Jenny Clay, and Rockhouse Pastures, and while more forage would be available for livestock upon completion of the restoration then it is possible that active use may still be less than historical level of 3,862 AUMs since that level was determined using healthy crested wheatgrass seedings. The restored seedings would be a mixture of grass species, including natives, and would not produce as much

forage as the old monotypic crested wheatgrass seedings. New analysis would take place to verify actual capacity.

After restoration activities are completed the long-term trend in the Blue Spring, Telegraph, Mine Spring, Jenny Clay and Rockhouse Pastures should be upward with an increase in the species that were seeded. The success of the restoration activities would depend on the timing and the amount of precipitation the area receives.

Upon resumption of grazing, the season of use would be shortened by two months or 61 days, with no grazing occurring in April and May. Removing cattle during this period would give the forage species periodic rest from livestock grazing during the critical growing period. It would also improve the vigor of the perennial grasses and shrub species. Shortening the season of use would maintain an upward trend in the pastures that are grazed in the spring of year, since these pastures would receive the periodic rest. This would allow the forage species to maintain their production and vigor resulting in an increase in the numbers and percent cover for perennial grasses and shrubs.

Nipple Pasture would be split into two separate pastures, and a deferred rest rotation system implemented. This would have a beneficial impact to the perennial grasses in the pasture, since it would improve cattle distribution throughout the existing Nipple Pasture by forcing cattle to use areas such as Wildcat Ridge and Deer Trail. Perennial grasses would be able to set seed each year which would increase the number and percent cover in the pasture. The deferred rotation in Nipple Pasture would also ensure that the cool season and warm season grasses would not be grazed the same time period in two consecutive years. This would improve long-term trend for perennial grass in the summer pastures. In order to fully implement a two pasture rotation in the Mollie Nipples allotment additional water locations would be needed in the pasture.

The riparian areas that were determined to not be meeting Standards would recover faster than upland sites from the grazing suspension. Once cattle are reauthorized on the allotment some of these riparian areas, would be fenced in order to protect these areas and to prevent livestock from being a contributing factor to not meeting Standards.

The proposed Buckskin Gulch fence would eliminate the recreational/livestock conflict in lower Buckskin Gulch. There would be no decrease in active use from the construction of the fence. Limiting the season of livestock use in Buckskin Gulch would assist in moving this area towards meeting Standards. This fence would also limit livestock use at the seep in Buckskin Gulch allowing it to attain or move toward PFC.

Since the installation of structural improvements is subject to funding, it is anticipated that the reduction of impacts would be phased in over the life of the plan. Considering the amount of time required for the environmental impact assessment, funding, and construction of this project on the ground gains would be slow at best

The temporary suspension of active use would have a short-term, significant negative impact on the permittee's livestock operations, and may have a negative impact on the permittee's finances. In the long-term, negative impacts would be mitigated by the actions described above.

Rock Creek-Mudholes
(Riparian did not meet)
The impacts would be the same as analyzed in Alternative B.

School Section
(Uplands did not meet)
This alternative would implement temporary grazing suspensions until Standards are met, with a reduction of 102 AUMs of active preference. Before the reauthorization of grazing would be allowed, a new Allotment Evaluation would need to be completed. The impacts of this alternative would be more noticeable than in the preceding alternatives since the entire allotment would be rested until Standards are met. Total rest from grazing would increase plant vigor by allowing increased carbohydrate storage. Seed development and dispersal would increase, as would total vegetative cover and plant litter, leading to decreased erosion. Complete recovery is not anticipated due to the presence of invasive annual grasses, as well as historical changes in the plant community. Those impacts would be corrected through plant community restoration.

The Rangeland Health Assessment identified 352 acres that were not meeting the Standards in a failed rangeland seeding. The reason for this determination was the lack of perennial grasses, and the dominance of exotic annual species throughout the seeding. Restoration of this seeding would enable it to meet the Standards.

Suspending active use would likely move the seeding in a positive direction but it is anticipated that Rangeland Health rating would remain the same without some kind of restoration activities to decrease the abundance of the exotic annual species.

Considering the amount of time required for the environmental assessment, funding, and implementation of the restoration activities on the ground gains would be slow until the actually activities are completed

Long-term trend would improve in the seeding upon the completion of restoration activities. It is anticipated that there would be a decrease in the percent cover of annual forbs and increase in perennial species upon completion of restoration species.

Once restoration is completed the new active use could be less then the current active use 102 AUMs. The amount of forage available for livestock would be less because the species that would be planted may produce less forage than the crested wheatgrass that was planted in the original seeding.

The temporary suspension of active use would have a short-term, significant negative impact on the permittee's livestock operations, and may have a negative impact on the permittee's finances. In the long-term, negative impacts would be mitigated by the actions described above.

Upper Paria
(Uplands and Riparian did not meet)
This alternative would implement temporary grazing suspensions until Standards are met, with a reduction of 2,780 AUMs of active preference. Before the reauthorization of grazing would be allowed, a new Allotment Evaluation would need to be completed. The impacts of this

alternative would be more noticeable than in the other alternatives since the entire allotment would be rested until standards are met. Total rest from grazing would increase plant vigor by allowing increased carbohydrate storage. Seed development and dispersal would increase, as would total vegetative cover and plant litter, leading to decreased erosion. Complete recovery is not anticipated due to the presence of invasive annual grasses, as well as historical changes in the plant community. Those impacts could be corrected through plant community restoration.

Riparian areas that currently do not meet Standards would rapidly progress toward recovery without grazing pressure but invasive and undesirable species would remain a problem. Litter, stream bank vegetative cover, plant vigor, and stream morphology would improve and soil loss would decrease. However, removal of livestock will not correct all of the identified riparian issues. The major factor behind three reaches of Willis Creek, one reach of Henrieville Creek and one reach of Little Creek ranking as "non-functional" were diversions and ditches, and these areas would most likely not reach PFC since these impacts cannot be mitigated because BLM does not have the authority to control the upstream diversions. Private water use also impacted several riparian sites rated "functioning at risk" such as Willis Creek, Heward Canyon, and Sheep Creek.

Upland sites would most likely move toward meeting Standards under this alternative; however the removal of cattle would not necessarily have a positive impact on all upland sites such as seedings. It is anticipated the ratings would remain the same in these areas without plant community restoration.

Other than the seedings discussed above overall trend would be upward or static depending on the ecological site. Without disturbance mid and late seral species would increase on most sites as they move toward potential natural community.

The temporary suspension of active use would have a short-term, significant negative impact on the permittee's livestock operations, and may have a negative impact on the permittee's finances. In the long-term, negative impacts would be mitigated by the actions described above.

Vermilion
(Uplands and Riparian did not meet)
This alternative would implement temporary grazing suspensions until Standards are met, with a reduction of 2,849 AUMs of active preference. Before the reauthorization of grazing would be allowed, a new allotment evaluation would need to be completed. Upon the achievement of Standards, and the resumption of grazing, the allotment has a potential for 2,849 AUMs, but the final quantity may change, subject to the determination of the new evaluation.

The impacts of this alternative would be more noticeable than in the preceding alternatives since the entire allotment would be rested until Standards are met. Total rest from grazing would increase plant vigor by allowing increased carbohydrate storage. Seed development and dispersal would increase, as would total vegetative cover and plant litter, leading to decreased erosion. Complete recovery is not anticipated due to the presence of invasive annual grasses, as well as historical changes in the plant community. Those impacts would be corrected through plant community restoration.

In order to meet all Standards additional input such as restoration activities need to be completed. For example just removing cattle would not correct the soil erosion problem occurring in the Fossil Wash and Petrified Hollow Pastures. Restoration is proposed in order to control the rills, overland flows, gullying and other soils related problems, which will assist in meeting the soils Standard. Also, suspending livestock use would not reduce the problems with exotic weed species. Treatment and/or reseeding would reduce the amount of exotic species on the allotment.

Fossil Wash and RCA 1 Pastures will require restoration in order to return to meeting Standards. The reseeding effort would include actions to reduce soil erosion in the two pastures. Future authorized use would probably be less than the current active use of 2,849 AUMs, since the mix of species used in restoration produce less forage then the (failed) monotypic crested wheatgrass seedings they replace.

Trend would move upward for the most part, especially in the Fossil Wash and RCA 1 after restoration. Trend may decline in pastures where sagebrush is replacing perennial grasses or where pinyon/juniper trees reestablish themselves in old seeded areas, where they out-compete shrubs and grasses.

Once cattle are authorized again there would be a requirement for growing season rest (GRAZ-2), which would keep the long-term trend at static to upward. Perennial grasses would be able set seed each year rather than every other year in some pastures. As a result, there would be more grasses and a higher percent cover of perennial grasses on the allotment.

As a result of total rest, the riparian areas on the allotment that are not meeting the riparian Standard would meet it within five years. Protective fences would be built around riparian areas to eliminate livestock as one of the contributing causes to riparian areas not meeting Standards upon their reintroduction. The riparian areas around the spring that which did not meet the Standards would respond well to rest.

Implementing a pasture rotation would improve cattle distribution on Nephi Pasture. The areas that would benefit the most would be the areas that are ¼ to ½ miles from the current livestock watering locations in the pasture. The new water developments would also improve cattle distribution and reduce utilization of key species in those areas nearest to the existing watering locations. Utilization of key species would increase in areas where new water developments would be installed.

The temporary suspension of active use would have a short-term, significant negative impact on the permittee's livestock operations, and may have a negative impact on the permittee's finances. In the long-term, negative impacts would be mitigated by the actions described above.

Willow Gulch

The impacts would be the same as analyzed in Alternative A.

VEGETATION

Aspen

Under Alternative D, aspen stands would continue to regenerate, based on 2007 analysis.

Evergreen Forest

Evergreen forest plant communities currently receive light use and minimal impacts from livestock grazing and would likely continue under Alternative D. Potential for indirect negative impacts may occur as adjacent plant communities reach capacity and grazing is shifted onto Evergreen Forest communities.

Oak woodland

Changes in distribution as a result of range developments and growing season rests would assist this community in reaching DPC parameters. Many of the Oak woodland communities in the Monument are functioning and would continue to function under this alternative with improvements in overall health occurring over time. Although Oak woodlands would receive a lower priority for intensive monitoring under this alternative, regular monitoring would occur to verify that sites are functioning normally.

Pinyon-juniper Woodland

Impacts on Pinyon-juniper woodlands would include moderate improvements in understory species cover and diversity. A more diverse age structure and greater diversity of understory species would be achieved and maintained over time with this alternative, particularly in areas where use was traditionally high or where Standards are not being met. For areas that received light or no use, some decreases in plant cover and diversity may be expected with this alternative, since efforts to better spread livestock use across a given pasture or allotment through range improvements would increase use of areas not previously impacted. With the suspensions proposed in this alternative for allotments not meeting Standards, plant communities would more rapidly improve than for alternatives that propose changes in grazing management. Cool season grasses, a traditionally important component of Pinyon-juniper woodlands, would have an increased chance for recovery under this alternative. In general, progress would be made towards achieving DPC for this community. The specific criteria outlined in the DPC for Pinyon-juniper woodlands would create higher priorities for restoration activities in this cover type. The emphasis on research oriented restoration under this alternative would benefit the community type overall and help guide restoration of Pinyon-juniper woodlands throughout the Monument. The rate for achieving results would be more accelerated than in Alternatives A, B, and C as a result of timeframes established for achieving restoration success and pre-restoration monitoring protocols and success criteria. The persistence of the restored or improved sites would be enhanced with this alternative as a result of the new rangeland health evaluation proposed for each site and the adjusted use levels.

Ponderosa pine/Douglas-fir

Under Alternative D, Ponderosa Pine/Douglas-fir communities would receive marginal impacts. Because this is a relatively uncommon community type with limited grazing pressure, no substantial impacts are expected. Slight improvements to community health may occur as a result of growing season rest requirements implemented in the "Management common to all"

measures. Indirect negative impacts may occur if adjacent cover types reach carrying capacity and grazing pressure is shifted onto Ponderosa pine/Douglas-fir communities. Although this cover type would likely receive a lower priority for intensive monitoring, routine monitoring would be conducted to ensure that sites are properly functioning.

Blackbrush

Blackbrush communities would experience gradual improvements to community health and may slowly progress towards achieving DPC. Blackbrush communities are generally not particularly resilient and improvements to vegetation cover and diversity may be slow at best under any alternative. Growing season rest would allow some of the native species to recover but complete recovery and reaching DPC objectives may not be possible without more substantial modifications to livestock management. Sites that are not meeting Standards would be given rest until Standards are met which would greatly increase the chances of site recovery. Adjusted use levels and management of Blackbrush communities once Standards are met would provide a means to prevent further degradation. Sites that were determined to be functioning at risk have the best chance to show improvements to soil erosion and species composition. Shifts in composition from cool season grasses to warm season grasses may be irretrievable without long-term season of use modifications, as proposed. Sites that are Non-Functioning would be prioritized for intensive monitoring under this alternative but overall improvements in this plant community are expected to be slow at best. Site stabilization and overall increases in total cover are the most likely factors to improve.

Desert shrub

Under Alternative D, Desert shrub communities would show some moderate improvements in overall vegetation cover and biological soil crust cover. Changes in species composition may be longer term in nature. Changes in distribution associated with range improvements would increase vegetation cover in areas heavily used but may result in decreases in areas that are currently lightly used. This may cause some sites that are at threshold conditions to deteriorate and may reduce functioning at otherwise intact sites. Progress towards DPC would be accelerated under this alternative, relative to Alternatives A-C. Soil loss and erosion have been identified as impacts on this community and changes in distribution and growing season rest would result in localized improvements over time to these factors. Provisions for adjusting the level of use and general management proposed under this alternative would allow for longer term stability of soils in this community type. Adjustments to management would encourage the establishment and competitiveness of desired species in Desert shrub sites. Desert shrub communities typically occur in dry low elevation sites, often with saline soils, and as such are naturally slower to recover from disturbance than other communities. With this, and all alternatives, degradations can occur rapidly if not closely monitored and improvements would occur slowly.

Grassland and Meadow

Grassland and Meadow communities would benefit from the improved distribution and growing season rest measures associated with Alternative D. Improvements to this community would include a long-term increase in total vegetation cover and subsequent decrease in the amount of bare ground. Changes in livestock distribution associated with range improvements may cause reductions in vegetation cover and possible species composition shifts in areas that had

previously received light use. This would result in reduced grazing use in areas that typically received relatively heavy use. Monitoring would help document any detrimental impacts on grasslands. Reduced surface resistance to erosion is a concern in some grassland sites and growing season rest would allow increases in vegetation cover and litter to improve these conditions. For sites that do not meet Standards, more immediate improvements would be observed as a result of suspensions and subsequent adjustments to use levels and general management. Because soil stability is an issue in Grassland and Meadow communities, temporary grazing suspensions would allow the longer time needed to stabilize these sites and adjusted use levels would provide a means to prevent future degradations.

Mountain shrub

Impacts associated with Alternative D to Mountain shrub communities are not expected to be substantial. Because of the relative scarcity of this cover type in the Monument, it does not receive much grazing pressure. All sites sampled for rangeland health were functioning normally and would likely continue to function normally.

Sagebrush-grassland

Alternative D would bring improved conditions to a large number of acres of Sagebrush-grassland. As with other community types, the changes would be gradual with initial increases in total vegetation cover and decreases in bare ground. Longer term changes may be expected for shifts in species composition and overall diversity. These shifts in species competition would occur more rapidly under this alternative as a result of the temporary suspension for sites that do not meet Standards. The competitiveness of native grasses against invaders such as cheatgrass would be increased with seasonal rest and at sites where suspensions occur. The potential for increased cover of cool season grasses relative to warm season grasses would improve under this alternative, particularly for sites that undergo changes in growing season after meeting Standards. Sagebrush-grassland sites would receive higher prioritization for monitoring under this alternative and would have a greater potential for reaching DPC. Livestock management changes under this alternative would not prevent or control the spread of juniper in Sagebrush-grasslands but monitoring may identify areas to prioritize for treatment. Changes in community structure would be identified much earlier with the monitoring criteria under this alternative. Therefore, sites that are at or near threshold states for recovery would receive modifications to grazing or restoration efforts at a stage where restoration is most effective.

Seedings

Under Alternative D, seedings that do not meet Standards or have experienced plant mortalities would not be grazed prior to restoration and grazing would only resume once post restoration success criteria are met. This would ensure that Standards for plant cover and composition set in the DPC for seedings are achieved. In some seedings where weeds are an issue, weeds may gain a stronger foothold when grazing pressure is removed. While removing grazing prior to restoration would stabilize soils, competition with exotic species would increase for seeded species. Seedings would make slow to moderate progress toward achieving and maintaining DPC. Adjustments to use levels and general management would provide a means for preventing widespread plant mortalities and site degradation during drought periods. With this alternative, seedings have a greater chance for long-term persistence.

Wetlands/Riparian

The proposed fences around riparian areas and improvements to water developments would result in immediate increases in the total vegetation cover with subsequent increases in the amount of litter, diversification of age classes of woody species, and potential expansion of riparian zones to match site potential. Positive impacts would occur because, changes in species composition and structure for herbaceous species may be observed in the short-term with more moderate to longer term changes to woody species composition. Where they exist, exotic species such as tamarisk and Russian olive would continue to be strong competitors with native tree and shrub species without proactive management and control of these plants. Alternative D emphasizes restoration and research activities in riparian areas which would lead to substantial improvements in native species cover and overall extent in many degraded riparian areas. The proposed changes in use and management after failing sites meet Standards would result in increased long-term stability and health of riparian areas, relative to Alternatives A-C.

THREATENED, ENDANGERED AND SENSITIVE PLANT SPECIES

Many of the special status species found in the Monument are edaphic endemics that are restricted to sparsely vegetated sites with specialized soil or bedrock characteristics. These are often harsh sites that provide little forage for livestock and are frequently inaccessible because of steep slopes. Because of these habitat features, most special status plant species receive little to no direct impacts from livestock grazing. With improved distribution of livestock, grazing impacts may occur closer to special status species than previously occurred resulting in a negative impact. Potential does exist for indirect negative impacts as a result of habitat degradation from invasive weed species from adjacent habitats and loss of pollinators that rely on the health of the surrounding vegetation. In general, the focus on restoration and research under this alternative would indirectly improve habitat conditions for special status plants. Threats to Kodachrome bladderpod are mainly related to off-road vehicle use but trampling by livestock is a possibility. Impacts on Kodachrome bladderpod would be reduced as a result of the language in VEG-5 (Chapter 2) which prevents trampling through placement of salt blocks, supplements, and water away from Kodachrome bladderpod populations. This species occupies approximately 600 acres within the Dry Valley, Upper Hackberry, and Upper Paria allotments. Under this alternative, roughly 585 acres of the occupied habitat (98% of population) would remain unchanged and approximately 0.5 acres of habitat (<1% of population) would experience improvements as a result of changes in grazing management. Under this alternative, Kodachrome bladderpod populations would generally remain the same or show improvements in size and extent.

Ute ladies' tresses has a restricted distribution (King Bench Allotment, Deer Creek) in the planning area and is managed in a manner that generally encourages the growth of the species. Winter grazing benefits this species by removing competing plant cover. Approximately 49 acres of riparian habitat is occupied by Ute ladies' tresses. Under Alternative D, current grazing practices would continue where this population is located, which would maintain the population at its' current levels.

Under Alternative D, Jone's cycladenia would remain unchanged. One site is known of this species within the planning area. The site occupies approximately 36 acres of steep, remote

habitat in the Moody allotment that is inaccessible to livestock. No change to this population is anticipated under this alternative.

RIPARIAN AND WATER RESOURCES

Watershed Health

Grazing would be suspended on the six allotments not meeting one or both of the upland Standards. Upon achieving Standards, allotment management strategies could include using rest, rotational grazing systems, changes in season of use, and permanent stocking adjustments. Grazing pressure on seedings that do not meet Standards would be reduced. The net effect of the proposed changes would be a moderate reduction in the severity of impacts on upland hydrologic processes. Moderate improvements in understory cover would occur in dominant vegetation types, causing commensurate reductions in runoff. Improvements would begin immediately in a substantial portion of the planning area. Maintenance and restoration of hydrologically important vegetation, such as the perennial cool season grass component of the Pinyon-juniper and Sagebrush-grassland communities and the grassland and meadow community in general, would have a higher likelihood of success under this alternative.

Improvements would occur both more quickly and over a much broader area under this alternative than under Alternatives A, B, and C, because use would be reduced immediately throughout the most degraded allotments. Using suspensions rather than changes in management would also increase the certainty of achieving watershed management objectives. Increased research, monitoring, and prioritization of Sagebrush-grassland and Pinyon-juniper plant communities would increase the effectiveness of management actions designed to restore desired vegetation conditions, as well as the likelihood that hydrologic processes would be considered in the selection and design of treatment units. As a result, compared to Alternatives B and C, vegetation restoration projects would be more apt to improve watershed conditions as well as habitat conditions.

In the long-term, upland hydrologic conditions governing infiltration and runoff would improve moderately in the six allotments failing upland standards. Causes of excessive runoff from uplands would be addressed in the short-term, via suspension of grazing. Relative to Alternatives A, B, and C, this alternative has a higher likelihood of achieving long-term maintenance and restoration of upland hydrologic conditions. Beneficial impacts would be strongest in areas where grazing is suspended or relinquished, where restoration occurs, and where proposed grazing management strategies are successful.

Riparian Proper Functioning Condition

Proposed actions and impacts associated with management of riparian areas and allotments that are failing the riparian Standard or are of concern due to riparian conditions are similar as under Alternative C. The primary difference between Alternatives C and D is in the management of allotments (and the riparian areas they encompass) that do not meet upland Standards.

Riparian vegetation communities would be a priority for restoration under this alternative. As with Alternative C, the toolbox emphasizes repair and installation of structural range improvements (fences and water developments), but also accommodates modification of grazing

management to meet riparian objectives. Active erosion control and treatment of invasive exotic species would occur on a limited basis.

Retrofitting existing water developments to reduce dewatering would increase the extent, diversity, and vigor of native riparian plants in many riparian areas in the short-term, and would improve stream channel conditions in the long-term by increasing bank stability and large wood recruitment. If constructed and maintained, fences (proposed in many allotments) and off-stream waters would reduce herbivory and trampling in riparian areas, and would also slow the rate of headcut development and migration. Under this alternative (as well as Alternatives B and C), maintenance of new and existing riparian fences would be critical to meeting riparian objectives.

Riparian systems on all allotments would benefit from the initiation of growing season rest every other year. Bank stability would increase as a result of less frequent trampling and increased vegetation cover, and sediment delivery from adjacent uplands to stream channels would decrease as a result of enhanced sediment capture by vegetation.

Immediate suspension of grazing in allotments failing upland Standards would cause short-term and long-term benefits in riparian areas, as five of the six allotments failing Standards 1 and/or 3 also fail the riparian standard. Short-term impacts in some lotic reaches would be slight, as ecological processes in certain areas have been affected by upland conditions that would take time to recover. Long-term reductions in runoff from uplands, coupled with the eventual repair or installation of range improvements, would cause reduced rates of headcutting and channel widening, thereby allowing for maintenance and establishment of riparian communities. Stream and wetland areas that are directly impacted by livestock grazing would benefit immediately from reduced grazing and trampling. Because grazing would be suspended until all Standards are met, there is a high likelihood that this alternative would allow riparian systems in these five allotments to achieve or trend towards PFC. Upon achieving Standards, grazing management would be designed to maintain desired riparian conditions.

Management changes on the three allotments failing only the riparian Standard (as well as in certain other allotments where the riparian standard is met but there are areas of concern) would be similar to Alternative C, and would emphasize improved range management and exclosure fences, as well as creation of off-stream water sources. Management changes would include reducing use of pastures with degraded riparian areas, changing the season of use to minimize livestock utilization impacts on desired riparian vegetation and, potentially, allocating relinquished AUMs to watershed resources. Reducing, eliminating, or reallocating use would reduce livestock utilization impacts on riparian systems; changing the season of use could either increase or decrease livestock utilization resulting positive or negative impacts, although design of the grazing strategy would consider riparian objectives.

As under Alternative C, management changes in allotments failing the riparian Standard would benefit some areas immediately, while other areas would improve incrementally over the life of the plan, since range improvements would only be constructed as funding allows. Riparian areas in allotments where temporary or permanent changes in grazing management are to be implemented immediately would begin improving more quickly, although installation of fences would be required to ensure sustained long-term recovery. Monitoring and associated

requirements for remedial action would ensure that progress is made towards reducing livestock impacts on riparian areas.

Erosion control projects would avert reductions in the extent or functionality of a limited number of riparian areas. The benefits of these projects would be greatest in Functioning-At-Risk systems where fences are repaired or installed to control grazing and trampling. Headcuts are a common cause of riparian areas not achieving PFC. Failure to prioritize and address headcuts in a timely manner would reduce the likelihood of recovering systems that are Functional-At-Risk.

The extent of riparian vegetation treatments to remove invasive exotics would be similar to Alternative C. These treatments could increase recruitment of willow and cottonwood and would thereby maintain or restore important ecological (e.g., habitat) and physical (e.g., large wood recruitment and bank stability) functions.

Water Quality

In the short-term, areas vulnerable to erosion would continue to receive livestock use, however because of management changes runoff and erosion from degraded allotments would be reduced. Because the primary sources of total dissolved solids (TDS) are marine shales ('badlands') that are naturally highly erosive and receive light grazing pressure, grazing would continue to have a negligible or minor impact on TDS and salinity. Limited implementation of erosion control projects could be used in streams and meadows to reduce the downstream transport of saline soils derived from eroding uplands.

Livestock use around spring-fed streams would be reduced as a result of range improvements, growing season rest, and use suspension in the nine allotments that fail the upland or riparian Standard.

Reducing the magnitude and duration of dewatering would improve water temperatures conditions in some springs. Livestock grazing would continue to affect woody riparian species that provide stream shading, although impacts would be reduced relative to current conditions (as well as Alternatives B and C) as a result of improved grazing management, repair and installation of fences, and suspension of use in eight allotments that fail the upland and riparian Standards. Channel incision and widening (and attendant increases in solar radiation inputs and water temperature) would continue, although recovery of riparian vegetation, as well as a limited program of erosion control, would allow channels to stabilize over time.

SOILS

Alternative D would improve and maintain the health of the soils resource more readily than any of the other alternatives, except E, due in part to the initial reduction in AUMs to 62,279. Livestock grazing would be suspended in allotments which did not meet upland Rangeland Health Standards. This suspension is expected to result in the second to the greatest increase, of any of the alternatives, in the protective cover of residual vegetation and litter resulting in reduced areas of bare soil.

Management conditions would encourage the growth of species with high root production and a mix of species with different rooting depths and patterns increasing micro-organism populations, infiltration, aggregate stability, porosity, plant nutrients, erosion prevention, organic matter, and resilience to compaction. An increase in near-surface roots, plant litter, and vegetation would reduce the susceptibility of soils to compaction by helping to cushion impacts.

Soil disturbance would be minimized during management activities including rangeland improvement projects (i.e. mechanical harvest of Pinyon-juniper, seed bed preparation, and drilling seed). When possible, only designated trails and roads would be used. Surface disturbance that would cause loss of litter and the organic matter layer would be avoided.

Where appropriate, eroding land would be rehabilitated with an emphasis on improving conditions in areas where there is a lack of ground cover, gullies, rills, and sheet erosion.

Detrimental impacts on soils would be avoided or mitigated with an emphasis on soils with a high risk of degradation. Vegetative manipulation and soil disturbing projects would be appropriate for the soil series within the project area to ensure success of the project.

NOXIOUS WEEDS AND NON-NATIVE PLANTS

Under this alternative there would be no further livestock spread of Noxious and/or invasive plant species in the three closed allotments and one pasture. The remaining six suspended allotments would have a reduced spread of Noxious and or invasive plant species since adjustments to livestock management would reduce grazing intensity, along with reducing disturbance during the growing season.

Successful restoration and vegetation treatment projects aimed at improving vegetation health and cover would result in a decrease in Noxious and/or invasive plant species. Soil disturbance due to fence building and pipeline extension has potential to increase weed spread but would be limited to the immediate area of the action. Replacing water catchments won't create new disturbances but, will evenly disperse livestock which will likely increase the distribution of invasive species.

WILDLIFE

Impacts on Migratory/Special Status Bird Species of Concern

Under Alternative D, there would be more emphasis on passive changes to livestock grazing management, in that more allotments (specifically those which fail the upland Standard) would receive rest. The active management proposed in Alternative C, (vegetation restoration, season of use changes, growing season rest, and the installation of range improvements) would also be proposed under this alternative.

This alternative continues an emphasis on rehabilitating failed seedings, along with requirements (VM 9 through 12) for a more diverse seed mix. The failed seedings were usually monotypic stands of non-native grasses. Restoration would result in greater plant variety and an increase in habitat diversity, with a positive impact on grassland dependent bird species; especially in

locations which currently have little surface cover as a result of seeding failure. There would be an increase in desirable habitat for ground nesting migratory birds which require nesting or protective cover. The small number of bird species which require exposed ground, such as horned larks or killdeer, would be negatively impacted for the long-term by restoration actions.

Season of use changes, growing season rest (GRAZ-2) and improved livestock distribution would result in changes in vegetative composition. Livestock engage in selective herbivory, and improved management would change vegetative composition through the recovery of species which are selectively grazed or browsed. This recovery would increase habitat niches for bird species, and would reduce the impacts of grazing on those bird species which have been negatively impacted by past grazing practices. The rate of recovery would vary by vegetation type, with rapid response in forb or grass dominated types (especially early seral vegetation dominated by annuals), and less response in late seral types such as Blackbrush or Pinyon-juniper.

This alternative proposes long-term rest on allotments which fail to meet either soils or biological diversity standards. Suspending grazing would assist in the recovery of shorter lived and rapidly reproducing species, such as grasses and forbs, resulting in an increase in structural diversity and cover. In comparison to seasonal rest, long-term rest would show better recovery of longer lived, and slower to reproduce species, such as woody shrubs. Strongest recovery is expected in communities which normally have a high percentage of grasses and forbs, such as the Grassland-meadow community. Fair recovery is expected in shrub dominated communities, such as Mountain Shrub or Oak Woodlands. Upland areas which have experienced a loss of soil productivity would show little or no recovery. Many Pinyon-juniper woodlands fall into this category. Impacts on bird species match those of the plant community, with overall increases in habitat and associated diversity in shrub and grass communities, and more gradual improvements in woodlands and arid shrub communities.

Long-term rest would increase the quantity and quality of surface litter and dead standing plant material. Livestock will consume this type of material in the absence of palatable forage, so seasonal restrictions and growing season rest would still result in the reduction of overall plant mass. The maintenance of standing dead material would increase cover, with positive impacts upon smaller bird species. An increase in litter would also provide additional habitat for insects, benefiting insectivores. Growing season rest would reduce trampling impacts on migratory ground nesting birds, since the growing season overlaps the nesting season. Long-term rest would remove trampling impacts.

Riparian area protection, through exclusion, long-term rest or by redirection, would improve the structure and density of riparian vegetation with a positive impact on riparian dependent species. The net increase in water availability from new range improvements would also have a positive impact on bird species.

Table 4-6 Impacts on Birds by Habitat Type

Habitat Type (% land)	Bird Species	Impacts
• Aspen (0.02 %)	• Williamson's sapsucker	Many aspen stands are located within this allotment which has been historically retarded in natural regeneration due to livestock use. This closure would greatly benefit these aspen habitats through and increase in reproduction, understory, and overall stand health.
• Pinyon-Juniper (41.7 %)	• Black-throated gray warbler • Gray vireo • Pinyon jay • Virginia's warbler	Suspensions on 9 allotments until health Standards are met would eliminate competition between P-J habitat dependent birds and livestock while providing for recovery of the vegetative understory, resulting in more production of insects and seeds for birds.
• Ponderosa Pine-Douglas Fir (1.1 %)	• Flammulated owl • Grace's warbler • Lewis's woodpecker • Northern goshawk	Results from more intensive livestock grazing management similar to Alternative C. Suspension of grazing on 10 allotments would also result in elimination of competition for habitats during breeding, nesting, and overwintering periods. There would also be increased grasses and forbs in the understory which would provide for more insect and rodent habitat for these birds.
• Desert Shrub (7.20 %) • Sagebrush-grassland (8.22 %)	• Brewer's sparrow • Sage sparrow • Sage grouse	Positive impacts on sagebrush and grassland dependent bird species and neotropical bird species from suspending livestock use in those areas that fail to meet upland Standards. Suspension would reduce competition for resources and physical disturbance during nesting and brood rearing. Priority on restoration activities and other rangeland improvements would benefit birds over the planning period.
• Grassland & Meadow (1.7 %) • Sagebrush-grassland (8.22 %)	• Black rosy-finch • Burrowing owl • Ferruginous hawk • Northern harrier • Short-eared owl • Swainson's hawk	Allotments which fail upland health Standards would have grazing suspensions until recovery which benefits grassland migratory birds. Improved habitat would also result from vegetation restoration and rangeland improvement projects.
• Riparian (0.51 %)	• Blue grosbeak • Broad-tailed hummingbird • Common Yellowthroat • Lucy's warbler • Peregrine falcon • Prairie falcon • Yellow-billed cuckoo • Bald eagle	Closure on nine allotment which fail both upland and riparian Standards would have a positive impact on riparian dependent bird species. Together with other riparian improvements, this would assist the protection and recovery of riparian dependent bird habitats.

Impacts on Bats

Under this alternative there would again be little to no change on non-riparian bat roosting habitat. Grazing suspension, vegetation restoration and rangeland improvement projects would result in more rapid recovery of understory plant communities, and riparian recovery, resulting in more rapid recovery in non-riparian and riparian bat foraging habitats. Increased vegetative ground cover would result in an increased diversity of understory plant and insect prey species in both non-riparian and riparian foraging habitats resulting in the development of better quality foraging habitats over time. Recovery of riparian communities would result in the development

of better quality roosting habitat (i.e. large cottonwood trees) over time. Improved water distribution and design would increase the availability of water for bats.

Table 4-7 Summary of Impacts on Bats

HABITAT TYPE	Non-riparian, Roosting	Non-riparian, Foraging	Riparian, Roosting	Riparian, Foraging	Open water, Foraging & Drinking
BAT SPECIES	Fringed myotis, Allen's lappet-brow bat, spotted bat, big free-tailed bat, Townsend's big-eared bat	Fringed myotis, Allen's lappet-brow bat, spotted bat, big free-tailed bat, Townsend's big-eared bat	Western red bat	Western red bat	Fringed myotis, Allen's lappet-brow bat, spotted bat, big free-tailed bat, Townsend's big-eared bat , Western red bat
IMPACTS	Little to no impacts on bat roosting habitat in cliff, cave, non-riparian tree, and multiple habitats.	Grazing suspension would recover uplands, with increased bat foraging habitat Benefits would also result from vegetation restoration and rangeland improvement projects.	High priority for annual riparian monitoring, and management change requirement after failure to move towards PFC within four years lead to improved riparian roosting habitat.	High priority for annual riparian monitoring, and management change requirement after failure to move towards PFC within four years lead to improved riparian roosting habitat.	Medium priority for improved water distribution would result in greater water availability, along with wildlife-friendly increasing access.

Impacts on Game Species

Desert Bighorn Sheep

While Alternative C emphasizes reduced stocking, Alternative D proposes long-term rest. The twenty nine percent unchanged (470,246 acres) and twenty seven percent with changed management (449,715 acres) are very similar to Alternative C. There would be an increase in area where livestock are removed for long term rest, (to thirty percent or 483,374 acres) and decrease in area where livestock numbers are merely reduced (fourteen percent or 227,367 acres). Together this would have a net positive impact on Bighorns, through increased forage availability. Areas under long-term rest would not have competition for water, in that Bighorns avoid water sources where livestock are present.

The seeding restoration activities proposed under this alternative would also have a positive impact on suitable Bighorn habitat by providing additional forage in the form of grass, but in areas which would receive little use. Structural improvements, in the form of water developments would provide additional sources of water for Bighorns, and improve livestock distribution.

Mule Deer

Sixty percent (26,226 acres) of Critical Mule Deer winter habitat would receive long-term rest from livestock use under this alternative. This would have a positive impact on Mule Deer by removing competition for browse in winter use areas.

This alternative also proposes new range improvements. Water developments would increase habitat availability to Mule Deer, which would be a positive impact, but better livestock distribution would come at the cost of more fencing, and fences have a potential to impede deer movements.

Seeding restoration would restore a forb component to lands which have reduced forbs, with a positive impact on Mule Deer by increasing forage availability for the long-term.

Pronghorn

Forty seven percent (46,356 acres) of suitable Pronghorn habitat would receive long-term rest under this alternative. Livestock competition with Pronghorn for forage would cease on these lands. On the fifty three percent (46,356 acres) of habitat which would continue to used by livestock, negative impacts on Pronghorn would be reduced through changes in grazing management. Growing season rest would be required (GRAZ-2), with a positive impact. This rest period would make forbs available for consumption early in the season, when Pronghorn prefer them over shrubs. Spring forb availability is also critical to fawn rearing success, since lactating females use forbs heavily.

Structural range improvements are proposed under this alternative. New water developments would increase the availability of browse for Pronghorns by increasing their distribution. Fences are also proposed, and they may have a negative impact on Pronghorns since they impede Pronghorn movement.

Sage Grouse

As was noted in the No Action Alternative, impacts on occupied Sage grouse habitat are identical under all alternatives.

Under this alternative, there would be changes in livestock management consist of growing season rest, and improved distribution on twenty four percent (431,941 acres) of historical habitat. The growing season rest would have the strongest impact, since it would prevent the removal of cover (through consumption) during the nesting and early brood rearing season. There also would be no competition between livestock and Sage grouse for forbs during the period when Sage grouse consume forbs. Growing season rest, along with improved distribution, would assist in riparian recovery, which would have a positive impact on Sage grouse. An additional eleven percent (192,587 acres) would receive reduced stocking along with improved management, with similar, but more pronounced, benefits. In most cases, the positive impact from growing season rest is not total, in that Sage grouse brood will still be susceptible to predation and trampling impacts upon the resumption of grazing, but to a lesser extent, since the highest risk of mortality occurs early in the season.

The livestock impacts described above would be removed from thirty-one percent of historical habitat (556,913 acres). While the positive impacts are similar to those from reduced stocking or growing season rest, there is an additional benefit in that trampling impacts will not take place. Dead or cured plant material will also remain in place, since winter livestock use would not occur, which would increase nesting cover, and further reduce the potential for predation.

Impacts on Fish and Aquatic Species

Under this alternative, riparian areas would have the least amount of livestock use of the other action alternatives. Herbaceous utilization by livestock Monument-wide would be less under this alternative than under alternatives B and C. Most riparian areas would only be authorized for livestock use during the late fall and winter seasons, or dormant season use. This would allow for the greatest establishment and growth of riparian herbaceous and woody plants. This alternative would result in the fastest recovery of riparian areas not meeting standards and the most rapid achievement of good to excellent ecologic conditions. These conditions would have the greatest benefit to the habitats which fish and other aquatic species need for maintaining healthy and sustainable populations.

Impacts on Threatened and Endangered Wildlife Species

Mexican Spotted Owl

Under this alternative, livestock grazing would be removed from Mexican Spotted Owl Protected Activity Centers during breeding and nesting seasons. Additional changes in grazing management would impact almost half (49%) of the Mexican Spotted Owl Critical Habitat within the planning area under this alternative. Both approaches (seasonal removal and improved rotation) would increase plant vigor, especially with grasses and forbs, which should have a positive impact on rodent and small animal populations, which in turn increases the prey population available to Mexican Spotted Owls.

The active use of the "riparian toolbox" in riparian restoration would improve the conditions of riparian areas. The Recovery Plan guidelines include "implement management strategies that will restore good conditions to degraded riparian habitat as soon as possible".

Southwestern Willow Flycatcher

Under this alternative, range improvements and growing season rest would encourage riparian recovery. Along with this, utilization standards would be imposed on allotments with suitable habitat for Southwestern Willow Flycatcher. Livestock use in allotments with suitable Southwestern Willow Flycatcher habitat will be restricted to between September 1st and March 15th. The net impact of these measures would be a strong improvement in riparian habitat and an eventual increase in bird numbers.

The Cottonwood Allotment contains habitat that meets the criteria for breeding Southwestern Willow Flycatchers. The Paria River and Cottonwood drainage portions of the allotment would be used as a separate pasture dedicated to trailing and emergency use. Any use would be subject to the winter only restriction. Taken together these actions would remove all livestock related impacts in this allotment from the stream corridor area, which would improve the suitability and extent of riparian habitat used by Southwestern Willow Flycatcher.

Forty two percent of the suitable and potential Southwestern Willow Flycatcher habitat would have livestock grazing impacts removed. While little of this habitat is within lands identified for recovery, the net impact would be the improvement of riparian corridors adjacent to high priority habitat, and an increased potential for Southwestern Willow Flycatcher recovery.

In addition to allotment specific changes on Cottonwood Allotment, long-term rest, and winter season grazing requirements on all other allotments with suitable habitat, stricter utilization standards would also be set on riparian plants, protecting plant recovery. Taken together, these measures would result in improved riparian habitat and benefits to Southwestern Willow Flycatcher.

CULTURAL RESOURCES

The implementation of the Cultural Resources Protocol (see Appendix 3) is common to all action alternatives. Under this alternative grazing related impacts on cultural resource sites would be identified on a site-specific basis, and appropriate mitigative measures would be implemented as necessary. In addition, the cultural resources research and monitoring component of the Protocol would provide the opportunity for in-depth research into grazing related impacts on cultural resource sites, use of appropriate mitigative measures, and the effectiveness of these measures, as well as provide for cultural resource inventory in areas where grazing related impacts are likely but the site density and character is unknown. This component is important in that research and monitoring regarding grazing related impacts would lead to a better understanding of the situation, and eventually better and more effective management practices.

This alternative emphasizes temporary suspensions of allotments failing upland range health standards in combination with changes in rangeland management practices (see Alternatives B and C). For cultural resources, this is an improvement over Alternatives B and C in that less on-the-ground improvements will be needed to keep livestock from concentrating in certain areas, vegetation will have an opportunity to re-establish (thus lessening erosion), and immediate protection from grazing related impacts are afforded to many cultural resource sites.

Although primarily designed for rangeland health and riparian concerns, proposed suspensions or closures would only benefit cultural resources in that the source of grazing related impacts would be, at least temporarily, lessened or removed. Erosion, either directly or indirectly caused by grazing pressures at cultural resource sites, is a major factor in the deterioration of these sites. Allowing the recovery of vegetation on these sites would generally slow the effects of erosion and help protect the sites. Suspensions on a long-term or permanent basis would also benefit the cultural resource research by providing a scientific control regarding grazing related impacts; the conditions and impacting agents at similar sites in similar settings could be directly compared between areas open to grazing and areas closed to grazing. Again, this would lead to better management practices in the future.

This alternative would provide immediate relief from grazing related impacts on cultural resource sites on 342,244 acres, primarily on those allotments with problems meeting upland rangeland health standards. This alternative provides for an increase in immediate protection for cultural resource sites over alternatives B and C. With the temporary removal of livestock from

14 % of the EIS area, grazing related impacts on those sites would halt immediately. While Alternatives B and C would gradually allow for the recovery of vegetation and the eventual protection this would afford many cultural resource sites, Alternative D provides many sites immediate relief from artifact trampling, breakage, dispersal, and other direct impacts associated with livestock on cultural resource sites.

Although the action alternatives are designed to achieve the same end rangeland health goals, the differences lie in the methods with which these goals are achieved by the various alternatives. Recovery of vegetation is an important factor in lessening overall impacts on cultural resource sites. In general, the faster an alternative leads to vegetative recovery, the better that alternative will be for cultural resources. This alternative would lead to more rapid vegetation recovery than Alternatives B and C, and is comparable to the following Alternative E when considering upland vegetation. This alternative also affords immediate protection from direct grazing related impacts on many cultural resource sites, an aspect that is largely lacking from Alternative B, and present only to a small extent in Alternative C.

RECREATION

Most conflicts between recreational use and livestock grazing would be reduced or eliminated under this alternative. During the period of temporary suspension of grazing in allotments that do not meet upland Standards, most conflicts would be eliminated in those allotments for the duration of the suspension, but upon the resumption of grazing those conflicts would return.

Recreational access problems relating to range developments (access through fences) would be reduced by incorporating the proposed "Standard Requirements and Design Restrictions on Range Improvements" (see *Standard Operating Procedures* [SOPs], Appendix 10). Additional requirements providing for recreational foot and horse access through fences would further reduce conflicts.

Changes in Seasons of Use under this alternative would reduce the overlap between the high recreational use season (mid-March through June, and September through November) and a grazing season in certain allotments.

The Upper Gulch Pasture of Circle Cliffs Allotment would be grazed only spring or fall of every other year. In years when spring grazing would occur, the season of use would end no later than March 15, which is also the typical start of the spring high recreational use season. Conflicts relating to competition for space in the Upper Gulch would be greatly reduced under this alternative.

The season of use for livestock grazing in Clark Bench Allotment would be cut back by one month in the spring, with the end of the grazing season being March 31st rather than April 30th. Conflicts with recreational use would be reduced during the highest recreational use period of the spring under this alternative. One pasture would be deferred each year. Additionally, by the creation of The Dive Pasture, there would be reduced livestock use of the Paria Canyon-Vermillion Cliffs Wilderness, further reducing opportunities for conflict on the allotment.

Death Hollow Allotment would have a season of use with less overlap onto the high recreational use season. Some livestock grazing has been authorized from April 1 through May 15; under this alternative all livestock grazing would end no later than March 31. Furthermore, fencing livestock out of the head of the narrows of Little Death Hollow would eliminate problems with hikers inadvertently herding livestock into the narrows. This would eliminate most recreational conflicts in this allotment.

The closure of Big Bowns Bench Allotment would eliminate all potential conflicts between recreational use and livestock grazing in that area.

One of the locations of highest conflict between recreational use and livestock grazing is the portion of the King Bench Pasture of King Bench Allotment that contains The Gulch, which is a very popular destination for hikers, backpackers and equestrians. Most of The Gulch on this allotment is designated as an Outstanding Natural Area, and there is an expectation among recreational users that it should be an outstanding, natural-appearing landscape. Because The Gulch supplies the only reliable water for most of the pasture, the livestock tend to concentrate use in the canyon bottom, which is also where recreational use is concentrated. Under this alternative the season of authorized use would be reduced by one month in the spring, ending no later than February 28, rather than March 31, and spring grazing would occur only every other year. This would greatly reduce conflicts relating to competition for space by eliminating the presence of livestock during the spring season of high recreational use. It would also improve the natural appearance of vegetation in the canyon by allowing for an extra month of un-grazed spring growth. However, this would only somewhat reduce conflicts relating to access to clean water, because while there would be no livestock present during the high recreational use season, there would still be relatively fresh livestock feces concentrated around the stream in years of spring grazing use, especially during the early part of the recreational season.

Since much of the forage in the pasture is on King Bench itself (above the canyon), development of water catchments and/or repair of the existing water development on the bench would provide the opportunity to keep livestock mostly out of the canyon except for trailing purposes. If water sources are successfully developed then most recreational conflicts with authorized livestock use would be eliminated.

The creation of a new "Deer Creek" Pasture in the King Bench Allotment would be necessary to achieve reduction of conflict in The Gulch. It is possible in this alternative that new conflicts could arise in Deer Creek. Monitoring for increasing conflict would be necessary. Mitigation measures would need to be taken if monitoring indicated an increase in conflict.

The exclusion of livestock from the slot canyons of Dry Fork of Coyote Gulch (Dry Fork Narrows, Peek-a-boo, Spooky and Brimstone) in Lower Cattle Allotment would eliminate recreational conflicts related to inadvertent herding of livestock and the resulting unpleasant confrontations in the constricted areas.

The creation of Buckskin Gulch Pasture in Mollies Nipple Allotment, and designating the portion of the pasture east of House Rock Valley Road as limited to livestock use would reduce conflicts with recreational use related to competition for water and space.

In Upper Cattle Allotment, the exclusion of livestock from the visitor facilities (parking, toilet and picnic area) and rock formations of Devil's Garden would eliminate conflicts with recreational use in those areas.

ALTERNATIVE E

LIVESTOCK GRAZING

Implementing Alternative E would result in the temporary suspension of livestock grazing in Collet, Ford Well, Soda, Mollies Nipple, School Section, Upper Paria, Vermilion, Death Hollow, Rock Creek-Mudholes allotments and portions of the Coyote allotment for restoration purposes or as a result of not meeting Standards. These suspensions, while temporary, would require adjustments to grazing operations in these allotments (impacts more specifically described below). Adjustments for some livestock operators could affect their ability to continue to operate. In order to adjust, livestock operators would be forced to reduce livestock numbers, feed livestock off-site and/or procure replacement pastures. The schedule of restoration activities and lifting of the temporary suspensions are dependent on funding available and successful establishment of desirable species. It would be unrealistic to expect that funding would be available to restore all allotments at the same time so the temporary suspension for some allotments could exceed five years.

Closure of the Big Bowns Bench Allotment would eliminate 750 AUMs. This would have minimal impacts as this allotment has not been grazed since 1999 due to unfavorable conditions. Closure of the Antone Flat (currently unallotted) and Little Bowns Bench (currently a forage reserve) Allotments and the Wolverine Pasture (currently a forage reserve) would have no impact as these areas are not used for livestock grazing and no AUMs are authorized within them. This alternative would close, at the request of Glen Canyon National Recreation Area, the southern tip of Grand Bench (Rock Creek-Mudholes allotment) for near-relic area research resulting in the elimination of 72 AUMs and also close the GCNRA portion of the Navajo Point Pasture (Lake allotment) resulting in the elimination of 294 AUMs.

Retention of the Phipps Pasture as a forage reserve would leave the status of the area unchanged.

For the remaining allotments that meet Standards, changes to existing management would be minimal as they would be limited to those short-term adjustments commonly associated with on-going allotment administration such as requests for change of season of use, modification to pasture rotation use, voluntary non-use, transfers and temporary non-renewable use.

Allotment Specific Consequences

Circle Cliffs

The impacts would be the same as analyzed in Alternative B.

Clark Bench

The impacts would be the same as analyzed in Alternative B.

Collet
(Uplands and Riparian did not meet)
The impacts would be the same as analyzed in Alternative D.

Coyote
The impacts would be the same as analyzed in Alternative C.

Death Hollow
(Riparian did not meet)
The impacts of this alternative would be greater than in the other alternatives because there would be an immediate temporary suspension of all 1,057 AUMs until Standards are met. Riparian areas that currently do not meet Standards because of livestock use would progress toward recovery without grazing pressure, but invasive and undesirable species would remain a problem. Priority would be increased for treatment of invasive species at these springs.

Fences to restrict livestock access to Little Death Hollow and Wolverine Creek narrows would be constructed, since their intent is to reduce conflicts between livestock and recreational users. The installation of those fences would be deferred until the allotment meets Standards and livestock use is reauthorized. The riparian exclosures would not be constructed, which would be a concern upon the reintroduction of livestock. The complete exclusion of livestock from the allotment would aid in adding scientific knowledge because this allotment would act as a livestock exclosure. Data gathered from the exclusion of livestock on this allotment would help the Monument utilize adaptive management concepts learned from management changes.

The temporary suspension of active use would have a greater impact on the permittee's livestock operations than any of the other alternatives. The temporary suspension of active use would have a significant negative impact on the permittee's livestock operations in the short-term, and may have a negative impact on the permittee's finances. In the long-term, proposed restoration actions would mitigate this impact.

Ford Well
(Riparian did not meet)
The impacts of this alternative would be more noticeable than in the preceding alternatives since there would be no grazing of livestock on the allotment until Standards are met. This alternative would suspend all 328 active AUMs until either the Ford Well riparian area meets that Standard or until livestock grazing is no longer a contributing factor to Standards not being met. The riparian area should improve more rapidly with this alternative compared to the others.

Total rest from grazing would improve uplands through increased plant vigor by allowing increased carbohydrate storage. Seed development and dispersal would increase, as would total vegetative cover and plant litter, leading to decreased erosion. Complete recovery is not anticipated due to the presence of invasive annual grasses, as well as historical changes in the plant community. Those impacts would be corrected through plant community restoration.

The temporary suspension of active use would have a significant negative impact on the permittee's livestock operations in the short-term, and may have a negative impact on the permittee's finances. In the long-term, proposed restoration actions would mitigate this impact.

Soda
(Uplands and Riparian did not meet)
The impacts would be the same as analyzed in Alternative D.

King Bench
The impacts would be the same as analyzed in Alternative C.

Lake
This alternative would close the GCRNA portion of the allotment resulting in a reduction of 294 AUMS on a portion of the Navajo Point pasture. This closure would result in a short-term and long-term positive impact to the health of the vegetative community in the closed portion. Substantial improvement to the vegetation is not anticipated however due to the presence of invasive annual grasses, as well as historical changes in the plant community. Riparian areas would improve and upward trend would continue.

The closure described above would have a significant negative impact on the permittee's livestock operations in the short-term and long-term, and may have a negative impact on the permittee's finances.

Last Chance
This alternative would not change livestock numbers. The only fence that would need to be constructed as part of this alternative would be to fence off East Roger's Canyon. The riparian assessment in East Roger's Canyon is trending downward because of livestock trailing. This alternative would effectively close the pasture since the canyon bottom is the only access to the entire drainage, but since it is not a significant amount of forage, no reductions in stocking rate are necessary for this alternative. The riparian area in East Roger's Canyon would improve as result of this action.

Five of the sites indicate a drastic downward trend since 1998, four of which are located in crested wheatgrass seedings. Two sites, both in the hotter and drier region of the allotment indicate a static trend. Overall the trend would be downward for the allotment and this trend would continue

The fencing of East Roger's Canyon would not have a negative impact on the remaining permittee's livestock operations.

Mollies Nipple
(Uplands and Riparian did not meet)
This alternative would implement temporary grazing suspensions until Standards are met, with a reduction of 3,862 AUMs of active preference. Before the reauthorization of grazing would be allowed, a new Allotment Evaluation would need to be completed. Upon achieving Standards, and the resumption of grazing, the allotment has a potential of 3,307 AUMs, but the final quantity may change, subject to the determination of the new evaluation.

The impacts of this alternative would be similar to the previous alternative since the entire allotment would be rested until Standards are met. Total rest from grazing would increase plant vigor by allowing increased carbohydrate storage. Seed development and dispersal would

increase, as would total vegetative cover and plant litter, leading to decreased erosion. Complete recovery is not anticipated due to the presence of invasive annual grasses, as well as historical changes in the plant community. Those impacts would be corrected through plant community restoration.

Once it has been determined that Standards are met, active use would be restored. Restoration work on Blue Spring, Telegraph, Mine Spring, Jenny Clay, and Rockhouse Pastures would be a high priority under this alternative. While more forage would be available for livestock upon completion of the restoration than is available currently, it is probable that active use would not be restored to the historical level of 3,862 AUMs since that level was determined using healthy crested wheatgrass seedings and a two month longer season of use. The restored seedings would be a mixture of grass species, including natives, and would not produce as much forage as the old monotypic crested wheatgrass seedings. A new Allotment Evaluation would be required prior to the reintroduction of grazing to assess the quantity of available forage, and to establish use at a level which would not result in a return to failing to meet Standards.

After restoration activities are completed the long-term trend in the Blue Spring, Telegraph, Mine Spring, Jenny Clay and Rockhouse Pastures should be upward with an increase in the species that were seeded. The success of the restoration activities would depend on the timing and the amount of precipitation the area receives.

The riparian areas that were determined to not be meeting Standards would recover faster than upland sites from the grazing suspension. .

Additionally, Nipple Pasture would not be sub-divided which would change its season of use. Under this alternative the Nipple Pasture would be grazed in June through the middle of August the first year and middle of August through October the second.

The temporary suspension of active use and the shortening of the season of use would have a significant negative impact on the permittee's livestock operations in the short- and long-term, and may have a negative impact on the permittee's finances. In the long-term, proposed restoration actions would not fully mitigate this impact.

Rock Creek-Mudholes
(Riparian did not meet)
This alternative would implement temporary grazing suspensions of 2,101 AUMs until Standards are met. Before the reauthorization of grazing would be allowed, a new Allotment Evaluation would need to be completed. Upon achieving Standards, and the resumption of grazing, the allotment has a potential of 2,101 AUMs, but the final quantity may change, subject to the determination of the new evaluation. Additionally, closure of the southern tip of Grand Bench for near-relic area research, by request of Glen Canyon National Recreation Area, would result in a permanent reduction in grazing preference of 72 AUMs.

Fencing and restoration of riparian sites would be a priority. It is anticipated that this would reduce erosion and increase desirable vegetative cover, community, and litter throughout the allotment. This would be verified by monitoring. Since the installation of structural improvements is subject to funding, it is anticipated that the reduction of impacts would be

phased in over the life of the plan. Considering the amount of time required for the environmental assessment, funding, and construction of these project, on the ground gains would be slow. Once in place, riparian areas would progress toward PFC, however exotic and undesirable species would continue to be present.

Trend within the allotment is monitored at seven different locations. Based on the most recent trend information, the allotment as a whole demonstrates an upward trend. With the implementations mentioned above it is anticipated that trend will improve under this alternative.

The temporary suspension of active use would have a significant negative impact on the permittee's livestock operations in the short-term, and may have a negative impact on the permittee's finances. In the long-term, proposed restoration actions would partially mitigate this impact. The loss of 72 AUMs would not result in negative long-term significant impact.

School Section
(Uplands did not meet)
The impacts would be the same as analyzed in Alternative D.

Upper Paria
(Uplands and Riparian did not meet)
The impacts would be the same as analyzed in Alternative D.

Vermilion
(Uplands and Riparian did not meet)
This alternative would implement temporary grazing suspensions until Standards are met, with a reduction of 2,849 AUMs of active preference. Before the reauthorization of grazing would be allowed, a new Allotment Evaluation would need to be completed. Upon the achievement of Standards, and the resumption of grazing, the allotment has a potential for 1,813 AUMs, but the final quantity may change, subject to the determination of the new evaluation.

The impacts of this alternative would be more noticeable than in the preceding alternatives since the entire allotment would be rested until Standards are met. Total rest from grazing would increase plant vigor by allowing increased carbohydrate storage. Seed development and dispersal would increase, as would total vegetative cover and plant litter, leading to decreased erosion. Complete recovery is not anticipated due to the presence of invasive annual grasses, as well as historical changes in the plant community. Those impacts would be corrected through plant community restoration.

In order to meet all Standards additional input such as restoration activities need to be completed. For example just removing cattle would not correct the soil erosion problem occurring in the Fossil Wash and Petrified Hollow Pastures. Restoration is proposed in order to control the rills, overland flows, gullying and other soils related problems, which will assist in meeting the soils Standard. Also, suspending livestock use would not reduce the problems with exotic weed species (such as cheatgrass). Treatment and/or reseeding would reduce the amount of exotic species on the allotment. While more forage would be available for livestock upon completion of the restoration than is available currently, it is probable that active use would not be restored to the historical level of 2,849 AUMs since that level was determined using healthy crested wheatgrass seedings and a three month longer season of use. The restored seedings would be a

mixture of grass species, including natives, and would not produce as much forage as the old monotypic crested wheatgrass seedings.

Fossil Wash and RCA 1 Pastures will require restoration in order to return to meeting Standards. The reseeding effort would include actions to reduce soil erosion in the two pastures. Future authorized use could probably be less than the current active use of 2,849 AUMs, since the mix of species used in restoration could produce less forage then the (failed) monotypic crested wheatgrass seedings they replace.

Trend would move upward for the most part, especially in the Fossil Wash and RCA 1 after restoration. Trend may decline in pastures where sagebrush is replacing perennial grasses or where pinyon/juniper trees are reestablished themselves in old seeded areas where they out-compete shrubs and grasses.

Once cattle are authorized on the allotment growing season rest (GRAZ-2) would be required, which would keep the long-term trend at static to upward. Perennial grasses would be able set seed each year rather than every other year in some pastures. As a result, there would be more grasses and a higher percent cover of perennial grasses on the allotment.

The riparian areas around the spring that which did not meet the Standards would respond well to rest.

A three pasture rotation in the Nephi Pasture would improve trend because early June use will be deferred each year.

The temporary suspension of active use and the shortening of the season of use would result in an estimated 1,036 AUM loss and would have a significant negative impact on the permittee's livestock operations in the short- and long-term, and may have a negative impact on the permittee's finances. In the long-term, proposed restoration actions would not fully mitigate this impact.

Willow Gulch

Same as Alternative A, except that Calf Creek between Upper and Lower Falls would be closed. The livestock/recreational user conflict would be resolved.

No impact to the livestock operations due to closure, because there are no AUMs associated with the proposed closed area.

VEGETATION

The impacts for all plant communities would be the same as analyzed in Alternative D.

THREATENED, ENDANGERED AND SENSITIVE PLANT SPECIES

Many of the special status species found in the Monument are edaphic endemics that are restricted to sparsely vegetated sites with specialized soil or bedrock characteristics. These are

often harsh sites that provide little forage for livestock and are frequently inaccessible because of steep slopes. Because of these habitat features, most special status plant species receive little to no direct impacts from livestock grazing. With improved distribution of livestock, grazing impacts may occur closer to special status species than previously occurred. Potential does exist for indirect impacts as a result of habitat degradation from invasive weed species from adjacent habitats and loss of pollinators that rely on the health of the surrounding vegetation. In general, the focus on restoration and research under this alternative would indirectly improve habitat conditions for special status plants. Therefore, indirect impacts are the most likely influences on special status plant populations under Alternative E.

Threats to Kodachrome bladderpod are mainly related to off-road vehicle use but trampling by livestock is a possibility. Impacts on Kodachrome bladderpod would be reduced as a result of the language in VEG-5 (Chapter 2) which prevents trampling through placement of salt blocks, supplements, and water away from Kodachrome bladderpod populations. This species occupies approximately 600 acres within the Dry Valley, Upper Hackberry, and Upper Paria allotments. Under this alternative, roughly 585 acres of the occupied habitat (98% of population) would remain unchanged and approximately 0.5 acres of habitat (<1% of population) would experience improvements as a result of changes in grazing management. Under this alternative, Kodachrome bladderpod populations would generally remain the same or show improvements in size and extent.

Ute ladies' tresses has a restricted distribution (King Bench Allotment, Deer Creek) in the planning area and is managed in a manner that generally encourages the growth of the species. Winter grazing benefits this species by removing competing plant cover. Approximately 49 acres of riparian habitat is occupied by Ute ladies' tresses. Under Alternative E, current grazing practices would continue where this population is located, which would maintain the population at its' current levels.

Under Alternative E, Jone's cycladenia would remain unchanged. One site is known of this species within the planning area. The site occupies approximately 36 acres of steep, remote habitat in the Moody allotment that is inaccessible to livestock. No change to this population is anticipated under this alternative.

RIPARIAN AND WATER RESOURCES

Watershed Health

Grazing would be suspended on the nine allotments not meeting one or more Rangeland Health Standards. Upon achieving Standards, allotment management strategies could include using rest, rotational grazing systems, changes in season of use, and permanent stocking adjustments. Grazing pressure on seedings that do not meet Standards would be suspended. The net effect of the proposed changes would be a moderate to strong reduction in the severity of impacts on upland hydrologic processes. Moderate improvements in understory cover would occur in dominant vegetation types, causing commensurate reductions in runoff. Improvements would begin immediately and occur over a majority of the planning area. Maintenance and restoration of hydrologically important vegetation, such as the perennial cool season grass component of the

Pinyon-juniper and Sagebrush-grassland communities and the grassland and meadow community in general, would have the highest likelihood of success under this alternative.

Beneficial impacts would occur both more quickly and over a much broader area under this alternative than under Alternatives A, B, and C, and over a broader area than under Alternative D, because use would be reduced immediately throughout the majority of the planning area. Using suspensions rather than changes in management would also increase the certainty of achieving watershed management objectives. As with Alternative D, increased research, monitoring, and prioritization of Sagebrush-grassland and Pinyon-juniper plant communities would increase the effectiveness of management actions designed to restore desired vegetation conditions, as well as the likelihood that hydrologic processes would be considered in the selection and design of treatment units. Unlike other alternatives, watershed restoration projects would be prioritized in this alternative.

In the long-term, upland hydrologic conditions governing infiltration and runoff would improve moderately in the six allotments not meeting Upland Standards, as well as in the three other allotments not meeting standards. Causes of excessive runoff from uplands would be addressed in the short-term, via suspension of grazing. Along with Alternative D, this alternative has the highest likelihood of achieving long-term maintenance and restoration of upland hydrologic conditions. Beneficial impacts would be strongest in areas where grazing is suspended or eliminated, where restoration occurs, and where proposed grazing management strategies are successful. Relinquished forage could be allocated to natural resource values or used to mitigate impacts elsewhere, further benefiting watershed conditions.

Riparian Proper Functioning Condition

Proposed actions and impacts associated with management of allotments that are failing upland Standards are similar as under Alternative D. The primary differences between Alternatives D and E are in the management of allotments that fail the riparian Standard.

This alternative places a priority on restoring rangeland and riparian health while providing research opportunities in restoration and monitoring. The Riparian Toolbox emphasizes management of riparian grazing and riparian and watershed restoration, and accommodates repair and installation of fences and water developments.

Retrofitting existing water developments to reduce dewatering would increase the extent, diversity, and vigor of native riparian plants in many riparian areas in the short-term, and would improve stream channel conditions in the long-term by increasing bank stability and large wood recruitment.

Riparian systems on all allotments would benefit from the initiation of growing season rest every other year. Bank stability would increase as a result of less frequent trampling and increased vegetation cover, and sediment delivery from adjacent uplands to stream channels would decrease as a result of enhanced sediment capture by vegetation.

Immediate suspension of grazing in the nine allotments failing one or more Standards would cause immediate and long-term benefits in riparian areas, as 8 of these allotments are failing the

riparian Standard. Immediate impacts in some lotic reaches would be slight, as ecological processes in certain areas have been affected by upland conditions that would take time to recover. Long-term reductions in runoff from uplands, coupled with the eventual repair of range improvements, would cause reduced rates of headcutting and channel widening, thereby allowing for maintenance and establishment of riparian communities. Stream and wetland areas that are directly impacted by livestock grazing would benefit immediately in eight allotments from reduced grazing and trampling.

Because grazing would be suspended until all Standards are met, there is a high likelihood that this alternative would allow riparian systems in these 8 allotments to achieve or trend towards PFC. Upon achieving Standards, grazing management would be designed to maintain desired riparian conditions using only existing fences and water developments. Livestock management strategies to be implemented following resumption of grazing would have to consider the vulnerability of unfenced riparian areas to direct and indirect impacts, or degradation of some riparian areas would occur as a result of inappropriate stocking rates or seasons of use.

Erosion control projects would avert reductions in the extent or functionality of riparian areas. The benefits of these projects would be greatest in functioning-at-risk systems in allotments without active use or where fences exist to control grazing and trampling. Because headcuts are a common cause of riparian areas not achieving PFC, the emphasis on erosion control in this alternative, coupled with upland and riparian restoration, would increase the likelihood for sustained long-term recovery of functioning-at-risk riparian systems.

Riparian vegetation treatments to remove invasive exotics would be most extensive under this alternative. These treatments could increase recruitment of willow and cottonwood and would thereby maintain or restore important ecological (e.g., habitat) and physical (e.g., large wood recruitment and bank stability) functions.

Water Quality

In the short-term, areas vulnerable to erosion would continue to receive livestock use, however because of management changes runoff and erosion from degraded allotments would be reduced. Because the primary sources of total dissolved solids (TDS) are marine shales ('badlands') that are naturally highly erosive and receive light grazing pressure, grazing would continue to have a negligible or minor impact on TDS and salinity. Erosion control projects could be used effectively in upland areas, streams, and meadows to reduce the supply and downstream transport of saline soils.

Livestock use and nutrient delivery around springs would be reduced as a result of use suspension in eight allotments that fail Standards. Installation and repair of existing fences would reduce livestock-derived nutrient loading around many waterbodies within allotments that receive continued or resumed livestock use.

Reducing the magnitude and duration of dewatering would improve water temperatures in some spring-fed streams. Suspension of livestock grazing on the 8 allotments that fail the riparian Standard would allow quicker and more widespread (compared to other alternatives) recovery of woody riparian species that provide stream shading. Channel incision and widening (and

attendant increases in solar radiation inputs and water temperature) would continue in some streams as channel adjustments that are already in progress would continue, although recovery of upland hydrologic conditions would reduce the overall rate at which new headcuts are initiated. Channel stability would increase in streams that are in the very early or advanced stages of channel adjustment, as a result of riparian vegetation recovery and implementation of erosion control projects.

SOILS

The soils resource would be improved and maintained under Alternative E more readily than any of the alternatives due in part to the initial reduction of AUMs to 18,030. On allotments not meeting Standards livestock grazing would be temporarily suspended until Upland and Riparian Standards are met. Rehabilitation efforts, such as re-seeding, watershed and riparian projects would be emphasized in those areas. The emphasis on resources other than grazing is expected to result in the increased protective cover of residual vegetation and litter resulting in reduced areas of bare soil.

In this alternative, a strong emphasis would be placed upon plant restoration within existing rangeland seedings. This would expedite the recovery of soil health

Management conditions would encourage the growth of species with high root production and a mix of species with different rooting depths and patterns increasing micro-organism populations, infiltration, aggregate stability, porosity, plant nutrients, erosion prevention, organic matter, and resilience to compaction. An increase in near-surface roots, plant litter, and vegetation would reduce the susceptibility of soils to compaction by helping to cushion impacts.

Management under this alternative would aid in prevention and/or mitigation of compaction and wind and water erosion.

Soil health including micro-organism populations, infiltration, aggregate stability, porosity, plant nutrients, litter accumulation, organic matter, woody material accumulation would be maintained.

Management activities would avoid and/or mitigate detrimental compaction, wind and water erosion.

The protective cover of plants and litter would increase or maintain minimizing erosion, reducing the amount of bare soil area and increasing soil aggregate stability, organic matter, and water infiltration.

Soil disturbance would be minimized during management activities including rangeland improvement projects (i.e. mechanical harvest of Pinyon-juniper, seed bed preparation, and drilling seed). When possible, only designated trails and roads would be used. Surface disturbance that would cause loss of litter and the organic matter layer would be avoided.

Where appropriate, eroding land would be rehabilitated with an emphasis on improving conditions in areas where there is a lack of ground cover, gullies, rills, and sheet erosion.

Detrimental impacts on soils would be avoided or mitigated with an emphasis on soils with a high risk of degradation. Vegetative manipulation and soil disturbing projects would be appropriate for the soil series within the project area to ensure success of the project.

NOXIOUS WEEDS AND NON-NATIVE PLANTS

Under this alternative there would be no further livestock spread of Noxious and/or invasive plant species in the three closed allotments, one pasture and one near-relic site. The remaining twenty suspended allotments would have a reduced spread of Noxious and or invasive plant species since adjustments to livestock management would reduce grazing intensity, along with reducing disturbance during the growing season.

Successful restoration and vegetation treatment projects aimed at improving vegetation health and cover would result in a decrease in Noxious and/or invasive plant species. Soil disturbance due to fence building has potential to increase weed spread but, the improvements would result in localized impacts. Replacing water catchments won't create new disturbances but, will evenly disperse livestock which will likely increase the distribution of invasive species.

WILDLIFE

Impacts on Migratory/Special Status Bird Species of Concern

Alternative E would place a high priority on passive grazing management, with an emphasis on long-term rest to resolve factors contributing to a failure to meet either upland or riparian Standards. Active management would consist of vegetation restoration and growing season rest. No structural range improvements are proposed.

This alternative proposes a strong emphasis on vegetation restoration, with a priority on rehabilitating failed seedings. Restoration would result in greater plant variety and an increase in habitat diversity, with a positive impact on grassland dependent bird species, especially in locations which currently have little surface cover due to a reduced grass component. There would be an increase in desirable habitat for ground nesting migratory birds which require nesting or protective cover.

Growing season rest (GRAZ-2) would result in changes in vegetative composition, but to a lesser degree than other alternatives, since the rest requirement would only go into effect on allotments which currently meet Standards, most of which already receive some form of seasonal rest.

This alternative proposes rest on nine allotments which fail to meet one or more Standards. Suspending grazing impacts would increase habitat niches for bird species, and would reduce the impacts of grazing on those bird species which have been negatively impacted by past or present grazing practices. Suspending grazing would assist in the recovery of shorter lived and rapidly reproducing species, such as grasses and forbs, resulting in an increase in structural diversity and cover. In comparison to seasonal rest, long-term rest would show better recovery of longer lived,

and slower to reproduce species, such as woody shrubs. Strongest recovery (and positive impacts on bird species) is expected in communities which normally have a high percentage of grasses and forbs, such as the Grassland-meadow community. Fair recovery is expected in shrub dominated communities, such as Mountain Shrub or Oak Woodlands. Upland areas which have experienced a loss of soil productivity would show little or no recovery. Many Pinyon-juniper woodlands fall into this category. Impacts on bird species match those of the plant community, with overall increases in habitat and associated diversity in shrub and grass communities, and more gradual improvements in woodlands and arid shrub communities.

Table 4-8 Impacts on Birds by Habitat Type

Habitat Type (% land)	Bird Species	Impacts
• Aspen (0.02 %)	• Williamson's sapsucker	Mudholes Allotments would be suspended from grazing. This would reduce livestock browsing of aspen stands allowing recovery. Under this alternative, protection fencing of aspen stands would not be authorized which would leave aspen vulnerable to browse by deer and livestock upon resumption of grazing.
• Pinyon-Juniper (41.7 %)	• Black-throated gray warbler • Gray vireo • Pinyon jay • Virginia's warbler	Same affects as under Alternative D, except to a much greater extent. However, no new range improvements would be developed, which may affect future redistribution of livestock and continue grazing concentration in some Pinyon-Juniper habitats.
• Ponderosa Pine-Douglas Fir (1.1 %)	• Flammulated owl • Grace's warbler • Lewis's woodpecker • Northern goshawk	Impacts on pine and fir habitats similar to Alternative D, however on a large scale.
• Desert Shrub (7.20 %) • Sagebrush-grassland (8.22 %)	• Brewer's sparrow • Sage sparrow • Sage grouse	The alternative has the most positive impact on this habitat, with grass and forb recovery due to suspensions. No new range improvements are proposed, so concentrated use in areas important to nesting and foraging for these dependent bird species would resume upon the reauthorization of grazing.
• Grassland & Meadow (1.7 %) • Sagebrush-grassland (8.22 %)	• Black rosy-finch • Burrowing owl • Ferruginous hawk • Northern harrier • Short-eared owl • Swainson's hawk	This alternative would result in the fastest rate of recovery in habitats for shrub, grassland, and wet meadow associated bird species. No new range developments would be accomplished which could hinder efforts to lessen long-term grazing pressure in shrublands and grasslands. Small meadows would not be protectively fenced from livestock use.
• Riparian (0.51 %)	• Blue grosbeak • Broad-tailed hummingbird • Common Yellowthroat • Lucy's warbler • Peregrine falcon • Prairie falcon • Yellow-billed cuckoo • Bald eagle	Same as Alternative D, but with stronger positive impacts. This alternative would provide the greatest protection of and most rapid recovery to riparian habitats for those bird species which are primarily dependent upon them.

Long-term rest would increase the quantity and quality of surface litter and dead standing plant material. Livestock will consume this type of material in the absence of palatable forage, so seasonal restrictions and growing season rest would still result in the reduction of overall plant mass. The maintenance of standing dead material would increase cover, with positive impacts upon smaller bird species which use it to provide cover. Increase in litter would also provide additional habitat for insects, which would benefit insectivorous birds.

The removal of livestock would result in the removal of trampling impacts on migratory ground nesting birds, with a positive impact on ground nesting birds.

Riparian areas would primarily be protected by long-term rest through the removal of livestock. This would improve the structure and density of riparian vegetation with a positive impact on riparian dependent bird species. Riparian areas respond rapidly to the removal of grazing pressure, so recovery would be expected in a matter of years, and not decades. On the negative side, a lack of exclosures would keep riparian areas vulnerable to wildlife browsing or grazing both during the long term livestock rest, and upon the reintroduction of livestock.

There would be no increase in water availability, since no water related range improvements would be proposed under this alternative.

Impacts on Bats

Under this alternative there would again be little to no change on non-riparian bat roosting habitat. This alternative would have the highest rate of recovery for non-riparian foraging habitat. Increased vegetative ground cover would result in an increased diversity of understory plant and insect prey species in both non-riparian and riparian foraging habitats resulting in the development of better quality foraging habitats over time. Temporary grazing suspension and annual riparian monitoring would result in more rapid recovery in riparian bat foraging and roosting habitats. Recovery of riparian communities would result in the development of better quality roosting habitat (i.e. large cottonwood trees) over time. Improved water distribution and increased availability of water for bats could be delayed under this alternative.

Table 4-9 Summary of Impacts on Bats

HABITAT TYPE	Non-riparian, Roosting	Non-riparian, Foraging	Riparian, Roosting	Riparian, Foraging	Open Water, Foraging, Drinking
BAT SPECIES	Fringed myotis, Allen's lappet-brow, spotted, big free-tailed, Townsend's big-eared bats	Fringed myotis, Allen's lappet-brow, spotted, big free-tailed, Townsend's big-eared bats	Western red bat	Western red bat	Fringed myotis, Allen's lappet-brow, spotted, big free-tailed, Townsend's big-eared, Western red bats
IMPACTS	Little to no impacts on bat roosting habitat in cliff, cave, non-riparian tree and multiple habitats.	This alternative would have the most impact on habitats for shrub and grassland foraging habitats, since it allow the highest rate of recovery.	Temporary grazing suspension and annual riparian monitoring result in improved riparian roosting habitat.	Temporary grazing suspension and annual riparian monitoring result in improved riparian foraging habitat.	Improved water distribution and water development improvement would be delayed until Standards are met.

Impacts on Game Species

Desert Bighorn Sheep

Sixty five percent of Desert Bighorn Sheep suitable habitat (1,055,828acres) would have no livestock interaction due to long-term rest requirements. This would remove competition between livestock and Bighorns for forage from the majority of the planning area. It would also prevent livestock-Bighorn interactions at water sources. Only seventeen percent (285,070 acres) would continue under existing management. Lands which continue under existing management meet all range monitoring requirements (specifically existing utilization requirements), and meet Standards. The remaining lands, eighteen percent (289,191 acres), would receive modified grazing management, specifically growing season rest, which would reduce forage competition.

Plant community restoration, including seeding rehabilitation, are proposed under this alternative, with a net positive impact on Bighorns through the increased availability of forage. Structural range improvements are not proposed under this alternative, so there would be no gain in water sources (or Bighorn distribution).

Mule Deer

As in Alternative D, under this alternative sixty percent (26,226 acres) of Critical Mule Deer winter habitat would receive long-term rest from livestock use under this alternative. This would have a positive impact on Mule Deer by removing competition for browse in winter use areas.

Unlike previous alternatives no new range improvements are proposed in this alternative. This would have a positive impact on deer in that no new fences would be constructed, and there would be no impacts on deer migration or access to browse.

Pronghorn

Impacts on Pronghorn would be greatly reduced under this alternative. Eighty six percent (85,962 acres) of suitable habitat would receive long-term rest from livestock grazing. This would remove competition for forage, primarily forbs during the early growing season. Incidental browsing of shrubs by livestock would also cease, again increasing the availability for Pronghorn.

Structural range improvements, specifically water developments, would not be built under this alternative, which may hinder Pronghorns in locations where the lack of water has restricted their access to browse. On the positive side, no new fences would be constructed. Fences have a negative impact on Pronghorn movement.

Sage Grouse

As was noted in the No Action Alternative, impacts on occupied Sage grouse habitat are identical under all alternatives.

Sixty percent of historical habitat (1,085,798 acres) would have livestock impacts removed. This would eliminate livestock caused impacts on Sage grouse. Along with an increase in live plant cover, dead or cured plant material would also remain in place, since winter livestock use would not occur. Together, this maximizes nesting cover, and reduces the potential for predation.

Riparian recovery would be strongest under this alternative, with positive impact of the food base of Sage grouse.

There would also be growing season rest, and improved distribution on sixteen percent (279,943 acres) of historical habitat. Growing season rest would prevent the removal of cover (through consumption) during the nesting and early brood rearing season. There also would be no competition between livestock and Sage grouse for forbs during the period when Sage grouse consume forbs. Growing season rest would assist in riparian recovery, which would have a positive impact on Sage grouse. In most cases, the positive impact from growing season rest is not total, in that Sage grouse brood will still be susceptible to predation and trampling impacts upon the resumption of grazing, but to a lesser extent, since the highest risk of mortality occurs early in the season.

Impacts on Fish and Aquatic Species

Of the action alternatives, this alternative would result in the most benefits to the condition of those riparian habitats, and their upland watersheds, upon which fish and aquatic species are dependent. Those allotments that are failing to meet rangeland and riparian Standards would be suspended from livestock grazing until their ecologic condition class improved to an acceptable condition. This would provide the most immediate response from any impacts caused from livestock grazing activities. Some riparian areas would be permanently closed to livestock grazing due to wildlife management concerns. Those allotments that are not subject to temporary closure would be grazed to the levels described under Alternative D.

Impacts on Threatened and Endangered Wildlife Species

Mexican Spotted Owl

Under this alternative two thirds of Mexican Spotted Owl Critical Habitat would receive long-term rest. Within the remaining one third, livestock would be removed from Protected Activity Centers during breeding and nesting seasons. Both approaches (seasonal removal and long-term rest) would increase plant vigor, especially with grasses and forbs, which would have a positive impact on rodent and small animal populations, and, in turn increases the prey population available to Mexican Spotted Owls.

Within riparian areas, recovery would take place due to removal of livestock from all riparian areas which are not either fully functioning, or showing recovery. This would result in an increased prey base and improved habitat, which a positive impact on Mexican Spotted Owls.

Southwestern Willow Flycatcher

Utilization standards would be imposed on allotments with suitable habitat for Southwestern Willow Flycatcher. Livestock use in allotments with potential or suitable Southwestern Willow Flycatcher habitat would be restricted to between September 1st and March 15th. By adding potential habitat to the seasonal use restrictions, there is a opportunity to recover riparian areas which currently lack the continuity and density of vegetation required by Southwestern Willow Flycatchers. The net impact of these measures would be a strong improvement in riparian habitat and an eventual increase in bird numbers.

In addition to long-term rest, and winter season grazing requirements on all other allotments with suitable or potential habitat, stricter utilization standards would be set on riparian plants, protecting plant recovery. Taken together, these measures would result in improved riparian habitat, and benefits to Southwestern Willow Flycatcher.

CULTURAL RESOURCES

The implementation of the Cultural Resources Protocol (see Appendix 3) is common to all action alternatives. Under this alternative grazing related impacts on cultural resource sites would be identified on a site-specific basis, and appropriate mitigative measures would be implemented as necessary. In addition, the cultural resources research and monitoring component of the Protocol would provide the opportunity for in-depth research into grazing related impacts on cultural resource sites, use of appropriate mitigative measures, and the effectiveness of these measures, as well as provide for cultural resource inventory in areas where grazing related impacts are likely but the site density and character is unknown. This component is important in that research and monitoring regarding grazing related impacts would lead to a better understanding of the situation, and eventually better and more effective management practices.

This alternative emphasizes temporary closure of allotments failing upland range health standards and riparian standards in combination with changes in rangeland management practices (see Alternatives B and C). For cultural resources, this is an improvement over Alternatives B and C in that less on-the-ground improvements will be needed to keep livestock from concentrating in certain areas, vegetation will have an opportunity to re-establish (thus lessening erosion), and immediate protection from grazing related impacts are afforded to a large number of cultural resource sites. This alternative offers immediate protection to a larger number of cultural resources sites than does Alternative D.

This alternative provides for temporary closures of nine allotments and the permanent closure of the Big Bowns Bench allotment. Although primarily designed for rangeland health and riparian concerns, such closures would only benefit cultural resources in that the source of grazing related impacts would be, at least temporarily, lessened or removed. By allowing the recovery of vegetative cover, these temporary and permanent closures would have the effect of reducing erosion. Erosion, either directly or indirectly caused by grazing pressures at cultural resource sites, is a major factor in the deterioration of these sites. Allowing the recovery of vegetation on these sites would generally slow the effects of erosion and help protect the sites. Closures on a long-term or permanent basis would also benefit the cultural resource research by providing a scientific control regarding grazing related impacts; the conditions and impacting agents at similar sites in similar settings could be directly compared between areas open to grazing and areas closed to grazing. Again, this would lead to better management practices in the future.

This alternative would provide for immediate relief from grazing related impacts on cultural resource sites on more than 446,935 acres, primarily on those allotments with problems meeting upland range and riparian health standards. This alternative provides for a substantial increase in immediate protection for cultural resource sites over alternatives B, C, and D. With the temporary removal of livestock from of the project area, grazing related impacts on sites in those areas would halt immediately. While Alternatives B and C would gradually allow for the

recovery of vegetation and the eventual protection this would afford many cultural resource sites, those alternatives provide comparatively little in the way of immediate site protection. Although Alternative D provides many cultural resource sites immediate relief from artifact trampling, breakage, dispersal, and other direct impacts associated with livestock, Alternative E applies these same protections to a larger land base and the concomitant cultural resource sites.

Although the action alternatives are designed to achieve the same end rangeland health goals, the differences lie in the methods with which these goals are achieved by the various alternatives. Recovery of vegetation is an important factor in lessening overall impacts on cultural resource sites. In general, the faster an alternative leads to vegetative recovery, the better that alternative will be for cultural resources. This alternative will promote vegetative recovery more rapidly than the other action alternatives. Also, Alternative E affords immediate protection from direct grazing related impacts on a substantial number of cultural resource sites, an aspect that is largely lacking from Alternative B, present only to a small extent in Alternative C, and not as inclusive in Alternative D.

RECREATION

Most conflicts between recreational use and livestock grazing would be reduced or eliminated under this alternative. During the period of temporary suspension of grazing in allotments that do not meet upland and riparian Standards, most conflicts would be eliminated in those allotments for the duration of the suspension, but upon the resumption of grazing those conflict would return.

Recreational access problems relating to range developments (access through fences) would be reduced by incorporating the proposed "Standard Requirements and Design Restrictions on Range Improvements" (see *Standard Operating Procedures* [SOPs], Appendix 10). Additional requirements providing for recreational foot and horse access through fences would further reduce conflicts.

Changes in Seasons of Use under this alternative would reduce the overlap between the high recreational use season (mid-March through June, and September through November) and a grazing season in certain allotments.

The Upper Gulch Pasture of Circle Cliffs Allotment would be grazed only spring or fall of every other year. In years when spring grazing would occur, the season of use would end no later than March 15, which is also the typical start of the spring high recreational use season. Conflicts relating to competition for space in the Upper Gulch would be greatly reduced under this alternative.

The season of use for livestock grazing in Clark Bench Allotment would be cut back by one month in the spring, with the end of the grazing season being March 31 rather than April 30. Conflicts with recreational use would be reduced during the highest recreational use period of the spring under this alternative. Any individual pasture would either spring or fall, further reducing conflicts in off-grazing years. Additionally, by the creation of The Dive Pasture, there would be

reduced livestock use of the Paria Canyon-Vermillion Cliffs Wilderness, further reducing opportunities for conflict on the allotment.

The designation of the Cottonwood Wash and Paria Box Pastures of the Cottonwood Allotment for limited use and trailing only would reduce conflicts between recreational use and livestock grazing. Excluding livestock from Snake Creek and Hogeye Canyon would protect valuable campsites and backcountry water sources from livestock impacts. This would eliminate conflicts related to competition for water and greatly reduce conflicts related to competition for space in these pastures.

Death Hollow Allotment would have a season of use with less overlap onto the high recreational use season. Some livestock grazing has been authorized from April 1 through May 15; under this alternative all livestock grazing would end no later than March 31. Furthermore, fencing livestock out of the head of the narrows of Little Death Hollow would eliminate problems with hikers inadvertently herding livestock into the narrows. This would eliminate most recreational conflicts in this allotment.

The closure of Big Bowns Bench Allotment would eliminate all potential conflicts between recreational use and livestock grazing in that area.

One of the locations of highest conflict between recreational use and livestock grazing is the portion of the King Bench Pasture of King Bench Allotment that contains The Gulch, which is a very popular destination for hikers, backpackers and equestrians. Most of The Gulch on this allotment is designated as an Outstanding Natural Area, and there is an expectation among recreational users that it should be an outstanding, natural-appearing landscape. Because the Gulch supplies the only reliable water for most of the pasture, the livestock tend to concentrate use in the canyon bottom, which is also where recreational use is concentrated. Under this alternative the season of authorized use would be reduced by one month in the spring, ending no later than February 28th, rather than March 31st, and spring grazing would occur only every other year. This would greatly reduce conflicts relating to competition for space by eliminating the presence of livestock during the spring season of high recreational use. It would also improve the natural appearance of vegetation in the canyon by allowing for an extra month of un-grazed spring growth. However, this would only somewhat reduce conflicts relating to access to clean water, because while there would be no livestock present during the high recreational use season, there would still be relatively fresh livestock manure concentrated around the stream in years of spring grazing use, especially during the early part of the recreational season.

Since much of the forage in the pasture is on King Bench itself (above the canyon), development of water catchments and/or repair of the existing water development on the bench would provide the opportunity to keep livestock mostly out of the canyon except for trailing purposes. If water sources are successfully developed then most recreational conflicts with authorized livestock use would be eliminated.

The creation of a new "Deer Creek" Pasture in the King Bench Allotment would be necessary to achieve reduction of conflict in The Gulch. It is possible in this alternative that new conflicts

could arise in Deer Creek. Monitoring for increasing conflict would be necessary. Mitigation measures would need to be taken if monitoring indicated an increase in conflict.

The exclusion of livestock from the slot canyons of Dry Fork of Coyote Gulch (Dry Fork Narrows, Peek-a-boo, Spooky and Brimstone) in Lower Cattle Allotment would eliminate recreational conflicts related to inadvertent herding of livestock and the resulting unpleasant confrontations in the constricted areas.

The creation of Buckskin Gulch Pasture in Mollies Nipple Allotment, and designating the portion of the pasture east of House Rock Valley Road as limited to livestock use would eliminate conflicts with recreational use related to competition for water and space.

In Upper Cattle Allotment, the exclusion of livestock from the visitor facilities (parking, toilet and picnic area) and rock formations of Devil's Garden would eliminate conflicts with recreational use in those areas.

SOCIO-ECONOMIC IMPACTS (ALL ALTERNATIVES)

Any adjustments in authorized uses of the public lands can produce impacts, both positive and negative, to social values associated with the public lands, often referred to as "Custom and Culture" and to economic values through changes to the "products" produced or harvested, as well as to the income and jobs these products generate.

IMPACTS ON CUSTOM AND CULTURE

Alternative A, the "No Action" Alternative, proposes continuation of livestock grazing in all of the allotments currently used for livestock grazing. Alternatives D and E propose the continuation of livestock grazing in all but one allotment (and that allotment has been in non-use for at least five years). All of the current livestock grazing operations would continue, subject to primarily voluntary changes if and when initiated by the permittees. The public lands that many livestock operations rely on for a viable business operation would continue to be available.

Custom and Culture, as often characterized in Kane and Garfield Counties by the image of the independent western rancher making a living by running cattle on the open range, would be seemingly unchanged even though this scenario is more the exception than the rule anymore. The reality of current Custom and Culture which is primarily characterized by small ranching operations carrying on family traditions, but which is often made possible only through primary employment of the rancher and/or spouse in non-farm occupations, would continue to be the most common form of livestock operation.

In assessing Custom and Culture, consideration must also be given to the context in which it is defined, and how that definition varies among residents and visitors. There is no single custom and culture of the region and no single "impact" to measure. Residents, especially those with long family ties to the region, are strongly tied to traditional uses such as livestock grazing, mining and logging. Their "culture" values the ability to pass on these traditions to future generations. They long to see these traditional uses continue. Few of the newer residents moved

to the region so they could follow the customs and culture of the ranching lifestyle. Many new residents chose this region specifically due to the combination of open space and the ability to tap into the growing market for tourism and recreation services. Retirees move here to get away from urban areas, or to maximize the economic benefits from appreciated real estate or for incentives that are not tied to the region but to a personal desire. Case in point is the Best Friends Animal Sanctuary in Kanab. A significant portion of new Kanab residents move to the area specifically to support Best Friends. Their "culture" is animal welfare. Newer residents may not even be aware of the region's history. To the general public visiting the planning area, the vast open spaces of the region, where livestock are often seen, would continue to present an image of the western rangelands where cattle and cowboys roam.

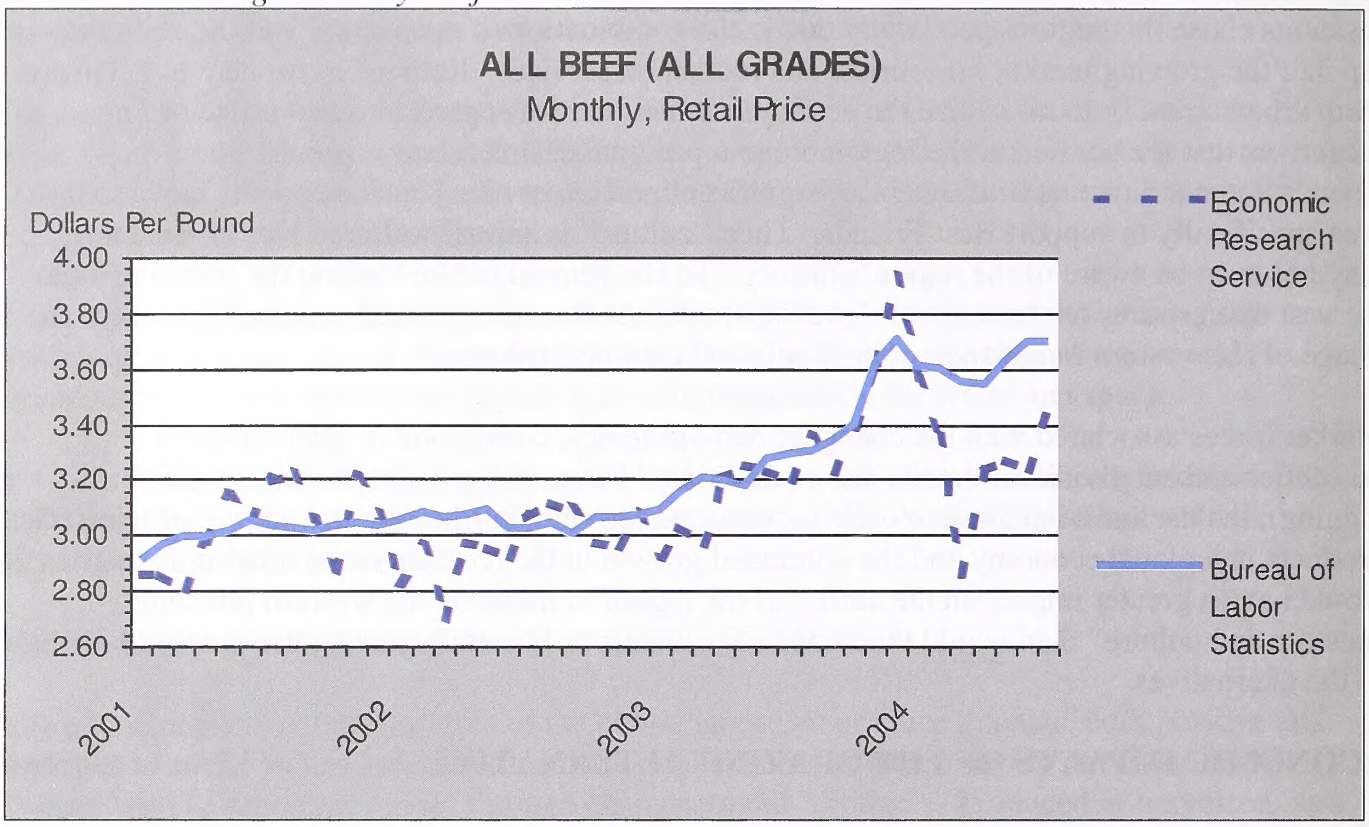
Market forces associated with the changing demographics, conversion of open range to ranchettes and subdivisions, the decline of traditional economic sectors (mining, ranching, logging), the decline of niche economic sectors (western movie filming), the pricing of livestock products in a global economy and the continued growth in the recreation and tourism industries, would have a greater impact on the ability of the region to maintain the western ranching "custom and culture" than would the minor adjustments to livestock grazing use proposed in any of the alternatives.

ECONOMIC IMPACTS OF THE GRAZING ALTERNATIVES

BACKGROUND AND OVERVIEW

As in other parts of the West, the economic viability of the livestock industry is increasingly influenced by global and national markets for beef. These markets have presented challenges for many beef producers. For example, recent trends in high-protein diets have spurred demands, while growing concerns over bovine *Spongiform encephalopathy* (i.e., mad cow disease), have moderated consumption. As with any market, there have been fluctuations, but overall since the mid 1980s, the market has improved 64% (Tables 4-1 & 4-2). This gain has happened even with recent gains in dietary substitutes like chicken, which has experienced growth in both price and per capita consumption in recent years.

Table 4-10 Average Monthly Beef Prices in the U.S.



Source: Sonoran Institute 2004.

Table 4-11 U.S. Beef Prices From 1970 - 2002, with Projections to 2015 (in Constant 1990 Dollars)

Year	Price ($/kg)
1970	$4.65
1980	$3.50
1990	$2.56
2000	$1.99
2002	$2.21
2003	$2.19
2004	$2.26
2005	$2.25
2010	$2.17
2015	$2.06

Source: Cattle Fax 2005.

CHAPTER 4
ENVIRONMENTAL IMPACTS

These broad-scale global and national market conditions present strong challenges to the economic viability of Utah's livestock industry, regardless of the actions of public land management agencies. However, within this broad market context, local management decisions on public lands can exacerbate or ameliorate the impacts of these market trends, especially in the arid West where public lands often comprise the vast majority of grazing lands.

Indeed, public lands are a dominant feature of the study area. For example, only 15.4% of Kane and Garfield Counties are privately owned (Table 4-3). The remaining 85.6% is in federal and state ownership and administered by various public land management agencies (see Table 3). Hence, while the economic base in this area has historically been logging, ranching, mining and agriculture, these activities have largely taken place on public–not private–lands (the exception is agriculture). These activities are still important components of the local economy; however, an increased emphasis on recreation and tourism, combined with growing concerns over environmental quality, have combined to limit the scale of these traditional uses on public lands.

Table 4-12 Land Ownership in Garfield and Kane Counties, Utah

Land Ownership	Acres	% Total
Total Acres in Kane County	***2,627,234***	***100.0***
Federal Government	2,178,531	82.9
BLM	1,655,087	63.0
US Forest Service	123,497	4.7
National Parks	399,948	15.2
State Government	108,573	4.1
State Trust Lands	103,000	3.9
State, County, City	5,743	0.2
Private (May Include Some Local Gov't Land)	266,149	10.1
Water: Lakes and Reservoirs	73,810	2.8
Total Acres in Garfield County	***3,331,004***	***100.0***
Federal Government	2,982,341	89.5
BLM	1,489,718	44.7
US Forest Service	1,044,849	31.4
National Parks	447,775	13.4
State Government	161,747	4.9
State Trust Lands	159,018	4.8
Stat, County, City	2,243	0.1
Private (May Include Some Local Gov't Land)	168,827	5.1
Water: Lakes and Reservoirs	18,513	0.6

Source: 2003 Utah State and County Economic Travel and Indicator Profile.

GRAZING WITHIN THE PLANNING AREA

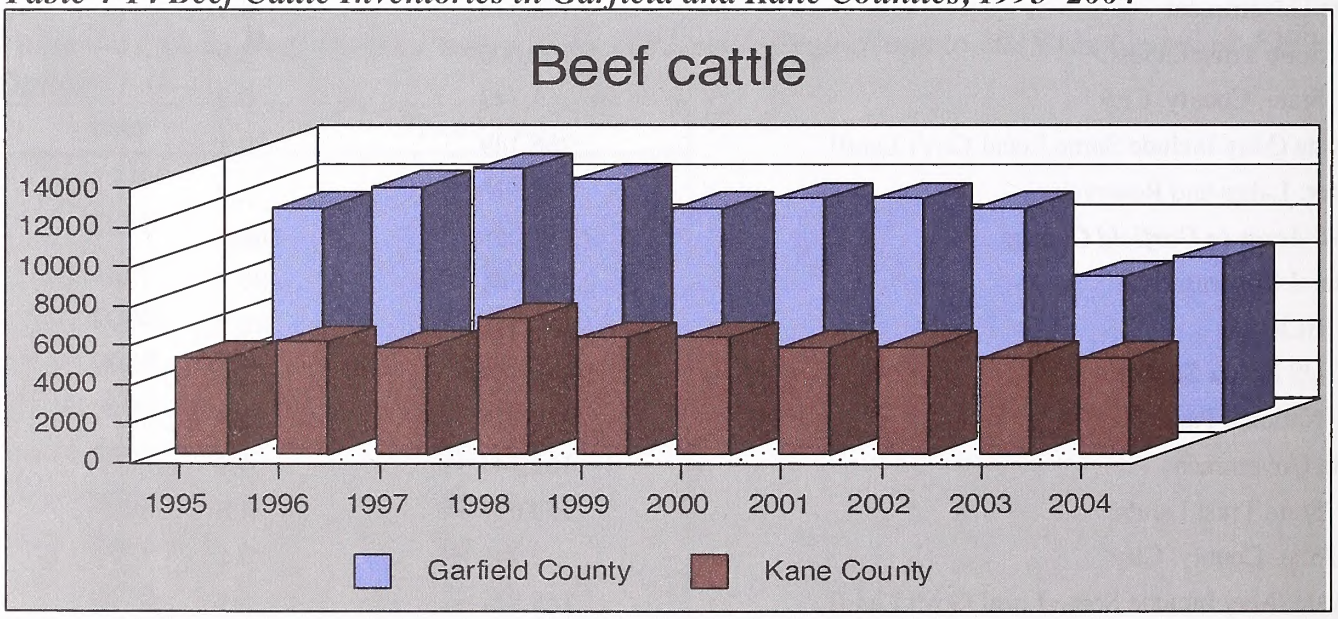
Grazing has long been a dominant use of the public lands within the planning area, including Grand Staircase-Escalante National Monument and Glen Canyon National Recreation Area. In fact, nearly all of the lands within the planning area are or have been grazed by livestock – mostly cattle. Given the vast acreage involved and the limited amount of private lands within Kane and Garfield Counties, livestock producers are highly dependent on public lands for their forage. For example, within Garfield County, 21% of all grazing takes place within or on lands administered by the BLM (Table 4-4). In Kane County, the corresponding figure is 72%.

Table 4-13 Acres Grazed in Garfield and Kane Counties

Garfield County	
Total acres grazed	2,644,513
Acres grazed within the Monument	568,358
Percent grazing within the Monument	21%
Kane County	
Total acres grazed	2,056,856
Acres grazed within the Monument	1,478,950
Percent grazing within the Monument	72%

Source BLM, 2005.

Table 4-14 Beef Cattle Inventories in Garfield and Kane Counties, 1995–2004



Source: Utah Agricultural Statistics, 1995 through 2004.

The AUM (animal unit month) is the basic unit of authorization for grazing on BLM lands. An AUM is the amount of forage required to sustain one cow and one calf for one month. The Agency determines an allotment's authorized level of AUMs as a percentage of the total forage produced that can be grazed while still maintaining a healthy ecosystem. The Agency currently charges $1.79 (2005) per AUM based on a formula established by Congress. This price is generally recognized as being below "fair market value," which is generally accepted as the price

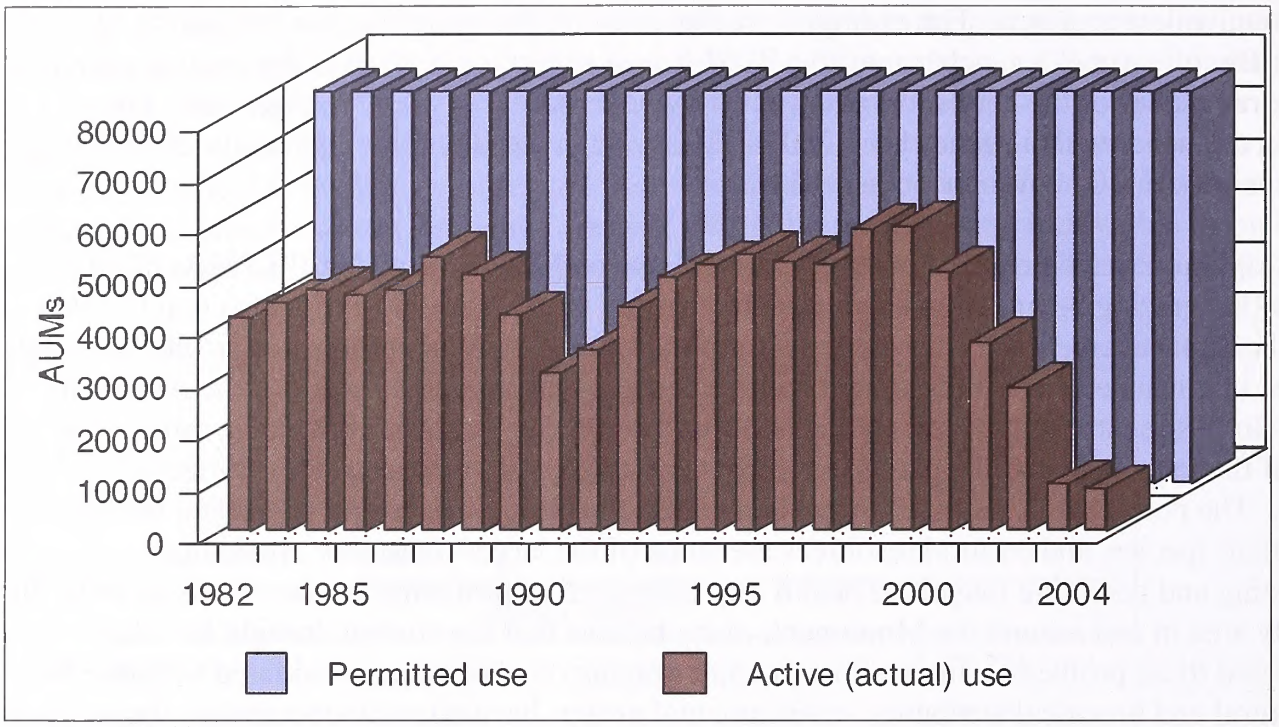
of privately offered forage. It is important to recognize that an AUM is a monthly unit, and that it is not equivalent to a cow. For example, grazing one cow for an entire year represents 12 AUMs. But oftentimes a rancher may use BLM forage for only a portion of the grazing year, with the remainder of the herd's forage supplied by other public or private rangelands. For example, a rancher with a permit for 1,200 AUMs could graze 100 cows all year, or 200 cows for six months, or 400 cows for three months.

The multiple-use mandate of the Federal Land Policy and Management Act (FLPMA) of 1976 requires that grazing be one of many considered uses of BLM lands. FLPMA also requires that federal land management agencies undertake a decision process that ensures that public lands are managed in a manner that will best meet today's needs as well as future needs of the American people. In this regard, grazing on public lands has become an increasingly volatile issue. The health of the rangeland and the perceived impacts of grazing are a concern for a variety of reasons. The potential for adverse impacts on wildlife habitat, riparian and watershed health, native plant species, and cultural resources are some of the largest concerns. In addition, overgrazing and declining rangeland health are recognized as problems in many areas as well. In the study area in and around the Monument, many believe that the current drought has also exacerbated these problems. In an effort to retire grazing on allotments considered valuable for their natural and historical attributes, environmental groups have attempted to change the terms and conditions of grazing permits, but have met with limited success. More recently, environmental groups have considered purchasing grazing privileges or base property from permittees, or working with ranchers to voluntarily relinquish some or all of their grazing privileges.

Today, approximately 76,457 active use AUMs are authorized within the planning area, and over the course of a year, permittees graze roughly 11,000 cattle on these lands. Differences between authorized active use and actual use are common and result from year-to-year forage variability, fluctuations in the market for livestock, and/or individual permittees taking voluntary non-use. These deviations can be large, and many permittees have historically not fully utilized the number of AUMs authorized for use.

The figure below shows that actual livestock grazing use within the planning area has consistently fallen below the permitted active use level of 76,457 AUMs (Table 4-6). For example, during pre-drought years between 1982 and 1996 inclusive, permittees used an average of 49,514 AUMs – or 64% of the approximately 76,457 AUMs permitted for use. During the more recent drought years of 1996 through 2004, permittees used roughly 35,000 AUMs – or just 45 % of permitted levels. In fact, actual use has ranged from high of 59,283 in 1999, to a low of 8,250 in 2004. The data reveal a cyclical pattern, in recent years being most strongly affected by the severe drought that began in 1997.

Table 4-15 Permitted and Actual AUM Use, 1982–2004



Source: BLM 2005.

MODELING THE ECONOMIC IMPACTS OF GRAZING

The economic impacts of the various grazing options considered is largely a function of each alternative's authorized level of AUMs, and the resulting number of livestock produced and marketed each year. For example, differences in annual livestock sales resulting from the various AUM levels will affect ranchers' income, as well as overall employment and economic activity within Garfield and Kane Counties.

In addition to these "direct" effects, changes in the number of AUMs authorized will also produce "multiplier effects" that ripple through the economy. For example, to more fully consider the economic impacts of alternative grazing levels, one must examine the "indirect effects" or "backward linkages" that measure the impact of expenditures that livestock producers make for various inputs needed to produce cattle (e.g., supplemental feed, veterinary services, etc.). These indirect effects would be missed if one examined only differences in the number of livestock marketed under each alternative.

In addition to these indirect effects, economists also consider the "induced effects" of proposed changes in economic activity. In this case, induced or "forward linkages" measure the effect that changes in personal income and associated spending has within the economy. For example, livestock producers spend some portion of the income generated by livestock sales on food, clothing, housing, and other miscellaneous purchases. This spending in turn supports other businesses and wage earners, which in turn spend a portion of their earnings. As with the indirect effects described above, the extent to which these expenditures are incurred and multiplied throughout the two-county study area is important in determining the overall induced economic impact of the grazing alternatives being considered.

While direct sales clearly have the largest impact on an economy, the indirect and induced effects are important as well, with the former effect generally larger than the latter. In the case of the Monument, however, "leakage" from the two-county study area is likely to be relatively high for all sectors of the economy given the limited availability of local services. Indeed, businesses and consumers alike appear to be increasingly dependent on large, rapidly-growing regional service centers like Cedar City and St. George, which are located outside of Kane and Garfield Counties. Also, as described earlier, the Agricultural Services sector comprised just 0.3% and 3% of total 2000 employment in the two counties, respectively (see Tables 3 and 6), thus implying a relatively small role for these businesses in the overall regional economy.

In summary, the economic impact of each grazing alternative can be estimated by the sum of the direct, indirect, and induced effects of the number of livestock produced under each alternative's level of authorized AUMs. In quantifying these impacts, we used an input-output model called IMPLAN, which describes the financial relationships between various sectors of the economy, and allows one to estimate the impact of changes in one sector of the economy on overall economic activity. In this case, the changes considered are authorized AUM levels under the various alternatives. The effects modeled include: (1) total production or output in goods and services, (2) labor income, and (3) the number of full and part-time jobs.

ECONOMIC IMPACTS OF THE ALTERNATIVES CONSIDERED

The alternatives considered range from No Action (Alternative A or the current use level of 76,457 AUMs) to Alternative E, which suspends grazing on allotments failing to meet any rangeland health standard (initial authorization of 58,427 AUMs, rising to 73,398 AUMs as allotments reach standards). In the analysis presented below, the economic impacts of the various alternatives are depicted as losses in output, income, and jobs vis-à-vis the current situation of 76,457 AUMs.

A direct impact value of $41.22 per AUM was used for this analysis. This figure represents the average value of production per AUM in 2002 dollars for the State of Utah based on a 10-year average (see USDI Bureau of Land Management 2005). Using this direct impact value, the total impact (including indirect and induced effects) for each alternative is presented below (Table 4-7). The initial decrease represents the immediate annual impact of the new authorized AUM level under each alternative. The long-term decrease represents the eventual annual impact once allotments achieve rangeland health standards. In reality, a transition between the initial and long-term effect would be experienced as rangeland health improves. The timing and path of this transition, however, is not known.

Table 4-16 Reductions in Overall Economic Output under the Various Alternatives (2002 dollars)

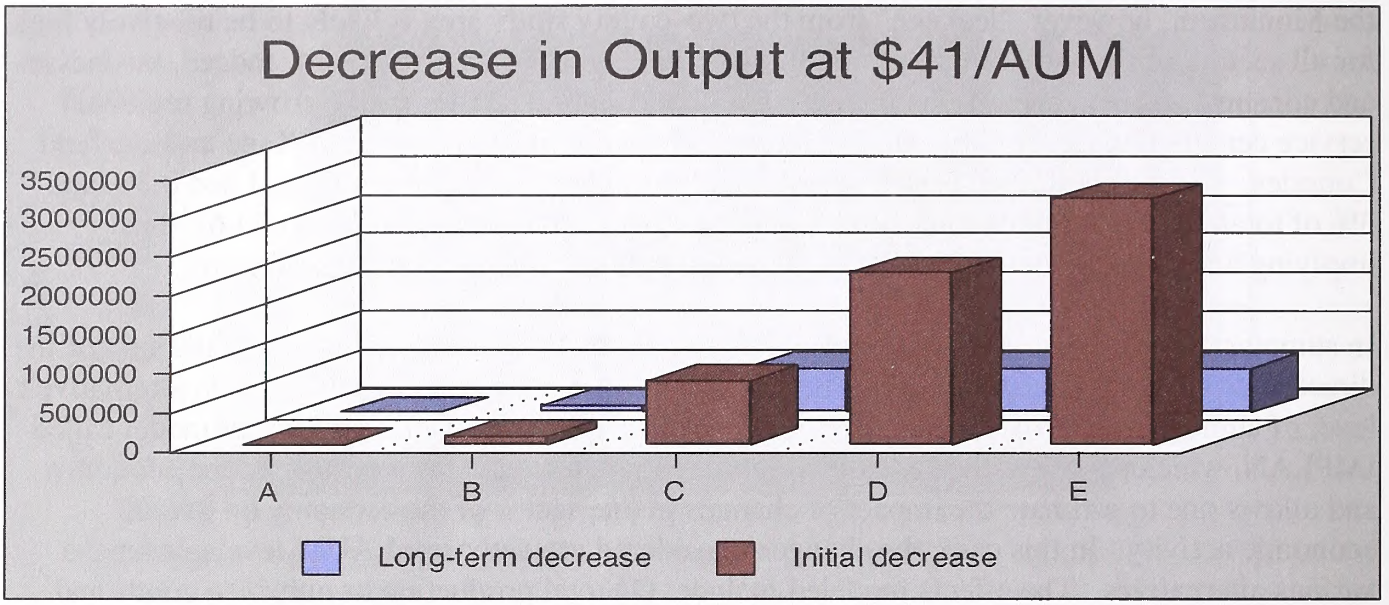


Table 4-17 Reduction in Output, Jobs, and Labor Income under the Various Alternatives (2002 Dollars)

	Total Economy	A	B	C	D	E	Potential C, D, E
Output	$356.3Million	0 (0%)	$97,018 (0.03%)	$826,485 (0.23%)	$2,153,816 (0.60%)	$3,107,633 (0.87%)	$568,417 (0.16%)
Jobs	6,439	0 (0%)	1.4 (0.02%)	12.3 (0.19%)	32.1 (0.50%)	46.4 (0.72%)	8.5 (0.13%)
Income	146.4 Million	0 (0%)	$6,100 (0.00%)	$51,970 (0.04%)	$135,433 (0.10%)	$195,409 (0.14%)	$35,742 (0.02%)

Under the preferred alternative (Alternative C), the immediate impact is an annual reduction of $826,485 in overall economic output for the two-county study area (Table 4-8). To place this number in perspective, total 2002 output across all sectors was $356.3 million. Hence, under the preferred Alternative C, output in the study areas is expected to fall just 0.23%. Under the most severe AUM reductions associated with the initial implementation of Alternative E, total output in the two-county region would be expected to fall by just 0.87%.

The impacts reflect an overall output multiplier (SAM) of 1.62 – meaning that every dollar generated though grazing in the two-county study area results in a total of $1.62 in total economic activity. The size of the multiplier is relatively low yet in line with what would be expected from a small, two-county study area with limited economic diversification (Hughes 2003).

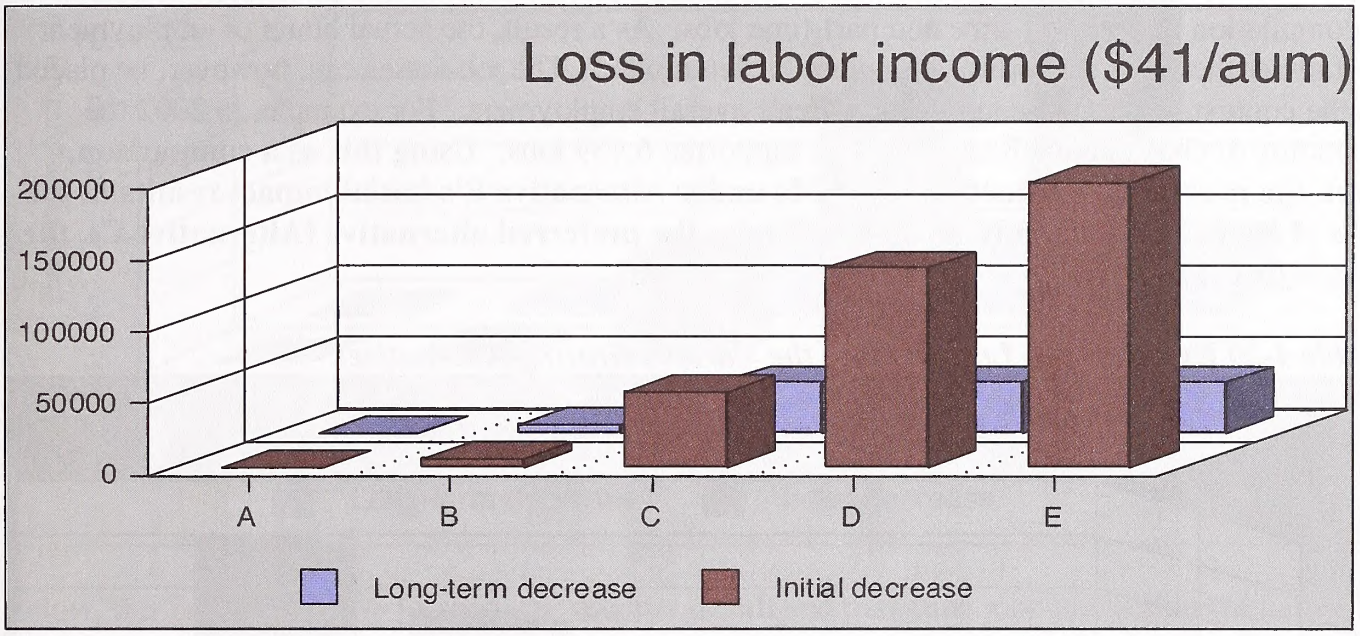
It is also important to note that the analysis of impacts presented here overstates the true impact of the alternatives because it compares each alternative against the current authorized grazing level of 76,457 AUMs. In reality (and as discussed above), actual AUM use levels on public lands in the planning area since 1982 have ranged from 45% to 64% of authorized use. Indeed, the actual 1996-2004 historic average use level of 35,000 AUMs falls below the initial impacts

of all the alternatives. It should be noted that the decreased AUM use during this time period has been with the cooperation of the grazing Permittees.

IMPACT ON EMPLOYMENT AND LABOR INCOME

Labor income includes both employee compensation and proprietor income. Reductions in labor income under the alternatives range from $6,100 per year for Alternative B, to nearly $200,000 under the initial grazing suspensions that would accompany Alternative E (Table 4-9). While these impacts are real in that they directly affect household earnings in a region where jobs and income are both limited, the impacts are quite small when expressed in relation to overall labor income. For example, the two-county region's total labor income was $146.4 million in 2002.

Table 4-18 Annual Losses in Personal Income under the Various Grazing Alternatives



Hence, under even the most restrictive alternative (i.e., the initial AUM reductions under Alternative E), initial labor income losses of $195,409 represent just 0.13% of the total. Under the preferred Alternative C, losses in labor income comprise just 0.04% of the total. For alternatives C, D, and E, the impacts are even lower under a long-term perspective (e.g., just 0.02% of total labor income) because AUMs are expected to increase as reduced grazing pressures and improved management allow rangeland health standards to be met on an increasing number of allotments.

The minimal impact of the alternatives on labor income reflects the low economic contribution of the farm sector overall. Indeed, Table 4-10 shows that personal farm income as a percent of total non-farm personal income has fallen from 7% in 1970, to less than 1% in 2001.

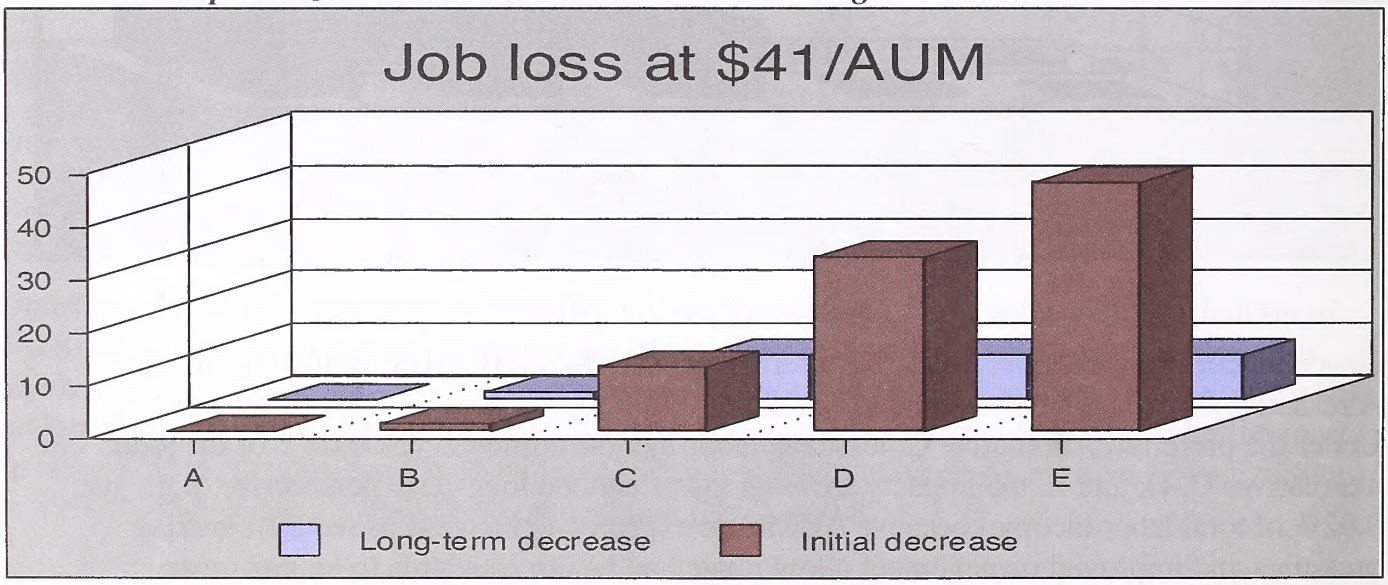
Table 4-19 Change in Personal Farm Income as a Percent of Non-farm Personal Income in Garfield and Kane Counties, Utah

County	1970	1980	1990	2001
Garfield	6.11%	3.98%	18.18%	0.30%
Kane	9.28%	3.13%	6.84%	0.48%
Average	*7.69%*	*3.56%*	*12.51%*	*0.39%*

Source: Governor's Office of Planning and Budget 2004.

Expected annual job losses range from just 1.4 under Alternative B, to 46.4 under Alternative E's initial impact (Table 4-11). It is important to note, however, that these are not full-time equivalent jobs (i.e., jobs paying a wage for roughly 2,080 hours of work per year), but instead is a compilation of both full-time and part-time jobs. As a result, the actual hours of employment lost under the various alternatives cannot be determined. The job losses can, however, be placed in the context of the two-county study area's overall employment. For example, in 2002 the economy of Garfield and Kane Counties supported 6,439 jobs. **Using this as a comparison, even the most severe reduction in AUMs under Alternative E's initial impact results in the loss of about .72% of study area jobs. Under the preferred alternative (Alternative C), the loss is just .19%.**

Table 4-20 Expected Job Losses under the Various Grazing Alternatives



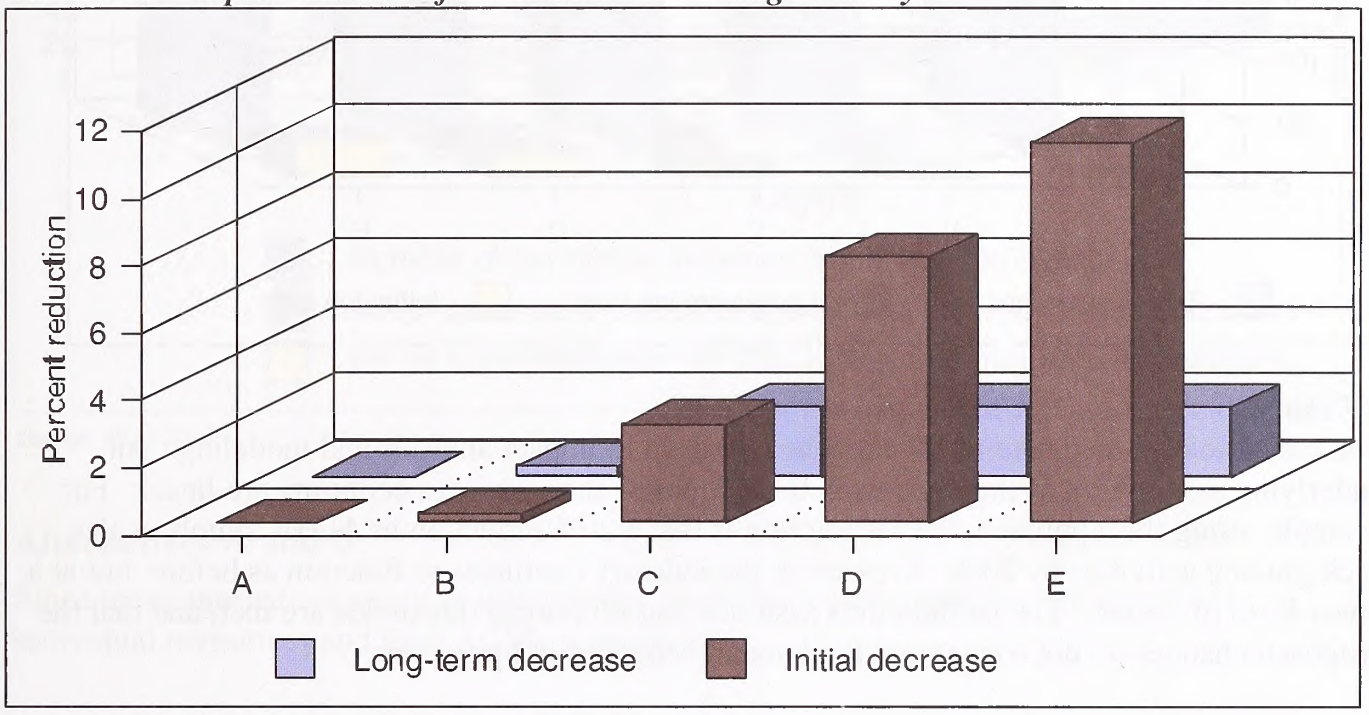
IMPACT ON THE CATTLE RANCHING AND FARMING INDUSTRY

While the output impact of the various alternatives is small in comparison to the overall economy of the two-county region, the effect on the cattle ranching and farming sector is greater. For example, the total output of this sector was $17 million in 2002. Using this as a benchmark for comparison, the impacts of the alternatives is shown below (Tables 4-12 & 4-13) using the direct impact value of $41.22 per AUM. Note that while the impacts of Alternatives A and B are still quite small (0 and 0.3 percent reductions in the sector's output), the effects of Alternative C through E are greater (3.0, 7.8, and 11.3 percent reductions, respectively). The long-term effects for these three alternatives, which portray the impact once rangeland health standards improve, are roughly 2% of total 2002 output.

Table 4-21 Data for Figure Showing Percent Output Reduction

	A	B	C	D	E
Initial decrease	0.0	0.3	2.96%	7.82%	11.29%
Long-term decrease	0.0	0.3	2.04%	2.04%	2.04%

Table 4-22 Output Reduction for the Cattle Ranching Industry

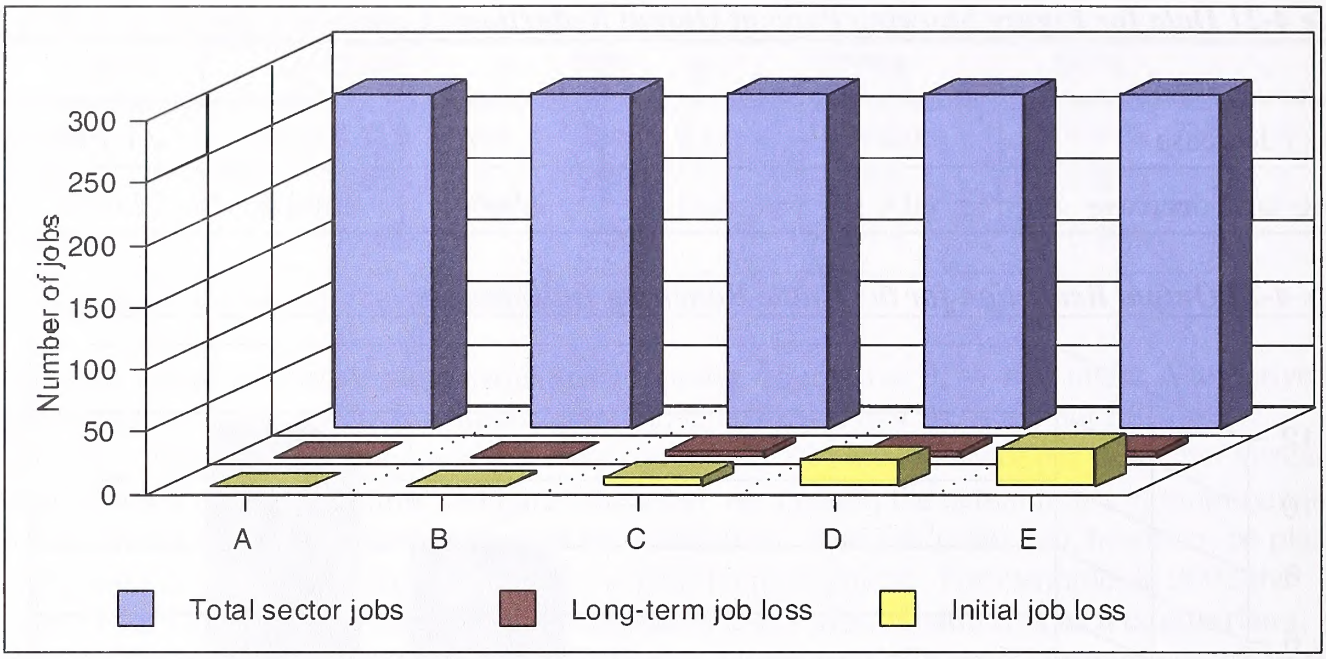


Below, the Table 4-14 & 4-15 show the number of full and part-time jobs lost within the cattle ranching and agriculture industry under each of the alternatives. For example, in 2002 the sector supported 269 full and part-time jobs. Under the alternatives, initial job losses range from zero (Alternative A), to 29.9 under Alternative E. Long-term job losses range from zero to 5.5.

Table 4-23 Data for Job Loss by Alternative

	A	B	C	D	E
Total sector jobs	269	269	269	269	269
Long-term job loss	0.0	0.9	5.5	5.5	5.5
Initial job loss	0.0	0.9	8.0	20.7	29.9

Table 4-24 Job Loss by Alternative



A Final Comment on Methods and Assumptions

The methodology used here represents one approach to impact analysis and modeling. An underlying assumption of this process is that proposed changes in an economy are linear. For example, using this approach, the assumption is that a 20% reduction in AUMs simply scales back grazing activities by 20%. In essence, the industry continues to function as before, but at a lower level of output. The method thus assumes that no critical thresholds are met, and that the proposed changes do not trigger any fundamental changes in operations.

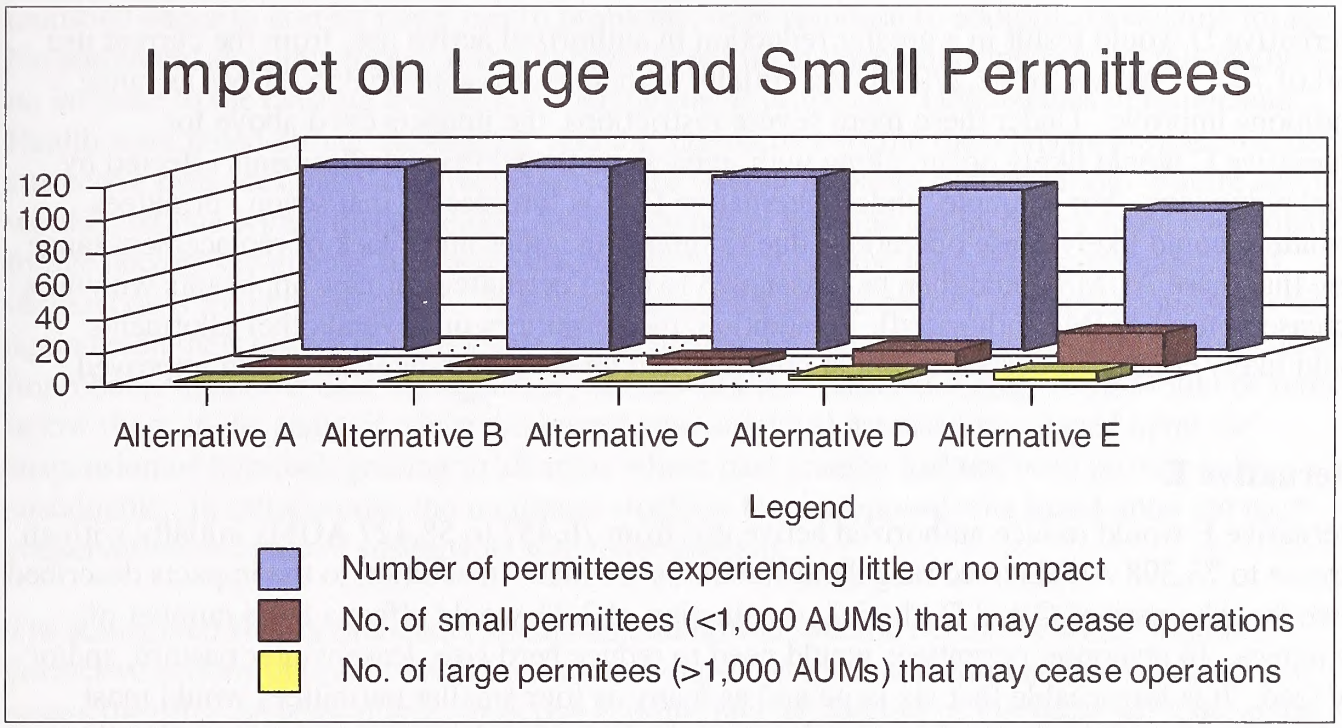
Given the nature of ranching operations in the study area, this may or may not be a good assumption. For example, if a ranching operation relies on BLM forage for a critical season of use, eliminating or reducing AUMs at that time could have a greater impact than what would be suggested by a linear model. For example, if the reduction occurs at a critical time, and if substitute forage is unavailable, an operation could cease to be economically viable, and thus be forced out of business.

ECONOMIC VIABILITY OF INDIVIDUAL PERMITTEES

In this section, we describe the impacts in relation to the economic viability of individual permittees, as well as the number of AUMS affected across the different allotments. Data are aggregated to the level required to protect the identity of individual permittees.

Table 4-16 below summarizes the likely impacts of the alternatives on the viability of existing permittees. Based on a total of 110 permittees, the impacts are broken down for large (greater than 1,000 AUMs) and small operators. As shown in the Figure, the impacts across all alternatives are relatively small, although small operators are likely to be the most severely affected, especially under alternative E.

Table 4-25 Likely Impact of Alternatives on Large and Small Permittees



Source: BLM 2005.

Alternatives A and B

Since these alternatives result in little change from the current condition, the impact on individual permittees and total AUMs is negligible.

Alternative C

Under Alternative C, total authorized active use initially drops from the current level of 76,457 AUMs, to 73,428 a decline of 9.6 %. Thereafter, as rangeland health improves, authorized active use is projected to eventually increase to 75,355 AUMS – a long-term decrease of 1 %.

Although the long-term reductions under this Alternative are fairly modest, the bulk of the initial reductions would occur on two of the planning area's 82 allotments – making the impact disproportionate on the permittees affected. For example, these two allotments currently have 4,336 authorized AUMs. This level of use would initially decline 7 % under Alternative C, or to a combined use of 3,379 AUMs. The likely response for most of the permittees affected by these reductions is to decrease herd size by roughly 50% or more, and/or buy feed or rent pasture to compensate for the reduced number of AUMs. It is foreseeable that one large and as many as four smaller permittees would most likely cease operations due to financing issues and a lack of replacement range (note that these AUMS could then be reassigned to other permittees or new applicants without a decrease in total AUMs authorized).

Alternative D

Alternative D would result in a greater reduction in authorized active use, from the current use level of 76,457 AUMs, to 62,279 AUMs initially with an increase to 75,355 AUMs as range conditions improve. Under these more severe restrictions, the impacts cited above for Alternative C would likely occur, along with impacts on the additional allotments affected by initial reductions. For example, under Alternative D, it is foreseeable that seven Permittees permittees could likely cease operations due to financing issues and a lack of replacement range (note that these AUMS could then be reassigned to other permittees or new applicants without a decrease in total AUMs authorized). In addition, the permittees on several other allotments would likely continue operations, but at reduced herd levels until rangeland health improved.

Alternative E

Alternative E would reduce authorized active use from 76,457 to 58,427 AUMs initially with an increase to 73,398 AUMs once rangeland standards are met. In addition to the impacts described above for Alternatives C and D, the initial reduction of 24% would affect a large number of permittees. In response, permittees would need to reduce herd size, lease winter pasture, and/or buy feed. It is foreseeable that six large and as many as four smaller permittees would most likely cease operations due to financing issues and a lack of replacement range (note that these AUMS could then be reassigned to other permittees or new applicants without a decrease in total AUMs authorized). In addition, the permittees on several other allotments would likely continue operations, but at reduced herd levels until rangeland health improved.

CUMULATIVE IMPACTS

Cumulative impacts consist of impacts from past, present, and reasonably foreseeable future actions on lands (Federal, State and private) within the analysis area. Few cumulative impacts are expected in connection to this analysis and decision-making process. Eighty three percent of the planning area consists of the Grand Staircase-Escalante National Monument. As was stated in the Proclamation for the Monument, the lands within are "set apart and reserved... for the purpose of protecting the objects described...", which include geological, paleontological, archeological, historical and biological resources. The direction of the Proclamation developed into the Monument Management Plan, which emphasizes "management of uses to protect and prevent damage to Monument resources". In effect, most actions which result in degradation of Monument resources are prohibited under the approved plan. Conformance with the plan requires the disapproval of most actions which would cause cumulative impacts. Specific examples would include mineral development, road construction, land disposals, or significant realty actions. Exceptions, which might generate cumulative impacts, consist of activities specifically authorized in the plan (usually related to recreation or frontcountry development), or existing (i.e, pre-plan) activities which have legal standing.

LIVESTOCK GRAZING

Livestock grazing is an existing activity, and its continuation was specifically addressed in the Monument Proclamation. In the context of range impacts, the past, present, and proclaimed future consists of continued livestock grazing. "Existing grazing uses shall continue to be

governed by applicable laws and regulations other than the proclamation." Grazing levels can be modified either to correct range health problems, or in response to additional available forage. No additional available forage was identified based upon the monitoring prior to this analysis, so no increase to the existing livestock authorizations is proposed. Deficiencies in Rangeland Health were noted during monitoring, and the alternatives within the analysis propose a series of corrective measures, including reductions in the overall livestock authorization. Future actions would continue within this envelope, varying between incremental increases when additional forage becomes available and incremental reductions when the long-term sustainability of rangelands is found to be at risk. It is highly improbable that grazing authorizations will ever again reach their historical high levels due to the legal mandates for sustainability. It is equally improbable under the existing regulatory framework that future stocking levels would be reduced below those in the analysis, since the lowest stocking level assessed was based upon the suspension of livestock grazing in all areas where past grazing had not been proven to be sustainable. In other words, the minimum stocking level proposed was based upon the most conservative estimate of sustainable forage production.

The Rangeland Health Standards assessment identified specific resources which required corrective actions in order to restore health. Long-term trend and continued monitoring will assess the effectiveness of any corrective actions, and the Record of Decision will take steps towards restoring Rangeland Health, and in turn, ensuring the viability of continued economic use of the range. All of the proposed alternatives would make progress toward achieving rangeland health. It is anticipated that future grazing actions would have the same goal, and as such, the main cumulative impact would be healthier range, and the restoration of resources which have experience past negative grazing impacts.

SOCIO-ECONOMIC

Cumulative impacts on the livestock industry are not anticipated. While the analysis has disclosed the potential for negative impacts on the economics of individual permittees, the overall intent of the proposed amendment to the management plan is to preserve the productivity of the rangelands within the planning area. A primary goal of this amendment process is to "keep lands suitable for grazing open and productive, while minimizing conflicts with other resources." Adjustments in livestock permits are proposed, but to restore rangeland health, which in turn maintains the viability of rangeland production.

Cumulative impacts on the "custom and culture" of South-central Utah are also not anticipated. Over ninety-nine percent of the lands within the planning area that are currently open to livestock grazing will be kept open for future grazing. While the quantity of livestock allowed may vary, in response to monitoring, the quality (and opportunity) to pursue a ranching experience will remain unchanged.

VEGETATION

At the present time, vegetation treatments are being applied on Buckskin Mountain (approximately 5700 acres), and are proposed at Ford Pasture (approximately thousand acres). The rangeland seedings on Circle Cliffs, Mollies Nipple, Cole Bench, Sheep Creek, and Coyote

Allotment are being maintained. It is anticipated that other previously approved rangeland seedings will be rehabilitated or maintained in the near future, subject to the availability of funding. Restoration, by seeding and scarification (excluding physical manipulation) currently costs between one hundred and one hundred and fifty dollars an acre. The final price is highly dependent upon seed mix selection and the availability of desired species on the seed market. It is anticipated that several hundred acres will be seeded each year, and seeding restoration work over the life of this plan should be less than twenty thousand acres.

Future restoration work, involving physical manipulation, is anticipated. Initial project assessment work is being done on roughly thirty thousand acres, mainly consisting of Pinyon-juniper vegetation within high value wildlife habitat. The assessments should identify future treatment tracts of land with high potential for habitat restoration (recognizing that high value does not equate to restoration effectiveness). Cost estimates for vegetation management run from nearly a hundred, to over four hundred dollars per acre. Based upon current budgets, it is anticipated that about a thousand acres of restoration will be proposed per year, and less than that accomplished based upon final cost estimates. Over the life of this plan amendment, there should be less than twenty thousand acres of vegetation restoration using physical manipulation.

The recent statewide amendments concerning fire planning may result in an increased use of introduced fire as a landscape management tool. While historically there has been little use of introduced fire within the planning area, fire is a viable tool for range rehabilitation. Lacking past experience, and accepting concerns over the role of fire in increasing the presence of non-native annuals, it is not anticipated that introduced fire will be a major vegetation treatment method. It is anticipated that several thousand acres will be treated over the life of this plan.

RIPARIAN AND WATER RESOURCES

The combination of past, present and future actions on riparian areas would be positive. Existing planning guidance (RIPA 1 through 9), along with habitat protection measures required for special status species, should result in the incremental improvement of riparian areas within the planning area. Proposed modifications to livestock grazing should improve riparian areas. No other impacts are anticipated.

SOILS AND BIOLOGICAL SOIL CRUSTS

Since the cumulative impacts to soils and biological soil crusts are the same, they are discussed together below.

No cumulative impacts on soils are anticipated. Most causes of detrimental impacts on soils are identified and restrained in the existing management plan. Historical impacts on soils and biological crust as a result of livestock grazing would continue, but at a lesser level. Minor new impacts are expected, mainly as a result of improved livestock distribution, but no impacts are expected beyond those assessed in this analysis.

CHAPTER 4
ENVIRONMENTAL IMPACTS

Eventual implementation of new structural range improvements will result in discrete, localized, surface disturbance. New disturbance from range improvements would be offset by improved livestock management, with a net reduction in surface erosion and compaction.

NOXIOUS WEEDS AND NON-NATIVE PLANTS

Noxious weed and non-native plant spread will continue, but as a result of ongoing activity, primarily disturbance and introduction related to recreational use, existing approved vehicular use, and the continued presence of livestock. No new mechanisms for the introduction or spread of noxious weeds are anticipated over the life of the plan. The rate of spread and introduction should diminish, as a result of new requirements for management of vegetation treatments and livestock. The effectiveness of control methods should increase as a result of a better understanding of noxious species distribution, and a more aggressive containment program.

WILDLIFE

Cumulative impacts (positive and negative) are anticipated to wildlife. Changes in livestock management, along with range restoration work, would result in changes to vegetation community composition. Grass and forb species should increase, and there will be a pronounced increase in riparian vegetation. Wildlife species which require greater structural diversity or greater cover, will improve in numbers and distribution. Interspecies competition would result in lower numbers of species which thrive with the existing vegetation communities. Species which require an open understory in woodlands or forests, would decline. Species which require the additional niche space of a diverse understory would increase. Species which prefer browsing shrubs or trees would face increased competition from species which prefer foraging on grasses and forbs.

CULTURAL RESOURCES

No cumulative impacts are anticipated to cultural resources. Existing uses would be continued at a lesser level. No new resource impacting activities are anticipated, and the continued, historical, uses will be mitigated or reduced in intensity.

RECREATION

It is anticipated that recreational use will continue to gradually increase. This is as a result of demographics, and not as a result of any specific action taken within the planning area. The (unchanged) constraints on recreation within the existing plan will spread recreational use over a large area, and would prevent concentrated use beyond the thresholds in the plan. Changes in livestock management would assist this dissemination pattern, in that user conflicts with livestock will be reduced.

CHAPTER 5
CONSULTATION AND COORDINATION

This chapter reviews agency consultation, coordination and public participation that occurred during the preparation of the Draft Grand Staircase-Escalante National Monument Management Plan Amendment and Draft Rangeland Health Environmental Impact Statement (DEIS).

PUBLIC NOTIFICATION PROCESS

A Notice of Intent to Prepare an Environmental Impact Statement for Livestock Grazing Allotments Administered by the Bureau of Land Management, Grand Staircase-Escalante National Monument, Utah, was published in the Federal Register on August 31, 2000. The public was invited as part of the scoping process to provide "information, data or concerns related to the potential impacts of livestock grazing…".

Three scoping open houses were held on Sept. 18, 2000 in Kanab, Utah; Sept. 20, 2000 in Salt Lake City, Utah; and October 4, 2000 in Escalante, Utah.

In July 2001, an update letter was sent to interested publics. In July 2004, a second update letter was sent to interested publics.

During public review of this DEIS public meetings will be held in Kanab, Escalante and Salt Lake City at a minimum.

On March 31, 2008 another update letter was sent to interested publics. This letter was sent to 938 groups, organizations, agencies, and individuals. This letter notified the public that the DEIS will be available in three formats;

- viewing and downloading in PDF format at http://www.blm.gov/ut/st/en/prog/planning/existing_plans.html
- Mailed upon request in CD ROM format
- Mailed upon request in hardcopy (paper) format

This letter included a post card with instructions to return if the reviewer wished to receive the DEIS by mail in the CD ROM or hardcopy format otherwise it is assumed the web site version would be used. The letter also indicated that a response could be sent via e-mail to UT_GSENM_NEPA@blm.gov.

Post cards or e-mail responses were received from 109 groups, organizations, agencies, and individuals. The post office returned 124 letters as undeliverable. The names on these were removed from the mailing list.

CHAPTER 5
CONSULTATION AND COORDINATION

CONSULTATION AND COORDINATION WITH FEDERAL, STATE, TRIBAL AND LOCAL GOVERNMENTS

Federal

Informal consultation with the U.S. Fish and Wildlife Service (USFWS) has occurred throughout the process. USFWS provided general comments and a list of species of concern. In accordance with section 7 of the Endangered Species Act (ESA) and its implementing regulations (50 CFR 402: 51 FR 19926, June 3, 1986) the Bureau of Land Management will prepare a Biological Assessment (BA) that analyzes the potential effects to all federally-listed species that may result from the implementation of decisions proposed by BLM within the DEIS. This BA will be submitted to the USFWS when the DEIS becomes available for public review.

The Environmental Protection Agency has been requested to review this DEIS. Coordination with the Dixie National Forest has occurred informally at the local level through staff at the Escalante Interagency Office. The National Park Service, Glen Canyon National Recreation Area is a Cooperating Agency.

State

The State of Utah is a Cooperating Agency. During the scoping period numerous informal discussions were held with State officials as to the most effective method for State participation. A representative of State of Utah is a member of the planning team and as such is invited to participate in all team meetings.

Tribal governments

Consultation with tribal governments has been initiated.

Counties

BLM has implemented Cooperating Agency Agreements with both Kane and Garfield counties. Representatives from both Kane and Garfield Counties are members of the planning team and as such are invited to participate in all team meetings.

DISTRIBUTION LIST

A complete distribution list of all groups, organizations, agencies, and individuals that have been provided a copy of the document is maintained at the Grand Staircase-Escalante National Monument headquarters located at 190 East Center, Kanab, Utah.

PREPARERS/TEAM MEMBERS

This DEIS was prepared by an interdisciplinary team of BLM specialists and cooperators from Federal, State and local agencies as listed below.

CHAPTER 5
CONSULTATION AND COORDINATION

Current BLM staff

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Amber Hughes	Botanist
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Clair Ramsey	Garfield County Commissioner, County representative
Brian Bremner	Garfield County, Engineer
Val Payne	State of Utah
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Randy Beckstrand	Range Management Specialist, BLM Utah State Office

Consultants

SWCA	Socio-economic baseline and assessment

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Thom O'dell	Mary Lou Zimmerman	Noel Logan
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Harry Barber	Marietta Eaton	Holly Beck

GLOSSARY OF TERMS

-A-

Abundance: The total number of individuals of a species in an area, population, or community.

Accelerated Erosion: Erosion in excess of natural rates, usually as a result of anthropogenic activities.

Accessibility: The ease with which an area can be reached and grazed by animals. The ease with which herbivores can reach plant or plant parts.

Active Preference: That portion of the total grazing preference for which grazing use may be authorized.

Activity Plan: A type of implementation plan (see Implementation plan); an activity plan usually describes multiple projects and applies best management practices to meet land use plan objectives. Examples of activity plans include interdisciplinary management plans, habitat management plans, recreation area management plans, and allotment management plans.

Active Use: Livestock grazing term meaning the current authorized use, including livestock grazing and conservation use. Active use may constitute a portion, or all, of permitted use. Active use does not include temporary non-use or suspended use of forage within all or a portion of an allotment. Same as Authorized Active Use, Active Grazing Use, (43CFR4100.0-5)

Actual Use: (1) The amount of animal unit months consumed by livestock based on the numbers of livestock and grazing dates submitted by the livestock operator and confirmed by periodic field checks by the BLM. (2) A report of the actual livestock grazing use certified to be accurate by the permittee or lessee. Actual use may be expressed in terms of animal unit months or animal months.

Administrative Determination: Process to determine is a proposed action if fully analyzed by an existing environmental document and to determine if further National Environmental Policy Act compliance is required.

Administrative Unit: Field Office, Resource Area, District, or State.

Administrative Use: Official use related to management and resources of the public lands by Federal, State or local governments or non-official use sanctioned by an appropriate authorization instrument, such as right-of-way, permit, lease, or maintenance agreement.

Administrative Route: Routes that are limited to administrative (official or authorized) users only.

Administrative Purposes: Administrative use functions involving regular maintenance or operation of facilities or programs.

Age Classes: The distribution of different ages of the same species or group of species on a site.

Air Quality: Refers to standards for various classes of land as designated by the Clean Air Act of 1978.

Air Quality Non-attainment Areas: Areas where EPA National Ambient Air Quality Standards (NAAQS) are not met for at least one of six pollutants: particulate matter with diameter of ten microns or less (PM10), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), ozone (O_3), or volatile organic compounds (VOC).

GLOSSARY OF TERMS

Airshed: A geographic area that, because of topography, meteorology, and/or climate, is frequently affected by the same air mass.

Allotment: An area of land where one or more livestock operators graze their livestock. Allotments generally consist of BLM lands but may also include other federally managed, state owned, and private lands. An allotment may include one or more separate pastures. Livestock numbers and periods of use are specified for each allotment.

Allotment Management Plan (AMP): (1) A written program of livestock grazing management, including supportive measures if required, designed to attain specific management goals in a grazing allotment. (2) A documented program which applies to livestock grazing on the public lands, prepared by consulting, cooperating, and coordinating with the permittee(s), lessee(s), or other interested publics.

Alluvial Fan: A low, outspread, relatively flat to gently sloping mass of loose rock material deposited by a stream where it flows from a narrow mountain valley onto a plain or broad valley.

Alluvium: Any sediment deposited by flowing water, as in a riverbed, floodplain, or delta.

Amendment: The process for considering or making changes in the terms, conditions, and decisions of approved Resource Management Plans (RMPs) and Management Framework Plans (MFPs). Usually only one or two issues are considered that involve only a portion of the planning area.

Animal Month: A month's tenure upon the rangeland by one animal. Animal month is not synonymous with animal unit month.

Animal Unit: Considered to be one mature cow of approximately 1,000 pounds, either dry or with calf up to six months of age, or their equivalent, based on a standardized amount of forage consumed.

Animal Unit Month (AUM): (1) A standardized measurement of the amount of forage necessary for the sustenance of one cow unit or its equivalent for 1 month, approximately 800 pounds of forage. (2) The amount of dry forage required by one animal unit for one month, based on a forage allowance of 26 pounds per day.

Annual Plant: A plant that completes its life cycle and dies in one year or less.

Annual Production (synonymous with Primary Production): The conversion of solar energy to chemical energy through the process of photosynthesis. It is represented by the total quantity of organic material produced within a given period of time.

Anthropogenic: Related to or the result of the influence of human beings on nature.

Apparent Trend: An assessment, using professional judgement, based on a one-time observation. It includes consideration of such factors as plant vigor, abundance of seedlings and young plants, accumulation or lack of plant residues on the soil surface, and soil surface characteristics (i.e., crusting, gravel pavement, pedicled plants, and sheet or rill erosion).

Appeal: Application for review of an implementation decision by a higher administrative level.

Aquifer: A water-bearing bed or layer of permeable rock, sand, or gravel capable of yielding large amounts of water.

Area of Critical Environmental Concern (ACEC): Areas within the public lands where special management attention is required to: (1) protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or (2) protect life and safety from natural hazards.

Arid: A term applied to regions or climates where lack of sufficient moisture severely limits growth and production of vegetation. The limits of precipitation vary considerably according to temperature conditions, with an upper annual limit for cool regions of 10 inches (25 cm) or less and for tropical regions as much as 15 to 20 inches (38 to 51 cm).

Arthropod: One of the largest animal groups characterized by jointed limbs and a hard, jointed external skeleton, including insects and arachnids (spiders, scorpions, and mites).

Aspect: (1) The visual first impression of vegetation or a landscape at a particular time or as seen from a specific point. (2) The predominant direction of slope of the land. (3) The seasonal changes in the appearance of vegetation.

Assessment: (1) The act of evaluating and interpreting data and information for a defined purpose. (2) The process of estimating or judging the value or functional status of ecological processes (e.g., rangeland health).

At Risk: Rangelands that have a reversible loss in productive capability and increased vulnerability to irreversible degradation based upon an evaluation of current conditions of the soil and ecological processes. At risk designation may point out the need for additional information to better quantify the functional status of an attribute.

Attribute: One of the three components, soil/site stability hydrologic function, and integrity of the biotic community that collectively define rangeland health.

Authorized Use: Number of AUMs that a permittee is allowed to grazing during a given season of use. Does not include Temporary Suspended Use. Same as Authorized Livestock Use,

Available Forage: That portion of the forage production that is accessible for use by a specified kind or class of grazing animal.

Available Water: The portion of water in a soil that can be absorbed by plant roots.

Avoidance Areas: Areas with sensitive resource values where rights-of-way and Section 302 permits, leases, and easements would be strongly discouraged. Authorizations made in avoidance areas would have to be compatible with the purpose for which the area was designated and not otherwise feasible on lands outside the avoidance area.

-B-

Background Level: The amount of a pollutant present in water or air from natural sources.

Badland: A land type consisting of steep or very steep barren land, usually broken by an intricate maze of narrow ravines, sharp crests, and pinnacles resulting from serious erosion of soft geologic materials.

Bare Ground (Bare Soil): All land surfaces not covered by vegetation, rock or litter. As used in this document, visible biological crust and standing dead vegetation are included in cover estimates as a type of vegetation and therefore are not bare ground.

Basal Area (Plants): The cross-sectional area of the stem or stems of a plant or of all plants in a stand. Herbaceous and small woody plants are measured at or near ground level; larger woody plants are measured at breast or other designated height.

Bedload: Sediment in a stream that moves by sliding, rolling, or bounding on or near the streambed.

Big Game: Large species of wildlife that are hunted, such as elk, deer, bighorn sheep, and pronghorn antelope.

Biodiversity: The diversity of living organisms considered at all levels of organization including genetics, species, and higher taxonomic levels, and the variety of habitats and ecosystems, as well as the processes occurring therein.

Biotic Communities: The assemblage of native and exotic plants and of a particular site or landscape, including microorganisms, fungi, algae, vascular and herbaceous plants, invertebrates, and vertebrates. These assemblages and their biotic and abiotic relationships serve landscape and watershed functions by promoting soil properties supporting water infiltration, recycling and transfer, species survival, and sustainable population dynamics.

Biological Crusts (also known as microbiotic, microphytic, cryptogamic, or cryptobiotic crusts/soils): Biological communities that form a surface layer or thin crust on some soils. These communities consist of cyanobacteria (blue-green bacteria), microfungi, mosses, lichens, and green algae and perform many important functions, including fixing nitrogen and carbon, maintaining soil surface stability, and preventing erosion. These crusts are slow to recover after disturbance, requiring 40 years or more to recolonize small areas. These microorganisms typically grow on or just below the soil surface.

Biomass (Plants): The total amount of living plants above and below ground in an area at a given time.

Biome: A major biotic unit consisting of plant and animal communities having similarities in form and environmental conditions, but not including the abiotic portion of the environment.

Biotic Integrity: Synonymous with "integrity of the biotic community" (see definition).

Browse: To browse (verb) is to graze a plant; also, browse (noun) is the tender shoots, twigs and leaves of trees and shrubs often used as food by livestock and wildlife.

Bunchgrass: Individual grasses that have the characteristic growth habit of forming a bunch as opposed to having stolens or rhizomes or single annual habit.

-C-

Calcareous: Containing enough fine carbonates that the soil will effervesce visibly when treated with drops of cold, dilute hydrochloric acid.

Calf Crop: The number of calves weaned from a given number of cows exposed to breeding, usually expressed in percent (i.e., number of calves ÷ number of cows exposed X 100 = percent calf crop).

Candidate species: Any species included in the Federal Register notice of review being considered for listing as threatened or endangered by the U.S. Fish and Wildlife Service.

Canopy: (1) The uppermost layer consisting of the crowns of trees or shrubs in a forest or woodland. (2) The vertical projection downward of the aerial portion of vegetation expressed as a percent of the ground so occupied. (3) The aerial portion of the over story vegetation.

Canopy Cover: The percentage of the ground covered by a vertical projection of the outermost perimeter of the natural spread of foliage of plants. Small opening within the canopy are included. It may exceed 100 percent.

Canopy Closure: The progressive reduction of space between crowns as they spread laterally, increasing canopy cover.

Carrying Capacity: (1) The maximum stocking rate possible without damaging vegetation or related resources. (2) The average number of livestock and wildlife that may be sustained on a management unit compatibly with management objectives. It is a function of site characteristics, and management goals and intensity.

Channel: An open conduit either naturally or artificially created which periodically or continuously contains moving water or forms a connecting link between two bodies of water.

Clean Air Act: Federal legislation governing air pollution. Prevention of Significant Deterioration above legally established levels.

Chemical Soil Crust: A soil-surface layer, ranging in thickness from a few millimeters to a few centimeters, which is formed when chemical compounds become concentrated on the soil surface. They can reduce infiltration and increase overland water flow similar to physical crusts. They are usually identified by a white color on the soil surface.

Class of Animal: Description of age-and/sex-group for a particular kind of animal.

Class of Livestock: The age and/or sex groups of a kind of livestock.

Climate: The average or prevailing weather conditions of a place over a period of years.

Climax: The culminating stage in plant succession for a given site where vegetation has reached a highly stable condition.

Climax Plant Community (e.g., Climax): The final or stable biotic community in a successional series; it is self-perpetuating and in equilibrium with the physical habitat.

Climax Vegetation: The final vegetation community and highest ecological development of a plant community that emerges after a series of successive vegetational stages. The climax community perpetuates itself indefinitely unless disturbed by outside forces.

Closed: Generally denotes that an area is not available for a particular use or uses; refer to specific definitions found in law, regulations, or policy guidance for application to individual programs. For

example, 43 CFR 8340.0-5 sets forth the specific meaning of " closed" as it relates to off-highway vehicle use, and 43 CFR 8364 defines "closed" as it relates to closure and restriction orders.

Code of Federal Regulations (CFR): The official, legal tabulation or regulations directing federal government activities.

Collaboration: A cooperative process in which interested parties, often with widely varied interests, work together to seek solutions with broad support for managing public and other lands. This may or may not involve an agency as a cooperating agency.

Community: An assemblage of plant and animal populations in a common spatial arrangement.

Competition: The interaction between organisms as a result of removal or reduction of a common, required resource from the environment. Resources may include water, nutrients, light, oxygen, carbon dioxide, food, and shelter.

Composition: The proportions of various plant species in relation to the total on a given area; it may be expressed in terms of cover, density, weight, etc. Synonymous with species composition.

Conformance: That a proposed action shall be specifically provided for in the land use plan or, if not specifically mentioned, shall be clearly consistent with the goals, objectives, or standards of the approved land use plan.

Conservation: The use and management of natural resources according to principles that ensure their sustained economic and/or social benefits without impairment of environmental quality.

Conservation Agreement: A formal signed agreement between the U.S. Fish and Wildlife Service or National Marine Fisheries Service and other parties that implements specific actions, activities, or programs designed to eliminate or reduce threats or otherwise improve the status of a species. Conservation agreements can be developed at a State, regional, or national level and generally include multiple agencies at both the State and Federal level, as well as tribes. Depending on the types of commitments the BLM makes in a conservation agreement and the level of signatory authority, plan revisions or amendments may be required prior to signing the conservation agreement, or subsequently in order to implement the conservation agreement.

Conservation Strategy: A strategy outlining current activities or threats that are contributing to the decline of a species, along with the actions or strategies needed to reverse or eliminate such a decline or threats. Conservation strategies are generally developed for species of plants and animals that are designated as BLM Sensitive species or that have been determined by the Fish and Wildlife Service or National Marine Fisheries Service to be Federal candidates under the Endangered Species Act.

Consistency: The proposed land use plan does not conflict with officially approved plans, programs, and policies of tribes, other Federal agencies, and state, and local governments to the extent practical within Federal law, regulation, and policy.

Consumer: Heterotrophic organism, chiefly animal, which ingests other organisms or particulate organic matter.

Cool Season Plants: Plants where the major growth occurs during the late fall, winter, and early spring.

Cooperating Agency: Assists the lead Federal agency in developing an Environmental Analysis or Environmental Impact Statement. The Council on Environmental Quality regulations implementing NEPA define a cooperating agency as any agency that has jurisdiction by law or special expertise for proposals covered by NEPA (40 CFR 1501.6). Any tribe or Federal, State, or local government jurisdiction with such qualifications may become a cooperating agency by agreement with the lead agency.

Coordinated Resource Management (CRM): A process in which various user groups discuss alternated resource uses, diagnose management problems establish goals and objectives, and evaluate multiple-use management options.

Corridor: A wide strip of land within which a proposed linear facility could be located.

Council on Environmental Quality (CEQ): An advisory council to the President of the United States established by the national Environmental Policy Act of 1969. It reviews Federal programs for their effect on the environment, conducts environmental studies, and advises the president on environmental matters.

Cover: (1) Any form of environmental protection that helps an animal stay alive (mainly shelter from weather and concealment from predators). (2) The plant or plant parts, living or dead, on the surface of the ground. Vegetative cover or herbage cover is composed of living plants (including biological crusts), and the litter cover of dead parts of plants.

Critical Habitat: An area occupied by a threatened or endangered species on which are found those physical and biological features (1) essential to the conservation of the species, and (2) which may require special management considerations or protection.

Cultural Resources: Nonrenewable elements of the physical and human environment including archaeological remains (evidence of prehistoric or historic human activities) and socio-cultural values traditionally held by ethnic groups (sacred places, traditionally used raw materials, etc.).

Cultural Site: Any location that includes prehistoric and/or historic evidence of human use, or that has important socio-cultural value.

Cumulative Impact: The impact on the environment that results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. 40CFR1508.7

-D-

Deciduous: Pertaining to plants that shed all their leaves every year in a certain season.

Deciduous Plant: Plant parts, particularly leaves, that are shed at regular intervals or at a given stage of development (i.e., a deciduous plant regularly loses or sheds its leaves).

Deferment: Delay of livestock grazing on an area for an adequate period of time to provide for plant reproduction, establishment of new plants, or restoration of vigor.

Deferred Grazing: The use of deferment in grazing management, but not in a systematic rotation.

Deferred Rotation Grazing: Discontinuance of livestock grazing on various parts of a range in succeeding years. Two, but more commonly three or more, separate pastures are required.

Deferred-rotation: A grazing system that provides for a systematic rotation of the deferment among pastures.

Decomposition: The biochemical breakdown of organic matter into its original compounds and nutrients.

Density: Numbers of individual or stems per unit area (does not equate to any kind of cover measurement).

Desert: Land on which the vegetation is absent or sparse, often shrubby, and characterized by an arid climate (less than 12 inches average annual precipitation).

Desertification: The process by which an area or region becomes more arid through loss of soil and vegetation cover.

Desired Future Condition: A type of land use plan decision that is a broad statement of desired outcomes for a use.

Desired Plant Community (DPC): Of the several plant communities that may occupy a site, the one that has been identified through a management plan to best meet the plan's objectives for the site. It must protect the site as a minimum.

Direct Impact(s): Impacts which are caused by the action and occur at the same time and place.

Director (BLM Director): The national Director of the BLM.

Discharge (Water): The rate of flow or volume of water flowing in a stream at a given place or within a given period of time.

Diversity: The relative abundance of wildlife species, plant species, communities, habitats, or habitat features per unit of area.

Dominant Species: Plant species or species groups, which by means of their number, coverage, or size, have considerable influence or control upon the conditions of existence of associated species.

Drainage: The removal of excess water from land by surface or subsurface flow.

Drought: Prolonged dry weather, generally when precipitation is less that 75% of average annual amount.

-E-

Ecological Site Inventory (ESI): The basic inventory of present and potential vegetation on BLM rangelands. Ecological site inventory uses soils, the existing plant community, and ecological site data to determine the appropriate ecological site for a specific area of rangeland.

Ecological Processes: Ecological processes include the water cycle (the capture, storage, and redistribution of precipitation), energy flow (conversion of sunlight to plant and animal matter), and nutrient cycle (the cycle of nutrients such as nitrogen and phosphorus through the physical and biotic components of the environment). Ecological processes functioning within a normal range of variation will support specific plant and animal communities.

Ecological Reference Area: A landscape unit in which ecological processes are functioning within a normal range of variability and the plant community has adequate resistance to and resiliency from most disturbances. These areas do not need to be pristine, historically unused lands (e.g., climax plant communities or relict areas).

Ecological Site: A kind of land with specific physical characteristics which differs from other kinds of land in it ability to produce distinctive kinds and amounts of vegetation and in its response to management. Apparently synonymous with ecological type used by USDA Forest Service. Syn. rangeland ecological site.

Ecological Site Description: Description of the soil, uses, and potential of a kind of land with specific physical characteristics to produce distinctive kinds and amounts of vegetation.

Ecological Status: Ecological status is the present state of vegetation of a range site in relation to the potential natural community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the potential natural plant community for the site.

Ecology: The interrelationships of organisms with their environment.

Ecosystem: (1) Organism together with their abiotic environment, forming an interacting system, inhabiting an identifiable space. (2) A complete, interacting system of living organisms and the land and water that make up their environment; the home places of all living things, including humans.

Emission: Effluent discharge into the atmosphere, usually specified by mass per unit time.

Endangered Species: A plant or animal species whose prospects for survival and reproduction are in immediate jeopardy, as designated by the Secretary of the Interior, and as is further defined by the Endangered Species Act.

Environment: The sum of all external conditions that affect an organism or community to influence its development or existence.

Environmental Assessment (EA): A concise public document that analyzes the environmental impacts of a proposed federal action and provides sufficient evidence to determine the level of significance of the impacts.

Environmental Impact Statement (EIS): A detailed written statement required by the National Environmental Policy Act when an agency proposes a major federal action significantly affecting the quality of the human environment.

Environmental Justice: The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environment consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and Tribal programs and policies.

Erodibility: The degree or intensity of a soils state or condition of, susceptibility to, being erodible.

Erosion: The wearing away of the land surface by running water, wind, ice, or other geological agents.

Estimated Use: The use made of forage on an area by wildlife, wild horses, wild burros, and/or livestock where actual use data are not available. Estimated use may be expressed in terms of animal unit months or animal months.

Evaluation: (1) An examination and judgment concerning the worth, quality, significance, amount, degree, or condition of something; or (2) the systematic process for determining the effectiveness of on-the-ground management actions and assessing progress toward meeting objectives.

Evaluation (plan evaluation): The process of reviewing the land use plan and the periodic plan monitoring reports to determine whether the land use plan decisions and NEPA analysis are still valid and whether the plan is being implemented.

Evaluator(s): The person or persons conducting the evaluation of rangeland health on an area of interest.

Evergreen Plant: A plant that has leaves all year long, and generally sheds them in a single season after new leaves of the current growing season have matured.

Exclosure: An area fenced to exclude animals.

Exotic Plant: (1) A plant species that is not native to the region in which it is found, whose introduction does or is likely to cause harm to the economy, environment, or human health. Executive Order 11987 more broadly defines "exotic" as any species not naturally occurring either presently or historically in an ecosystem in the United States. (2) A plant that is not born, growing, or produced naturally (native) in an area, region, or country. Synonymous with 'non-indigenous plant.'

-F-

Fan: An accumulation of debris brought down by a stream descending through a steep ravine and debouching in the plain beneath, where the detrital material spreads out in the shape of a fan, forming a section of a very low cone.

Federal Land Policy and Management Act (FLPMA) of 1976: Public Law 94-579. October 21, 1976, often referred to as the BLM's Organic Act, which provides the majority of the BLM's legislated authority, direction, policy, and basic management guidance.

Federal Register: A daily publication which reports Presidential and Federal Agency documents.

Fire Return Intervals: Time between consecutive wildland fires in a given area; fire frequency. Often described as the typical range of years between fires in a healthy, functioning ecosystem.

Fishery: Habitat that supports the propagation and maintenance of fish.

Flood Plain: The relatively flat area or lowlands adjoining a body of standing or flowing water which has been or might be covered by floodwater.

Forage: (1) Browse and herbage which is available and can provide food for animals or be harvested for feeding; or (2) to search for or consume forage.

Forage Allocation: The planning process or act of apportioning available forage among various kinds of animals (e.g., elk and cattle).

Forage Production: The weight of forage that is produced within a designated period of time or given area. Production may be expressed as green, air dry, or oven dry weight. The term may also be modified as to time of production such as annual, current year, or seasonal forage production.

Forb: (1) Any herbaceous plant that is not a grass, sedge, or rush (i.e., any nongrass-like plant having little or no woody material on it). (2) A broadleaved flowering plant that's above ground stem does not become woody and persistent.

Formation: A body of rock identified by lithic characteristics and stratigraphic position; it is prevailingly, but not necessarily tabular, and is mappable at the earth's surface or traceable in the subsurface.

Fossil: Mineralized or petrified form from a past geologic age, especially from previously living things.

Frequency: A quantitative expression of the presence or absence of individuals of a species in a population. It is defined as the percentage of occurrence of a species in a series of sample of uniform size.

Fugitive Dust: Airborne particles emitted from any source other than through a stack or vent.

Functioning: Refers to the rangeland health attributes where the majority (see definition of "preponderance of evidence") of the associated indicators are functioning properly relative to the ecological site description and/or ecological reference area given the normal range of variability associated with the site and climate.

-G-

General Management Plan: NPS general planning document giving broad guidance to the NPS units, comparable to the BLM Resource Management Plan (RMP).

Goal: The desired state or condition that a resource management policy or program is designed to achieve. A goal is usually not quantifiable and may not have a specific date by which it is to be completed. Goals are the base from which objectives are developed. (See Objective).

Grass: A group of plants with jointed, hollow, spike-like roots and fibrous roots. A Member of the plant family Poaceae.

Grassland: Land on which the vegetation is dominated by grasses, grasslike plants, and/or forbs. Non-forested lands are classified as grassland if herbaceous vegetation provides at least 80 percent of the canopy cover excluding trees. Lands not presently grassland that were originally or could become grassland through natural succession may be classified as potential natural grassland.

Grasslike Plant: A plant of the Cyperaceae of Juncaceae families which vegetatively resembles a true grass of the Gramineae family.

Grazing Cycle: The total time of one grazing and one rest period in a unit where forage is regularly grazed and rested. Grazing distribution. Dispersion of livestock grazing within a management unit.

Grazing Management: The control of grazing and browsing animals to accomplish a desired result.

Grazing Preference: (1) Selection of plants, or plant parts, over others by grazing animals. (2) In the administration of public lands, a basis upon which grazing-use permits and licenses are issued. Includes Active and Suspended Use. (Same as Full Preference.)

Grazing Pressure: An animal-to-forage relationship measured in terms of animal units per unit weight of forage at any instant.

Grazing System: (1) Grazing management that defines the periods of grazing and non-grazing. (2) The manipulation of livestock grazing to accomplish a desired result.

Ground Cover: (1) Vegetation, mulch, litter, rock, etc. (2) The percentage of material (e.g., litter, standing dead vegetation, gravel/rocks, vegetation, and biological crust), excluding bare soil, covering the land surface.

Groundwater: Water contained in pore spaces of consolidated and unconsolidated surface material.

Guidelines: Actions or management practices that may be used to achieve desired outcomes, sometimes expressed as best management practices. Guidelines may be identified during the land use planning process, but they are not considered a land use plan decision unless the plan specifies that they are mandatory.

Gully: (1) A channel formed in the soil surface by ephemeral running water, usually considered to be more than 1 foot deep. (2) A furrow, channel, or miniature valley, usually with steep sides through which water commonly flows during and immediately after rains or snow melt.

Gully Erosion: The removal of soil by the forming of relatively large gullies or channels cut into the soil by concentrated surface runoff.

-H-

Habitat: (1) A specific set of physical conditions that surround a species, group of species, or a large community. In wildlife management, the major constituents of habitat are considered to be food, water, cover, and living space. (2) The natural abode of a plant or animal, including all biotic, climatic, and edaphic factors affecting life.

Habitat Type: The collective area that one plant community occupies or will come to occupy as succession advances to climax.

Hardpan: A hardened soil layer in the lower A horizon or the B horizon caused by cementation of soil particles with organic matter or with materials such as silica or calcium carbonate.

Headcut: Abrupt elevation drops in the channel of a gully that accelerates erosion as it undercuts the gully floor and migrates upstream.

Healthy Rangelands: See definition of "rangeland health."

Heavy Grazing: A degree of herbage utilization that does not permit the primary forage species to maintain themselves. On most rangelands, heavy grazing involves forage utilization levels above 50%.

Herbaceous: (1) Pertaining to or characteristic of an herb (fleshy-stem plant) as distinguished from the woody tissue of shrubs and trees. (2) Vegetation growth with little or no woody component; non-woody vegetation such as graminoids and forbs.

Herbicide: A phytotoxic chemical used for killing or inhibiting the growth of plants.

Herbivore: An animal that subsists principally entirely on plants or plant material.

Herbivory: The process of plant consumption by animals.

Herd Area: The geographic area identified as having been used by wild horse or burro herds as their habitat in 1971.

Historic: Period of human occupation defined when the written record appeared (usually at the time of Euroamerican colonization or expansion in the Western Hemisphere), based primarily upon European roots.

Historic Property: Historic or archaeological site which qualifies for listing on the National Register of Historic Places.

Home Range: The area in which an animal travels in the scope of natural activities

Hummocky: Like a hummock, full of hummocks (a low, rounded hill, knoll, hillock; a tract of wooded land higher than a nearby swamp or marsh).

Hydrologic Function: The capacity of the site to capture, store, and safely release water from rainfall, run-on, and snowmelt (where relevant), to resist a reduction in this capacity, and to recover this capacity, and to recover this capacity following degradation (one of the three attributes of rangeland health).

-I-

Impact(s) (or Effects): Environmental consequences (the scientific and analytical basis for comparison of alternatives) as a result of a proposed action. Effects may be either direct, which are caused by the action and occur at the same time and place, or indirect, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable, or cumulative.

Implementation Decisions: Decisions that take action to implement land use plan decisions. They are generally appealable to Interior Board of Land Appeals (IBLA) under 43 CFR 4.410.

Implementation Plan: An area or site-specific plan written to implement decisions made in a land use plan. Implementation plans include both activity plans and project plans (they are types of implementation plans). Examples of implementation plans include interdisciplinary management plans, habitat management plans, and allotment management plans.

Increaser: For a given plant community, those species that increase in amount as a result of a specific abiotic/biotic influence or management practice.

Indian Tribe: Any American Indian group in the United States that the Secretary of the Interior recognizes as possessing tribal status (listed periodically in the Federal Register).

Indicator: Components of a system whose characteristics (e.g., presence or absence, quantity, distribution) are used as an index of an attribute (e.g., rangeland health) that are too difficult, inconvenient, or expensive to measure.

Indirect Impact(s): Impacts caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable, or cumulative.

Infiltration: (1) The entry of water into the soil. (2) The downward entry of water into the soil or other material.

Infiltration Rate: Maximum rate at which soil under specified conditions can absorb rain or shallow impounded water, expressed in quantity of water absorbed by the soil per unit of time (e.g., inches/hour).

Infrastructure: The facilities, services, and equipment needed for a community to function including roads, sewers, water lines, police and fire protection, and schools.

Integrity of the Biotic Community: Capacity of a site to support characteristic functional and structural communities in the context or normal variability, to resist loss of this function and structure due to a disturbance, and to recover following such disturbance.

Intensity: In reference to the Grazing Response Index, the proportion of leaves removed during a grazing period.

Interdisciplinary Team: A group of individuals with different training, representing the physical sciences, social sciences, and environmental design arts, assembled to solve a problem or perform a task. The members of the team proceed to a solution with frequent interaction so that each discipline may provide insights to any stage of the problem and disciplines may combine to provide new

solutions. The number and disciplines of the members preparing the plan vary with circumstances. A member may represent one or more discipline or Bureau program interest.

Interim Management Policy (IMP): Policy that guides management of existing Wilderness Study Areas. The policy balances the various uses of Wilderness Study Areas with the requirement to protect the lands wilderness values.

Interior Board of Land Appeals (IBLA): The Department of the Interior, Office of Hearings and Appeals board that acts for the Secretary of the Interior in responding to appeals of decisions on the use and disposition of public lands and resources. Because the Interior Board of Land Appeals acts for and on behalf of the Secretary of the Interior, its decisions usually represent the Department's final decision but are subject to the courts.

Intermittent Stream: A stream that occasionally is dry or reduced to pool stage.

Interpretation: Explaining or telling the meaning of something and presenting it in understandable terms.

Introduced Species: A species not a part of the original fauna or flora of a given area.

Invader: Plant species that were absent in undisturbed portions of the original vegetation of a specific range site and that will invade or increase following disturbance or continued heavy grazing.

Invasive Plant: Plants that are not part of (exotic) or a minor component of (native) the original plant community or communities that increase above what's expected given the normal range of variability of a site.

Invasive Species: With respect to a particular ecosystem, any animal or plant that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm, or harm to human health.

Inventory (Rangeland Inventory): The systematic acquisition and analysis of resource information needed for planning and management of rangeland.

Invertebrates: Animals without backbones or internal bony skeletons.

Isopleth: A line on a map connecting points at which a given variable has a specified constant value.

-J-

Jurisdiction: The legal right to control or regulate use of a transportation facility. Jurisdiction requires authority, but not necessarily ownership.

-K-

Key Area: A relatively small portion of a range selected because of its location, use or grazing value as a monitoring point for grazing use. It is assumed that key areas, if properly selected, will reflect the overall acceptability of current grazing management over the range.

Key Species: Forage species whose use serves as an indicator to the degree of use of associated species. (2) those species which must, be of their importance, be considered in the management program.

Kind of Livestock: Species of domestic livestock – cattle, sheep, horses, burros, and goats.

-L-

Land Classification: A process for determining the suitability of public lands for certain types of disposal or lease under the public land laws or for retention under multiple use management.

Land Use Allocation: The identification in a land use plan of the activities and foreseeable development that are allowed, restricted, or excluded for all or part of the planning area, based on desired future conditions.

Land Use Plan (LUP): A set of decisions that establish management direction for land within an administrative area, as prescribed under the planning provisions of FLPMA; an assimilation of land-use-plan-level decisions developed through the planning process outlined in 43 CFR 1600, regardless of the scale at which the decisions were developed. The term includes both Resource Management Plans (RMPs) and Management Framework Plans (MFPs).

Land Use Plan Decision: establishes desired outcomes and actions needed to achieve them. Decisions are reached using the BLM planning process in 43 CFR 1600. When they are presented to the public as proposed decisions, they can be protested to the BLM Director. They are not appealable to IBLA.

Lentic: Standing water habitats, as in lakes, ponds, bog, marshes, or meadows.

Life Form: Characteristic form or appearance of a species at maturity (e.g., tree, shrub, herb).

Light Grazing: A degree of herbage utilization that allows palatable species to maximize their herbage-producing ability. Typically involves a forage utilization level below 31%.

Litter: The uppermost layer of organic debris on the soil surface, essentially the freshly fallen or slightly decomposed vegetal material.

Livestock Operation: The management of a ranch or farm so that a significant portion of the income is derived from the production of livestock.

Loading: The total amount of a pollutant generated from a specific area of land or received by a water resource during a fixed period of time.

Loamy: Intermediate in texture and properties between fine- and course-textured soils.

Lotic: Running water habitats such as rivers, streams, and springs.

-M-

Maintenance: The work required keeping a facility in such a condition that it may be continuously utilized at its original or designed capacity and efficiency, and for its intended purposes. (Road or trail maintenance actions include [a] signage, [b] minor repairs: e.g. correction of drainage, erosion, or vegetation interference problems. Upon condition assessment performance, maintenance could

also be construed as [c] allowing road or trail to remain in present state for regular and continuous use.)

Management Decision: A decision made by the BLM or NPS to manage public lands. Management decisions include both land use plan decisions and implementation decisions.

Management Framework Plan (MFP): Planning decision document prepared before the effective date of the regulations implementing the land use planning provisions of the FLPMA, which establishes, for a given area of land, land-use allocations, coordination guidelines for multiple-use, and objectives to be achieved for each class of land use or protection.

Management Practices: Any actions or practices that improve or maintain basic soil and vegetation resources, and better manage livestock. Management practices typically consist of Rangeland Improvements AMPs that establish and grazing systems: seasons-of-use, utilization levels, stocking rate etc., which allows the achievement of standards in conformance with the guidelines.

Minimize: To reduce the adverse impact of an operation to the lowest practical level.

Mitigation Measures: Methods or procedures that reduce or lessen the impacts of an action.

Monitoring: The periodic observation and orderly collection of data on 1) changing conditions of public land related to management actions and 2) the effects of implementing decisions.

Monitoring: The orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting management objectives. The process must be conducted over time in order to determine whether or not management objectives are being met.

Monitoring (plan monitoring): The process of tracking the implementation of land use plan decisions and collecting and assessing data/information necessary to evaluate the effectiveness of land use planning decisions.

Mosaic Pattern: The intermingling of plant communities and their successional stages in such a manner as to give the impression of an interwoven design.

Mulch: (n.) (1) A layer of dead plant material on the soil surface. (2) An artificial layer of material such as paper or plastic on the soil surface. (v.) To place rock, straw, asphalt, plastic, or other material on the soil's surface as surface cover.

Multiple Use: The management of the public lands and their various resource values so that they are used in the combination that will best meet the present and future needs of the American people; the use of some lands for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long term needs of future generations for renewable and non-renewable resources, including but not limited to: recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the lands and the quality of the environment with consideration being given to the relative values of the sources and not necessarily to the combination of uses that will give the greatest economic return or greatest unit output.

-N-

National Ambient Air Quality Standards (NAAQS): The allowable concentrations of air pollutants in the ambient (public outdoor) air. National ambient air quality standards are based on the air quality criteria and divided into primary standards (allowing an adequate margin of safety to protect the public health) and secondary standards (allowing an adequate margin of safety to protect the public welfare). Welfare is defined as including (but not limited to) effects on soils, water, crops, vegetation, human-made materials, animals, wildlife, weather, visibility, climate, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.

National Environmental Policy Act (NEPA) of 1969: An Act that encourages productive and enjoyable harmony between man and his environment and promotes efforts to prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; enriches the understanding or the ecological systems and natural resources important to the Nation, and establishes the Council on Environmental Quality.

National Landscape Conservation System (NLCS): A system of Congressional, Presidential, or other designated areas managed by the BLM, the components of which include National Monuments, National Conservation Areas, Wilderness Areas, Wilderness Study Areas, Wild and Scenic Rivers, National Historic Trails, National Scenic Trails, the California Desert Conservation Area, and the Headwaters Forest Reserve.

National Register of Historic Places (NRHP): A register of districts, sites, buildings, structures, and objects, significant in American history, architecture, archaeology and culture, established by the National Historic Preservation Act of 1966 and maintained by the Secretary of the Interior.

National Wild and Scenic Rivers System (NWSRS): A system of nationally designated rivers and their immediate environments that have outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values and are preserved in a free-flowing condition. The system consists of three types of streams: (1) recreation rivers or sections of rivers that are readily accessible by road or railroad and that may have some development along their shorelines and may have undergone some impoundments or diversion in the past, (2) scenic rivers or sections of rivers free of impoundments with shorelines or watersheds still largely undeveloped but accessible in places by roads, and (3) wild rivers or sections of rivers free of impoundments and generally inaccessible except by trails, with watersheds or shorelines essentially primitive and waters unpolluted.

Native Species, Plant or Vegetation: (1) A species that is a part of the original fauna or flora of a given area. (2) A species that, with respect to a particular ecosystem, historically occurred or currently occurs in that ecosystem. Executive Order 11987 more broadly defines "native" as any species naturally occurring either presently or historically in any ecosystem of the United States.

Naturalness: For designated wilderness character: An area which generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable. (From Section 2(c), Wilderness Act.) For wilderness characteristics: Lands and resources exhibit a high degree of naturalness when affected primarily by the forces of nature and where the imprint of human activity is substantially unnoticeable. Attributes of the lands and resources on public lands, which, taken together, are an indication of an area's naturalness. These attributes may include the presence or absence of roads and trails, fences and other improvements; the nature and extent of landscape modifications; the presence of native vegetation communities; and the connectivity of habitats.

Negligible Impact: Impact that is small in magnitude and importance and is difficult or impossible to quantify relative to those occurring naturally or due to other actions.

Nitrogen Fixation (Fixers): The biological reduction of molecular nitrogen to chemical forms that can be used by organisms in the synthesis of organic molecules.

No Surface Disturbance: In general, this applies to an area where an activity is allowed so long as it does not disturb the surface.

Non-native: A species that is not a part of the original flora or fauna of the area in question (synonymous with introduced flora or fauna).

Non-Native Invasive Species: Species that were not components of pre-European settlement vegetative communities: which have been introduced, either deliberately or inadvertently; which have the capacity to aggressively invade new habitats, displacing and out-competing native species, and; whose introduction does or is likely to cause economic or environmental harm or harm to human health.

Non-use: Available grazing capacity which is not permitted during a given time period.

Noxious Weeds: A plant species designated by Federal or State law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or nonnative, new, or not common to the United States.

Noxious Species: A plant species that is undesirable because it conflicts, restricts, or otherwise cause problems under management objectives.

-O-

Objective: (1) A description of a desired outcome for a resource. Objectives can be quantified and measured and, where possible, have established time frames for achievement. (2) Planned results to be achieved within a stated time period. Objectives are subordinate to goals, are narrower in scope and shorter in range, and have increased possibility of attainment. The time periods for completion, and the outputs or achievements that are measurable and quantifiable, are specified. (See Goal).

Operator: Any person who has taken formal responsibility for the operations conducted on the leased lands.

Organic Matter: Living plant tissue, and decomposed or partially decomposed material from living organisms.

Outstanding Opportunities for Solitude:

For designated wilderness: Superior or excellent condition favorable for avoiding the sights, sounds, and evidence of other people in the area or for attaining a state of being alone or remote from others. A lonely or secluded place.

For manage for wilderness characteristics: when the sights, sounds, and evidence of other people are rare or infrequent (and) where visitors can be isolated, alone or secluded from others.

Outstanding Opportunities for Primitive/Unconfined Recreation:
For designated wilderness: Superior or excellent situations favorable for non-motorized, non-mechanical (except as provided by law), and undeveloped types of recreation activities. Provides dispersed, undeveloped recreation, either through the diversity in the number of primitive and unconfined recreational activities possible in the area or the outstanding quality of one opportunity.

For manage for wilderness characteristics: Where the use of the area is through non-motorized, non-mechanical means, and where no or minimal developed recreation facilities are encountered.

Overgrazing: Continued heavy grazing that exceeds the recovery capacity of individual plants in the community and creates a deteriorated range.

Overland Flow: A portion of the precipitation that moves laterally off the site to streams, ponds, reservoirs, and oceans.

Overuse: Using an excessive amount of the current years growth.

Overstory: The upper canopy or canopies of plants, usually referring to trees, shrubs, and vines.

-P-

Palatability: The relish with which a particular species or plant part is consumed by and animal.

Paleontological Resources (Fossils): The physical remains of plants and animals preserved in soils and sedimentary rock formations.

Paleontology: A science dealing with the life forms of past geological periods as known from fossil remains.

Paleozoic: An era of geologic time between the Precambrian and the Mesozoic (about 550 million to 245 million years ago) whose beginning witnessed an explosion in the diversity of multicelled animals and whose conclusion experienced the greatest mass extinctions in history.

Particulate Matter: Fine liquid or solid particles suspended in the air and consisting of dust, smoke, mist, fumes, and compounds containing sulfur, nitrogen, and metals.

Pasture: A grazing area enclosed and separated from other areas by a fence or natural barrier.

Pedestal (Erosional): Plants or rocks that appear elevated as a result of soil loss by wind or water erosion (does not include plant or rock elevation as a result of non-erosional processes such as frost heaving).

Perennial Stream: A stream that flows continuously during all seasons of the year.

Perennial Vegetation: Plants that have a life cycle of 3 or more years.

Period of Use: The time of livestock grazing on a range area based on type of vegetation or stage of vegetative growth.

Permitted Use: The forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease; expressed in Animal Unit Months.

Personal Income: The sum of wage and salary disbursements, other labor income, proprietors' income, rental income of persons, personal dividend income, personal interest income, and transfer payments to persons, less personal contributions for social insurance.

Petroglyph: A figure, design, or indentation carved, abraded, or pecked into a rock.

PFC: See Proper Functioning Condition.

Physiographic Province: A region defined by a unified geologic history and a characteristic geologic structure and climate that differs from adjoining regions.

Pictograph: A figure or design painted onto a rock.

Plan: A document that contains a set of comprehensive, long range decisions concerning the use and management of Bureau and Park administered resources in a specific geographic area.

Planning Analysis: A process using appropriate resource data and NEPA analysis to provide a basis for decisions in areas not yet covered by a (Resource Management Plan (RMP).

Planning Area: A geographical area for which land use and resource management plans are developed and maintained.

Planning Criteria: The standards, rules, and other factors developed by managers and interdisciplinary teams for their use in forming judgments about decision making, analysis, and data collection during planning. Planning criteria streamline and simplify the resource management planning actions.

Plant Association: A kind of potential natural community consisting of stands with essentially the same dominant species in corresponding layers.

Plant Community: An assemblage of plants occurring together at any point in time, denoting no particular ecological status.

Plant Mortality: The death of a plant or in a plant community the death of a number of plants in the community.

Plant Succession: The process of vegetational development whereby an area over time is occupied by different plant communities or later ecological stage.

Plant Vigor: Plant health; relates to the relative robustness of a plant in comparison to other individuals of the same species.

Population: Within a species, a distinct group of individuals that tend to mate only with members of the group. Because of generations of inbreeding, members of a population tend to have similar genetic characteristics.

Poisonous Plant: A plant containing or producing substances that cause sickness, death or a deviation form the normal state of health of animals.

Potential Natural Community (PNC): The biotic community that would become established if all successional sequences were completed without interference by human beings under the present environmental conditions. Natural disturbances are inherent in development. PNCs can include naturalized non-native species.

Potential Natural Vegetation (PNV): (See Potential Natural Community.)

Potential Wild and Scenic River: A flowing body of water or estuary or a section, portion, or tributary thereof, including rivers, streams, creeks, runs, kills, rills, and small lakes.

Prehistoric: Refers to the period wherein American Indian cultural activities took place before written records and not yet influenced by contact with nonnative culture(s).

Prescribed Burning: The use of fire as a management tool under specified conditions for burning a predetermined area.

Prescribed Fire: The introduction of fire to an area under regulated conditions for specific management purposes.

Prevention of Significant Deterioration: A regulatory program based not on the absolute levels of pollution allowable in the atmosphere but on the amount by which a legally defined baseline condition will be allowed to deteriorate in a given area. Under this program, geographic areas are divided into three classes, each allowing different increases in nitrogen dioxide, particulate matter, and sulfur dioxide concentrations.

Prime Farmland: Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses.

Project Area: The area of land upon which an operator conducts mining operations, including the area needed for building or maintaining of roads, transmission lines, pipelines, or other means of access.

Project Plan: A type of implementation plan (see Implementation Plan). A project plan typically addresses individual projects or several related projects. Examples of project plans include prescribed burn plans, trail plans, and recreation site plans.

Proper Function Condition (PFC): An element of the Fundamental of Rangeland Health for watersheds and therefore a required element of state or regional standards and guidelines under 43CFR4180.2.

Protest: Application for review of a land use plan decision by a higher administrative level.

Public Land: Land or interest in land owned by the United States and administered by the Secretary of the Interior through the BLM without regard to how the United States acquired ownership, except lands located on the Outer Continental Shelf, and land held for the benefit of Indians, Aleuts, and Eskimos. (See 43 CFR 4100.0-5).

-Q-

Qualitative: Observational type data that is recorded but not measured.

Quantitative: Collection of data by measuring vegetation or soil characteristics.

-R-

Range: Land supporting indigenous vegetation that either is grazed or has the potential to be grazed and managed as a natural ecosystem. Range includes grassland, grazable forestland, shrubland, and pastureland.

Range Condition: The present status of vegetation of a range site in relation to the climax (natural potential) plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the climax plant community for the site.

Range Development: A structure, excavation, treatment or development to rehabilitate, protect, or improve public lands to advance range betterment.

Rangeland: Uncultivated land that will provide the necessities for life for grazing and browsing animals.

Rangeland Health: The degree to which the integrity of the soil, vegetation, water, and air as well as the ecological processes of the rangeland ecosystem is balanced and sustained. Integrity is defined as maintenance of the structure and functional attributes characteristic of a particular locale, including normal variability.

Rangeland Improvements: Any activity or program, structural or nonstructural, on or relating to rangelands that is designed to improve forage production, change vegetation composition, control patterns of use, provide water, stabilize soil and water conditions, and enhance habitat for livestock, wildlife. Rangeland improvements include land treatments (e.g., chaining, seeding, burning, chemical, etc.), stockwater developments, fences, corrals, and trails etc.

Rangeland Inventory: The systematic acquisition and analysis of resource information needed for planning and management of rangeland.

Range Management: A distinct discipline founded on ecological principles with the objective of sustainable use of rangelands and related resources for various purposes.

Range Readiness: Stage of plant development at which grazing may begin in an area/pasture/allotment without damage to vegetation or soil.

Range Site: Subdivisions of rangeland for management purposes having similar soils, climate and climax plant communities. Two or more identical range sites that are spatially separated should respond in a similar manner to the same kind of management.

Range Trend: (1) The change in range condition over time. (2) The direction of change in range condition. See also Trend.

Rangeland: Land used for grazing by livestock and big game animals on which vegetation is dominated by grasses, grass-like plants, forbs, or shrubs. Rangelands also include natural grasslands, savannas, shrublands, many deserts, tundra, alpine communities, marshes, and wet meadows as well as oak and pinyon-juniper woodlands.

Raptor: Bird of prey with sharp talons and strongly curved beaks such as hawks, owls, vultures, and eagles.

Reach: A specified length of a stream or channel.

Reasonable Foreseeable Development Scenario: The prediction of the type and amount of oil and gas activity that would occur in a given area. The prediction is based on geologic factors, past history of drilling, projected demand for oil and gas, and industry interest.

Reclamation: The process of stabilizing disturbed areas to protect both disturbed and adjacent undisturbed areas from unnecessary degradation and returning the disturbed area to a condition approximate or equal to that which existed prior to disturbance, or to a stable and productive condition compatible with the land use plan.

Record of Decision (ROD): A document signed by a responsible official recording a decision that was preceded by the preparing of an environmental impact statement.

Recreation Experiences: Psychological outcomes realized either by recreation-tourism participants as a direct result of their onsite leisure engagements and recreation-tourism activity participation or by non-participating community residents as a result of their interaction with visitors and guests within their community and/or interaction with the BLM and other public and private recreation-tourism providers and their actions.

Recreation Settings: The collective, distinguishing attributes of landscapes that influence, and sometimes actually determine, what kinds of recreation opportunities are produced.

Recruitment: The successful entry of new individuals into the breeding population.

Rehabilitation: Effort undertaken to repair or improve damaged lands (such as from wildfire) unlikely to recover naturally to management approved conditions, utilizing native and or nonnative plant species to obtain a stable plant community that will protect the burned area from erosion and invasion by weeds.

Relict: A remnant or fragment of the vegetation of an area that remains from a former period when the vegetation was more widely distributed.

Residual Ground Cover: That portion of the total vegetative ground cover that remains after the livestock grazing season.

Resource Advisory Council (RAC): A council established by the Secretary of the Interior to provide advice or recommendations to BLM management. In some states, provincial advisory councils (PACs) are functional equivalents of RACs.

Resource Management Plan (RMP): A land use plan as prescribed by the Federal Land Policy and Management Act which establishes, for a given area of land, land-use allocations, coordination guidelines for multiple-use, objectives and actions to be achieved.

Rest: Leaving an area ungrazed for a specified time. Rest period. The length of time that a management unit is not grazed.

Rest-rotation: A grazing management scheme in which rest periods, usually for a full growing season, for individual grazing units are incorporated into a grazing rotation.

Rest-rotation Grazing: A grazing system typically involving four pastures in which each pasture periodically receives a year or more of nonuse.

Restoration: The process of returning ecological integrity to the area, and to obtain a plant community that is similar in appearance and function to the historic community.

Revision: The process of completely rewriting the land use plan due to changes in the planning area affecting major portions of the plan or the entire plan.

Rhizome: A horizontal underground stem, usually sending out roots and aboveground shoots from the nodes.

Rill: A channel formed in the soil surface by ephemeral running water, usually considered to be less than 1 foot deep. Rills generally are linear erosion features.

Riparian: Referring to or relating to areas adjacent to water or influenced by free water associated with streams or rivers on geologic surfaces occupying the lowest position on a watershed.

Riparian Area: A form of wetland transition between permanently saturated wetlands and upland areas. Riparian areas exhibit vegetation or physical characteristics that reflect the influence of permanent surface or subsurface water. Typical riparian areas include lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels. Excluded are ephemeral streams or washes that lack vegetation and depend on free water in the soil.

Riparian Ecosystems: (1) Assemblages of plants, animals, and aquatic communities whose presence can be either directly attributed to factors that are water influenced or related. (2) Interacting system between aquatic and terrestrial situations identified by soil characteristics and be distinctive vegetation that requires or tolerates free or unbound water.

Riparian Zone: The banks and adjacent areas of water bodies, water courses, seeps, and springs whose water provide soil moisture sufficiently in excess of that otherwise available locally so as to provide a more moist habitat than that of contiguous flood plains and uplands.

River Suitability: Referring to a river's suitability for Congress to designate is as a National Wild and Scenic River.

Road: As used herein, a transportation facility used primarily by vehicles having four or more wheels, documented as such by the owner, and maintained* for regular and continuous use. (*See "maintenance" definition.)

Rock Art: Petroglyphs or pictographs; rock incisions, carvings, or paintings placed on rocks.

Rotation: A technique performed while cementing, whereby casing is rotated in the hole in order to move the cement slurry uniformly around the casing to eliminate channeling and provide an effective cement bond on the casing and formation walls.

Rotation Grazing: A grazing scheme where animals are moved from one grazing unit in the same group of grazing units to another without regard to specific graze: rest periods or levels of plant defoliation.

Rotational Stocking: Unlike rotational grazing, rotational stocking uses grazing cycles with defined grazing and rest periods.

Route: Any motorized, non-motorized, or mechanized transportation corridor. Corridor may either be terrestrial or a waterway. "Roads", "trails" and/or "ways" are considered routes.

Runoff: (1) The portion of precipitation or irrigation on an area which does not infiltrate, but instead is discharged by the area. (2) The water that flows on the land surface from an area in response to rainfall or snowmelt.

-S-

Sacrifice Area: A portion of the range, irrespective of site, that is unavoidably overgrazed to obtain efficient overall use of the management area.

Saleable Minerals: Common variety minerals on the public lands, such as sand and gravel, which are used mainly for construction and are disposed of by sales or special permits to local governments.

Saline Soils: Soils containing soluble salts in such quantities that interfere with the growth of most plants.

Salinity: A measure of the mineral substances dissolved in water.

Sample: A set of sampling units, as opposed to a single measurement.

Savanna: A grassland with scattered trees, whether as individuals or clumps; often a transitional type between true grassland and forest.

Scale: Refers to the geographic area and data resolution under examination in an assessment or planning effort.

Scenic River: A river or section of a river that is free of impoundments and whose shorelines are largely undeveloped but accessible in places by roads.

Scoping: The process of identifying the range of issues, management concerns, preliminary alternatives, and other components of an environmental impact statement or land-use planning document. It involves both internal and public viewpoints.

Section 7 Consultation: The requirement of Section 7 of the Endangered Species Act that all federal agencies consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service if a proposed action might affect a federally listed species or its critical habitat.

Section 106 Compliance: The requirement of Section 106 of the National Historic Preservation Act that any project funded, licensed, permitted, or assisted by the Federal Government be reviewed for impacts to historic properties and that the State Historic Preservation Officer and the Advisory Council on Historic Preservation be allowed to comment on a project.

Sediment: Soil, rock particles and organic or other debris carried from one place to another by wind, water or gravity.

Semiarid: Regions or climates where moisture is normally greater than under arid conditions but still definitely limits the production of vegetation. The upper limit of average annual precipitation in the cold, semiarid regions is as low as 15 inches (380 mm), whereas in warm tropical regions, it is as high as 45-50 inches (1,100-1,300mm).

Sensitive Species: All species that are under status review, have small or declining populations, live in unique habitats, or need special management. Sensitive species include threatened, endangered, and proposed species as classified by the Fish and Wildlife Service and National Marine Fisheries Service.

Seral: Pertaining to the successional stages of biotic communities.

Setting Character: The condition of any recreation system, objectively defined along a continuum ranging from primitive to urban in terms of variation of its component physical, social, and administrative attributes.

Shaft: A vertical or inclined opening to an underground mine.

Short-duration Grazing: Grazing management whereby short periods (days) of grazing and associated non-grazing are applied to range or pasture units. The lengths of grazing and non-gazing periods are based on the rate of plant growth.

Shrub: (1) A low, woody plant, usually with several stems, that may provide food and/or cover for animals. (2) A plant that has persistent, woody stems and a relatively low-growth habit, and that generally produces several basal shoots instead of single bole. It differs from a tree by its low stature (generally less that 5 meters, or 16 feet) and non-arborescent form.

Shrubland: Land on which the vegetation is dominated by shrubs. Non forested lands are classified as shrubland if shrubs provide more than 20 percent of the canopy cover, excluding trees. Lands not presently shrubland that were originally or could become shrubland through natural succision

Significance Criteria: Criteria identified for specific resources used to determine whether or not impacts would be significant.

Significant: An effect that is analyzed in the context of the proposed action to determine the degree or magnitude of importance of the effect, either beneficial or adverse. The degree of significance can be related to other actions with individually insignificant but cumulatively significant impacts.

Slope: The degree of deviation of a surface from the horizontal.

Soil: A dynamic, natural body of the surface of the earth in which plants grow.

Soil Aggregates: A group of primary soil particles that cohere to each other more strongly that to other surrounding particles.

Soil Compaction: Increasing the soil bulk density, and concomitantly decreasing the soil porosity, by the application of mechanical compression forces to the soil.

Soil Horizon: A layer of soil or soil material roughly parallel to the land surface and differing from adjoining genetically related layers in physical, chemical, and biological properties or characteristics, such as color, structure, and texture.

Soil Productivity: The capacity of a soil to produce a plant or sequence of plants under a system of management.

Soil Series: A group of soils having genetic horizons (layers) that, except for texture of the surface layer, have similar characteristics and arrangement in profile.

Soil/Site Stability: The capacity of a site to limit redistribution and loss of soil resources (including nutrients and organic matter) by wind and water (one of the three attributes of rangeland health).

Soil Texture: The relative proportions of the three size groups of soil grains (sand, silt, and clay) in a mass of soil.

Solitude and Primitive/Unconfined Recreation: Visitors may have outstanding opportunities for solitude, or primitive and unconfined types of recreation when the sights, sounds, and evidence of other people are rare or infrequent, where visitors can be isolated, alone or secluded from others, where the use of the area is through non-motorized, non-mechanical means, and where no or minimal developed recreation facilities are encountered.

Special Status Plant: A species that is either Federally listed as threatened or endangered, officially proposed (or a candidate) for Federal listing as threatened or endangered, State listed as threatened or endangered, or listed by a BLM State as sensitive.

Special Status Species: Includes proposed species, listed species, and candidate species under the ESA; State-listed species; and BLM State Director-design. (See BLM Manual 6840, Special Status Species Policy).

Species Composition: A term relating the relative abundance of one plant species to another using a common measurement; the proportion (percentage) of various species in relation to the total on a given area.

Species Diversity: The number, different kinds of, and relative abundances of species present in a given area.

Standard: A description of the physical and biological conditions or degree of function required for healthy, sustainable lands (e.g., land health standards). It is to be expressed as a desired outcome (goal).

Steppe: Semiarid grassland characterized by grasses occurring in scattered bunches with other herbaceous vegetation and occasional woody species.

Stipulations: Requirements that are part of the terms of a mineral lease. Some stipulations are standard on all Federal leases. Other stipulations may be applied to the lease at the discretion of the surface management agency to protect valuable surface resources and uses.

Stocking Rate: The number of specific kinds and classes of animals grazing a unit of land for a specified time period.

Streambank Erosion: The removal, transport, deposition, recutting and bedload movement of material by concentrated flows.

Structural Condition: The vegetative structure of a group of plants, vegetative structure is the form or appearance of a stand and can include plant size (height and diameter), arrangement of plants in the landscape in both the horizontal and vertical dimensions, stem density, percent cover, and other measures of biomass quantity.

Structure (Vegetation): The height and area occupied by different plants or life forms in a community.

Stubble: The basal portion of herbaceous plants remaining after the top portion has been harvested either artificially or by grazing animals.

Succession: The orderly process of community change; it is the sequence of communities that replace on another in a given area.

Successional Community: (See Seral Community.)

Successional Stage: (See Seral Stage.)

Succulent: Generally a type of cactus.

Suitability: The adaptability of an area to grazing by livestock or wildlife.

Surface Erosion: Erosion that removes materials from the surface of the land as distinguished from gully, or channel erosion.

Surface Runoff: See overland flow.

Suspended Sediment: The very fine soil particles that are maintained in suspension in water for a considerable time by the upward components of turbulent currents or because they are fine enough to form a colloidal suspension.

Sustainability: The ability of an ecosystem to maintain ecological processes and functions, biological diversity, and productivity over time.

Sustained Yield: Maintenance of an annual or regular periodic output of a renewable resource from public land consistent with the principles of multiple use.

-T-

Take: As defined by the Endangered Species Act, 'to harass, harm, pursue, hunt, shoot, wound, kill, capture, or collect, or attempt to engage in any such conduct.'

Taxa: A group of organisms sharing common characteristics in varying degrees of distinction and constituting one of the categories in taxonomic classification, such as a phylum, order, family, genus, or species.

Terrestrial Species: Ground-dwelling plants and animals.

Threatened Species: Any plant or animal species defined under the Endangered Species Act as likely to become endangered within the foreseeable future throughout all or a significant portion of its range; listings are published in the Federal Register.

Threshold: A transition boundary that an ecosystem crosses resulting in a new stable state that is not easily reversed without significant inputs of resources.

Total Dissolved Solids (TDS): A water quality parameter defining the concentration of dissolved organic and inorganic chemicals in water. After suspended solids are filtered from water and water is evaporated, dissolved solids are the remaining residue.

Total Maximum Daily Load: An estimate of the total quantity of pollutants (from all sources: point, non-point, and natural) that may be allowed into waters without exceeding applicable water quality criteria.

Total Preference: The total number of animal units of livestock grazing on public lands, apportioned and attached to base property owned or controlled by a permittee or lessee. The active preference and suspended preference are combined to make up the total grazing preference.

Traditional Cultural Property (TCP): A tangible place important to a community today and has been important to that community for at least 50 years. It has integrity of location, design, setting, materials, workmanship, feeling, and association and has definable boundaries. Not all TCPs are eligible or listed on the National Register of Historic Places.

Traditional Lifeway Values: Values that are important for maintaining a group's traditional system of religious belief, cultural practice, or social interaction. A group's shared traditional lifeway values are abstract, nonmaterial, ascribed ideas that cannot be discovered except through discussions with members of the group. These values may or may not be closely associated with definite locations.

Trail (interagency definition): Linear route managed for human powered, stock, or OHV forms of recreation or for historic or heritage values. Trails are not generally managed for use by four wheel drive or high clearance vehicles.

Trampling: The damage to plants or soil brought about by movement or congestion of animals.

Transition: A shift in plant composition that results in relatively stable states, as reflected in composition and structure. These shifts can occur by natural forces or as a result of human actions.

Treatment: Any management practice or procedure applied to a resource to achieve desired results.

Tree: A woody perennial, usually single-stemmed plant that has a definite crown shape and reaches a mature height of at least 4 meters. The distinction between woody plants known as trees and those called shrubs is gradual. Some plants, such as oak, may grow as either trees or shrubs.

Trend: The direction of change in ecological status or desired plant community observed over time. Trend is described as: "toward" or "upward"; "away from", "downward", or "declining" or as "not apparent" or "static."

Turbidity: An interference to the passage of light through water due to insoluble particles of soil, organics, microorganisms and other materials.

-U-

Unallotted Lands: Public lands open to grazing which currently have no livestock grazing authorized.

Understory: Plants growing beneath the canopy of other plants; usually refer to grasses, forbs, and low shrubs under a tree or shrub canopy.

Ungulates: Hoofed animals, including ruminants but also horses, tapirs, elephants, and swine.

Uplands: Lands at higher elevations than alluvial plains or low stream terraces; all lands outside the riparian-wetland and aquatic zones.

Use: The proportion of current years forage production that is consumed or destroyed by grazing animals.

Utilization (rangeland): The proportion of the current year's forage production that is consumed or destroyed by grazing animals. Utilization is usually expressed as a percentage. Utilization is synonymous with use.

-V-

Vascular: Having vessels for circulating or transmitting plant or animals fluids.

Vascular Plants: Higher plants with vessels that conduct sap throughout the plant.

Vegetation: Plants in general, or the sum total of the plant life above and below ground in an area.

Vegetation Community: An assemblage of plant populations in a common spatial arrangement.

Vegetation Treatments: Land treatment projects undertaken to alter the existing vegetation communities, designed to improve the production of the species desired.

Vegetation Manipulation: Altering existing vegetation communities to ensure production of the species desired.

Vegetation Type: A plant community with distinguishable characteristics described by dominant vegetation present.

Viable: Capable of sustaining a healthy and reproducing population over a long period of time.

Vigor: Relates to the relative robustness of plant in comparison to other individuals of the same species. It is reflected primarily by the size of a plant and its parts in relation to its age and the environment in which it is growing.

Visual Resources: The visible physical features of a landscape (topography, water, vegetation, animals, structures, and other features) that constitute the scenery of an area.

-W-

Warm Season Plants: Plants whose major growth occurs during the spring, summer, or fall, and are usually dormant in winter.

Water Cycle (e.g., Hydrologic Cycle): The capture, storage, and redistribution of precipitation.

Water Quality: The chemical, physical, and biological characteristics of water with respect to its suitability for a particular use.

Water Table: The surface in a groundwater body where the water pressure is atmospheric. It is the level at which water stands in a well that penetrates the water body just far enough to hold standing water.

Watershed: (1) All lands enclosed by a continuous hydrologic drainage divide that lay upslope from a specific point on a stream. (2) A total area of land above a given point on a waterway that contributes runoff water to the flow at that point. (3) A major subdivision of a drainage basin.

Weather: The current state of the atmosphere with regards to wind, temperature, cloudiness, moisture, pressure, etc.

Weed: (1) A plant growing where unwanted. (2) A plant having a negative value within a given management system.

Wet Meadow: A meadow where the surface remains wet or moist throughout the summer, usually characterized by sedges and rushes.

Wetlands: Areas that are inundated or saturated by surface or ground water often and long enough to support and under normal circumstances do support a prevalence of vegetation typically adapted to saturated soil conditions.

Wild Horses and Burros: All unbranded and unclaimed horses and burros using public lands as all or part of their habitat.

Wild, Scenic or Recreational River: Three classes that is traditionally referred to as a "Wild and Scenic River." Designated river segments are classified as wild, scenic and/or recreational, the segments cannot overlap.

Wilderness Character: Key qualities of a designated wilderness or wilderness study area are listed in section 2(c) of the "Wilderness Act of 1964" and were used by BLM in its original wilderness inventory. Those qualities include size, naturalness, outstanding opportunities for solitude, and outstanding opportunities for primitive and unconfined type of recreation. Other qualities may include ecological, geological, or other features of scientific, educational, scenic, or historic value.

Wilderness Characteristics: Features of the land associated with the concept of wilderness that may be considered in land use planning when BLM determines that those characteristics are reasonably present, of sufficient value (condition, uniqueness, relevance, importance) and need (trend, risk), and

are practical to manage." (BLM I.M. 2003-275). These features are not part of designated wilderness areas (WA) or wilderness study areas (WSA).

Wilderness Study Area (WSA): A designation made during the official BLM wilderness review period and through the land use planning process of a roadless area found to have wilderness character as described in Section 2(c) of the Wilderness Act of 1964.

Wilderness: A congressionally designated area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, that is protected and managed to preserve its natural conditions and that (1) generally appears to have been affected mainly by the forces of nature, with human imprints substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres or is large enough to make practical its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

Wildfire: A fire on wildlands not meeting management objectives and thus requiring a suppression response.

Wildland: An area is which development is essentially non-existent, except for roads, railroads, powerlines, and similar transportation facilities. Structures, if any, are widely scattered.

Wildland Fire: Any fire occurring on the wildlands, regardless of ignition source, damages, or benefits.

Wild River: Those rivers or sections of rivers free of impoundments and generally inaccessible except by trail, with watershed or shorelines essentially primitive and waters unpolluted. They represent vestiges of primitive America.

Winter Range: Range that is grazed during winter.

Woodland: A forest community occupied primarily by noncommercial species such as juniper, mountain mahogany, or quaking aspen; all western juniper forest lands are classified as woodlands, since juniper is classified as a noncommercial species.

-X-

Xeric: Having very little moisture; tolerating or adapted to dry conditions.

-Y-

Yearlong Grazing: Continuous grazing for a calendar year.

-Z-

ABBREVIATIONS AND ACRONYMS

ACEC(s)	Area(s) of Critical Environmental Concern
AMP(s)	Allotment Management Plan(s)
AUM(s)	Animal Unit Month(s)
BA	Biological Assessment
BLM	Bureau of Land Management
CEQ	Council on Environmental quality
CFR	Code of Federal Regulations
CO2	Carbon Dioxide
DEIS	Draft Environmental Impact Statement
DPC	Desired Plant Community
EA(s)	Environmental Assessment(s)
EIS(s)	Environmental Impact Statement(s)
EPA	Environmental Protection Agency
ESA	Endangered Species Act (of 1973)
FLPMA	Federal Land Policy and Management Act (of 1976)
FR	Federal Register
GCNRA	Glen Canyon National Recreation Area
GSENM	Grand Staircase-Escalante National Monument
IM	Instruction Memorandum
IMP	Interim Management Policy for Lands Under Wilderness Review
IPCC	Intergovernmental Panel on Climate Change
LUP(s)	Land Use Plan(s)
MAC	Grand Staircase-Escalante National Monument Advisory Committee
MFP(s)	Management Framework Plan(s)
MMP	Grand Staircase-Escalante National Monument Management Plan
NEPA	National Environmental Policy Act
NLCS	National Landscape Conservation System
NPS	National Park Service
NRA	National Recreation Area
NWSRS	National Wild and Scenic River System
PACS	Protected Activity Centers
PFC	Proper Functioning Condition (riparian)
PNC	Potential Natural Community
PSD	Prevention of Significant Deterioration
RLH	Rangeland Health Standards
RMP	Resource Management Plan
ROD	Record of Decision
SITLA	State of Utah School and Institutional Trust Lands Administration
SWFL	Southwest Willow Flycatcher
TCP(s)	Traditional Cultural Property(ies)
TDS	Total Dissolved Solids
TGA	Taylor Grazing Act (of 1934)
TMDL	Total Maximum Daily Load
UDWQ	Utah Division of Water Quality
UDWR	Utah Division of Wildlife Resources
USDI	United States Department of the Interior
USF&WS	United States Fish and Wildlife Service
UTCDC	Utah Conservation Data Center
WO	Washington Office of the Bureau of Land Management
WSA(s)	Wilderness Study Area(s)

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Appendix 1 – Allotment Descriptions

NOTE TO READERS

Due to the size and cost of printing this Draft Plan Amendment/Draft EIS Appendix 1, it will not be available in hardcopy (printed) format. It may be viewed on the CD ROM attached to the back cover.

Appendix 2

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240
http://www.blm.gov

January 28, 2003

In Reply Refer To:
4100 (220) N

EMS TRANSMISSION 01/28/2003
Instruction Memorandum No. 2003-074
Expires: 09/30/2004

To: All Field Officials

From: Assistant Director, Renewable Resources and Planning

Subject: FY 2003 General Drought Management Direction DD: 02/14/2003

Program Area: Drought Management

Purpose: The purpose of this Instruction Memorandum (IM) is to provide general guidance/direction to the field relating to drought management over the course of the next year. More specific livestock grazing guidance/direction is also provided.

Policy/Action: When dealing with drought conditions and issues, the principle focus of our actions should be to maintain the long-term health and productivity of the Nation's rangelands. Likewise, a conscious awareness needs to be maintained that every action taken may and often does place a hardship on those who use or rely on the public lands for their livelihood. Balancing these two priorities is not an easy task. Although the focus of this guidance is directed toward the biological resource programs (i.e., rangeland management, wildlife, wild horses and burros) that have direct impact on the long-term health of rangelands, much of the guidance is applicable to many of BLM's other resource programs (i.e., recreation, wilderness).

Several years of extended drought in many areas of the West has impacted vegetative vigor and stand composition; created conditions suitable for invasion by exotic plants; reduced both surface and subsurface water quantities and qualities; and created economic hardship for many users of the public land. Projections for the end of the multi-year drought in the near future are not promising. Prolonged drought impacts resource conditions long after rainfall and snowmelt have recharged soil moisture. The following guidance is offered to:

1. Promote a consistent, Bureau-wide approach to managing drought situations.

2. Serve to increase communication internally within BLM as well as with our external partners, stake holders, other users of the public lands, Resource Advisory Councils (RACs), industry and conservation organizations, other Federal agencies and local, Tribal and State governments, including Governors' Drought Task Forces.

3. Assure managers are provided the most current information and data for making timely decisions consistent with the standards for rangeland health.

The following guidelines and recommendations are intended to provide data, flexibility and direction for line management and public land users as they work cooperatively to develop local, regional or national level drought management strategies and make critical decisions during drought conditions. Success of this policy hinges on promoting constant communication, consultation and coordination between Field Offices, State Offices, the Washington Office and the Department as well as with livestock operators, RACs, wild horse and burro constituents, conservation organizations, industry and professional organizations, local, State, and Tribal governments, other Federal agencies, and the public.

Mike Holbert (WO-220) has been designated to serve as the BLM's Drought Coordinator. Each State Office is asked to designate a drought coordinator to serve as the State's liaison with the Washington Office. The States are asked to notify Mike Holbert of the selected State drought coordinator no later than February 14, 2003.

A four-phased approach to detection and management of drought is outlined in this policy. The "early assessment" phase outlines actions and tools recommended four or more months prior to livestock turnout and/or the peak plant growth period to determine the potential for, extent and severity of drought. The "pre-season assessment" phase, which occurs within 3 months of livestock turnout and/or the peak plant growth period, supplements and builds upon the actions taken during the "early assessment" phase. The "continuing assessment" phase outlines actions that are recommended during the grazing season. The "post drought" phase emphasizes the importance of assessing on-the-ground conditions and using an inter-disciplinary approach to establish site-specific criteria required to be present before livestock use is returned to permitted levels.

Early Assessment Phase

The following actions and tools are provided for consideration as early assessments are being made.

1. Standardized indices based on the Standard Precipitation Index, the U. S. Drought Monitor and other data are available from the Predictive Services program at the National Interagency Coordination Center (NICC), and at the local Geographic Coordination Centers for projecting short-term, broad-scale assessment of drought conditions as well as forecasts on continued drought conditions. This information may be useful at the State and National scales. The frequency and need for these

reports will vary by region or state. As appropriate, these reports should be shared with the Field Offices, RACs, other partners, stakeholders, etc.

2. Field Offices are encouraged to utilize an inter-disciplinary approach to (1) identify natural resources of highest vulnerability to being adversely impacted by drought and (2) prioritize emphasis areas[1] to focus monitoring, assessment and allocation of scarce labor and operational resources. It is also recommended that the information and decisions resulting from the inter-disciplinary approach be shared with the State Office drought coordinator to facilitate consistency across the State, working with other State level partners (as referenced in Item 5 below) and coordinating with the Washington Office.

   Information and data that could be considered during this process includes the information provided in Item 1 above, data available from partners, stakeholders and others; remote automated weather stations; previous years' monitoring results (plant growth, utilization and/or stubble height, livestock and wild horse actual use, occurrence of insect infestations, use of "rest" pastures, etc.); severity of drought conditions; presence of significant or sensitive resources; priority watershed assessments; allotments that have failed to meet standards for rangeland health; available GIS, remote sensing information and other forms of electronic data and available scientific information. A determination should be made as to the adequacy of existing data to support decisions that will need to be made. Site-specific data is recommended, if available, to support the decisions. If additional data is needed, an assessment of the types of data and the capability to collect such data will need to be made.

   In areas of concern due to vegetative conditions, soil moisture may be measured in representative areas using techniques found in agency manuals/handbooks and professional literature. The Crop Moisture Index may also be referenced at http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/cmi.gif.

3. Websites with information pertinent to drought are listed in Attachment 1.

4. The Washington Office will develop a communications plan to address (1) release of drought-related information to national media sources and (2) coordination with national Non-Government Organizations (NGOs), key Congressional contacts, the Department of the Interior and other Federal agencies at the national level. The communication plan will be shared with the State Offices and other National Program offices.

5. Similarly, State and Field Offices are encouraged to develop communication plans addressing release of drought-related information to appropriate media sources and coordination with RACs, County Extension Agents, State/local NGOs, State/local drought task forces, Congressional delegations, local, county, State and Tribal governments, other Federal government agencies[2], etc. Informal

interaction with as many groups/people as possible to gather their thoughts and ideas is also encouraged. Close coordination between the field offices, the State Offices and the Washington Office is critical to assure a consistent message is provided.

Relating specifically to livestock grazing, as appropriate, livestock permittees/lessees within projected drought areas should, at a minimum, be notified through written correspondence of current and projected conditions, the potential of livestock grazing use being affected during the upcoming grazing season, etc. Permittees/lessees should be encouraged to make needed changes in their grazing operations, which might include adjusting the number of livestock and/or the season-of-use, applying for non-use and to work closely with their Rangeland Management Specialist. Although adjusting both numbers and season-of-use may be used, adjusting the number of animals may provide the most flexibility during the grazing season.

If livestock normally graze public land year-round, follow the guidance identified for the Continuing Assessment Phase.

If on-the-ground conditions at the end of the previous grazing season are known based on monitoring information to warrant changes in livestock grazing use, early consultation and coordination with the affected permittees/lessees and interested publics should be initiated. Whenever feasible, on-the-ground tours to discuss conditions, concerns and possible solutions are recommended. Written agreements are recommended to document agreed upon changes in use. If agreement cannot be reached, the use of Alternative Dispute Resolution techniques is encouraged. As necessary, issuance of a grazing decision(s) in accordance with 43 CFR 4110.3-3 (a) or (b) should be initiated. Issuance of grazing decision(s) should be considered the option of "last resort" only after consultation, coordination and communication has taken place and should not "come as a surprise" to the affected permittee(s)/lessee(s). Whether these changes are implemented with written agreements, or a decision, it should be emphasized that the changes are designed to allow recovery of the long-term rangeland health and may be necessary even if precipitation improves and vegetation production increases during the next growing season.

6. Use of checklists is recommended to ensure all critical resources and issues are addressed when making drought-related decisions. Checklists should be tailored to meet local needs but could include resources such as areas of special concern (i.e., wild horse herd management areas, riparian pastures, critical habitat), special status species, and areas of fragile soils (i.e., Mancos shale). The checklist could be used to document coordination with all parties, interdisciplinary involvement, etc. Several states (Oregon, Arizona and Utah) have already developed checklists to use in drought-related situations.

7. As appropriate, Field offices should assess their current situation against Emergency Gather Criteria released by the National Wild Horse and Burro Program Office. If the assessment determines an emergency gather is appropriate, notification through appropriate management channels should be immediately initiated. It is important that this assessment also be completed during the "pre-season assessment" and "continuing assessment" phases.

8. As appropriate, Field and/or State Offices should initiate early discussions with the State Fish and Wildlife agencies concerning the potential need for wildlife herd reductions, if necessary. Any information available on the drought effects on local wildlife populations should be acquired.

9. Field Offices should complete an assessment of their capability to accomplish projected AWP workload measures in light of the projected drought workloads. As appropriate, notification through appropriate management channels should be initiated. This assessment should also be completed during the "pre-season assessment" and "continuing assessment" phases.

Pre-season Assessment Phase

For reference purposes, the timeframe for the pre-season assessment phase would be within 3 months of livestock turnout and/or the peak plant growth period. The following actions are recommended.

1. Updated information from the Predictive Services program at the National Interagency Coordination Center (NICC) and Geographic Coordination Centers should be obtained. Precipitation, snow pack and soil moisture records for the winter and early spring should be reviewed.

2. On-the-ground conditions (e.g., residual vegetation (height, vigor, amount), snow pack influence on available water, soil moisture) should be assessed to determine the effects and appropriateness of continued grazing use. Recognizing that wildlife, wild horses and burros and aquatic dependent resources will also be stressed by drought, close coordination and consultation between resource program professionals is critical. Working closely with the State Drought Coordinators, the Washington Office will develop a format for summarizing drought-related adjustments.

   Soil moisture measurements may need to be continued where problems are apparent or in areas of concern. Measurements in the root zone to determine available water for plants will be especially important during this period. If the capability of the office staff to either collect or interpret information becomes an issue, consider partnering opportunities with other agencies or groups (e.g., NRCS, Conservation Districts, etc.).

3. Review and, if necessary, modify the Communication Plans. Continue implementation of communication plans at all levels. It is important that this review also be completed during the "continuing assessment" phase.

4. Specifically related to livestock grazing, continue to communicate and refine livestock grazing management practices with affected livestock permittees/lessees. Issuance of letters updating drought conditions, identifying areas of particular concern, emphasizing the need to work closely with field office Rangeland Management Specialists, etc., is recommended.

   Whenever feasible, one-on-one meetings with livestock permittees/lessess and interested publics (as appropriate) to review and discuss drought information, needed management changes, etc., are encouraged. Written agreements are highly recommended to document agreed upon changes in livestock grazing use. The extent of livestock use adjustments (delayed turnout, reduction in numbers and/or duration, total exclusion, etc.) should be based on assessment of all factors including past grazing use, rangeland health, residual cover, precipitation, soil moisture, long-term weather forecasts, and other resources that may be affected.

   Use of a categorical exclusion to authorize placement and use of temporary water troughs for a period not to exceed one month is addressed in 516 Departmental Manual 6, Appendix 5.4(D)(2). Placement and use of temporary water troughs in one location for a period greater than one month should be addressed through the minimum level environmental assessment needed to provide appropriate analysis. If appropriate, troughs may be moved to other locations to facilitate livestock distribution within an allotment.

   If voluntary adjustments needed for proper livestock grazing cannot be reached, issuance of grazing decisions in accordance with 43 CFR 4110.3-3(a) or (b) should be initiated, as appropriate. These decisions may be issued as Final Decisions effective upon issuance or on the date specified in the decision if those measures are needed to provide immediate protection of resources. The decision document should specify the on-the-ground conditions that must be present prior to returning livestock use to the range. Modification or cancellation of grazing permits/leases should not be used to make short-term livestock grazing use adjustments.

5. Field offices are encouraged to work closely with the State Fish and Wildlife Agencies to review wildlife data, including population levels, winter mortality, fawning/calving success, etc. As appropriate, discussions with the State Fish and Wildlife agencies concerning the need for wildlife herd reductions should continue, if necessary.

Continuing Assessment Phase

During the grazing season, the following actions are recommended.

1. Monitor on-the-ground conditions including precipitation, utilization by all herbivores of key plant species in key areas, plant growth and production, use supervision of livestock grazing, insect infestations, etc. Grazing utilization should be appropriate to provide sufficient vegetative cover for other resources such as wildlife, fisheries, special status species, and watershed following conclusion of livestock grazing. If field office staff capability is limited, consider exploring partnership opportunities and focusing monitoring to priority watersheds and critical emphasis areas[3] such as allotments that have failed to meet rangeland health standards, or areas with reduced vegetation production.

   If assessment of monitoring information determines adverse impacts are occurring on the ground resulting from livestock grazing, affected grazing permittees/lessess should be notified immediately to move or remove livestock within a designated period of time. As appropriate, consultation and communication with interested publics should also take place. If livestock normally use public land year-round, identify when the decision to eliminate livestock will be reconsidered (i.e., during or following the normal peak plant growth period). Field offices with year-round grazing should also review the pre-season assessment stage prior to the next peak plant growth period. If the livestock are not moved or removed timely, issuance of a grazing decision based on 43 CFR 4110.3-3(b) should be initiated.

2. Continue coordination efforts with State Fish and Wildlife Agencies concerning wildlife herd reductions where they pose a threat to rangeland health and; therefore, their own long-term habitat requirements.

Post Drought Phase

The importance of achieving or maintaining the health of the rangeland cannot be over emphasized as consideration is given to returning uses to the public lands following the end of drought. When drought conditions ease, an assessment of all on-the-ground conditions (soil, vegetative, water supply, etc.) should be completed prior to the consideration of returning appropriate levels of use including livestock to the range. It is recommended an interdisciplinary team approach be used to establish site-specific criteria required to be present on-the-ground before livestock use would be returned to permitted levels. Involvement of the livestock grazing permittees/lessees and other interested publics in discussions addressing the return of authorized uses to the public land is recommended. Adequate time will need to be allowed for the vegetative resource to restore the vigor of the plant to a level where the plant can sustain grazing use.

Other Considerations

1. The use of salt, minerals, and certain mineral supplements as necessary to overcome natural shortages of minerals in rangeland forage may be authorized to provide for proper range management.

2. Maintenance feeding due to drought is generally prohibited. If an application for maintenance feeding permit is sought because of poor forage conditions

associated with drought, the application should be denied and livestock removed or not allowed. Exceptions for special or emergency situations are allowed. An example of a special exception would be the continuation of a historical practice of overnight maintenance feeding of sheep being trailed over several days.

3. Mid-season grazing applications to modify existing authorizations to request non-use should be processed promptly. Field/District Managers are authorized to waive the application processing service charge and to refund previously paid unused grazing fees.

The Bureau, in cooperation with other partners also affected by drought, will be developing a long-term management strategy to better prepare the Agency to address future droughts. In general terms, the strategy will focus toward effective communication between partners and accurate, timely assessment of drought conditions to trigger effective mitigation and emergency response activities.

Timeframe: This IM is effective upon receipt.

Budget Impacts: Implementation of this IM may affect the ability of field offices in accomplishing targeted AWP workload measures.

Manual/Handbook Sections Affected: None

Coordination: Opportunity to review draft versions of this IM were given to a BLM interdisciplinary Drought Task Force, State 1020 program leaders; WO 170; WO 210; WO 220; WO 230; WO 260; WO 610; Western States Water Council.

Contact: Contact Michael R. Holbert at 202-452-5191 (mike-holbert@blm.gov)

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[1]Emphasis areas may be defined as grazing allotments, geographic management areas, herd management areas, priority watersheds or any other area that meets the needs of the local field office or state.
[2]Close coordination with adjacent BLM offices and other federal government agencies (e.g. U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Indian Affairs, Bureau of Reclamation, National Park Service) that manage lands adjacent to public lands is important to maintaining consistent approaches.
[3]Refer to Item 2 in the **Early Assessment Phase**

Signed by:
Edward Shepherd
Acting, Assistant Director
Renewable Resources and Planning

Authenticated by:
Robert M. Williams
Policy and Records Group, WO-560

1 Attachment

1 –Drought-Related Websites (1 p)

Appendix 3

Cultural Resources Management Protocol

Unlike many other resources, the management of cultural resources on Federal lands is dictated to a large part by Federal laws and regulations, most recently the National Environmental Policy Act, the Federal Lands Policy Management Act, National Historic Preservation Act, the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, and the Code of Federal Regulations 36 CFR 800 and 43 CFR 8100 (BLM). Because there is little leeway in how these resources are managed and protected, measures outlined or proposed here are presented as common to all Action Alternatives.

Cultural resources are non-renewable resources; that is, any loss or degradation of cultural resources is permanent. It is important that there is not net loss of scientific information regarding cultural resources, and all National Register eligible sites and Archaeological Districts should be managed as to prevent or minimize adverse impacts. Preservation and protection are the primary goals of any Federal cultural resource program.

Chapter 3 of the EIS presents the background information on Cultural Resources within the planning area. Included in that chapter is a brief description of the types of sites found in the planning area and the various forms of impacts by which these sites are affected. Below is a description of the site types felt to be most susceptible to grazing related impacts. Also included in this section is a description of the process by which cultural resources will be analyzed for this EIS, the criteria by which Determinations of Effect will be made, and a proposal for a grazing-related inventory and monitoring program.

Sites and Impacts

Cultural resource concerns regarding grazing and related impacts focus on site type and the potential for effects caused by livestock. Site types felt to be most susceptible to grazing related activities include:

A. Rock shelters, where cattle tend to congregate for shelter both in hot and cool seasons. These locations often contain complex sites with a variety of features that can include delicate and perishable materials not found in open settings, and very complicated natural and cultural sedimentary stratigraphy. Sites in these locations can suffer from the immediate and cumulative physical impacts of the livestock, increased erosion, trampling and sedimentary churning, and chemical changes in the soils due to the deposition of large amounts of livestock dung and urine.

B. Sites with standing architecture, including historic and prehistoric sites, and sites with exposed architectural features that may be subject to livestock impacts.

These sites may have architectural features that may suffer from livestock impacts. Standing walls at both historic and prehistoric sites can attract cattle as rubbing areas, resulting in immediate and significant impacts to those structures. Even sites with only a few courses of intact masonry would be included in this category, as any adverse impacts to the intact portions of these walls will result in unacceptable levels of damage.

C. Open sites in sensitive locations, such as in erosive soils or in areas that tend to concentrate the presence of livestock (such as watering or feed locations, corrals, trails, or salt licks), and those sites with discreet features such as hearths, slab features, soil staining, middens, and other features that are susceptible to trampling from livestock. Sites in erosive sediments suffer from natural weathering impacts that are exacerbated by trampling and vegetation removal by livestock. Features such as middens, hearths, and fire cracked rock (FCR), lithic debitage and artifact concentrations are easily disturbed by trampling, and once disturbed, lose integrity and scientific value. In certain contexts, cumulative impacts due to disturbance and erosion can quickly and irreversibly impact these features, especially in sensitive soils and on slopes. Buried slab features, such as slab-lined hearths, storage features, and pit houses may at first seem impervious to cattle impacts. Observation has shown that, especially with softer sandstones, this is not always the case. Hard sandstone slabs may help to enclose and protect some features, but softer sandstones may weather quickly. As the upper margins of soft sandstone slabs are exposed through erosion and weathering, these slabs can be quickly broken down by exposure to the elements and trampling by livestock. Without the slabs to help protect and define the features, these can then be rapidly lost to additional exposure, erosion, and trampling.

   This category does not *exclude* any site based on site type; rather, it excludes sites based on their likelihood of additional adverse impacts. For example, a lithic scatter found on sandy sediments or slopes open to cattle trailing and increased erosion would be included in this category, while a lithic scatter on stable, gravely sediments with little depth potential, light grazing use, and not prone to increased erosion might not be included in this category.

D. Rock art sites accessible to livestock, especially those sites located in areas where cattle are likely to congregate. Although vandalism is by far the most important factor concerning impacts to rock art, livestock can adversely impact these sites as well. Instances of both petroglyphs and pictographs suffering from livestock rubbing have been noted within the EIS area, and cases of dung splattering on rock art panels have been documented in the EIS area and noted in nearby areas.

All readily accessible sites are subject to various degrees of grazing related influences, but the above sites are considered to be more easily damaged than most other site types. These conclusions are based on personal observations, reviews of literature, and conversations with other area archaeologists. While site type is important with regards to impacts, location of the sites is also a factor. Observation has shown that sites in the

immediate vicinity of range improvements that focus livestock related activity, including seedings, will suffer more grazing related effects than those sites more removed from range improvements and natural or developed water sources.

Determinations of Effect

Determinations of Effect represent a scientific analysis of the state of an archaeological or historical site in relation to the agents in question or a proposed activity (in this case, grazing and livestock related activities). Identification of factors leading to any Determination of Effect will need to be based on scientific observations and data collection. A Determination of No Effect means that the site is not being or will not be affected. A Determination of No Adverse Effect means that although the site is being or will be affected by the agents, the effect is not detrimental. A Determination of Adverse Effect means that the site is being or will be adversely impacted by the agents in question.

Determinations for previously identified, recorded sites will be based on existing data, at least until such time as the sites can be re-visited and an updated site form prepared (if necessary). Determinations will also need to be applied to cultural resource sites identified in the future as well. Future data will come from research-driven and Section 106 inventories, as well as from an active, ongoing monitoring and management program. Thresholds for making Determinations of Effect follow the description of each category (see below). Determinations for all sites, whether previously documented or newly discovered, will be made on an individual, case-by-case basis.

Determination of No Effect

This class of sites will likely include primarily those sites that are inaccessible to livestock, such as certain rock art panels, those sites on isolated land forms, and those found on very steep or cliff-side or otherwise inaccessible locations. As the vast majority of sites are accessible to livestock, this class of sites will be a small percentage of the whole.

Thresholds: Sites in this category will show no evidence of disturbance by livestock or grazing related activities.

Determination of No Adverse Effect

After more than 100 years of grazing, it would be difficult to find any livestock-accessible site that has not been affected to some degree. However, under specific conditions on some sites the impacts may have reached their most detrimental levels decades before the present. Numbers of livestock were significantly higher prior to 1935 than they are at current levels, indicating that grazing related impacts were probably greater at that time as well and have probably diminished to some degree since that time. This trend has been noted by other archaeologists as well (see for example Popelish 2001).

At stable sites, not prone to erosion (as noted above), additional adverse impacts might not be expected, as modern cattle are probably only re-mixing the upper few centimeters of site sediments that have been previously mixed. Lithic and ceramic artifacts (flakes and sherds) at these sites will eventually become reduced to a minimum size likely to be impacted by trampling, and will probably suffer only a minimal amount of additional damage.

In some cases, the architectural features of a site have been (either through natural forces or through previous livestock use or other impacts) adversely impacted to the point that additional use by livestock will not further damage these features. The structural component of a pueblo site on stable sediments whose walls have been reduced to linear rubble mounds will probably not suffer greatly from additional use by cattle, as the cattle will tend to walk around loose rock rather than over it.

Thresholds: Sites in the Determination of No Adverse Effect category may show indications of past or ongoing use by livestock, but will show no indications that ongoing livestock use is contributing to adverse impacts. Research potential at these sites is not and will not be affected by ongoing grazing activities. However, care must be exercised when assigning sites to this category. It may be difficult to determine if current grazing use is not contributing to ongoing adverse impacts. As noted by Nielson (1991:493), sherds (and presumably other artifacts) will eventually reach a size class that is no longer affected by trampling, but this size class will differ based on variables such as artifact and material type, sediment characteristics, and weight and contact surface of the trampling agent. The No Adverse Effect category should be used with caution and reserved for sites where it is readily apparent that current grazing practices are not adversely affecting the site.

Determination of Adverse Effect

These determinations will be based on observations regarding the site type, condition, ongoing impacts, use by livestock, and compounding factors such as increased erosion, vandalism, and visitation. Mitigation for these sites can include a variety of approaches, as outlined in the following sections.

Thresholds: Factors of site condition and ongoing impacts will need to be considered prior to a Determination of Adverse Effect. An evaluation by archaeologists should focus on key points regarding site integrity. Following are suggestions of thresholds for a Determination of Adverse Effect:

1. Indications of actively ongoing erosion that is caused by, or exacerbated by, livestock use of the site area.

2. Indications of direct impacts due to livestock, where it is apparent that the livestock are impacting portions of the site or features in the site that were not previously impacted by earlier use of the site area by livestock.

3. Indications of direct impacts by livestock, where it is apparent that the levels of adverse impacts are beyond those previously suffered by the site (or portion of the site) and intact areas are now losing integrity and research potential.

Following are detailed explanations of the various mitigation measures ("tools" in our "toolbox") for cultural resources in relation to the Rangeland Health EIS. Which mitigation option or options are chosen will depend on several factors, including site type, eligibility to the National Register, location, access and use for/by livestock, nearby rangeland improvements, soil type, site condition, and likelihood for continued adverse, grazing related impacts. The tools are presented below in two primary sections, Non-Cultural Tools, and Cultural Tools. Each tool is examined and detailed in regards to grazing and grazing related impacts. These tools may be used singly or in combination to meet the required objectives.

Non-Cultural Tools for Site Protection

Access Restriction: Restriction of livestock access can be used on a variety of scales, from site-specific to larger, more encompassing areas involving sets of sites or certain geographic settings (canyons, plateaus, ridges, etc.). In some settings, such as a rock shelter or overhang, restrictions may be accomplished easily with barriers. Where possible, brush barriers could be utilized. Brush barriers would have the advantages of appearing more natural and would not call attention to the site, and would not generally require much in the way of tools or man-made materials. Where such "natural" barriers could not be used, traditional fencing or other restrictive options may be necessary. For larger area closures, natural barriers would be used if possible, but traditional fencing is the more likely option.

Closures of small, site-specific locations would not cause any substantial loss of land base (and therefore AUMs) to the permitees. Any closures of areas large enough to result in a reduction of AUMs would require a Land Use Plan amendment, and would require consultation with the permitees.

Access restriction should not be viewed as only for site protection, but could play an important part in scientific research as well. Part of the Cultural Resources proposal for this EIS involves scientific research regarding grazing related impacts to cultural sites and landscapes. Closure of certain areas would act as a scientific control compared to areas left open to livestock. This would be an important aspect when considering livestock impacts, both direct (livestock on the sites) and indirect (such as erosion exacerbated by livestock use) as compared to other, non-livestock, related impacts. Restrictions for scientific purposes should be planned to take full advantage of the research potential. Areas with a variety of site types should be considered, but the restricted and open portions of the research areas should be as similar in the geographic and cultural landscapes as possible. This allows the researcher to compare "apples to apples," not "apples to oranges."

Changes in Season of Use: It is at first difficult to see how changes of season of use could be used as mitigation for cultural resource site, but the potential of this "tool" should be considered as a possibility. Livestock tend to congregate in sheltered areas, such as alcoves, overhangs, and rock shelters. Part of this behavioral pattern is in response to weather conditions; in the summer, livestock will "shade up" in shelters, in the winter they will move to these shelters for protection from wind, rain, and snow. In either weather extreme, livestock will seek the sheltered areas. Is there a middle ground in the spring and autumn when livestock are not particularly attracted to sheltered locations? Vegetation has a stabilizing effect on sediments and soils. A change in season of use that results in less impacts to vegetation would also increase site stability by lessening erosion.

In wet weather, such as the monsoon season, there is a more abundant water supply in areas that might not usually have available water (such as natural tanks in slick rock areas). Under these conditions livestock may tend to wander further from their traditional water source than they would under normal conditions, entering areas and impacting sites that only rarely see livestock. Under such conditions a seasonal restriction may be all that is needed to protect a whole series of sites.

Certain types of soils and sediments may also be more prone to livestock impacts under specific weather conditions. Soft sediments and clay soils may be much more susceptible to the hoof action of livestock in wet conditions than dry. Sites found in these areas, within these sediment types, would be more open to negative impacts as the sediments themselves become more susceptible. Again, a seasonal restriction may be all that is necessary to protect sites in these settings.

Location of Range Improvements: Livestock are controlled by the use of a whole series of range improvements, such as fence lines, corrals, water sources, salt licks, and drive ways. All of these improvements have the tendency to focus livestock use into certain areas, concentrating the related impacts. When cultural resource sites are found in the vicinity of these improvements, the impacts to these sites go up significantly.

In many cases these impact can be mitigated by movement of the range improvement. Fences can be constructed around, rather than through, sites. Watering troughs can be constructed or moved away from sites, as can be corrals and other improvements. Removing the reason for livestock congregation would have a positive effect on any site in the vicinity.

Livestock congregation at a watering source not only intensifies livestock use of the source area itself, but also increases livestock use of the surrounding area. Glen Canyon NRA data indicate that cattle will tend to stay within a two mile radius of their water source (GCNRA 1999:22), meaning that livestock will impact sites within that two mile radius to a greater degree than outside that area. If a watering source, corral, etc. is found within or proposed for an area of high site density, it may be prudent to move that improvement to an area of lesser site density.

GSENM has the ability to develop accurate maps plotting the location of cultural resource sites. The Monument can also generate maps depicting the areas generally utilized by cattle (more accurate maps of utilization are proposed, see Research, below). Using these two data sets together should provide a tool that could help pre-plan the location of range improvements to minimize the impacts to cultural resources.

Livestock Herding and Driving Techniques: Over the course of the past few decades, herding techniques have changed dramatically. For well over 100 years, the horse was the means of choice, and often the only choice, for the herding, monitoring, and driving of livestock. Even after automobiles became common in rural southern Utah, the lack of roads and suitable automotive trails dictated that, for many tasks, the horse remained the principle means of transportation. With the advent of the off-road motorcycle, and more recently all-terrain vehicles (ATVs), the horse has in many cases taken a back seat to motorized vehicles.

ATVs have been recognized as a serious problem on BLM administered lands. By increasing the accessibility of distant parts of the landscape, they have also increased the accessibility of cultural resource sites on that landscape. ATV related problems are not just one of access, but also relate to the destructive nature of ATV use in roadless areas. Tracks and trails left by ATVs (and wheeled vehicles in general) are linear and continuous in nature, compared to the separate hoof prints left behind by horses. ATV tracks and trails are far more prone to erosion than are horse tracks. In addition, horsemen will detour around low brush, while ATV riders will often destroy vegetation by driving straight through it when possible. ATV use on cultural resource sites has an immediate destructive effect, and increases the overall rate of secondary erosion. Restricting the use of ATVs and similar vehicles where such activities are impacting cultural resource sites would remove a serious threat to these sites.

Changes in Range Management Practices: Practices such as clearing and seeding to increase the forage in a given area eventually have the effect of drawing livestock to these areas. The clearing operations themselves (chaining, "dozer pushes," etc.) can have immediately disastrous consequences for cultural resource sites. And then as the seeding matures and cattle are drawn to the project area, additional grazing-related impacts to sites in that area will increase. If cultural resource sites were protected during the clearing operations by leaving them in undisturbed tree "islands," cattle are later drawn to these islands for the shade they provide in an otherwise open setting. The sites are then open to impacts by not just a few cattle wandering by, but by larger numbers of cattle drawn to the very spot designed to protect the site.

Future large-scale range improvement projects such as seedings should be planned in conjunction with cultural resource specialists to insure that cultural resource sites are taken into consideration, and that potential impacts can be mitigated prior to project implementation. In the seeding example noted above, hand-thinning of the remaining tree cover on the cultural resource site to match the surrounding vegetation density would not adversely impact the site, and would leave no reason for livestock to concentrate on that location.

Reduction of AUMs: The amount of impact a cultural resource site suffers from livestock is, for the most part, proportional to the number of livestock on that site at any given time. Reduction of the number of livestock will therefore reduce livestock related impacts. This is not a complete mitigation in that the amount of impacts will go down with the reduction of livestock, but some livestock (source of the impacts) will remain.

Cultural Tools for Site Protection

Inventory: Approximately 3% of the EIS area has been comprehensively surveyed for cultural resources. While some range improvements are included in this 3%, many older improvements and development projects were implemented or established prior to standard cultural resource surveys. Inventory is needed at those actively grazed locations that have never been surveyed, and will be needed at proposed project locations. Certain projects, such as salt licks or watering locations, will tend to concentrate livestock. With such projects inventory should not be limited to the specific development location, but must take into account the effect of livestock concentration in the area surrounding the improvements. Glen Canyon National Recreation Area calls for an inventory area of a 2 mile radius around water development projects (GCNRA 1999:22); the survey area associated with livestock-concentrating projects on BLM administered lands will be decided on a case-by-case basis and take into account terrain, site potential, site types, numbers of livestock, livestock behavior, and type of project.

Additional inventory across the EIS area should be directed at locations or topographic features likely to harbor site types known to be at risk from livestock, locations that tend to attract livestock, and areas of known or suspected high site density. Larger areas that have seen little or no inventory but that are used for a significant amount of grazing should also be surveyed to identify at-risk sites as well as to establish the cultural resource character of the area.

Detailed Site Recording and Collection: Cultural resource sites are generally documented by recording certain data on specially prepared forms, the "site forms." Many factors can influence what kind of, and the amount of, information that makes it onto a site form. Early site forms often lacked many categories that are today are considered required information. An example of this would be impacts to sites. Most site forms from 30 or 40 years ago did not even include a category or space for noting specific site impacts, and instead may have had only a check box for site condition, "Good," "Fair," or "Poor." The rare comments on specific impacts, if any, would be added in the narrative portion of the site form, and these narratives themselves were often not as detailed as modern procedures require.

In some specific cases, detailed recording or re-recording of a site may be all that is necessary for mitigation. Sites that have been heavily impacted in the past and retain little integrity, for example, may be adequately documented by a thorough recording process and artifact collection and curation. Recording and collection as mitigation

should be reserved for sites where it is apparent that these actions alone will retrieve any scientific information left at that site.

At the very least, detailed recording should be seen as the beginning the documentation process. It is a requirement prior to any collection, testing, or full excavation (see below). And if any reasonable form of scientific monitoring is to be accomplished, a detailed record of the site before the monitoring process begins is a must. Only then can changes in site condition, artifact counts and dispersal patterns, and future impacts be accurately tracked.

Archaeological Testing and Excavation: Archaeological testing of a site refers to test excavations to determine a site's character, depth, cultural affiliation, and eligibility to the National Register. Test excavations are usually restricted in scope and nature, and involve a small number of small test plots or trenches. Testing can provide a host of information without the destruction and cost involved in larger scale excavations, and can often provide the level of information needed to make informed decisions regarding management direction for that site. Testing (and also excavation, see below) can often provide information not just about that specific site, but about other nearby sites in similar settings and apparent cultural affiliation. Thus the testing of one site may provide insight to the management needs of numerous sites. While testing, like excavation, is a destructive process, testing is performed on a scale small enough that the overall integrity of the site is not impaired.

Excavation of cultural resource sites is a destructive process, and once a site has been excavated it cannot be re-assembled and protected. Excavation is generally used in situations where the site is in imminent danger of destruction and some form of data retrieval is necessary, or in situations where important scientific research questions cannot be answered by other, non-destructive means. As a mitigative tool, excavation should be considered a last resort. Excavation can provide a host of scientific information that cannot be had otherwise, but excavation is costly, can be time consuming, and results in the loss of some or all of the cultural resource site. Excavation may well be the only suitable form of mitigation at sites that have been so heavily impacted that other mitigation forms do not seem applicable.

Monitoring: Monitoring is a necessary component of any cultural resource program. Federal archaeologists have in place existing monitoring programs, but these are generally either site-specific, or performed on an as-needed or when-possible basis, and respond to a variety of projects and impacts. This EIS project highlights the need for a more comprehensive inventory and monitoring program designed to identify, quantify, asses, and monitor impacts to cultural resource sites based on livestock use and related factors.

Base line data on the condition of sites is generally collected at the time the site is recorded. However, many older site forms did not adequately address impacts to the sites, and grazing impacts were not always recognized or given much weight among the list of site impacts. Within the past two or three decades this has begun to change as

archaeologists gain a broader understanding of the nature of various impacts, especially those related to grazing. Monitoring will provide base line data where necessary, and will allow tracking of resource condition over time. Monitoring is also included as part of the proposed research component (see below).

As various mitigating measures are proposed and implemented, research monitoring will track the effectiveness of these measures allowing managers to make informed decisions regarding cultural resources.

Research: A major focus of cultural resources and this EIS is a research component directed at a better understanding of grazing related impacts to cultural resources, and the effectiveness of various mitigating measures. A fair amount of research has been accomplished over the past couple of decades into grazing related impacts to cultural resources, but most of these studies have been relatively small in nature and relatively short term. The research proposed here will be of greater scope, covering many site types in a variety of geomorphological settings and soil types. This is proposed as a long term project, to be initiated with the finalization of the EIS and carried through until definitive statements can be made regarding grazing related impacts and cultural resources. This is an ambitious proposal that will result in the most comprehensive study of its kind to date.

Another phase of this proposed research will involve the foraging behavior of cattle. As noted above, there is some indication that cattle will tend to stay within two miles of a water source (GCNRA 1999:22). However, this "sphere of influence" is probably dependent on a series of factors, including variables such as terrain, forage, and weather. This EIS provides the chance to pursue an avenue of research that perhaps has not been addressed before-- the actual movement of cattle across the landscape. By placing GPS tracking devices on cattle, their movements in specific types of terrain and under specific conditions could be tracked. This information would be valuable in predicting livestock movement in relation to cultural resource sites, and would be an important management tool. This proposal should be seriously considered in the research portion of this document.

A third component of this research consists of a cultural resource inventory and monitoring plan directly related to range uses and improvements and will become part of the overall range management program. To date, only about 3% of the EIS area has been comprehensively inventoried for cultural resources. Although this means that certain areas can be well characterized as to their cultural resources, it also leaves vast blank spots on the maps. The generation of detailed livestock utilization maps (see above) can help determine what areas see heavy grazing use, but have seen little or no cultural resource inventory. Future inventory projects could then be focused on areas that would provide the "most bang for the buck."

While inventory provides a first look and recording episode for cultural resource sites, monitoring provides the basic information by which changes to the site can be measured. This portion of the monitoring program will be a research component directed at identifying and investigating the specific agents of livestock related impacts at

archaeological and historic sites (for example: direct impacts from livestock, erosion associated with livestock use, impacts from development of range projects, impacts from maintenance of range improvements, and impacts related to increased accessibility/visitation resulting from range improvements). This will be required to track changes in site condition.

Monitoring will also be necessary to track the effectiveness of different mitigative measures applied to various cultural resource sites, so that management can make more informed decisions in the future as to what forms of mitigation may better apply to various site types. Specific forms will be developed for the monitoring of these sites, detailing information such as what kinds of impacts are present; for example, apparent amount of livestock use (as seen by trailing, cow dung, ground disturbance, etc.), linear meters of stock trails that appear on the site, size and location of areas impacted by livestock, changes in numbers and types of features and artifacts visible, the condition of these features and artifacts.

While inventory and monitoring are not mitigating measures in themselves, they are a vital part of an overall mitigation plan.

A final portion of this research program is the continuation of the collection of local oral histories. Interviews conducted with long-time area residents can address the history of the ranching and livestock industry in the EIS area, and can help describe range conditions and how they have changed over the past several decades. Also included here might be an ethnographic study concerning the local ranching life style; this may be particularly important in that the ranching life style of the past few decades is quickly becoming a thing of the past.

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Appendix 4

Riparian Toolbox
The "Toolbox" Approach to Riparian Site Restoration

Because of the wide range of riparian conditions and site specific problems that need to be addressed in order to help restore riparian areas, a "toolbox" approach has been developed. This approach allows flexibility in determining the best methods to use for each specific site. This toolbox contains a variety of tools that can be used to mitigate problems, help repair broken systems, and allow riparian areas to reach a Properly Functioning Condition.

While certainly not an all-inclusive list of tools available, the following examples of tools and methods can be used in a variety of situations:

Repairing Existing Fencing – Many of the riparian areas that are not meeting standards have existing fencing that needs maintenance in order to continue to exclude livestock.
Repairing Existing Developments – Many riparian areas contain developments such as water lines, collection systems, troughs, and storage. Some of these developments have been poorly maintained over the years and are in disrepair. By performing maintenance on these existing developments, livestock will be pulled away from the riparian areas through the availability of water in troughs.
Installing Float Valves and Overflows on Troughs – Where appropriate, float valves will be installed on troughs to allow unneeded water to remain in the riparian area. In situations where float valves are not feasible because of freezing, overflows can be installed to return unused water to the riparian area.
Install Shut Off Valves on Water Lines – Pipes that collect water from riparian areas could have a shut off valve installed. This valve would allow the collection system to be shut off when it is not needed or when collection needs to be shut off in order to protect the riparian area from dewatering.
Water Gap Fencing – In lotic reaches where livestock impacts are occurring, but where animals still need access to water, water gap fencing may be installed. These are short pieces of fence that usually run perpendicular to the flow of the stream, and only allow animals to access a very short section of the lotic reach. This fencing excludes the animals from the rest of the riparian area.
Moving Water Troughs Away from Riparian Areas – In some cases it is appropriate to install a collection system and a water trough in order to preserve the riparian area itself by providing water for wildlife and livestock offsite. The water can be piped to a location that is out of the riparian area directing the impacts way from the more delicate vegetation of the riparian area.
Eliminating Livestock from Riparian Areas – In order to protect riparian resources, some situations require that livestock be completely eliminated from the riparian area. This can be done through several methods, including fencing the riparian area, pasture closure, allotment suspension, or allotment closure.
Changing Livestock Season of Use – By changing the time of year that livestock are allowed access to a riparian area, impacts can be reduced.

Using Four Inch Stubble Height Standards – By maintaining a four inch stubble height in riparian areas, enough vegetation remains at the end of the grazing period to help guard against erosion of critical soils, to slow and filter runoff, and to prevent riparian plant mortality due to overgrazing.

Reducing Livestock Numbers – By reducing the number of livestock that use a riparian area, impacts can be trimmed down, allowing the area to recover more quickly.

Using Erosion Control Methods – Through the use of check and spreader dams, vegetation, and other flow control methods many of the erosion problems that damage riparian areas such as headcuts, downcutting, entrenchment, and bank erosion can all be improved or eliminated.

Removal of Exotic and Invasive Species – The removal of exotic and invasive species, such as Tamarisk, in riparian areas helps to reduce the uptake of water by these plants and allows more water to remain available for native riparian vegetation.

No Spring Grazing in Back to Back Years – By only allowing livestock to use a riparian area during the growing season every other year, vegetation will recover faster and will have a chance to make seed at least every other year.

Appendix 5

Consistency with County General Plans

Garfield County General Plan *Adopted 13 March 1995* *Amended 26 January 1998 (To incorporate the Grand Staircase-Escalante National Monument Proclamation)*	
CHAPTER 6, PUBLIC LANDS MANAGEMENT ***Planning Assumption #1*** "Historically the livestock, timber and agriculture industries within the county have shaped county custom and culture and made significant contributions to the economic base. These industries continue to play a vital role in the county's lifestyle and economic stability.... *Therefore*, the county deems it critical that: resource management plans provide for range improvements, current grazing on public lands be preserved, county water rights be maintained... "	**DRAFT MMP AMENDMENT/DRAFT EIS** **Consistent** – The "management preferred" alternative specifically provides for the continuation of the livestock industry. To "keep lands suitable for grazing open and productive" was a major planning goal. The draft MMP amendment recognizes the role of the state in managing water rights, and proposes no changes in water rights. Range improvements are proposed under all action alternatives.
Planning Assumption #2 "County wildlife resources are important elements of county's custom and culture... Therefore, the county desires that wildlife resources be comprehensively managed without detriment to county economic interests."	**Consistent** – No changes in wildlife management are proposed. The draft MMP amendment fully supports Utah Division of Wildlife Resources wildlife management goals, and all action alternatives improve wildlife habitat.
Planning Assumption #3 "Over 96 percent of the land within the county is federal or state land. County industries such as agriculture, grazing... depend on these lands and their accompanying resources for economic stability. Therefore, it is in the county's best interest that: • BLM/USFS land management practices encourage economic ecological stability."	**Consistent** – The draft MMP amendment would bring the GSENM into compliance with the Standards for Rangeland Health, which address the ecological stability of rangeland resources (soils, riparian and biotic), while providing for the economic stability of the livestock industry. Changes which impact livestock economics are only proposed when monitoring indicates a loss of ecological function, with the proposed action being designed to restore full functionality.
Policy Statement #7 "Garfield County takes the position that the number of Animal Unit Months (AUMs) allocated within the county should be expanded to the full carrying capacity of the forage resource."	**Consistent** – The alternatives within the EIS are based upon extensive monitoring. Proposed reductions in stocking are tied to monitoring data, and are proposed to protect the forage resource, along with providing restoration of that resource.
Policy Statement (Grand Staircase-Escalante National Monument) #2 "Garfield County endorses management of the monument by the Bureau of Land Management, pursuant to applicable legal authorities, as specific in the proclamation so long as BLM continues to	**Consistent** – All alternatives are proposed consistent with the legal authorities of the BLM. Monitoring and data interpretation were completed consistent with existing BLM Technical References,

follow established procedures and to use balanced multiple use management as the basis of managing the monument."	and Standard Operating Procedures.
Policy Statement (Grand Staircase-Escalante National Monument) #2 "Current policy is that the lands in the monument must remain open for multiple use activities including… grazing, etc." "The County holds that it is critical that all uses be dealt within the management plan."	**Consistent** – Grazing will be continued under all alternatives.
Policy Statement (Grand Staircase-Escalante National Monument) #10 "Garfield County holds that the three year planning process for the monument must involve, in a meaningful way, both the State of Utah and the two counties in which the monument is located."	**Consistent** – Garfield and Kane Counties, along with the State of Utah were members of the interdisciplinary team for this draft EIS.
Policy Statement (Grand Staircase-Escalante National Monument) #12 "The County endorses the position that nothing in the proclamation shall be deemed to affect permits or leases for, or levels of livestock grazing on Federal lands within the monument. Existing grazing uses should continue to be governed by applicable laws and regulations other than the proclamation, as specified in that document." "… it will be essential… that provisions be included in the NMMP which designate livestock grazing and related activities as essential parts of those historic values to be protected by the designation of the monument. The County's position is that there should be no net loss of AUMs due to designation of the monument."	**Consistent** – No changes in livestock management are proposed based upon either the Proclamation or the Monument status of lands within the planning area. All proposed changes are based upon the BLM grazing regulations at 43 CFR 4100, and the other existing authorities under which the BLM operates. All proposed AUM reductions are based upon a failure to achieve Rangeland Health Standards (43 CFR 4180), and proposed actions are consistent with BLM's livestock management on non-NLCS lands.
Kane, Garfield County, and Gateway Communities Joint Grazing and Forage Principles Resolution	
"Be It Further Resolved that livestock grazing be continued and based on the existing preference levels, unless prudent management practices dictate otherwise."	**Consistent** – Livestock grazing will continue unchanged, except where monitoring indicated negative impacts to the range resource.
"Be it Further Resolved that any changes to management of grazing allotments on the Monument be based on peer reviewed scientific management practices and that day to day management be based on joint determination by the permittee and appropriate BLM Resource Area personnel."	**Consistent** – All monitoring, data interpretation, and proposed management changes are consistent with BLM Technical References, which have been peer reviewed by Society for Range Management accredited individuals. The Rangeland Health Indicators used in the analysis were co-authored by the BLM and the NRCS, and have undergone peer review. The Rangeland Health Standards evaluation process used in this analysis has undergone a Technical Team review by BLM and

	academic specialists. Permittees have been involved in data collection, and in proposing alternatives to resolve identified concerns.
"Be it Further Resolved that if any management conflicts arise between Monument management personnel and the BLM area resource and grazing specialists, an expert third party arbiter acceptable to the permittees(s) and the BLM resolve differences in a timely manner."	**Inconsistent** – The Proposed decision will receive ninety days of public comment. The subsequent Final decision is subject to appeal by interested parties, and the proposed plan amendment is subject to protest. "Conflicts" at any stage of this public decision-making process must be resolved consisted with Federal law, and the BLM appeal regulations at 43 CFR 4. Future implementation actions will be coordinated with the County to avoid "management conflicts". Any and all third party information would be considered during future implementation actions.
"Be it Further Resolved that BLM management of the monument shall follow the Presidents Proclamation allowing reasonable and planned maintenance, improvement, restoration, and rehabilitation processes, while enhancing the land and its forage not only forts it value for domestic livestock, but for wildlife and for protection and enhancement of the watershed."	**Consistent -** All action alternatives in the draft EIS include restoration, and rehabilitation proposals to improve the vegetation resource, and thereby to improve the "value" for wildlife, livestock, and watershed protection. Proposed actions are based upon 43 CFR 4120.
"Be if Further Resolved that the BLM must coordinate its management of grazing on the Monument with the grazing policy provisions of the Garfield and Kane County General Plans before any action is taken. Differences or disputes regarding actions between the BLM and the County General Plan shall be mutually resolved before implementation of the federal action or plan."	**Inconsistent -** To the maximum extent practicable, the draft MMP amendment has been coordinated with the Garfield and Kane County General Plans, and other applicable Federal, State and local plans. BLM will continue to work to resolve all "differences and disputes" with all interested parties.
Kane County General Plan Adopted June 22, 1998	
Vision Statement "Federal land managers have recognized that to be most effective, federal land planning must include state and local governments as full partners in the public lands planning process." "The Kane County Commission intends to become a proactive partner in all public lands planning processes which impact the county land base." "*Federal land management planning processes will include Kane County as an active, on-going partner and will be consistent with county goals and policies when not constrained by federal law.*"	**Consistent** – Kane County has been an active participant in the analysis, including membership on the interdisciplinary analysis team, and formal recognition as a collaborator in the planning process.

Environment Goals and Policies "Maintain or improve the primary landscape soil, vegetation and watershed resources in a manner that perpetuates and sustains a diversity of uses while fully supporting the custom, culture, economic stability and viability of Kane County and our individual citizens. Essentially all rangeland use and value is dependent upon maintenance and enhancement of the primary landscape soil and vegetation resource."	**Consistent** – All actions proposed are intended to protect rangeland health while maintaining the sustainability of the livestock industry within the County.
"*Strategies*: 1) Develop a systematic procedure to coordinate all BLM land use inventory, planning and management activities with Kane County…	**Consistent**
2) Develop and implement Allotment Management Plans (AMP's)…	**Consistent** – The allotment specific actions in Appendix 1 meet the regulatory requirements for allotment management planning.
3) Review and adjust grazing stocking levels only in accordance with developed AMPs and/or trend monitoring data based on rangeland studies in accordance with trend monitoring…	**Consistent** – Stocking adjustments are proposed based upon trend, utilization, riparian functionality, and rangeland health indicators. No reductions are proposed which are inconsistent with trend, when used with other monitoring methods.
4) Assure that adjudicated grazing preference held by permittees is authorized according to the governing Federal statutes…	**Consistent**
6) Include within, fire line and site rehabilitation plans native or exotic vegetation capable of supporting watershed function and habitat for wildlife and livestock.	**Consistent** – the draft MMP amendment language specifies when native and non-native seeds can be used in restoration or rehabilitation, and continues the use of non-native seeds when necessary to protect watershed function, consistent with the needs of wildlife and livestock.
7) Develop grazing management plans following wild or prescribed fire…	**Consistent** – the draft MMP amendment provides direction for the management of livestock to protect vegetation and watershed resources after either a natural or introduced fire.
8) Develop and implement an aggressive juniper and shrub abatement and control plan for all sites where invasion is adversely affecting desirable vegetation and or wildlife.	**Consistent** – The modifications of existing MMP language concerning vegetation management are proposed to increase the effectiveness of rangeland restoration projects, including those which restore lands impacted by juniper and woody shrub encroachment.
9) Develop surface disturbance mitigation plans on soils with a high or very high erosion hazard rating within plans for multiple… mechanical range treatments, prescribed fires, range improvements and vegetation manipulation.	**Consistent** - The modifications of existing MMP language concerning vegetation management are proposed to protect soils from erosion, and target highly erosive soils. Mechanical treatments, introduced fire, range improvements, and seedings are proposed to correct identified concerns with erosion.
11) Apply State of Utah approved noxious weed control methods…"	**Consistent** – Required by law, and by BLM policy. Included in the Standard Operating Procedures.

Economic Development (No mention of ranching in this portion of the County Plan, outside of historical discussion of the introduction of livestock and subsequent development of "overgrazing".)	**Consistent** – The preferred alternative will further the economic stability of the County by ensuring the future sustainability of the livestock grazing industry.
Public Lands *Goals and Policies (Range Management)* "Continue to insist that federal land management plans which regulate public lands in Kane County promote the multiple use/sustained yield concepts of public lands use."	**Consistent** – All action alternatives are consistent with multiple use and sustained yield. Monitoring indicates that the "no action" alternative is not consistent with sustained yield, and multiple use conflicts were identified. The "cause for change" behind this proposed MMP amendment is to return livestock management to sustained yield while reducing multiple use conflicts.
"Work closely with federal land managers in the preparation of federal Resource Management Plans."	**Consistent** – The County participate directly in all phases of the analysis process, including the formulation of alternatives and proposed MMP amendment language.
"All federal land management agencies in Kane County should include a full assessment of the social and economic impacts of management actions."	**Consistent** – A full assessment of the economic impacts was included in the analysis, with contributions by the County, a third party academic contractor, and a subcommittee of the Monument Advisory Committee.
"Provide for landscape vegetation maintenance and improvement which will support restoration of suspended AUM's, allocation of continuously available temporary non-renewable use as active preference, and will support continued use and or increased use of State school endowment trust lands."	**Consistent** – All action alternatives provide for the improvement of vegetation. No allotments had "continuously available temporary non-renewable use", and many were unable to use full preference.
Strategies: (Range Management) "2) Implement rangeland improvement programs, including but not limited to; water developments, rangeland restoration, juniper/shrub control, and weed control to achieve forage and livestock grazing as well as other multiple use resource goals.	**Consistent** – Range improvements and vegetative treatments are proposed under all action alternatives
3) Identify and develop off-stream water sources… in all allotments pastures with sensitive riparian areas and in all allotments where improved livestock distribution will result…	**Consistent** – The protection of sensitive riparian areas is proposed in all action alternatives, to include the use of off-stream water sources, and improved livestock distribution.
4) Identify and implement all possible livestock distribution, forage production enhancement and weed control programs before seeking changes in livestock use levels.	**Consistent** – While "all possible" actions have not been assessed, all action alternatives include proposals which improve livestock distribution, vegetation restoration, and noxious/invasive species controls. Livestock stocking level adjustments are proposed where forage use levels indicate negative impacts, such as increased susceptibility to weeds.
5) Identify and initiate reductions in stocking levels, only when monitoring data demonstrates that	**Consistent** – Reductions and/or changes in grazing management are proposed when monitoring

grazing management supported by range improvements and specialized grazing systems, are not supporting basic soils, vegetation and watershed goals.	indicates negative impacts of soils, vegetation, or watershed health. Proposed changes in grazing management include range improvements and revised grazing systems, including rest, and deferred rest rotations.
6) Assure that all grazing management actions and strategies fully consider… potential impacts of such actions on grazing animal production."	**Consistent** – Economic impacts have been assessed and disclosed for all action alternatives.
7) Where monitoring history, actual use or authorizations of TNR demonstrates that supplemental use is continuously available, and can or should be used to improve or protect rangelands… initiate a process to allocate such use to permittees as active preference."	**Consistent** – No incidents of "continuously available" forage as indicated by TNR authorizations, or actual use levels were found. Monitoring did not indicate the perpetual availability of excess forage.
Goals and Policies: (Water Quality) "Meet the requirements for water quality contained in the State of Utah water quality plan… to maintain or improve riparian areas and aquatic habitat that represents a range of variability for functioning condition."	**Consistent** – Compliance with Utah water quality standards was assessed. All action alternative include measures to maintain or improve riparian and aquatic habitat.
Goals and Policies: (Wildlife) "Maintain, improve or mitigate habitat in order to sustain viable and harvestable populations of big game and upland game species as well as wetland/riparian habitat for… a diversity of other game and non-game species."	**Consistent** – All action alternatives include actions design to improve or maintain wildlife habitat, and improve or maintain riparian habitat.
Strategies: (Wildlife) "3) Accelerate the planning, approval and completion of additional water developments, rangeland treatment projects and prescribed burns with objectives for enhancement of big game and other wildlife habitat.	**Consistent** – All action alternative include proposals to improve vegetation management, with intent to improve wildlife habitat in accordance with Utah DWR wildlife management goals.
Actions: Cultural 2) Where sufficient data indicates adverse impacts of multiple uses occurring on a site, establish mitigation measures to reduce impacts and protect and conserve unique cultural and paleontological resources."	**Consistent** –The Cultural Resource Protocol (Appendix 3) establishes mitigation measures to protect cultural sites. No impacts to paleontological resources were disclosed during scoping for this analysis.
Goals and Policies (Woodland Management) "Maintain or improve conifer tree health, vegetation diversity, wildlife and watershed values through active management of conifer forests in Kane County and prevent encroachment of Pinyon-Juniper into these communities"	**Consistent** – The draft MMP amendment language increases vegetation management effectiveness, and proposes active management of woodlands and forests through rehabilitation and restoration.
Actions: (Woodland Management) "1) Plan and implement selective… firewood harvesting programs… to improve forest health.	**Consistent** – Draft MMP amendment language specifically addresses fuelwood harvesting, and maintains or improves the availability of fuelwood

	consistent with vegetation management goals.
2) Plan and implement reclamation of disturbed forest sites.	**Consistent** – Reclamation of disturbed vegetation, including forests, is included in the draft MMP amendment.
4) Plan and implement grazing management strategies designed to enhance conifer forest goals."	**Consistent** – The impacts of grazing management on forest resources was assessed during the analysis process.
Actions: (Recreation) "6) Describe methods of minimizing or mitigating documented use conflicts or damage and define the manner in which each method is expected to accomplish minimization or mitigation."	**Consistent** – Conflicts between livestock and recreation were identified on a site specific basis during the analysis, and actions are proposed in all action alternatives to reduce or remove the conflict. Proposed measures are provided in Appendix 1, on an allotment specific basis.

Appendix 6

Vegetation Desired Plant Community

Vegetation communities (and their associated wildlife species) are in a constant state of flux. While communities develop towards a final mature state (climax), few communities either attain that point, or remain there long. Range scientists classify these progressive states as the early, mid, and late seral stages. Disturbances tend to move communities from later to earlier seral stages. Natural disturbance such as fire, flood, and drought move communities to earlier stages and renew the development cycle. The introduction of human caused disturbances has also influenced natural vegetation community development. Humans can directly manage vegetation to create or preserve a particular community or condition. A healthy landscape would include vegetation communities in different seral stages with varying degrees of disturbance. Typically a mosaic or mixture of early, mid, and late seral stages provides greater vegetation (and animal) diversity and habitat resiliency. Plant communities that are dominated by late seral stage vegetation typically are less diverse, more susceptible to catastrophic events and less able to tolerate change. The Desired Plant Community (DPC) for vegetation resources is the maintenance of a mosaic of early, mid, and late seral stages based on both maintaining the diversity of self sustaining native plant populations and providing for the habitat requirements of native wildlife.

The plant community descriptions in this DPC are based on the best available information. This includes the Utah Range Site Descriptions for major land resource areas 035 Colorado and Green River plateaus (April 1994), Soil Write Up Areas (SWA), and Monument reference areas. The most common range site descriptions in a given cover type (top 75% of area) were evaluated to create a range of cover values for vegetation functional groups. In addition, seral stages within frequently managed cover types were outlined and the percent contribution of each listed. Percentages of plant cover are based on canopy cover and not dry weight.

The vegetation classification is modified from the Utah Gap Analysis Project (Edwards et al. 1995), being merged and modified to match Monument Vegetation Types. These vegetation types have not been extensively verified and the number of acres should be used as a rough guide and not as absolute acreages.

The cover types and the number of acres of each are presented below. The most common cover type is the Pinyon-juniper cover type, occupying approximately 42% of the Monument. Cover types that are present in this table but not addressed in the DPC are water body, developed, and altered or disturbed lands.

Vegetation Cover Types

GSENM Vegetation Class*	Acres	% of Area
Altered or Disturbed Land Cover Types	12,742	0.55
Aspen	426	0.02
Barren Rock Outcrop	617,892	26.65
Blackbrush	269,382	11.62
Desert Shrub	166,882	7.20
Developed	1,010	0.04
Evergreen Forest	646	0.03
Grassland and Meadow	39,310	1.70
Mountain Shrub	271	0.01
Oak Woodland	6,868	0.30
Pinyon-Juniper	966,709	41.69
Ponderosa Pine/Douglas Fir	26,550	1.14
Riparian	11,898	0.51
Sagebrush Grassland	190,668	8.22
Seeding	5,768	0.25
Water Body	1,812	0.08
TOTAL	2,318,833	100

Specific DPC standards by vegetation cover type within the Grand Staircase-Escalante National Monument (Monument) follow.

ASPEN

Aspen plant communities occupy 426 acres (0.02%) of the Monument. Although aspen communities are a relatively minor component of the Monument flora, they are important because of their high species diversity and their value to wildlife. Because of their limited extent and high value, DPC will contain specific goals to maintain the health of these communities.

Quaking aspen is the dominant species in aspen stands and should occupy approximately 20-40% cover in mature stands. Aspen stands on the Monument have shown limited regeneration because of browsing and livestock grazing. To promote the health of these stands, an emphasis will be placed on encouraging recruitment of young age classes. All age classes of aspen should be present and saplings should be protected from excessive browsing by livestock or wildlife. At least 15% of the total aspen cover should be in young age classes such as seedling or sapling. No more than 60% of the total aspen cover should be in older age classes such as mature or decadent. Other species associated with aspen communities include Mountain snowberry, Bigtooth maple, Muttongrass, and Silvery lupine. Exotic and/or invasive species (invasives) often gain a foothold in aspen communities because of the ample soil moisture. Invasives will be controlled and monitored to ensure that they do not out-compete native species.

Treatment Goals:

Treatments that favor the regeneration of young aspen age classes and control invasion by evergreen trees will be encouraged. Treatments will be carefully designed to discourage the introduction or spread of invasive plant species. Treatment of these stands may be necessary if invasion from Pinyon-juniper is occurring. Use of fire to eliminate invading tree species or to stimulate regeneration is a treatment option. Fire should be used only on a small percentage of total aspen cover at any given time in order to mitigate the overall affects to wildlife in this small habitat type. Stands should also be monitored for the presence of disease within aspen. If disease outbreaks threaten these stands, then other treatment options should be considered. Protection of aspen stands with fencing or through reduction in browser/grazer populations will be given priority. Treatments that follow wildfire will contain seed mixes appropriate to the diversity and plant composition of aspen stands on the Monument. Any noxious or invasive weeds will be controlled and closely monitored.

Wildlife Habitat:

Aspen stands, though limited in extent, provide small islands of important habitat. These stands are located within, or adjacent to, sagebrush-grass and Pinyon-juniper dominated landscapes. It is critical to manage existing aspen stands to promote and preserve those mechanisms which provide for natural regeneration and the perpetuation of aspen within its historic extent. Aspen mainly regenerates by way of root sprouting and suckering. Management should allow for the protection of sprouts from grazing and browsing until they reach a height beyond the reach of grazing animals. It is also important to protect the associated trees, shrubs, and herbaceous vegetation within these stands from over utilization as well. Aspen provides important breeding habitat for a number of bird species, including Williamson's sapsucker. Game animals such as deer and elk also use these areas for browsing. Excess browsing by these animals can have the same negative affects to regeneration as livestock and should be monitored closely, especially if elk populates these areas.

Aspen Cover

Functional Group	**Percent Cover Range**	**Common Species**
Trees	20-40	Quaking aspen
Shrubs	10-40	Mountain snowberry, Bigtooth maple, Woods' rose, Big sagebrush
Grasses	10-30	Muttongrass, squirreltail grass, Wiregrass, Douglas' sedge
Forbs	5-20	Silvery lupine, Aspen bluebells, Indian paintbrush,
Biological soil crust	0-20	
Litter	10-40	
Bare Ground	0-10	
Exotics	0-10	

BLACKBRUSH

Blackbrush occupies 269,382 acres (12%) of the Monument. This cover type occurs primarily in the southern portion of the Monument and is interspersed with the barren rock outcrop cover type. Blackbrush occupies the lowest and/or driest portions of the Monument on non-saline soils of old pediment slopes and terraces with petrocalcic horizons or caliche layers. It can have a high degree of species richness but a low amount of replacement when disturbed, particularly after fire. The general objective for blackbrush communities is to protect blackbrush stands from disturbance effects and maintain sufficient native plant cover to protect from invasive weed dominance. Common species in blackbrush communities include blackbrush, galleta grass, and Indian pipeweed.

Treatment Goals:

Treatment of blackbrush stands should be considered on a site specific basis but generally discouraged, particularly if the goal is to shift composition or cover of existing species. Because blackbrush stands are susceptible to invasion by cheat grass and red brome, treatment should be limited unless it targets weed control. Fire should be avoided as a treatment method because it can result in very long recruitment times for blackbrush and can increase invasive weeds into this cover type.

Wildlife Habitat:

Management practices should preserve large contiguous blocks of scrublands for such species as ferruginous hawk, Brewer's sparrow, and sage sparrow. Livestock management schemes should be adopted that reduce the introduction and spread of cheatgrass and other non-native species. Management activities would preserve native shrub, grass, and forb species for birds and prey animals such as rodents and jack rabbits. Where needed, restoration would provide for an increase in understory native grasses and forbs to benefit wildlife habitat characteristics. Concentrated livestock use would be avoided and restoration practices during bird nesting season would not occur.

Blackbrush Cover

Functional Group	**% Cover Range**	**Common species**
Trees	0	
Shrubs	30-60	Blackbrush, Shadscale, Four-wing saltbush, Broom snakeweed
Grasses	15-50	Galleta grass, Indian ricegrass, Sand dropseed, Squirreltail grass
Forbs	5-15	Indian pipeweed, Gooseberry leaf globemallow, Spreading skyrocket, Flat crown wild buckwheat
Biological soil crust	5-30	
Litter	5-25	
Bare ground	20-50	

BARREN ROCK OUTCROP

Barren rock outcrop covers 617,892 acres (27%) in the Monument. This cover type includes a wide range of ecological sites with diverse soils varying from very sandy substrates to an array of thin soil types. Within this cover type are lava fields, rock outcrops, sand, salt flats, and playas that are largely devoid of vegetation. In order to accommodate the variety in vegetation within this cover type, DPC descriptions will be very general. More specific criteria will need to be developed on a site by site basis.

Plant communities of the barren rock outcrop are typically sparsely vegetated, often with less than 10% vegetation cover but occasionally up to 30%. Despite the limited cover, these areas often support many endemic species. Many endemic species in southern Utah are restricted to soils derived from a specific geologic formation and most occur in areas of exposed parent materials similar to the barren rock outcrop type. Therefore, general goals for the cover type should not focus on the percentage of vegetation in each functional group but instead on factors that ensure stability and resiliency of these plant communities. An emphasis should be placed on protecting these communities from exotic plant invasion. Exotic plant cover should comprise no more than 5% of the vegetation cover. Species composition if highly variable but may include Utah juniper, Shrub live oak, Indian ricegrass, and Gooseberry leaf globemallow.

Treatment Goals:
The goal of vegetation treatments should be to promote stability of the plant communities. Treatments that reduce the cover of invasive plant species should be prioritized. Mechanical treatments that shift general vegetation composition and cover will be considered on a site by site basis but will generally be discouraged. Because these sites receive minimal use from livestock due to their lack of forage and water, they have been relatively unaffected by grazing activities. However, recreation may be a disturbance factor and changes in use may be required to achieve DPC for this cover type.

Wildlife Habitat:
Manage habitat for the preservation of shrub species for the benefit of neotropical birds, deer, and small mammals. Land management practices will be adopted to prevent the invasion of exotic plants.

Barren Rock Outcrop Cover

Functional Group	**Percent Cover Range**	**Common Species**
Trees	0-20	Utah juniper, Pinyon pine
Shrubs	5-30	Shrub live oak, Bigelow sagebrush, Dwarf mountain mahogany and Mormon tea
Grasses	5-30	Indian ricegrass, Galleta grass, Sand dropseed, and Squirreltail grass
Forbs	5-10	Gooseberry leaf globemallow, Pale evening primrose, Crescent milkvetch, and Hairy false goldenaster.
Biological soil crust	0-40	
Litter	5-20	
Bare ground	20-60	
Exotics	0-5	

DESERT SHRUB

Desert Shrub communities comprise approximately 166,882 acres (7%) of the Monument. Several different shrub types are contained within this cover type, including Four-wing saltbush, Mat saltbush, and Mormon tea dominated sites. This cover type includes all dry, low elevation shrub types other than sagebrush and blackbrush types. Because of the variability within this cover type, ranges for DPC will appear large and site specific criteria will need to be developed if treatment is planned for a given area.

A primary goal for Desert Shrub communities is site stabilization in respect to soil loss and protection from invasive weeds. Many of the soils in this cover type are sandy in nature and susceptible to soil loss if adequate cover is not maintained. Perennial grasses are an important component in maintaining site stability and should constitute at least 20% or greater canopy cover. Shrub cover is somewhat variable depending on soil type but should be at least 10% canopy cover. Forbs should be at least 5% and tree cover is generally absent. Common species that occur in the desert shrub cover type are Four-wing saltbush, Indian ricegrass, and White-margined swertia.

Treatment Goals:

Treatment emphasis would be to reduce the proliferation of invasive annual plant species and improve soil functioning. Treatment that encourages native plant species cover and reduces soil erosion would be prioritized. Treatments that promote perennial grass and shrub cover would be the focus of restoration efforts.

Wildlife Habitat:

These areas are important habitat for neotropical birds, rodents, reptiles, rabbits, and occasional use by deer. Livestock management should result in the preservation of large blocks of shrub communities with a representative mix of native grasses and forbs in the understory. Concentrated livestock use should be avoided during bird breeding season. Natural water sources are critical to wildlife in these dry habitats and should be protected from damaging use by livestock. Some areas of desert shrub may be suitable for future establishment of pronghorn antelope populations which would depend upon a forb component in the shrub community. Pronghorn need patches of mature shrubs to use as cover during fawning. During the winter, their diet almost exclusively consists of browse species, especially sagebrush. A management objective should be the prevention or eradication of invasive plant species which compete with more desirable native species important for wildlife uses.

Desert Shrub Cover

Functional Group	% Cover Range	Common species
Trees	0	
Shrubs	20-50	Four-wing saltbush, Mormon tea, Winterfat, Mat saltbush
Grasses	20-40	Indian ricegrass, Galleta grass, Sand dropseed, Sandhill muhly
Forbs	5-10	White-margined swertia, Pale evening primrose, Desert trumpet, Fine leaf wooly white
Biological soil crust	0-20	
Litter	5-20	
Bare ground	20-50	

EVERGREEN FOREST

The Evergreen Forest community accounts for 646 acres (0.03%) in the Monument. This uncommon plant community typically occurs in mesic sites on steep lower slopes with northern aspects or in narrow canyons and ravines. Because of the inaccessibility, few impacts have affected this community type. Protection and maintenance of spruce-fir communities is the goal of the DPC for the type. Tree cover is variable but should range from 30-60%. A variety of age classes will be present with young age classes such as seedling and sapling representing at least 15% of the total tree cover. Understory species are site specific but should be dominated by native cool season grasses and forbs typical of more mesic sites. Common species of the Evergreen Forest plant community include White fir, Bigtooth maple, Mountain lover, and Fendler's meadow rue.

Treatment Goals:
Evergreen forests should not be targeted for treatment unless burned by fire, damaged by insects, or invaded by exotic species. Treatments should focus on restoring the native species assemblages and controlling noxious and invasive weed species. Treatments should avoid ground disturbing activities that would allow invasive species to become established.

Wildlife Habitat:
To provide and maintain habitats for wildlife species which use this community, it is important to manage for a multi-age structure of both evergreen and deciduous tree species. An important component is the understory which provides for nuts and fruits for both mammals and birds. Riparian areas are critical to the needs of all wildlife species and should be carefully managed for good to excellent ecologic condition.

Evergreen Forest Cover

Functional Group	**Percent Cover Range**	**Common Species**
Trees	30-60	White fir, Engelmann spruce
Shrubs	10-40	Bigtooth maple, Mountain lover, Creeping mahonia, Gambel's oak
Grasses	5-30	Mutton Grass, Slimstem Reed Grass, June Grass
Forbs	5-10	Fendler's meadow rue, starry false solomon's seal, Red alumroot
Biological soil crust	0-20	
Litter	10-50	
Bare ground	10-40	
Exotics	0-5	

GRASSLAND AND MEADOW

Grassland and Meadow plant communities occupy approximately 39,310 acres (2%) within the Monument. Management of this cover type will focus on maintenance or development of perennial grass dominated communities with minimal shrub or invasive components. Grassland communities in good ecological condition should be dominated by perennial bunchgrasses with sod forming grasses as subdominants. Grass canopy cover should be maintained at or increased to at least 25%. Shrub cover would remain low (less than 15%) to reduce competition with grass and forb species. Forbs would be maintained at or increased to at least 5% canopy cover. Common species of this cover type may include Basin big sagebrush, Sand dropseed, Indian ricegrass, and Gooseberry leaf globemallow.

Treatment Goals:

Treatment objectives will focus on restoring natural disturbance regimes and increasing native grass and forb cover. Grasslands would also be managed to prevent or reduce the proliferation of non-indigenous annual plants such as cheat grass and Russian thistle. Changes in livestock management may be used to favor perennial bunchgrasses over sod forming bunchgrasses. In areas that require treatment because of natural disturbance such as fire or as a result of invasive species, an emphasis should be placed on seeding with native perennial bunchgrasses that are highly competitive with cheatgrass and other weedy species. Treatment of grassland and meadow communities should also focus on diversity of growth forms to ensure resiliency. This may be achieved through seeding an array of species with differing yet complementary above and below ground structures.

Wildlife Habitat:

This cover type provides valuable habitat for a variety of wildlife species. Habitat is provided for the nesting and foraging of neotropical birds, rodents and other small mammals which provide a prey base for raptors and carnivores, and for pronghorn antelope. It is important to manage for the health and production of native perennial grasses and forbs as dominants and native shrubs as sub-dominants in this vegetation type. The maintenance of a standing cover crop following grazing is important to maintaining insect production for birds and cover for mammals, as well as providing nesting opportunities. Vegetation heights of 15-30 inches should be available within the vegetation mosaic in order to provide forage and fawn security areas for pronghorn. Forbs are of particular importance during pronghorn reproductive periods. Maximum forb production should be a management objective, along with the control or elimination of noxious and non-native plants. Restoration activities need to be scheduled during the non-breeding season, or limited in extent to cause little disruption to these processes.

Grassland and Meadow Cover

Functional Group	% Cover Range	Common species
Trees	0	Utah juniper may invade this site
Shrubs	5-15	Basin big sagebrush, Rubber rabbitbrush, Winterfat, Four-wing saltbush
Grasses	25-50	Sand dropseed, Indian ricegrass, Needle and thread grass, Blue grama
Forbs	5-10	Gooseberry leaf globemallow, Larkspur, Golden aster, Tufted evening primrose
Biological soil crust	5-20	
Litter	10-30	
Bare ground	10-40	
Exotics	0-5	

MOUNTAIN SHRUB

Mountain shrub communities occupy approximately 271 acres (0.01%) of the Monument. This plant community is relatively scarce, occurring on open rocky sites on foothill slopes or valley bottoms. Because most sites on the Monument are in good condition, maintenance of the health of these communities is the focus of mountain shrub DPC. Most of the dominant species of mountain shrub communities are adapted to fire and will resprout. Therefore, natural fire cycles should be restored in areas where this plant community is found and fire suppression activities discouraged. Vegetation cover ranges and species assemblages for mountain shrub communities are variable depending on substrate and the amount of snow accumulation. Generally, shrub cover should range from 20-50% with tree cover no more than 15%. Grasses should range from 10-30% and forbs should range from 5-15%. Common species found in the mountain shrub communities include Ponderosa Pine, Utah serviceberry, Muttongrass, and Lobeleaf grounsel.

Treatment Goals:
Treatments that favor the persistence of shrub cover and exclusion of tree species will be favored with an emphasis on restoring the natural fire frequency. Treatments should encourage the establishment and maintenance of native grass and forb understory species. Ground disturbing treatments will be avoided to prevent the spread of noxious and invasive weed species.

Wildlife Habitat:
The general and treatment goals described above will adequately address habitat requirements for those species using this very limited cover type on the Monument. Species needs described under ponderosa pine, Pinyon-juniper, and sagebrush grasslands would also be applied here.

Mountain Shrub Cover

Functional Group	Percent Cover Range	Common Species
Trees	0-15	Ponderosa Pine, Douglas-fir, Utah juniper, Pinyon pine
Shrubs	20-50	Utah serviceberry, Mountain snowberry, Cliffrose, Greenleaf manzanita
Grasses	10-30	Muttongrass, Sandberg's bluegrass, Needle-and-thread grass, junegrass,
Forbs	5-10	Lobeleaf grounsel, Phlox, Scarlet gilia, Arrowleaf balsam root
Biological soil crust	5-20	
Litter	5-20	
Bare ground	20-50	
Exotics	0-5	

OAK WOODLAND

Oak woodland comprises 6,868 acres (0.3%) of the Monument. Within the Monument, oak woodland is relatively stable and seral stage percentages were not developed. Emphasis will be placed on promoting vigorous and productive stands of Gambel's oak within the oak woodland cover type. Healthy, diverse oak woodland communities would consist of a mosaic of several seral stages. In general oak woodland would be composed of a variety of different height structures and age classes, with a thriving complement of native grasses, forbs, and shrubs. Tree cover should be not more than 20%, shrub cover at least 10%, and grasses should occupy at least 15%. Forbs should achieve approximately 5% cover. Common species within the oak woodland cover type include Utah juniper, Gambel's Oak, Indian ricegrass, and Wright's birdbeak. More specific criteria will be established if a given area is selected for treatment or more fine scale management.

Treatment Goals:

Treatment in oak woodland vegetation communities would focus on maintenance of existing stands and protecting the community from juniper invasion. Treatment priority areas would be where juniper canopy cover exceeds 35%, perennial grasses and forbs are less than 10%, and bare ground exceeds 70%. Fire may be used as a management tool to encourage sprouting of oak stands and to decrease canopy cover of juniper and pinyon. Fire will not be used when there is potential for invasion of non native plant species, particularly cheat grass.

Wildlife Habitat:

Although small in extent, oak woodlands provide important habitat elements for a number of wildlife species. Land management activities should encourage the preservation, health, and vitality of oak woodlands where present. Oak woodlands provide an important wildlife food resource in the form of mast production (acorns) for small mammals, black bear, and turkey. Activities that result in oak sprouting can be employed to stimulate decadent stands. Invasion by Pinyon-juniper and non-native plants should be prevented or eradicated.

Oak Woodland Cover

Functional Group	Percent Cover Range	Common Species
Trees	5-20	Utah juniper, Pinyon pine
Shrubs	10-50	Gambel's oak, Shrub live oak, Utah serviceberry, and Mormon tea
Grasses	15-30	Indian ricegrass, Galleta grass, Sand dropseed, and Needle-and-thread grass
Forbs	5-15	Wright's birdbeak, Gooseberry leaf globemallow, Wooly milkvetch, and Sand wild buckwheat
Biological soil crust	5-30	
Litter	10-20	
Bare ground	30-60	
Exotics	0-5	

PINYON-JUNIPER

Pinyon–juniper woodlands comprise approximately 966,709 acres (42%) of the Monument. Because of the large extent of this cover type and the amount of natural variability, DPC will be very general in nature with an emphasis placed on maintaining diversity within the Pinyon–juniper cover type. Healthy, diverse woodland communities would consist of a mosaic of several seral stages. The mosaic would be comprised of Early (5%), Middle (25%), Late (25%), and Old (35%) seral stages with differing amounts of grass, forb, shrub, and tree cover in each. In general the seral stages would be composed of a variety of different height structures and age classes, with a thriving understory community of native grasses, forbs, and shrubs. Early seral stage communities would be composed primarily of native forbs and grasses with low tree and shrub cover. Middle seral stage communities would have increased dominance of shrub species with low to moderate densities of juniper and pinyon. Shrubs would be primarily in the young to mature age classes with little decadence. Tree canopies would be open with crowns that do not touch. The overall structure to the middle seral stage would be savanna in nature. Late seral stage communities would have an increase in shrub decadence, higher densities and later age classes of pinyon and juniper, touching tree crowns, and a decrease in the cover of understory grasses and forbs. Old seral stage communities would have an increase in the age of pinyon and juniper and a continued decrease in the understory of shrubs, grasses, and forbs. Common species within the Pinyon-juniper cover type include Utah juniper, Pinyon Pine, Utah serviceberry, Mexican cliffrose, Indian ricegrass, and Utah firecracker. Many Pinyon-juniper communities have changed from cool season grass dominated to warm season grass dominated. Late spring grazing has often facilitated this shift. Grazing strategies and restoration treatments would favor the establishment and maintenance of cool season grasses. Targets for each of the functional groups will reflect likely scenarios for each seral stage. More specific criteria will be established if a given area is selected for treatment or more fine scale management.

Treatment Goals:

Treatment objectives in the Pinyon-juniper vegetation communities would focus on restoring the natural disturbance regime, increasing vegetation ground cover of native grasses, forbs, and shrubs, and removing non-native invasive species. Cool season native grasses would be increased to more traditional levels. Treatments would favor a balance in age class distribution of shrub species, with no single age class dominant. Individual old growth trees would be maintained and protected during treatment implementation. Treatment priority areas would occur where juniper canopy cover exceeds 30%, perennial grasses and forbs are less than 10%, and bare ground exceeds 50%. Other areas will be treated as needed to fulfill mosaic objectives across the Monument.

Wildlife Habitat:

Stands of Pinyon-juniper would be managed for a balance between tree, shrub and perennial grass cover to support pinyon jay and mule deer. This mosaic would include stands of old growth Pinyon-juniper to support juniper titmouse; large openings of grasses, forbs and shrubs to support mule deer and provide foraging habitat for raptors such as sharpshin, goshawk, ferruginous hawk, Coopers hawk, American kestrel, and red tail hawk; and areas of sparse to dense tree canopy cover to support pinyon jay. Management should focus on maintaining habitat qualities for neotropical bird conservation. Management activities would ensure the potential grass and forb cover percentages in order to provide for healthy prey populations for raptors. Herbicides would be avoided in areas used by nesting neotropical birds, such as black-throated gray warblers, gray vireo, and Virginia's warbler. Treatments would provide for mosaic patterns of various age classes of Pinyon-juniper stands with various percent compositions of tree, shrub, and grass/forb species within the landscape. The use of control burns until after the nesting and fledging season would be limited. Grazing should be managed to maintain shrub and grass components. Grazing should be managed during the nesting period so as not to negatively impact neotropical breeding success.

Pinyon - Juniper Seral Stages and Cover

Seral Stage	Early Grass-Forb	Middle Grass/Forb/Shrub/Young PJ	Late Decadent shrub with PJ, decrease in understory	Old Old growth character, limited understory
Percent of Cover Type	5-15	15-30	30-40	30-40
Trees	0-5	5-10	10-25	25-50
Shrubs	0-30	30-60	25-45	15-30
Grasses	20-40	15-30	10-25	5-15
Forbs	5-20	5-10	5-10	0-5
Biological soil crust	5-20	5-30	5-25	5-20
Litter	5-25	5-20	5-15	5-10
Bare ground	20-40	30-60	40-60	40-70
Exotics	5-10	0-5	0-5	0-5

Common Species in Pinyon - Juniper Cover

Functional Group	**Common Species**
Trees	Utah juniper, Pinyon pine
Shrubs	Utah serviceberry, Mexican cliffrose, Big sagebrush, Torrey jointfir, Roundleaf buffaloberry
Grasses	Indian ricegrass, Galleta grass, Needle-and-thread grass, Sand dropseed, Threeawn
Forbs	Wright's birdbeak, Horned spurge, Wooly milkvetch, Scarlet globemallow, Utah firecracker

PONDEROSA PINE/DOUGLAS-FIR

Ponderosa/Douglas-fir woodlands comprise approximately 26,550 acres (1.14%) of the Monument. Though a relatively minor component, the Ponderosa pine/Douglas fir cover type is an important, diverse, and desirable vegetation element. Vegetation of this cover type is relatively stable and seral stage percentages were not developed, however stress should be placed on promoting viable and productive stands of Ponderosa Pine and Douglas-fir within their respective ecological niches. Healthy, diverse communities would consist of a mosaic of several seral stages. In general this cover type would be composed of a variety of different height structures and age classes, with a viable complement of native grasses, forbs, and shrubs. Common species include Ponderosa pine, Douglas-fir, Manzanita, Mutton grass, and Wallflower.

Treatment Goals:
Treatment objectives in the Ponderosa Pine/Douglas fir vegetation communities would focus on restoring the natural disturbance regime, increasing vegetation ground cover of native grasses, forbs, and shrubs, and removing invasive species. An emphasis would be placed on maintaining and protecting new seedlings and individual old growth trees during any treatment implementation. Treatments should focus on promoting a savanna-like understory composed of species adapted to the acidic soils produced by the abundant needle debris.

Wildlife Habitat:
Management practices should preserve large trees for such species as raptors and Lewis's woodpecker in order to provide perches, nesting, and foraging opportunities. Snags should be maintained. Livestock use should be managed to maintain understory vegetation for the benefit of prey species for raptors and insect production for neotropical birds. Management activities should provide for conifer recruitment and a diverse understory of shrub, grass, and forb species. Prescribed burns could be used to open canopies that are closed and to rejuvenate forest floor habitats components.

Ponderosa Pine Cover

Functional Group	% Cover Range	Common species
Trees	10-35	Ponderosa Pine, Douglas Fir, Rocky Mt. juniper, Pinon pine
Shrubs	5-40	Serviceberry, Manzanita, Snowberry, Bitterbrush, Mt. Mahogany
Grasses	1-2	Indian ricegrass, Squirreltail, Mutton Grass, Needle-and-thread grass
Forbs	1-5	Yarrow, Aster, Groundsel, Wallflower
Biological soil crust	5-15	
Litter	5-60	
Bare ground	10-30	

RIPARIAN

Riparian cover types occupy 11,898 acres (0.50%) of the Monument. Riparian areas would consist of a diversity of vertical and horizontal structures, vegetation age classes, and native species. Tree canopy would vary on site potential but may be up to 25%. Native shrub cover should be at least 10% and may be the dominant life form in many situations. Grass cover should be at least 40% and forbs may range from 5-10%. Ecological functions and processes would be intact with plant species composition and cover appropriate to the site. All riparian areas would be managed for proper functioning condition. Where possible, contiguous flowing water and associated riparian plant species composition and cover and would be provided by Lotic (river) systems. Availability of surface water at seeps and springs would be appropriate for the soil type, climate, and landform and would support a diverse population of native plant and wildlife species. Species assemblages in this cover type are variable based upon seasonality of water but may include Fremont's cottonwood, Coyote willow, Scratchgrass, and Yellow monkeyflower.

Treatment Goals:

The focus of treatment activities in riparian communities would be to reduce or eliminate non-native species, especially Tamarisk and Russian olive, and restore proper amounts of willows and cottonwood. A focus should be placed on maintaining or restoring proper soil function, stabilizing banks, and retaining enough water in the system (at least 50% of natural flows) to maintain riparian vegetation.

Wildlife Goals:

The majority of wildlife species on the Colorado Plateau are dependent for at least part of their life cycle on riparian habitats for purposes of foraging, cover, reproduction, or water. Many birds of prey and neotropical migrants are heavily dependent upon riparian habitats. These birds include: peregrine falcon, prairie falcon, yellow-billed cuckoo, common yellowthroat, blue grosbeak, broad-tailed hummingbird, Lucy's warbler, southwest willow flycatcher, and owl species, including the Mexican spotted owl. Many classes of mammals as well as amphibians, such as woodhouse's toad, red-spotted toad, and northern leopard frog, and several reptiles are highly dependent upon streams, seeps, and springs. Management practices within riparian areas should encourage the recruitment of woody deciduous species in order to provide for multiple age classes. Well vegetated banks comprised of sedges, rushes, and other aquatic plants are important for habitat qualities and bank stability. Clean water quality is important to maintain. Seasonal restrictions may be necessary in order to provide for successful nesting of some critical bird species, such as southwest willow flycatcher and Mexican spotted owl. A mosaic of various canopy closures should be provided for those species that need dense cover. Spring sources should be protected from negative impacts in order to protect water quality and vegetative features, as well as provide unimpaired access by wildlife.

Riparian Cover

Functional Group	% Cover Range	Common species
Trees	0-25	Fremont's cottonwood, Narrowleaf cottonwood, River Birch, Box elder
Shrubs	10-40	Coyote willow, Yellow willow, Western virgin's bower, Greasewood
Grasses	40-60	Scratch grass, Inland salt grass, Wiregrass, Olney's threesquare
Forbs	5-15	Louisiana wormwood, Yellow monkeyflower, Silver leaf milkvetch, Slender seepweed.
Biological soil crust	0-20	
Litter	10-30	
Bare ground	0-20	

SAGEBRUSH GRASSLAND

Sagebrush-Grassland comprises approximately 190,668 acres (8%) of the Monument. Sagebrush grasslands typically replace desert shrub communities in areas of higher elevation and precipitation. Several types of sagebrush communities may exist depending on whether the dominant species of sagebrush is Basin big sagebrush, Wyoming big sagebrush, Black sagebrush, or Sand sagebrush. Some generalities in plant community structure can be made for the purpose of DPC. Sagebrush (primarily *Artemesia tridentata*) communities would consist of a healthy, diverse mosaic of different height and age structures with a thriving community of native grasses and forbs. Several seral stages comprised of Early (5%), Middle (40%), Late (25%), and Old (30%) classifications include stands of young and old sagebrush, openings (ranging to short or sparse vegetation to high density grasslands) and interspersed shrub and savannah habitats with differing amounts of grass, forb, shrub, and tree cover in each. Sagebrush grassland communities would be managed for no net loss (long-term or permanent removal from the landscape). A no net loss objective would not preclude restoration, rehabilitation, or related management actions. Native grass and forb cover would be maintained or increased in balance with open to moderate (5 to 25%) shrub canopy cover and within ecological site potential. Perennial grass components would be maintained or increased at or above 30%, with cool season grasses comprising at least 50% of the grass component. Native forb composition would be maintained at or above 5%. Common species that occur in the sagebrush grassland include Utah juniper, Big sagebrush, Indian ricegrass, and globemallow In general the seral stages would be composed of a variety of age classes, with a thriving and viable community of native grasses, forbs, and shrubs.

Treatment Goals:
Treatment objectives in sagebrush grassland communities would focus on restoring natural disturbance processes, increasing vegetation ground cover of native grasses and forbs, removing invasive non-native plants, and restoring soil and hydrological function. Sagebrush grassland stands that exhibit a high amount (40-60%) of shrub decadence would be targeted for restoration activities. Fragmentation of sagebrush habitat would be held to less than 50% of the treatment area.

Wildlife Habitat:
Existing stands of sagebrush (primarily *A. tridentata*) would be managed for a balance between shrub and perennial grass cover, for open to moderate shrub canopy cover (5-25%) and multiple height classes. This mosaic would include young, sparse stands to support vesper sparrows and lark sparrows, and older, dense stands to benefit Brewer's sparrows, sage sparrows, black-throated sparrows, gray flycatchers, and sage thrashers. Shrub habitats would be maintained with small, grassy openings to support long-billed curlews, and burrowing owls. Large, continuous blocks ($\geq$300 acres) of unfragmented sagebrush habitat would be maintained, including mosaics of open to moderate shrub canopy cover (5-25%) and multiple age and height classes to benefit sage-dependent species. Openings of short vegetation surrounded by sagebrush would be maintained for ground foraging by sage thrashers, loggerhead shrikes, Brewer's sparrows, and sage sparrows. Openings of short vegetation (5-20 cm; 2-8 in) with wide visibility would be maintained to provide breeding habitat for long-billed curlew and burrowing owls. For sage grouse habitats, create an age mosaic of sagebrush. Encourage the production of forb species and restrict grazing activities around leks and brood rearing areas. Guidelines for sage grouse habitat will be followed on a site specific basis when treatments are proposed.

The percent cover expected in each type of sagebrush community varies widely. Nontheless, broad cover categories can be generalized. In sagebrush grasslands, grass cover should range between 30-60%.

Sagebrush-Grassland Seral Stages and Cover

Seral Stage	Early Grass-Forb	Middle Grass/Forb/Shrub/Young PJ	Late Decadent shrub with PJ, decrease in understory	Old Old growth character, limited understory
Percent of Cover Type	5-15	15-30	30-40	30-40
Trees	0	5-10	10-20	25-50
Shrubs	0-25	25-45	45-60	15-45
Grasses	10-25	10-20	5-20	0-10
Forbs	5-20	5-15	5-10	0-5
Biological soil crust	0-10	5-25	5-25	5-25
Litter	5-25	5-25	5-20	5-15
Bare ground	30-40	30-40	40-60	40-70
Exotics	5-15	0-5	5-10	5-10

Common Species in Sagebrush Grassland Cover

Functional Group	**Common species**
Trees	Utah juniper, Pinyon pine
Shrubs	Big sagebrush, Bigelow sagebrush, Sand sage, Mormon tea, Winterfat, Four-wing saltbrush, Small rabbitbrush, Rubber rabbitbrush, Broom snakeweed
Grasses	Indian ricegrass, Needle-and-thread grass, Sand dropseed, Mutton grass, Galleta, Blue grama, Squirreltail grass
Forbs	Globemallow, Bird's beak, Cryptantha, Swertia, Buckwheat

SEEDINGS

Areas of vegetation manipulation or "seedings" comprise approximately 5,768 acres (0.25%) of the Monument. The majority of these areas were formerly sagebrush grassland or Pinyon–juniper vegetation types that were converted to grasslands containing both native and non-native desirable grasses. Though a relatively minor component of BLM administered lands in this area, these seedings provide a valued forage base for livestock and wildlife throughout the Monument. Most of these seedings were established under cooperative agreement with grazing permittees. In order for these seedings to function according to cooperative agreements, an emphasis should be placed on maintaining grass cover. Grass cover should be maintained or increased to at least 20% cover. Forbs should contribute approximately 5% and shrubs should be at least 15%.

Treatment Goals:
Treatment objectives in "seeding" vegetation communities would focus on restoring them to production levels consistent with established cooperative agreements, increasing the vegetation ground cover of desirable grasses, forbs, and shrubs, and removing invasive species. An emphasis will be placed on treating areas damaged or lost due to drought, those where special status species are a concern and also those that have exceeded their life expectancy. Treatment objectives will be determined on a site specific basis and adhere to criteria established in the Monument Plan.

Wildlife Habitat:
These seedings comprise rangeland treatments in sagebrush-grassland and Pinyon-juniper vegetation types. As such, they are adjacent to or surrounded by these native landscapes. As a consequence of this, those wildlife species found in these types would normally be represented, in part, within these areas. These seedings are generally in close proximity to water developments which also tend to concentrate game animals and certain neotropical birds in these seedings. Many of these seedings replaced the formal native plant community with non-native grass species that are lacking in those habitat structural qualities needed by wildlife that are represented in the native vegetation community. Many of these seedings have subsequently been invaded by noxious weeds and non-native invasive species, further degrading the area's value for wildlife.

In order to restore or maintain those habitat qualities important to upland game and neotropical bird species that use these seedings, it is desirable to manage for structure in the vegetation community. Seedings should have a mixture of native shrubs, grasses, and forbs which would represent the species composition percentages of the original plant community. This may involve restoration activities comprised of re-seeding the area and/or applying treatments to control or eradicate noxious and invasive weed species. Timing and intensity of livestock grazing should be done in order to accommodate the forage, nesting, and breeding needs of wildlife, especially shrub and ground nesting birds.

Seeding Cover

Functional Group	% Cover Range	Common species
Trees	0-5	Utah juniper, Pinyon pine
Shrubs	15-30	Four-wing saltbush, Winterfat, Bitterbrush, Big sagebrush
Grasses	20-50	Crested wheatgrass, Western wheatgrass, Russian wildrye, Indian ricegrass, Squirrel tail, Mutton grass, Needle-and-thread grass
Forbs	5-10	Globemallow
Biological soil crust	14	
Litter	10-25	
Bare ground	10-30	

Appendix 7

Relinquishment Policy

Upon receipt of a voluntary relinquishment, the following actions would be taken in accordance with current grazing regulations and current BLM policy (See http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2007/im_2007-067__.html)

1. Coordinate with the permittee regarding alternatives to relinquishment and make changes to the existing permit as appropriate.

2. Upon receipt of a properly executed letter of relinquishment:

   Determine if Rangeland Health Standards are being met on the allotment.

   If Standards **are not** being met, then administrative actions may be made to either adjust the management of permitted livestock or if the allotment is not suitable for livestock grazing, then a Land Use Plan Amendment may be made to allocate the forage to uses other than livestock grazing.

   If Standards **are** being met, then one or more of the following actions would take place:

   1. Issue a grazing permit to a different applicant
   2. Stock with livestock from another allotment with unmet resource objectives.
   3. Combine with another adjacent allotment that has unmet resource objectives.
   4. Continue livestock grazing on the allotment but not recognize an individual with the preference to the forage (forage reserve).
   5. Amend or revise the Land Use Plan, allocating acquired livestock grazing capacity to other resource needs.

APPENDIX 8

RANGELAND HEALTH:
FUNDAMENTALS AND STANDARDS, ASSESSMENT AND EVALUATION

Introduction

In America's West, rangelands are the dominant landscape. Sometimes overlooked and under-appreciated, rangelands contribute significantly to the quality of life of residents and visitors alike. BLM's 200 million + acres of rangeland have long been valued for livestock grazing and mining, but rangelands now are also prized for their recreation opportunities, wildlife habitats, watershed, cultural values, and scenery.

During the western migration of the mid and late 1800s, rangelands attracted settlers who wanted to build a new life of ranching, farming, business, and mining. As settlement continued, competition for land and water intensified. Land was put to uses that were not sustainable over the long term, and insufficient thought was given to future needs.

With time, competing interests have changed and intensified. Over the past 125 years, significant public values have been placed at risk. Irreplaceable topsoil has been lost, habitats are diminished, and clean water supplies are coming into question. A new focus is emerging from this continuing uncertainty, one that looks at sustainability of ecosystems rather than production of commodities. The land itself is in jeopardy, and the variety of products and values that this land has produced may not be sustained for future generations of Americans unless ecosystems are healthy and productive.

It is time for a change, and BLM is changing to meet the challenge. BLM is now giving management priority to maintaining functioning ecosystems. This simply means that the needs of the land and its living and nonliving components (soil, air, water, flora, and fauna) are to be considered first. Only when ecosystems are functioning properly can the consumptive, economic, political, and spiritual needs of man be attained in a sustainable way. To achieve these ends, BLM has developed the following Fundamentals of Rangeland Health and their companion rules-Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah.

Fundamentals of Rangeland Health

As provided by regulations, developed by the Secretary of the Interior on February 22, 1995, the following conditions must exist on BLM Lands:

(a) Watersheds are in, or making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity, and timing and duration of flow.

(b) Ecological processes, including the hydrologic cycle, nutrient cycle, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.

(c) Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving established BLM management objectives such as meeting wildlife needs.

(d) Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Federal candidate, other special status species, native species, and for economically valuable game species and livestock.

Standards for Rangeland Health

Standard 1. Upland soils exhibit permeability and infiltration rates that sustain or improve site productivity, considering the soil type, climate, and landform.

As indicated by:

a) Sufficient cover and litter to protect the soil surface from excessive water and wind erosion, promote infiltration, detain surface flow, and retard soil moisture loss by evaporation.

b) The absence of indicators of excessive erosion such as rills, soil pedestals, and actively eroding gullies.

c) The appropriate amount, type, and distribution of vegetation reflecting the presence of (1) the Desired Plant Community [DPC], where identified in a land use plan conforming to these Standards, or (2) where the DPC is not identified, a community that equally sustains the desired level of productivity and properly functioning ecological processes.

Standard 2. Riparian and wetland areas are in properly functioning condition. Stream channel morphology and functions are appropriate to soil type, climate and landform.

As indicated by:

a) Streambank vegetation consisting of, or showing a trend toward, species with root masses capable of withstanding high streamflow events, vegetative cover adequate to protect stream banks and dissipate streamflow energy associated with high-water flows, protect against accelerated erosion, capture sediment, and provide for groundwater recharge.

b) Vegetation reflecting: Desired Plant Community, maintenance of riparian and wetland soil moisture characteristics, diverse age structure and composition, high

vigor, large woody debris when site potential allows, and providing food, cover and other habitat needs for dependent animal species.

c) Re-vegetating point bars, lateral stream movement associated with natural sinuosity, channel width, depth, pool frequency and roughness appropriate to landscape position.

d) Active floodplain.

Standard 3. Desired species, including native, threatened, endangered, and special-status species, are maintained at a level appropriate for the site and species involved.

As indicated by:

a) Frequency, diversity, density, age classes, and productivity of desired native species necessary to ensure reproductive capability and survival.

b) Habitats connected at a level to enhance species survival.

c) Native species reoccupy habitat niches and voids caused by disturbances unless management objectives call for introduction or maintenance of non-native species.

d) Habitats for threatened, endangered, and special-status species managed to provide for recovery and move species toward de-listing.

e) Appropriate amount, type, and distribution of vegetation reflecting the presence of (1) the Desired Plant Community [DPC], where identified in a land use plan conforming to these Standards, or (2) where the DPC is identified, a community that equally sustains the desired level of productivity and properly functioning ecological processes.

Standard 4. BLM will apply and comply with water quality standards established by the State of Utah (R.317-2) and the Federal Clean Water and Safe Drinking Water Acts. Activities on BLM lands will fully support the designated beneficial uses described in the Utah Water Quality Standards (R.317-2) for surface and groundwater. 1

As indicated by:

a) Measurement of nutrient loads, total dissolved solids, chemical constituents, fecal coliform, water temperature and other water quality parameters.

b) Macro-invertebrate communities that indicate water quality meets aquatic objectives.

Appendix 9

Sensitive Wildlife Species List

The following table is a compilation of Utah's Federally (US F&WS) Listed Threatened (T), Endangered (E), and Candidate (C) wildlife species.

This list has been prepared pursuant to Utah Division of Wildlife Resources Administrative Rule R657-48. By rule, wildlife species that are federally listed, candidates for federal listing, or for which a conservation agreement is in place automatically qualify for the *Utah Sensitive Species List.*

Utah's Federally (US F&WS) Listed Threatened (T), Endangered (E), and Candidate (C) Plant Species					
Common Name	**Scientific Name**	**Status**	**Garfield**	**Kane**	**Within Planning Area?**
BIRDS					
California Condor	*Gymnogyps californianus*	E experimental		X	K
Mexican Spotted Owl	*Strix occidentalis lucida*	T	X	X	K
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E	X	X	K
Yellow-billed Cuckoo	*Coccyzus americanus*	C	X	X	P
FISH					
Bonytail	*Gila elegans*	E	X	X	
Bluehead Sucker	*Catostomus discobolus*	CS	X	X	
Bonneville Cutthroat Trout	*Oncorhynchus clarki utah*	CS	X	X	
Colorado Pikeminnow	*Ptychocheilus lucius*	E	X	X	
Colorado River Cutthroat Trout	*Oncorhynchus clarki pleuriticus*	CS	X		
Flannelmouth Sucker	*Catostomus latipinnis*	CS	X	X	P
Humpback Chub	*Gila cypha*	E	X	X	P
Razorback Sucker	*Xyrauchen texanus*	E	X	X	P
Roundtail Chub	*Gila robusta*	CS	X	X	P
INSECTS					
Coral Pink Sand Dunes Tiger Beetle	*Cicindela limbata albissima*	E		X	
MAMMALS					
Utah Prairie-dog	*Cynomys parvidens*	T	X	X	
MOLLUSKS					
Kanab Ambersnail	*Oxyloma kanabense*	E		X	
PLANTS					
Aquarius Indian Paintbrush	*Castilleja aquariensis*	C	X		

Utah's Federally (US F&WS) Listed Threatened (T), Endangered (E), and Candidate (C) Plant Species					
Common Name	**Scientific Name**	**Status**	**Garfield**	**Kane**	**Within Planning Area?**
Autumn Buttercup	*Ranunculus aestivalis*	E	X		
Jones'Cycladenia	*Cycladenia humilis var jonesii*	T		X	K
Kodachrome Bladderpod	*Lesquerella tumulosa*	E		X	K
Maguire Daisy	*Erigeron maguirei*	T	X		
Navajo Sedge	*Care specuicola*	T		X	P
Siler Pincushion Cactus	*Pediocactus sileri*	T		X	P
Ute Ladies'-tresses	*Spiranthes diluvialis*	T	X		
Welsh's Milkweed	*Asclepias welshii*	T		X	

DEFINITIONS

C	A taxon for which the U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threats to justify it being a "candidate" for listing as endangered or threatened.
CS	Species receiving special management under a Conservation Agreement in order to preclude the need for Federal listing.
E	A taxon that is listed by the U.S. Fish and Wildlife Service as "endangered" with the possibility of worldwide extinction.
E Experimental	An "endangered" taxon that is considered by the U.S. Fish and Wildlife Service to be "experimental and non-essential" in its designated use areas in Utah.
E, T, or C Extirpated	An "endangered," "threatened," or "candidate" taxon that is "extirpated" and considered by the U.S. Fish and Wildlife Service to no longer occur in Utah.
K	Known to exist within the planning area.
P	Potential to exist within the planning area.
E or T Proposed	A taxon "proposed" to be listed as "endangered" or "threatened" by the U.S. Fish and Wildlife Service.
T	A taxon that is listed by the U.S. Fish and Wildlife Service as "threatened" with becoming endangered.

The BLM of Utah has adopted the "wildlife species of concern," *Utah Sensitive Species List* for all non-plant species. The BLM of Utah has a separate list for sensitive plants. Utah BLM flora and fauna identified as BLM Sensitive are given the (BS) designation in the status column.

Utah BLM's Sensitive (BS) Wildlife Species				
Common Name	**Scientific Name**	**Status**	**Garfield**	**Kane**
AMPHBIANS				
Arizona Toad	*Bufo microscaphus*	BS	X	X
Western (Boreal) Toad	*Bufo boreas*	BS	X	X
BIRDS				
American White Pelican	*Pelecanus erythrorhynchos*	BS		X
Burrowing Owl	*Athene cunicularia*	BS	X	X
Ferruginous Hawk	*Buteo regalis*	BS	X	X
Greater Sage-grouse	*Centrocercus urophasianus*	BS	X	X
Lewis's Woodpecker	*Melanerpes lewis*	BS	X	X
Long-billed Curlew	*Numenius americanus*	BS	X	X
Northern Goshawk	*Accipiter gentilis*	BS	X	X
Short-eared Owl	*Asio flammeus*	BS	X	
Three-toed Woodpecker	*Picoides tridactylus*	BS	X	X
Bald eagle	*Haliaeetus leucocephalus*	BS	X	X
FISH				
Desert Sucker	*Catostomus clarki*	BS		X
Leatherside Chub	*Gila copei*	BS	X	
INSECTS				
MAMMALS				
Allen's Big-eared Bat	*Idionycteris phyllotis*	BS	X	X
Big Free-tailed Bat	*Nyctinomops macrotis*	BS		X
Fringed Myotis	*Myotis thysanodes*	BS	X	X
Kit Fox	*Vulpes macrotis*	BS	X	X
Pygmy Rabbit	*Brachylagus idahoensis*	BS	X	
Spotted Bat	*Euderma maculatum*	BS	X	X
Townsend's Big-eared Bat	*Corynorhinus townsendii*	BS	X	X
MOLLUSKS				
Black Canyon Pyrg	*Pyrgulopsis plicata*	BS	X	
Utah Physa	*Physella utahensis*	BS	X	
PLANTS				
Alcove Bog-Orchid	*Habenaria zothecina*	BS	X	
Atwood's Pretty Phacelia	*Phacelia pulchella* var. *atwoodii*	BS		X
Cataract Gilia	*Gilia latifolia* var. *imperialis*	BS	X	X
Cedar Breaks Goldenbush	*Haplopappus zionis*	BS	X	X
Chinle Chia	*Salvia columbariae var. argillacea*	BS		X
Claron pepperplant	*Lepidium montanum* var. *claronense*	BS	X	X

Utah BLM's Sensitive (BS) Wildlife Species				
Common Name	**Scientific Name**	**Status**	**Garfield**	**Kane**
Cronquist's Buckwheat	*Eriogonum corymbosum* var. *cronquistii*	BS	X	
Cronquist's Phacelia	*Phacelia cronquistiana*	BS		X
Cutler's Lupine	*Lupinus caudatus* var. *cutleri*	BS		X
Escarpment Milkvetch	*Astragalus striatiflorus*	BS		X
Gumbo Milkvetch	*Astragalus ampullarius*	BS		X
Hole-in-the-Rock Prairie-clover	*Dalea flavescens* var. *epica*	BS	X	
Kanab Thelypody	*Thelypodiopsis ambigua* var. *erecta*	BS		X
Kane Breadroot	*Pediomelum epipsilum*	BS		X
Lori's Columbine	*Aquilegia loriae*	BS		X
Murdock's Evening Primrose	*Oenothera murdockii*	BS		X
Paria Breadroot	*Pediomelum pariense*	BS		X
Paria Iris	*Iris pariensis*	BS	X	
Pinnate Spring-parsley	*Cymopterus beckii*	BS	X	
Sandloving Penstemon	*Penstemon ammophilus*	BS	X	X
Smokey Mountain Mallow	Sphaeralcea fumariensi	BS		X
Tropic Goldeneye	*Viguiera soliceps*	BS		X
Utah Spurge	*Euphorbia nephradenia*	BS	X	X
Zion Jamesia	*Jamesia americana* var. *zionis*	BS		X
REPTILES				
Common Chuckwalla	*Sauromalus ater*	BS	X	X
Desert Night Lizard	*Xantusia vigilis*	BS	X	X

DEFINITIONS

BS	BLM sensitive species. See IM-97-118, UT2001-081, and UT 2003-027.

The BLM of Utah has adopted the "wildlife species of concern," *Utah Sensitive Species List* for all non-plant species. The BLM of Utah has a separate list for sensitive plants. Utah BLM flora and fauna identified as BLM Sensitive are given the (BS) designation in the status column.

Utah BLM's Sensitive (BS) Wildlife Species				
Common Name	**Scientific Name**	**Status**	**Garfield**	**Kane**
AMPHBIANS				
Arizona Toad	*Bufo microscaphus*	BS	X	X
Western (Boreal) Toad	*Bufo boreas*	BS	X	X
BIRDS				
American White Pelican	*Pelecanus erythrorhynchos*	BS		X
Burrowing Owl	*Athene cunicularia*	BS	X	X
Ferruginous Hawk	*Buteo regalis*	BS	X	X
Greater Sage-grouse	*Centrocercus urophasianus*	BS	X	X
Lewis's Woodpecker	*Melanerpes lewis*	BS	X	X
Long-billed Curlew	*Numenius americanus*	BS	X	X
Northern Goshawk	*Accipiter gentilis*	BS	X	X
Short-eared Owl	*Asio flammeus*	BS	X	
Three-toed Woodpecker	*Picoides tridactylus*	BS	X	X
FISH				
Desert Sucker	*Catostomus clarki*	BS		X
Leatherside Chub	*Gila copei*	BS	X	
MAMMALS				
Allen's Big-eared Bat	*Idionycteris phyllotis*	BS	X	X
Big Free-tailed Bat	*Nyctinomops macrotis*	BS		X
Fringed Myotis	*Myotis thysanodes*	BS	X	X
Kit Fox	*Vulpes macrotis*	BS	X	X
Pygmy Rabbit	*Brachylagus idahoensis*	BS	X	
Spotted Bat	*Euderma maculatum*	BS	X	X
Townsend's Big-eared Bat	*Corynorhinus townsendii*	BS	X	X
MOLLUSKS				
Black Canyon Pyrg	*Pyrgulopsis plicata*	BS	X	
Utah Physa	*Physella utahensis*	BS	X	
PLANTS				
Alcove Bog-Orchid	*Habenaria zothecina*	BS	X	
Atwood's Pretty Phacelia	*Phacelia pulchella* var. *atwoodii*	BS		X
Cataract Gilia	*Gilia latifolia* var. *imperialis*	BS	X	X
Cedar Breaks Goldenbush	*Haplopappus zionis*	BS	X	X
Chinle Chia	*Salvia columbariae var. argillacea*	BS		X
Claron pepperplant	*Lepidium montanum* var. *claronense*	BS	X	X
Cronquist's Buckwheat	*Eriogonum corymbosum* var. *cronquistii*	BS	X	
Cronquist's Phacelia	*Phacelia cronquistiana*	BS		X

Utah BLM's Sensitive (BS) Wildlife Species				
Common Name	**Scientific Name**	**Status**	**Garfield**	**Kane**
Cutler's Lupine	*Lupinus caudatus* var. *cutleri*	BS		X
Escarpment Milkvetch	*Astragalus striatiflorus*	BS		X
Gumbo Milkvetch	*Astragalus ampullarius*	BS		X
Hole-in-the-Rock Prairie-clover	*Dalea flavescens* var. *epica*	BS	X	
Kanab Thelypody	*Thelypodiopsis ambigua* var. *erecta*	BS		X
Kane Breadroot	*Pediomelum epipsilum*	BS		X
Lori's Columbine	*Aquilegia loriae*	BS		X
Murdock's Evening Primrose	*Oenothera murdockii*	BS		X
Paria Breadroot	*Pediomelum pariense*	BS		X
Paria Iris	*Iris pariensis*	BS	X	
Pinnate Spring-parsley	*Cymopterus beckii*	BS	X	
Sandloving Penstemon	*Penstemon ammophilus*	BS	X	X
Smokey Mountain Mallow	Sphaeralcea fumariensi	BS		X
Tropic Goldeneye	*Viguiera soliceps*	BS		X
Utah Spurge	*Euphorbia nephradenia*	BS	X	X
Zion Jamesia	*Jamesia americana* var. *zionis*	BS		X
REPTILES				
Common Chuckwalla	*Sauromalus ater*	BS	X	X
Desert Night Lizard	*Xantusia vigilis*	BS	X	X

Appendix 10

Standard Operating Procedures

The Standard Operating Procedures, which also could be considered Best Management Practices, listed below provide an administrative framework for resource management. SOPs are not Land Use Plan decisions or allocations. They are listed to give the public and public lands users basic information on how resource uses will be managed. Specific decisions on resource use and land use allocations are included in the alternatives and/or Management Common to All Alternatives.

GUIDELINES FOR GRAZING MANAGEMENT

(from Standards and Guidelines for Healthy Rangelands, BLM, Utah 1997; GSENM MMP (2000) decisions which provide additional guidance are in italics)

1. Grazing management practices will be implemented that:

a) Maintain sufficient residual vegetation and litter on both upland and riparian sites to protect the soil from wind and water erosion and support ecological functions;

b) Promote attainment or maintenance of proper functioning condition riparian/wetland areas, appropriate stream channel morphology, desired soil permeability and infiltration, and appropriate soil conditions and kinds and amounts of plants and animals to support the hydrologic cycle, nutrient cycle, and energy flow.

c) Meet the physiological requirements of desired plants and facilitate reproduction and maintenance of desired plants to the extent natural conditions allow;

d) Maintain viable and diverse populations of plants and animals appropriate for the site;

e) Provide or improve, within the limits of site potentials, habitat for Threatened or Endangered Species;

f) Avoid grazing management conflicts with other species that have the potential of becoming protected or special status species;

g) Encourage innovation, experimentation and the ultimate development of alternatives to improve rangeland management practices;

h) Give priority to rangeland improvement projects and land treatments that offer the best opportunity for achieving the Standards.

2. Any spring or seep developments will be designed and constructed to protect ecological process and functions and improve livestock and wildlife distribution.

3. New rangeland projects for grazing will be constructed in a manner consistent with the Standards. Considering economic circumstances and site limitations, existing rangeland projects and facilities that conflict with the achievement or maintenance of the Standards will be relocated and/or modified.

4. Livestock salt blocks and other nutritional supplements will be located away from riparian/wetland areas or other permanently located, or other natural water sources. It is recommended that the locations of these supplements be moved every year.

5. The use and perpetuation of native species will be emphasized. (See Vegetative Management in Chapter 2, Management Common To All Alternatives for additional guidance.)

6. When rangeland manipulations are necessary, the best management practices, including biological processes, fire and intensive grazing, will be utilized prior to the use of chemical or mechanical manipulations.

7. When establishing grazing practices and rangeland improvements, the quality of the outdoor recreation experience is to be considered. Aesthetic and scenic values, water, campsites and opportunities for solitude are among those considerations.

8. Feeding of hay and other harvested forage (which does not refer to miscellaneous salt, protein, and other supplements) for the purpose of substituting for inadequate natural forage will not be conducted on BLM lands other than in (a) emergency situations where no other resource exists and animal survival is in jeopardy, or (b) situations where the Authorized Officer determines such a practice will assist in meeting a Standard or attaining a management objective.

9. In order to eliminate, minimize, or limit the spread of noxious weeds, (a) only hay cubes, hay pellets, or certified weed-free hay will be fed on BLM lands, and (b) reasonable adjustments in grazing methods, methods of transport, and animal husbandry practices will be applied.

10. To avoid contamination of water sources and inadvertent damage to non-target species, aerial application of pesticides will not be allowed within 100 feet of a riparian/wetland area unless the product is registered for such use by the EPA.

11. On rangelands where a standard is not being met, and conditions are moving toward meeting the standard, grazing may be allowed to continue. On lands where a standard is not being met, conditions are not improving toward meeting the standard or other management objectives, and livestock grazing is deemed responsible, administrative

action with regard to livestock will be taken by the Authorized Officer pursuant to CFR 4180.2(c).

12. Where it can be determined that more than one kind of grazing animal is responsible for failure to achieve a Standard, and adjustments in management are required, those adjustments will be made to each kind of animal, based on interagency cooperation as needed, in proportion to their degree of responsibility.

13. Rangelands that have been burned, reseeded or otherwise treated to alter vegetative composition will be closed to livestock grazing as follows: (1) burned rangelands, whether by wildfire or prescribed burning, will be ungrazed for a minimum of one complete growing season following the burn; and (2) rangelands that have been reseeded or otherwise chemically or mechanically treated will be ungrazed for a minimum of two complete growing seasons. *GSENM MMP RM-3 indicates that the closure period may exceed two years.*

14. Conversions in kind of livestock (such as from sheep to cattle) will be analyzed in light of Rangeland Health Standards. Where such conversions are not adverse to achieving a Standard, or they are not in conflict with BLM land use plans, the conversion will be allowed. *GSENM MMP GRAZ-1 prohibits conversion from cows and horses to domestic sheep within nine (9) miles of bighorn sheep habitat.*

GUIDELINES FOR RESOURCE MANAGEMENT AND MONITORING

15. Incorporated by reference GSENM Monument Management Plan, MMP Decisions and Appendix 2, Standard Procedures for Surface disturbing Projects and Proposals, Feb. 2000. Monitoring activities will be conducted following BLM protocol and direction in accordance with approved Handbooks, Technical References, and other appropriate Federal and State guidelines. These materials are available to the public on the internet and BLM offices.

16. Monitoring studies designed to measure the results of livestock management are essential to measure progress toward meeting management objectives and making necessary changes over time. They are also essential in assuring compliance with the Utah Standards and Guidelines for Healthy Rangelands. These studies, including utilization and trend, will monitor directly or indirectly the soils, ecosystem components and habitat and biota standards and associated indicators identified in the Standards and Guidelines.

17. Key species monitoring, including frequency and canopy cover, will be used to determine vegetative trends and assess soil stability and achievement of desired plant community objectives. In order to provide better estimate of productivity and rangeland capabilities, particularly within allotments not meeting Standards, monitoring will include periodic clip-and-weigh studies to estimate forage availability and provide a correlation with utilization and trend data and actual grazing use reported by the

permittees. Rangeland Health Assessments will be repeated when frequency and cover data indicate a change in trend has occurred.

18. Forage utilization and riparian stubble height measurements will be a standard part of rangeland monitoring. As a general guideline, forage utilization of the current year's growth should not exceed 50 % and riparian areas should maintain a residual stubble height of four (4) inches. Where these guidelines are found to be exceeded, or the allotment is not in an upward trend, riparian areas are not meeting proper functioning condition and/or Rangeland Health Standards are not being met, lower utilization levels may be implemented and adjustments to authorized grazing levels, pasture rotations, season of use and/or permit terms and conditions may be required. Where resource management goals support higher levels of forage utilization to reduce undesirable species and assist in achieving the desired future vegetative conditions, forage utilization exceeding 50 % may be allowed. In these cases the desired amount of forage utilization would be determined in advance and intensive monitoring conducted to avoid undesirable impacts.

19. Climatic data, seasonal and annual precipitation and temperature, will be analyzed and correlated to the trend, condition, utilization and actual use data to evaluate the overall management and attainment of objectives.

RANGELAND IMPROVEMENT STANDARDS

20. Where appropriate spring sources should be fenced to protect riparian vegetation and the water source from trampling. Sufficient water will be left at the source for vegetative, wildlife and recreational requirements, where appropriate. Spring development design will accommodate wildlife needs so that livestock and wildlife will not have direct competition on site. Livestock waters should be piped off-site to avoid concentrating use around the water source.

21. All water collection and storage structures will accommodate use by birds and all classes of terrestrial animals including the installation of escape ladders.

22. Water developments should be designed and built to blend into the natural background features of the surrounding landscape.

23. The impacts of new water improvements on surrounding lands will be monitored for degradation of resource conditions (see MMP WAT-1). If degradation is occurring the improvement will be redesigned or removed. An effort will be made to place new improvements near existing access routes so that new routes will not be necessary. Hauling water will be considered as an option where the need for new water sources is identified.

24. Fence design standards will be in accordance with BLM Handbook H-1741-1, technical references and other appropriate BLM guidelines. All fences will be designed to assure a minimum of impacts to wildlife (including considerations for wildlife

passage), recreation and visual resources. All fences will have appropriate hiker/equestrian/pack stock gates installed. New or reconstructed livestock fences in pronghorn antelope habitat would meet specifications adopted by BLM.

25. Where fences limit access to riparian reaches (streams), water gaps will be provided as appropriate. However, "ribbon" fencing of long stretches of riparian reaches will be considered a method of last resort in addressing riparian issues and restoring areas to Proper Functioning Condition.

GUIDELINES FOR SOILS MANAGEMENT

26. Construct waterbars, lead out ditches, or rolling dips on sloping two tracks and roads.

27. Lead out ditches and waterbars should not be constructed in such a manner as to divert runoff into stream courses.

28. Designate stream and draw crossings to protect the banks from erosion during ground disturbing activities where drainages and stream courses (wet or dry) are crossed.

29. Where fire has removed the surface litter component to the degree that would initiate erosion, emergency fire rehabilitation actions will be initiated to stabilize soils.

GRAZING PERMIT – TERMS AND CONDITIONS

30. With considerations for adverse weather and soil conditions, livestock trailing should be completed at a minimum of 10 miles per day and done as a herd rather than allowing the drift of individual animals.

31. Actual use reports are required and submitted for every allotment in order to correlate monitoring data with use data.

Appendix 11

Rangeland Health Assessment and Evaluation Process, Meeting or Not Meeting Standards

Assessment Process Overview

The Rangeland Health Assessment was conducted in accordance with the protocol for Interpreting Indicators of Rangeland Health, version 3 (Technical Reference 1734-6, 2000). Assessments conducted in 1999 were done under an earlier version and reviewed for conformance with version 3.

The assessments utilized 18 qualitative indicators that evaluate soil and site stability, hydrologic function and biotic integrity. In version 3 of the protocol, 17 indicators are mandatory. The 18th indicator, biological crust, is an optional indicator that was included due to the widespread occurrence of crust in the study area.

Assessments were conducted on soil mapping units or ecological survey areas defined by NRCS Site Write Ups with a target of cumulatively representing 75% of the geographic area of each pasture of each grazing allotment. One to several assessments were conducted within each pasture depending on its degree of homogeneity. Additional areas above the 75% level were included at the discretion of the assessment team (e.g., seedings, loamy bottom sites, reference areas) if they were areas frequently used by livestock.

Assessments were conducted by interdisciplinary teams, representing at least two of three areas of expertise: livestock management (usually the range management specialist responsible for the allotment), soils, and vegetation. Grazing permittees were invited to accompany BLM on assessments and to participate in staff training on the protocols.

Approximately 630 upland assessments have been completed. In addition, riparian assessments have been completed on 500 seeps, springs, and stream reaches. These also employed interdisciplinary teams and standard agency protocols.

Evaluating whether Standards 1 and 3 are being met

Utilizing the Attribute Summaries for "Departure from Ecological Site Description/Ecological Reference Area" for Soil/Site Stability and Biotic Integrity prepared in the Assessment Evaluation process (Technical Reference 1734-6, App. 1), and reviewing existing additional data such as trend and utilization, an evaluation was made as to whether or not areas were meeting Standards based on the following criteria:

> Attribute Summary Departure for Soil/Site Stability and/or Biotic Integrity was either "None to Slight" (5) or "Slight to Moderate" (4)
>
> Area was found to be meeting Standard(s).

Attribute Summary Departure for Soil/Site Stability and/or Biotic Integrity was "Extreme" (1)

Area was found to not be meeting Standard(s).

Attribute Summary Departure for Soil/Site Stability and/or Biotic Integrity was "moderate to extreme" departure (2) and other summary indicators rated greater than (2)

Area was found to not be meeting Standard(s) unless there was evidence to the contrary

Attribute Summary Departure for Soil/Site Stability and/or Biotic Integrity was "Moderate" (3).

Summary indicator ratings were 3, 4 or 5, area was found to be meeting Standard(s).

Evaluating whether Standard 2 is being met

Utilizing Utah's Standards for Rangeland Health, riparian sites were assessed using the Properly Functioning Condition (PFC) assessment process. As part of these assessments photo points and other historic data were used to assess trend.

Site was evaluated as meeting Standard 2 if rated as either:

Proper Functioning Condition, or

Functioning-At-Risk with an upward trend, or

Functioning-At-Risk with no apparent/static trend, or

Site was evaluated as not meeting Standard 2 if rated as either:

Functioning-At-Risk with a downward trend, or

Not Functioning.

Evaluating whether Standard 4 is being met

Utilizing Utah's Standards for Rangeland Health, water quality was evaluated using standards set forth by the Utah Division of Water Quality. Long term water quality monitoring data as well as single sample data was used in this determination.

Allotments were evaluated as meeting Standard 4 if water sources tested either within the allotment or downstream from the allotment, but still representative of that allotment's water quality, were within Utah water quality standards.

Allotments were evaluated as not meeting Standard 4 if water sources tested either within the allotment or downstream from the allotment, but still representative of that allotment's water quality, did not meet Utah water quality standards.

For each allotment that failed Standard 4, an explanation is given as to the reason that water quality was an issue (see individual allotment write-ups in Appendix 1). In most cases, water quality was highly dependent on area soils and geology and non-attainment of Standard 4 was caused by factors outside the control of management.

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