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Environmental Assessment

Naturita Division Rangeland Analysis

Norwood Ranger District, Uncompahgre National Forest
San Miguel County, CO.

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Chapter 1: Introduction

DOCUMENT ORGANIZATION

This Environmental Assessment (EA) documents the analysis of the potential environmental effects resulting from a proposal to re-issue four livestock grazing permits all with new allotment management plans (AMP's). In compliance with the National Environmental Policy Act (NEPA), the Environmental Assessment addresses the direct, indirect, and cumulative environmental impacts that may result from implementation of the Proposed Action or its alternative.

The information contained in this EA will allow the District Ranger to make an informed decision about how best to meet the stated purpose and need for action. The decision will be documented in a Decision Notice when the environmental review process is completed.

- Chapter 1: This chapter provides an overview of the legal and administrative parameters including the purpose and need for action. It also documents the public involvement process used to identify issues, concerns, and opportunities associated with the Proposed Action. The comments from public scoping were used in the formulation of alternatives.

- Chapter 2: This chapter describes the alternatives considered for meeting the project purpose and need. It includes comparison of alternatives to aid in decision-making. The No Grazing Alternative provides a baseline for evaluation and comparison of the other alternatives that follow.

- Chapter 3: This chapter describes the current environmental condition and effects of implementing the proposed action and other alternatives. Selected environmental and social aspects affected by the proposed action organize the chapter. Resource discussions address the following components: (1) existing condition, and (2) direct, indirect, and cumulative effects.

- Chapter 4: This chapter provides a list of persons and agencies contacted during the development of this environmental assessment. References are also included in this chapter.

- Chapter 5: This chapter provides various maps referenced throughout this Environmental Analysis.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Norwood Ranger District Office in Norwood, Colorado.

ANALYSIS AREA

The Naturita Division Range Allotment Analysis Area is located on the Norwood Ranger District, on the Uncompahgre National Forest, in San Miguel County, Colorado. The Analysis Area is all contained within an isolated tract containing about 26,145 total acres of National Forest System Land. This area is situated just south of the Town of Norwood, Colorado and north of Miramonte Reservoir, between the San Miguel River and Uncompahgre Plateau to the North and the San Juan Mountain Range to the South.

Extensive private land development is occurring along the North and East boundaries of the Naturita Division. Many private parcels have been broken and subdivided. It is expected this trend will continue and may possibly extend along the southern boundary of the National Forest.

The Analysis Area currently consists of four active cow/calf allotments – East Naturita, West Naturita, Cy Orr, and Portis. See Vicinity Map (Exhibit 1-A) in appendix A-1 for the Analysis Area. Currently, 470 cow/calf pair (1612 Head Months or 2127 Animal Unit Months) are authorized to graze in the Analysis Area. All are authorized under Term Grazing Permits, which include only public National Forest System Lands.

Within this Analysis Area, 19,826 acres of "Suitable" rangeland exist (i.e., encompassing both suitable and capable rangeland). "Capable" rangeland is accessible to livestock, produces forage or has inherent forage-producing capabilities, and can be grazed on a sustained basis under reasonable management practices. Suitable rangeland is land determined to be appropriate for use by livestock – that is, there are no decisions (including specifically the Forest Plan) that preclude use by livestock. There are many areas that currently provide forage, that absent disturbances, will eventually succeed to closed-canopy forest limited foraging opportunities in the future. These areas are associated with timber harvest and stand replacing fire.

BACKGROUND

A project-level analysis evaluating the site-specific impacts of livestock grazing activity, in conformance with the National Environmental Policy Act (NEPA), is required in order to authorize livestock grazing on specific allotments. Site-specific analysis will provide appropriate prescriptions for livestock management and rangeland resources, and ensure that these prescriptions will move toward or meet desired rangeland resource objectives.

Prior to 1995, controversy existed over whether there was any need to consider a grazing permit as a Federal action requiring review under the NEPA as well as the adequacy of the progress toward getting allotment NEPA decisions completed. To resolve the issue,

Congress included language in the Rescission Act of Fiscal Year 2005 (Public Law 104-19, Section 504), which requires the Forest Service to identify all allotments, on which NEPA analysis is needed, and to prepare and adhere to a schedule for conducting an assessment of grazing actions under NEPA.
Allotment Management Plans direct livestock grazing management practices. They are updated by conducting an environmental analysis of the impacts of grazing and associated activities. Section 504(b) and (c) allows the Forest Service to issue expired and waived permits on allotments listed on the schedule, but have not gone through a NEPA analysis, as long as the terms and conditions of the permit are not changed. In a reply to Congress, the Forest Service established a fifteen-year schedule for completion of this work.

Grazing actions on public land must be viewed as an on-going action. To understand the context of grazing activity today, one must have an appreciation of the history of grazing in the West. Prior to the 1930's grazing on public land was unregulated until Congress enacted laws, which required grazers to own a local home ranch to qualify for a permit to graze. The Granger-Thye Act of 1950: P.L. 81-478 (April 24, 1950) established the direction for National Forest System allotment management, including the authorization to issue grazing permits for terms up to 10 years; authorization to use grazing fee receipts for rangeland improvement; and the establishment of grazing advisory boards. Also, requirements, including base property and commensurability, were designated by statute to ensure economic stability to local communities, but and to foster stewardship toward the public land resources and to mange the rangelands for sustainability. This period of unregulated grazing resulted in adverse environmental consequences such as soil loss, plant community change, and watershed modifications that appear in many of the rangelands throughout the west and can be seen today in parts of the project area. Some of these impacts, such as the incapacity of sites to naturally restore native vegetation communities, must be clearly recognized and understood to ensure that unrealistic expectations for management are not part of the action alternatives.

This assessment of vegetation and watershed conditions takes into account the historic level of use that occurred on these allotments prior to the establishment of management and control of livestock numbers with the enactment of the Granger-Thye Act of 1950. The purpose of both the Granger-Thye Act for the Forest Service and Taylor Grazing Act for the Bureau of Land Management was to establish controls and stewardship creating a linkage of the use of public land to an established private landowner who would bring stability to the community and bring these lands into a sustainable level of production for both forage and wildlife habitat.

FOREST PLAN CONFORMANCE

The Land and Resource Management Plan provides guidance for management on the Uncompahgre National Forest. Livestock grazing has been determined in the Forest Plan to be an appropriate use of the project area, based in part on the Forest Plan Suitability determination.

This environmental analysis was prepared and is consistent under the current Grand Mesa, Uncompahgre, and Gunnison Land and Resource Management Plan (Forest Plan). In addition, to prepare for the new Forest Plan revision that is considered to be in the final stages of completion, this document conforms to the new plan's strategic and aspirational emphasis. Both the current and new Forest Plans are managed for a particular emphasis area such as a theme in the current plan or management area in the new revision. Each management area in both Forest Plans have a description of the physical setting for the areas, a description of the desired conditions for the area, and in the current plan only, a list of standards and guidelines that apply to the area. The new Forest Plan instead, puts extra emphasis on the desired future condition of the forest.

An interdisciplinary review of applicable laws and regulations was conducted. Conformance to these laws and regulations were documented and can be found in the project file. This is a requirement of the ISO 14001 Environmental Management System (EMS), which was implemented on June 1st 2006. More information about EMS can be found on the Grand Mesa, Uncompahgre, and Gunnison National Forest Website.

PURPOSE AND NEED FOR ACTION

Purpose

The purpose of this Environmental Analysis is to determine whether to allow livestock grazing to continue to be permitted on all, on parts, or on none of the project area. Furthermore, if the decision is to continue, this analysis will determine what management will be applied so as to meet or progress toward achieving desired rangeland resource conditions as outlined in the analysis. Moreover, this analysis will define the timeframes to achieve the desired resource conditions to the extent that livestock grazing is the key-limiting factor.

Need

The site-specific need for the proposed action is based on knowing that a change in management needs to occur. This need for a change in management is identified by comparing what currently exists on the landscape in the project area to specific descriptions of what should exist across the project area. Essentially, comparing what is present to what is wanted. Some specific items within the project area have been identified to not be meeting or moving towards desired future conditions within acceptable timeframes. Desired future conditions and their timeframes for implementation are criteria established by the Forest Plan, regulation such as the National Forest Management Act, and Memorandums of Understanding (MOU's) such as the Gunnison Sage Grouse Range Wide Conservation Plan. These documents and others were used in conjunction with site inventories to determine if management goals were being achieved. Allotment-specific disparities that we have identified are:

West Naturita Allotment

Burn Canyon Wildfire Areas:

- There is apparent mortality to planted tree seedlings caused by livestock trampling.

- Current grazing strategies do not allow for widespread distribution.

- Current grazing strategies do not allow for control of livestock in relation to the timing, frequency, intensity, and duration of use of vegetative resources.

- Rangeland structural improvements currently lack the ability to adequately assist in control of livestock.

- Invasive plant species are widespread and concentrated in high livestock use areas such as ponds and springs. Livestock have the ability to transport noxious weeds to new locations and may create situations advantageous for new infestations to occur. Reducing the risks associated with new infestation establishment is needed for long-term weed treatments and eradication to be successful.

- A statistically significant difference exists on shrub cover, total vegetation, % cover of litter, % cover of bare soil, % cover of wood, and species richness related to both time since the burn, and the silvicultural treatments within the burned area. Current livestock grazing strategies have the potential to further influence these differences and negatively effect the restoration of the burned area. There is a need to more precisely control the timing, intensity, frequency, and duration of livestock grazing within this burned area to achieve the desired future conditions.

Sagebrush Landscapes:

- Some sagebrush parks lack structural and species diversity sufficient to successfully rear Gunnison Sage Grouse broods. This area has been mapped; see (Exhibit 1-C) in appendix A-3. Current livestock grazing timing, intensity, and duration are likely a key factor.

Naturita Creek:

- Upper reaches of Mainstem Naturita Creek have been determined to be "functioning at risk". Moreover, these reaches have a static apparent trend. Current livestock grazing strategies appear to be contributing to this static trend.

- The upper 2 miles of Naturita Creek show species composition lacks sufficient stabilizing vegetation in some locations.

- Streambank stability is low in many locations on the upper 2 miles of Naturita Creek. Livestock hoof shear is a contributing factor.

Callan Draw:

- The upper 1 mile of Callan Draw appears to be "non-functional" with a static trend. Livestock grazing strategies appear to be contributing to this static trend.

- Streambank stability is low in the upper 1 mile and appears to be contributing to erosion.

- Desired riparian streambank vegetation appears to be lacking in the upper 1 mile of Callen Draw.

West Naturita Allotment Landscape:

- The majority of rangelands in "fair" condition are currently not in an upward trend moving towards "good" condition. Moreover, only about 21% of all suitable and capable rangelands within this allotment in "fair" condition are in an upward trend. See also (Exhibit 1-B) in Appendix A-2.

- All rangelands in "good" condition should remain in "good" condition with no areas in a downward trend. There is a need to assure no downward trends occur in the future.

  The table below breaks the condition/trend classes and acreages down by management pasture or unit.

PASTURE/UNIT	CONDITION/TREND CLASS	APPROXIMATE ACREAGE	PERCENT OF FAIR CONDITION RANGELANDS IN UPWARD TREND
Sawmill Springs	Fair/Stable	219	68%
	Fair/Upward	483	
	Good/Stable	458	

Callan	Fair/Stable	831	6%
	Fair/Upward	55	
	Good/Stable	2308	
Wheeler	Fair/Upward	49	100%
	Good/Stable	998	
Mckee Draw	Fair/Stable	1954	9%
	Fair/Upward	189	
	Good/Stable	3572	

- Currently, a defined livestock management strategy does not exist to balance big-game and livestock interactions. Manipulating the timing, frequency, intensity, and duration of use on the range by both livestock and wild ungulates, is needed to increase the quality and quantity of forage resources. These adjustments to management are needed to meet the multiple management objectives related to big-game management, while still meeting the needs of the grazing permittee.

East Naturita Allotment

Sagebrush Landscapes:

- Some sagebrush parks lack structural and species diversity sufficient to successfully rear Gunnison Sage Grouse broods. Current livestock grazing timing, intensity, frequency and duration are likely a key factor.

Naturita Creek:

- Upper reaches of West Naturita Creek have been determined to be "functioning at risk". Moreover, these reaches have a static apparent trend. Current livestock grazing strategies appear to be contributing to this static trend.

- The upper 1 mile of West Naturita Creek show species composition lacks sufficient stabilizing vegetation in some locations.

- Streambank stability is low in many locations on the upper 1 mile of Naturita Creek. Livestock hoof shear is a contributing factor.

East Naturita Allotment Landscape:

- The majority of rangelands in "fair" condition are currently not in an upward trend moving towards "good" condition. All of the rangelands in "fair" condition are considered to be stable.

- All rangelands in good condition should remain in good condition with no areas in a downward trend. There is a need to assure no downward trends occur in the future.
  The table below breaks the condition/trend classes and acreages down by management pasture or unit.

PASTURE/UNIT	CONDITION/TREND CLASS	APPROXIMATE ACREAGE	PERCENT OF FAIR CONDITION RANGELANDS IN UPWARD TREND
Unit 1	Good/Stable	154	NA
Unit 2	Fair/Stable	140	NA
	Good/Stable	833	
Unit 3	Good/Stable	631	NA
Unit 4	Good/Stable	454	NA
Unit 5	Good/Stable	388	NA
Wheeler Ridge	Good/Stable	154	NA

Portis Allotment

Portis Allotment Landscape:

- The majority of rangelands in "fair" condition are currently not in an upward trend moving towards "good" condition. All of the rangelands in "fair" condition are considered to be stable.

- All rangelands in good condition should remain in good condition with no areas in a downward trend. There is a need to assure no downward trends occur in the future.

- Vegetation in areas showing fair rangeland condition would benefit from less frequent defoliation.

- Additional livestock management techniques are needed to relieve pressure on heavily used areas.

The table below breaks the condition/trend classes and acreages down by management pasture or unit.

PASTURE/UNIT	CONDITION/TREND CLASS	APPROXIMATE ACREAGE	PERCENT OF FAIR CONDITION RANGELANDS IN UPWARD TREND
Unit 1	Fair/Stable	100	0%
	Good/Stable	644	
Unit 2	Fair/Stable	128	0%
	Good/Stable	781	
Unit 3	Good/Stable	1436	NA

Cy Orr Allotment

Cy Orr Allotment Landscape:

- The majority of rangelands in "fair" condition are currently not in an upward trend moving towards "good" condition. All of the rangelands in "fair" condition have a trend rating of stable.

- All rangelands in good condition should remain in good condition with no areas in a downward trend. There is a need to assure no downward trends occur in the future.

  The table below breaks the condition/trend classes and acreages down by management pasture or unit.

PASTURE/UNIT	CONDITION/TREND CLASS	APPROXIMATE ACREAGE	PERCENT OF FAIR CONDITION RANGELANDS IN UPWARD TREND
Cy Orr	Good/Stable	639	NA
Homestead	Fair/Stable	943	100%
	Good/Stable	32	

PROPOSED ACTION

The Forest Service proposes:

- To authorize livestock grazing;
- To utilize livestock adaptive-management strategies to improve or maintain rangeland health;
- To allow for adequate vegetative resource conditions to sustain multiple uses;
- To manage authorized livestock to improve riparian condition.

A range of grazing systems and management strategies would be applied on 19,826 acres of capable and suitable rangelands within the Uncompahgre National Forest on the Naturita Division of the Norwood Ranger District (see Figure 2.1). Implementation would occur through incorporation of the selected Alternative into an allotment management plan (AMP) specific to each allotment. All grazing systems and management adjustments would be designed to meet all Forest Plan guidance and desired future conditions and would be consistent with the Environmental Management System (ISO 14001 Compliant).

This alternative focuses on desired resource conditions and outlines specific management objectives. Adaptive-management principles would be applied by describing sideboards, which are flexible enough to ensure that progress is made in achieving the desired resource conditions and objectives. Each sideboard would have the ability to adjust for annually changing conditions or disturbances such as drought, fire, flood, disease, plague, and planned management activities.

Each specific *Management Objective* would be designed to incorporate those *Key Features* identified through scoping and through consultations with various resource specialists. *Design Criteria* illustrate how each *Management Objective* would be achieved and is essentially a "roadmap" to achieve the desired future condition. Finally, monitoring using specified protocols would construct a *Measure of Success*. This in turn, would create a feedback-loop to make adjustments to grazing strategies, which in the end would document and affirm that resource management is moving in the planned

direction. Any new science or management techniques would be incorporated as needed, or when they are developed which would assist in achieving the stated objectives.

Important Definitions:

*Key Feature*s are critical elements of the proposed action and may be resource or socially based.

Management Objectives are generally items of importance surrounding the Key Feature and define the desired resource or social condition.

Design Criteria identify specific management actions, which would be required to achieve the Management Objective.

Measure of Success defines both the mechanism and procedures for determining if requirements of the Design Criteria are being achieved. Moreover, a built-in feedback loop allows for adjustments of management strategies to be made if the desired results are not being achieved.

Adaptive Management Strategies:

- For the Key Feature of Gunnison Sage Grouse

Management Objectives for this resource include:

- ✓ Improve Gunnison Sage Grouse Habitat at selected sites.
- ✓ Maintain Gunnison Sage Grouse Habitat at selected sites.

Design Criteria for this resource include:

- ✓ Improve or maintain structural diversity, and species diversity/richness of identified sage grouse habitats (see Figure 2.2), by moving toward or meeting the desired conditions of the Gunnison Sage Grouse Range Wide Conservation Plan, Appendix H (Structural Habitat Guidelines).
- ✓ Utilize the Gunnison Sage Grouse Range Wide Conservation Plan to assist in annual decision-making.
- ✓ Adjust the timing, intensity, frequency, and duration of permitted livestock grazing to assist in achieving the desired resource condition.

- ✓ Utilize prevention, control and eradication measures to limit the establishment and spread of undesirable invasive plant species, which may limit the ability to improve or maintain habitat.

Measures of Success for this resource include:

- ✓ Evaluate the quality and quantity of invasive species control being utilized on an annual basis. This should reveal whether or not increases of undesirable target species are increasing or decreasing.

- ✓ Every fifth year, re-read rangeland health transects located within sagebrush ecosystem community types. Establish new transects if needed or desired. This will establish if species diversity and species richness is moving in the desired direction.

- ✓ Utilize the Grazing Response Index (GRI) to assess the effect of annual livestock management with a positive GRI score average every three years in areas where Gunnison Sage Grouse habitat requires improvement. Intensity: light use as defined in the GRI. If the GRI score is not achieved, adjust grazing practices so these criteria are met.

- ✓ Utilize the GRI to assess the effect of annual livestock management with at least a neutral GRI score average every three years in areas where Gunnison Sage Grouse habitat is currently at acceptable levels. Intensity: light to moderate use as defined in the GRI. If the GRI score is not achieved, adjust grazing practices so these criteria are met.

- ✓ Conduct periodic interdisciplinary reviews to evaluate the rate and effectiveness of livestock grazing strategies, in achieving the desired habitat conditions outlined in the Gunnison Sage Grouse Range Wide Conservation Plan.

- For the Key Feature of Big Game and Livestock Interaction

Management Objectives for this resource include:

- ✓ Provide high quality big game habitat to encourage utilization of National Forest system lands.

Design Criteria for this resource include:

- ✓ The total amount of vegetation utilized by both wildlife and livestock should allow for sustained health of the ecosystem and desired vegetation in the identified winter range areas, (see Figure 2.3).

- ✓ Adjust the timing, intensity, frequency, and duration of livestock grazing to provide high quality palatable forage and browse to wild ungulates.

Measures of Success for this resource include:

- ✓ Utilize the GRI score to assess the effects of annual, livestock management with a positive or neutral GRI score average over every 3-year period. Intensity: light to moderate use as defined in the GRI. Make adjustments as necessary if the GRI score averages below neutral.

- ✓ Periodically review the Colorado Division of Wildlife's population and distribution data and GRI scores to determine the effectiveness of livestock grazing strategies.

- ✓ Every fifth year, re-read rangeland health transects located within the identified winter range area. Establish new transects if needed or desired. Analyze to establish if desired habitat components are moving towards or staying in the desired condition.

- For the Key Feature of Riparian and Aquatic Health

Management Objectives for this resource include:

- ✓ For the upper mile of West Naturita Creek; move the stream channel from a Rosgen type "F" and/or "C", towards a Rosgen type "E" stream channel with inclusions of Rosgen type "C" (see Figure 2.4).

- ✓ For the upper mile of Callan Draw; move the stream channel from a Rosgen type "F" and/or "C", towards a Rosgen type "E" stream channel with inclusions of Rosgen type "C" (see Figure 2.4).

- ✓ For the upper one and a half miles of East Naturita Creek; move the stream channel from a Rosgen type "F" and or "C" towards a Rosgen type "E" stream channel with inclusions of Rosgen type "C" (see Figure 2.4).

- ✓ Maintain all other reaches of stream in present condition and classification (see Figure 2.4).

Design Criteria for this resource include:

- ✓ Determine appropriate riparian indicators to allow for adjustments in livestock grazing strategies.

- ✓ Until more precise riparian indicators can be established, adjust the timing, intensity, frequency, and duration of livestock use in the riparian areas of

East Naturita Creek, West Naturita Creek, and Callan Draw as to allow for no greater than 30% bank alteration of stream banks.

- ✓ Create a new management unit called Wheeler Ridge, to allow for more precise management of Naturita Creek. This management unit will be included into the East Naturita Cattle and Horse grazing allotment.

Measures of Success for this resource include:

- ✓ Conduct Proper Functioning Condition Assessments in the project area on East Naturita, West Naturita, and Callan Draw. Establish desired riparian monitoring locations.

- ✓ Establish two riparian monitoring sites (using the Boise Aquatic Science Team and Rosgen protocols) each for the upper reaches of West Naturita Creek, East Naturita Creek, and establish one monitoring site along the upper reach of Callan Draw, (see Figure 2.4).

- For the Key Feature of Reforestation:

Management Objectives for this resource include:

- ✓ Limit tree seedling mortality caused by livestock management strategies in current and future plantations within the project area, up to 5 years after establishment. The target is to achieve survival of at least 150 seedlings per acre. (see Figure 2.5)

Design Criteria for this resource include:

- ✓ Do not salt and/or supplement within plantations or within 200 yards of plantation boundaries.

- ✓ Utilize deferred rotation grazing systems.

- ✓ Adjust the timing, intensity, frequency, and duration of permitted livestock grazing to assist in achieving the desired seedling survival rates.

- ✓ Utilize livestock and wildlife as a tool to increase the available resources needed to allow for tree seedling establishment by removing competitive vegetation. Balance the risk of direct trampling verses the benefit of removing competitive vegetation to achieve the desired survival rates of tree seedlings.

Measures of Success for this resource include:

- ✓ Utilize plantation survival surveys to determine first if survival is less than 150 seedlings per acre, and second likely average cause of mortality. If mortality is greater than desired, analyze both the Colorado Division of Wildlife's population/distribution data for big game, and livestock concentration areas.

- ✓ If mortality is greater than desired conduct interdisciplinary reviews to evaluate the effectiveness of livestock grazing strategies.

- For the Key Feature of Rangeland Health

Management Objectives for this resource include:

- ✓ Rangelands in good condition are maintained in good condition. No areas of good condition are in downward trend. While specifics vary by cover type, good condition rangelands include sites dominated by native species with densities, species composition, and diversity in age, size and structural classes which provide natural vegetation patterns or a mosaic of successional stages appropriate for the given cover type. Desired non-native species may be present. Invasive species populations are kept small due to early detection and rapid response. Effective control efforts reduce or eliminate populations over time. Where populations of invasive species persist, they are a component of the plant community but do not dominate ecosystem functions. Timing and intensity of grazing systems are designed considering invasive plant phenology. Good condition rangelands are resilient following natural or management disturbances and are sustainable over time. (see Figure 2.6).

- ✓ The trend in fair condition rangelands is shifted so that the majority is in an upward trend moving towards good condition. No fair condition rangeland is in a downward trend. These changes would be evident through species mixes with increased amounts of native or desired non-native species, increased (where possible) or sustainable level of production, increased diversity in ages and size of desired plants (especially in pinyon-juniper woodland and shrubland communities which have become very dense or have encroached into grasslands due to interruption of fire disturbances and/or historic grazing pressure), and reduction or elimination of invasive species. These changes may be the result of allowing previously interrupted natural disturbances (e.g., wildland fire, insects, disease) to alter rangeland ecosystems. Livestock grazing management may be the dominant method used to change conditions in these areas (see Figure 2.6).

- ✓ Currently no areas of poor condition rangeland have been identified within this project area. No areas of poor condition rangeland will occur.

Design Criteria for this resource include:

- ✓ Utilize deferred rotation grazing systems.
- ✓ Salt and/or supplement at least ¼ mile away from water and riparian areas. Do not place salt and/or supplement in the same location every year.
- ✓ Improve distribution of livestock through; construction of two new pastures boundary fences within the West Naturita Allotment, Create an additional pasture (Wheeler Ridge) in the East Naturita Allotment. This will increase the total acreage in the East Naturita Allotment by approximately 333 acres and decrease the West Naturita Allotment by approximately the same. Reconstruct and make functional Sawmill Spring, and Cogan Spring (see Figure 2.7).
- ✓ Utilize herding for dispersing animal concentrations and movement into underutilized and new areas.
- ✓ Where possible utilize low-pressure livestock handling techniques.
- ✓ Conduct prevention, control, and eradication strategies for targeted invasive plant species, utilizing integrated weed management techniques through implementation of the GMUG weed action plan.
- ✓ Analyze local annual precipitation data in conjunction with the "Soil Survey of San Miguel Area, Colorado" to determine if the years outlook is "favorable", "unfavorable", or "neutral". Favorable years equate to when the month-by-month precipitation average is greater than the 2-out-of-10 year average. Unfavorable years equate to when month-by-month precipitation average is less than the 2-out-of-10 year average. Neutral years equate to when month-by-month precipitation average falls in the 6 year middle range of the 10 year average (see Figure 2.9).
- ✓ Stock all pastures to no greater than 100 AUM's less than the estimated carrying capacity (based on 40% utilization of available forage) for "favorable", "unfavorable", and "neutral" years to allow for variability of onsite conditions and disturbance regimes. (see Figure 2.8).
- ✓ Remove 28 pair of permitted livestock from the Portis allotment and add 28 pair of permitted livestock to the West Naturita allotment.

Measures of Success for this resource include:

- ✓ Every fifth year, re-read rangeland health transects located in the project area. Establish new transects if needed or desired. This will verify condition and trend of the range.

- ✓ Utilize the GRI to assess the effect of annual livestock management with at least a neutral GRI score average every three years in areas where the rangeland condition and trend is rated as "good/stable" and "fair/upward" Intensity: light to moderate use as defined in the GRI. If the GRI score is not achieved, adjust grazing practices so these criteria are met.

- ✓ Utilize the Grazing Response Index (GRI) to assess the effect of annual livestock management with a positive GRI score average every three years in areas where the rangeland condition and trend is rated as "fair/stable" Intensity: light use as defined in the GRI. If the GRI score is not achieved, adjust grazing practices so these criteria are met.

DECISION TO BE MADE

The District Ranger of the Norwood Ranger District is the responsible official who will decide whether or not to continue to authorize livestock grazing on all or portions of the 4 grazing allotments and if so, under what terms and conditions so as to meet or move toward the desired conditions outlined in this Environmental Assessment and the Forest Plan.

Management on each allotment is implemented through an allotment-specific Allotment Management Plan based on the alternative selected in the NEPA Decision. The Allotment Management Plan is the implementation document by which the Forest Service communicates to the permittee and others the management objectives and planned actions to accomplish those objectives. If the Decision is to continue to graze, then the Allotment Management Plan will amend the existing or future livestock grazing permits for the areas considered in this Environmental Assessment.

PUBLIC INVOLVEMENT

This project was scoped with the public on June 6th, 2007 and mailed to a variety of individuals, groups, public-land agencies, and governmental entities. We received 8 comments (written and verbal). These comments are in the official project file, and are available for review. In addition, an open house was held on March 5th, 2005. Various specialists were available to answer questions or comments regarding the proposed action. No significant issues were identified in the public involvement process.

Chapter 2: Alternatives Including the Proposed Action

ALTERNATIVES CONSIDERED BUT DROPPED FROM DETAILED ANALYSIS

All reasonable Alternatives developed by the IDT are analyzed in detail. No Alternatives were dismissed from detailed study.

ALTERNATIVES CONSIDERED IN DETAIL

We developed three Alternatives in detail for this environmental analysis process. Each was designed to be viable, and consistent with Forest Plan direction or guidance.

Three Alternatives are described and analyzed in detail:

- Alternative 1 –Adaptive Management also referred to as the Proposed Action (grazing management would change based on resource needs and desired conditions)
- Alternative 2 –Current Management (continued current management as applied on the ground over the past 5 to 10 years)
- Alternative 3 – No Action also referred to as No Grazing (current grazing permits would be cancelled and allotments would be closed).

Alternative 1: Adaptive Management (Proposed Action)

This Alternative is based on "adaptive management," a process that uses monitoring information to determine if management changes are needed—and, if so, what changes, and to what degree. It is a process that allows the Forest Service to cope with uncertainty and changing conditions over time. It gives the authorized officer the flexibility to adapt to change. This Alternative strives to resolve the disparity between Forest Plan Desired

Conditions and the existing conditions in the Analysis Area (within the scope of the analysis, i.e., the analysis is limited to evaluating the appropriate level of livestock grazing, given considerations of rangeland condition and other multiple-use goals and objectives).

This means that a proposed course of action would be selected as a starting point that we believe best meets or fosters Forest Plan Desired Conditions. Recurrent monitoring would occur over time, with evaluation of the results by the Forest Service to make appropriate adjustments in management, as needed, to ensure adequate progress toward Forest Plan Desired Conditions. All adaptive-management options available would be analyzed under this environmental assessment and adopted for potential future use.

A list of possible rangeland management options, called the "Grazing Management Toolbox," is presented in *Table 2-1*. This list of management tools is not intended to be all-inclusive, but identifies the types of actions available to the Forest Service to maintain or improve resource conditions to meet Forest Plan Desired Conditions and Management Objectives. New rangeland management techniques, as they are developed, would be incorporated into this toolbox, to the extent that their implementation is consistent with the effects documented in this EA and its accompanying Decision Notice. The Alternative may, in some cases, restrict the use of a tool or require the use of more than one tool. All proposed adaptive-management actions would be within the scope of effects documented in this EA, or a supplemental NEPA document and decision would be prepared. Four allotment management plans would be created incorporating grazing management tools listed below and any other technique, which would move the project area toward specific desired conditions.

Table 2-1: Grazing-Management Toolbox*

Use a full-time herder to manage the livestock in the chosen rotational pattern.
Change season of use (variable season), use range readiness to determine on-date, utilize the grazing response index to determine annual implementation success of grazing activities.
Change animal numbers or class (variable numbers/variable class)..
Defer livestock turn-on date for range readiness. Remove livestock early if conditions require. Adjust pasture rotations to achieve desired conditions.
Defer and rotate pasture use.
Rest specified areas from livestock grazing.
Adjust the timing, intensity, frequency, and duration of livestock use in specific areas to allow for multiple uses.
Adjust grazing rate to Light or Moderate Grazing Intensity.
Reconfigure allotment boundaries to attain management flexibility if within suitable lands and improvements are cost effective.
In allotments or pastures having riparian or aquatic management issues, cattle use would be adjusted by reducing or altering the timing, intensity, frequency, or duration of use. The specific action taken would be based on the desired resource condition.
In the event of a wildfire or prescribed fire on the Analysis Area, pasture rotations will be adjusted to accommodate rangeland health needs. This may include rest of an allotment or pasture.

* Use of any tool must consider rangeland condition, site potential, and other relevant multiple-use objectives for the Analysis Area under study.

This action will ensure that livestock-grazing use is consistent with the Forest Plan, as amended, that proper management is in place on the ground, and that management remains focused on attainment of Desired Conditions

Range Improvements

- All assigned range improvements will be maintained to standard.

- Structural range improvements will be constructed as needed to facilitate livestock management, and as funding is available. These will be completed on an approximately 50:50 cost-share basis and will be performed under a Permit Modification for Cooperative Range Improvement Agreement. All new improvements will have appropriate, site-specific NEPA, including all required clearances for TES species and Heritage Resources.

Evaluation

If evaluation indicates that progress is not being made toward meeting Desired Conditions within the implementation timeframe, management will be reevaluated and a decision made either to stay the course or to follow a different course of action.

If the livestock operators are unable to implement management practices to meet or further Desired Conditions, the stocking rate and season of use will be adjusted to the level dictated by monitoring results.

Additional adjustments in the stocking rate and season of use will continue until demonstrated progress is made, as evidenced by monitoring and inventory data. Adjustments to stocking rates will be consistent with the Forest Service Handbook and Manual, and will be reflected in the Annual Operating Instructions, and Term Grazing Permit, as needed.

Detailed Sequence of Potential Allotment Management Prescriptions

Each bullet can be considered an event or non-discretionary course of action that will be taken to achieve the desired objectives outlined in Chapter One. Each event will be implemented in the sequence listed below. The understanding is that implementation of any event will **only** occur if monitoring suggests it is necessary to achieve the desired resource condition. For analysis purposes, implementation of all events for any key feature in any allotment assumes a worst-case scenario situation. There is a level of

confidence that the worst-case situation would not occur on any allotment. Obviously if this were the case, management events would not be brought to their full extent.

For the Key Feature #1 Gunnison Sage Grouse

West Naturita Allotment

Management Event Year 1 through 3:

- The "grazing management toolbox" will be used at the permittees discretion to achieve the levels of use necessary to meet the desired condition.

- If monitoring indicates that at the end of year three levels of use are greater than desired (based on the design criteria for this Key Feature), then the next management event will be implemented.

Management Event Year 4 through 5:

- A 25% reduction of use in either time or numbers would occur in the Sawmill Springs and Wheeler units.

- If monitoring indicates that at the end of year five, levels of use are greater than desired, or long-term monitoring shows no sufficient achievement of meeting the desired future condition (based on the design criteria for this Key Feature), then the next management event will be implemented.

Management Event Year 6 through 7:

- An additional 50% of either time or numbers of livestock will be cut in the Sawmill Springs and Wheeler units.

- If monitoring indicates that at the end of year seven, levels of use continue to be greater than desired, (based on the design criteria for this Key Feature), then the next management event will be implemented.

Management Event Year 8 through 10:

- Full Rest will occur in the Sawmill Springs unit.

- This area will be rested until adequate movement toward management objectives have been achieved.

For the Key Feature #2 Big-Game and Livestock Interaction

West Naturita Allotment

Management Event Year 1 though 3:

- The "grazing management toolbox" will be used at the permittees discretion to achieve the levels of use necessary to meet the desired condition.

- If monitoring indicates that at the end of year three levels of use are greater than desired (based on the design criteria for this Key Feature), then the next management event will be implemented.

Management Event Year 4 through 5:

- A 25% reduction of use in either time or numbers would occur in the Callan unit.

- If monitoring indicates that at the end of year five, levels of use are greater than desired, or long-term monitoring shows no sufficient achievement of meeting the desired future condition (based on the design criteria for this Key Feature), then the next management event will be implemented.

Management Event Year 6 through 7:

- An additional 50% of either time or numbers of livestock will be cut in the Callan unit.

- If monitoring indicates that at the end of year seven, levels of use continue to be greater than desired, (based on the design criteria for this Key Feature), then the next management event will be implemented.

Management Event Year 8 through 10:

- Full Rest will occur in the Callan unit.

- This area will be rested until adequate movement toward management objectives have been achieved.

For the Key Feature #3 Riparian and Aquatic Health

West Naturita Allotment

Management Event Year 1 though 3:

- ❖ The “grazing management toolbox” will be used at the permittees discretion to achieve the levels of use necessary to meet the desired condition.

- ❖ If monitoring indicates that at the end of year three levels of use are greater than desired (based on the design criteria for this Key Feature), then the next management event will be implemented.

Management Event Year 4 through 5:

- ❖ A riparian fence will be constructed to eliminate use along the entire length of the upper mile of West Naturita Creek and Callan Draw.

East Naturita Allotment

Management Event Year 1 though 3:

- ❖ The “Grazing Management Toolbox” and a Permanent fence will be constructed to achieve the levels of use necessary to meet the desired condition.

- ❖ If monitoring indicates that at the end of year three levels of use are greater than desired (based on the design criteria for this Key Feature), then the next management event will be implemented.

Management Event Year 4 through 5:

- ❖ A riparian fence will be constructed to eliminate use along the accessible areas of East Naturita Creek.

For the Key Feature #4 Reforestation

West Naturita Allotment

Management Event Year 1 though 2:

- ❖ The “grazing management toolbox” will be used at the permittees discretion to achieve the levels of use necessary to meet the desired condition.

- ❖ If monitoring indicates that at the end of year three levels of use are greater than desired (based on the design criteria for this Key Feature), then the next management event will be implemented.

Management Event Year 3:

- Livestock will be removed from the Callan unit until such time as the saplings are of sufficient height to prevent use or damage via trampling, whichever cause is creating mortality.

For the Key Feature # Rangeland Health

All Allotments

Management Event Year 1 though 5:

- The "grazing management toolbox" will be used at the permittees discretion to achieve the levels of use necessary to meet the desired condition.

- If monitoring indicates that at the end of year five levels of use are greater than desired (based on the design criteria for this Key Feature), then the next management event will be implemented.

Management Event Year 5 though 10:

- A major change to the timing, intensity, duration, or frequency of livestock use will occur. This could include but is not limited to reduction in numbers of animals grazed, time spent on the allotments, and pasture use area changes including reconfiguration of allotment boundaries.

Alternative 2: Current Management

Under this Alternative, livestock grazing would continue to be authorized under current management. There would be no changes in permitted livestock, permitted season of use, kind or class of livestock, or grazing system (other than minor changes made, by exception, in the AOI). Changes in grazing management would be administrative only. Proactive management of the range resource, to adapt to changed resource or environmental conditions, would occur on a limited basis. Four Allotment Management Plans would be developed for the allotments emphasizing current management practices.

Range Improvements

Range improvements would be maintained by the term-grazing-permit holders, as specified in the term grazing permit.

Evaluation

This alternative is only partially responsive to achieving site-specific desired future conditions. Monitoring would be limited and may not reveal problems with current management as they relate to the desired future condition. While eventual changes in management may occur the outcome of those changes may not be evident for decades.

Under this Alternative, if monitoring shows that site-specific Desired Conditions are not being met or satisfactory progress is not occurring toward meeting them, and all administrative actions have been exhausted, then the Forest Service has limited flexibility to make changes, without completing a new NEPA analysis.

Alternative 3: – No Action/No Grazing

All Term Grazing Permits would be canceled. No permits would be issued for the four affected allotment until and unless a subsequent NEPA decision to re-authorize grazing on any or all of the allotments was made. The purpose of the no-grazing alternative is to describe the effects of cancellation of grazing permits.

Other management activities taking place in the area would continue if this alternative were chosen, but no livestock management activities would take place. Activities such as motorized access, travel management, road maintenance, dispersed recreation, noxious weed management, fuels management, and timber management would be allowed to continue as they currently take place in the Planning Area.

Permittees would be given two years written advance notice of the cancellation of their permits as provided under 36 CFR222.4 (a)(1).

Range Improvements

All range developments currently in existence on the allotments (such as fences and water developments) would be left in place but not maintained. If removal or maintenance of any developments for other resource needs was desired, subsequent administrative decisions would need to be made regarding those developments.

Evaluation

No evaluation would take place pertaining to livestock management. Although, some inventory may take place in the future pertaining to rangelands and their condition. Management changes would not be needed as grazing would not be occurring in the project area.

COMPARISON OF ALTERNATIVES

Alternatives are listed by key feature as stated in the proposed action. The differences are listed by alternative.

Table 2-2: Comparison of the Alternatives

Key Feature #1: Gunnison Sage Grouse			
Key Feature Indicator	**Alt. 1: Adaptive Management (Forest Service Proposed Action)**	**Alt. 2: No Action also referred to as Current Management**	**Alt. 3: No Grazing**
Sage Grouse Habitat Quality	Improved structural diversity, improved species diversity especially in forbs and grasses are expected.	A delay in rate of recovery of areas not meeting the desired future conditions are anticipated with current season of use, frequency of defoliation and duration of use in pastures. Overall improvement may not be adequate to make an improved habitat call.	Sage Grouse Habitat may improve, however since no grazing related monitoring would be occurring the amount of recovery may not be known.
Key Feature #2: Big Game and Livestock Interaction			
Key Feature Indicator	**Alt. 1: Adaptive Management (Forest Service Proposed Action)**	**Alt. 2: No Action also referred to as Current Management**	**Alt. 3: No Grazing**
Quantity and Quality of Forage Resources	Adequate vegetative resources will be provided where needed to sustain the expected increases of wildlife while providing grazing opportunities to permittees. Management strategies would condition rangeland vegetation to improve the quality of forage for big-game.	Current management may not provide adequate forage for increases of big game following grazing by livestock in the areas where needed. Distribution of livestock currently does not allow for conditioning of forage resources where it's needed.	Wildlife would have the ability to utilize all vegetative resources.

Table 2-2 Continued: Comparison of the Alternatives

Key Feature #3: Riparian and Aquatic Health			
Key Feature Indicator	**Alt. 1: Adaptive Management (Forest Service Proposed Action)**	**Alt. 2: No Action also referred to as Current Management**	**Alt. 3: No Grazing**
Riparian Condition and Trend	Improvements to width to depth ratios, vegetative vigor, species composition, and streambank stability would be evident. Movement toward more desirable stream channel function.	No improvements to width to depth ratios, and streambank stability may not occur. Vegetative vigor and species composition likely will not improve over time.	Width to depth ratios, vegetative vigor, species composition, and streambank stability would all likely improve. Steady movement toward desirable stream channel would occur.
Key Feature #4: Reforestation			
Key Feature Indicator	**Alt. 1: Adaptive Management (Forest Service Proposed Action)**	**Alt. 2: No Action also referred to as Current Management**	**Alt. 3: No Grazing**
Quantity of seedling survival	Seedling mortality would fall within desired or acceptable limits. Both apparent wildlife and livestock induced mortality would be accounted for.	Seedling mortality may exceed acceptable limits. The direct cause of the mortality would remain unknown.	Seedling mortality may exceed or may be adequate. The direct cause of mortality would be known.

Table 2-2 Continued: Key-Issue Comparison of the Alternatives

Key Feature #5: Rangeland Health			
Key Feature Indicator	**Alt. 1: Adaptive Management (Forest Service Proposed Action)**	**Alt. 2: No Action also referred to as Current Management**	**Alt. 3: No Grazing**
Indicators of Good Rangeland Health Such as Quantity of Bare Ground, Species Diversity, Species Composition, and Quantity of Invasive Species Infestation	Indicators of good rangeland health would move in the positive direction. Acres of rangeland in "fair condition" would move into "good condition"	Indicators of good rangeland health would likely remain static. Acres of rangeland in "fair condition" would likely remain in "fair condition".	Indicators of good rangeland health would move in the positive direction. Acres of rangeland in "fair condition" would move into "good condition". Although, this outcome would largely be undocumented do to a lack of monitoring.

A brief comparison of effects on other resources is presented in *Table 2-3* on the next page. For the full effects analysis see Chapter 3.

Table 2.3: Comparison of Alternatives for Other Resources

Resource and Unit of Measure	Alt. 1: Adaptive Management (Forest Service Proposed Action)	Alt. 2: No Action also referred to as Current Management	Alt. 3: No Grazing
Fisheries	Improvement to fishery habitat could be expected over time.	Fishery habitat could stagnate or potentially decline.	Improvement to fishery habitat could be expected over time.
Wildlife Habitat Vegetation structure and composition	Improvement to wildlife habitats could be expected over time.	Wildlife habitats could stagnate or potentially decline.	Improvement to wildlife habitat could be expected over time.
TES Wildlife Species	Would likely improve habitats for sagebrush obligates.	May have conflicts between livestock and habitat conditions required for TES species.	Would likely improve habitats for sagebrush obligates.
Management Indicator Species	Would likely provide forage necessary to meet management objectives for elk.	May have conflicts between livestock and elk forage needs.	Would likely provide forage necessary to meet management objectives for elk.
TES Plant Species	NA	NA	NA
Invasive Species Acres of noxious weeds	Invasive species would likely decline in abundance and area.	Invasive species would likely persist and possibly increase in abundance and area.	Invasive species would likely persist and possibly increase in abundance and area.
Soil Resources Soil health	Soil conditions would likely improve.	Soil conditions would likely not change.	Soil conditions would likely improve.
Recreation and Transportation System Visitor/livestock encounters in dispersed recreation areas and travelways	Multi-user conflicts could increase slightly due to increases in multi-user days. This effect could likely be mitigated.	Multi-user conflicts could increase substantially.	Multi-user conflicts would decrease.
Heritage Resources	Resources would be protected from damage or alteration.	Resources would not be protected from damage or alteration although no damage or alteration currently exists.	Resources would be protected from damage or alteration.
Fuels	Overall light fuels and fuel loading would be balanced in the project area.	Light fuels and fuel loading would be locally heavy or locally light depending on livestock use.	Light fuels and fuel `loading would be heavy, and would continue to increase annually.
Social Individual permit holders Agricultural community	Permittees may see slight inconveniences to their operations.	No effect is likely to permittee operations	Permittees would loose grazing permits and possibly the ability to continue ranching operations locally.
Economics Present Net Value to all partners	-$390,105.67	-$194,231.09	-$14,915.84

Resource and Unit of Measure	Alt. 1: Adaptive Management (Forest Service Proposed Action)	Alt. 2: No Action also referred to as Current Management	Alt. 3: No Grazing
Quantity of seedling survival	Significant livestock-induced detrimental effects on seedling survival would be detected soon enough to eliminate them through adoption of effective measures from the "toolbox."	Seedling mortality may exceed acceptable limits. The direct cause of mortality would remain unknown.	Seedling mortality may exceed or may be adequate. The direct cause of mortality would be unknown.

Chapter 3: Affected Environment And Environmental Consequences

INTRODUCTION

This chapter describes the included physical, biological, social, and economic environments of the Naturita analysis area. These environmental conditions form the basis for determining what changes and impacts will occur should each alternative be implemented.

In addition, this chapter discloses the environmental impacts should each alternative be implemented in the Naturita analysis area. Descriptions of the direct, indirect and cumulative effects of implementing each alternative relative to these resources and issues are included.

Cumulative effects are discussed for the entire Naturita analysis area. The cumulative effects analysis area is bound spatially to the Naturita Project Area and temporally by this planning period of 20 years. Cumulative effects were determined based on the following list of past, present, and reasonably foreseeable actions in the analysis area.

Historic Activities

- Logging (clearcuts) since the mid 1800's.
- Homesteading on areas now under Forest Service management and control.
- Heavy early historic livestock grazing across the planning area landscape.

Past Activities (post 1905)

- Wildfire Suppression.
- Wildfires (Burn Canyon).
- Prescribed burning.
- Drilling for Natural Gas.
- Managed livestock grazing.
- Logging (more recently salvage, commercial, and pre-commercial thinning).
- Expansion of elk populations.
- Increases in recreational use including unauthorized Off Highway Vehicle (OHV) use.
- Development of private lands, especially in areas along the eastern and northern flanks of the planning areas.
- Road effects over time to riparian and aquatic habitats.
- Improvements to Gunnisons Sage Grouse habitats.

Current Management Activities

- Reforestation of the Burn Canyon Wildfire areas.
- Burn Canyon restoration work.

- Road closures.
- Implementation of Travel management objectives.
- Invasive species management.
- Small sale timber harvesting.
- Three active irrigation ditchs flow through the planning area.
- TransColorado Natural Gas Pipeline.
- San Miguel Power overhead distribution line.

Reasonably Foreseeable Future Actions

- Small sale timber harvesting.
- Reforestation and restoration work in the Burn Canyon Wildfire areas.
- Intensive invasive species management in the Portis allotment.
- Managed livestock grazing.
- Continued implementation of the Travel Management Plan. This could include additional road closures.
- Fuels management including thinning, and pre-scribed burning, and implementation of wildland fire use.
- Leases of mineral rights to oil and gas companies could lead to development of at least 2 wells for gas development.

GENERAL DESCRIPTION OF THE ANALYSIS AREA

The Analysis Area is displayed in *Figure 1.1*. The size of the Analysis Area does not vary by Alternative. The future livestock management of four existing cattle and horse allotments are being evaluated in this Environmental Assessment. The affected rangeland allotments are as follows: West Naturita, East Naturita, Cy Orr, and Portis.

RANGELAND RESOURCES

EXISTING CONDITION

Overview and Discussion

Multiple disturbances have occurred in the project area over the recent years. Perhaps the most obvious and telling was the Burn Canyon Wildfire. In 2002, a large stand replacing wildfire burned about 31,616 acres of National Forest, Bureau of Land Management, and privately controlled lands. About 10,982 acres were burned on the National Forest. This equates to about 35% of the project area. This fire burned with a varying degree of intensity and severity in some instances creating a patchwork of burned over lands accompanied by interspersed green areas. In others and especially in the Pinyon-Juniper ecological types, the landscape was reset to early seral conditions. As a result of this disturbance rangeland condition has changed dramatically across the board within the burned area.

Both wildlife and livestock use patterns have changed within the project area. Because of the fire, much of the area has opened up, allowing herbivory to resume in locations where previously it may have been difficult for large ungulates to reach. Big-game now have shifted their use and currently utilize the burned area extensively as winter range. Many of the existing range improvements were destroyed by the wildfire, such as fences, and have not yet been reconstructed. The only exception is the boundary fence bordering the Bureau of Land Management and National Forest Service controlled lands along the Western portion of the project area. Because of this livestock are essentially uncontrolled in the West Naturita allotment and have the ability to utilize the entire allotment season-long.

The West Naturita allotment, which is the largest of the four allotments, is the only allotment affected by the wildfire (albeit extensive). A decision was made following the disturbance to rest the area from livestock grazing for two full years and the herd was sold off. Since that time a steady rebuilding of the herd size has ensued, and full numbers are expected to be grazed in 2007.

Along with the obvious change to vegetation, the burn had an effect on other resources as well. According to one model, erosion due to a lack of ground cover following the fire, was as high as ½ to 20 tons of soil loss per acre. (Burned Areas Emergency Response report 2003). This disturbed area allowed many invasive species to occupy open sites. Additionally, livestock and wildlife concentration areas show high levels of invasive species infestation. Many of these areas are centered on water sources. Currently, weeds are being treated in the area and this is expected to continue. Although specific weed treatments are considered beyond the scope of this analysis.

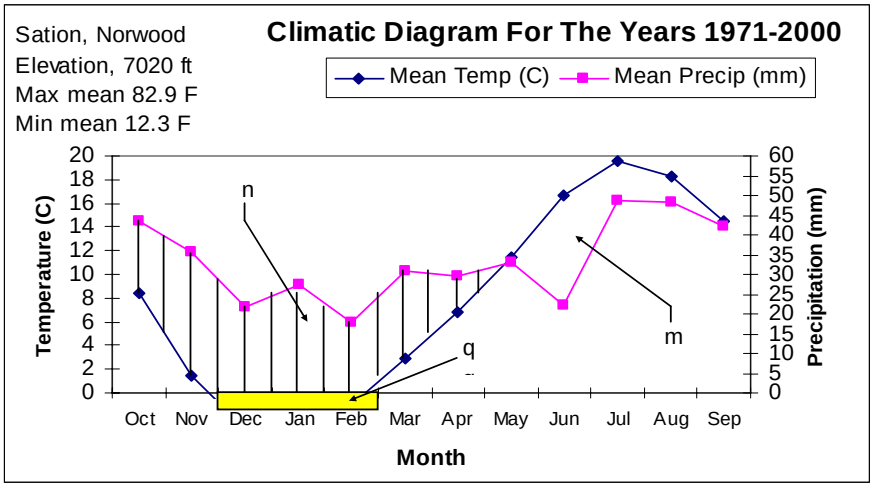
As a result of the wildfire, a timber salvage project was put into place. Some stands were salvaged, and others were left standing to provide for such things as large wood and snags for wildlife. The salvage operations had varying degrees of impact on rangeland condition and trend. For example, a group of concerned citizens formed what is now known as the Burn Canyon Monitoring Work Group, to study and assess the impacts of salvage logging in the burned area. After three years of study and guidance from Colorado State University, a report was released to the Forest Service showing that the salvage operations had a statistically significant effect on the total cover of the shrub layer. In this case shrubs on the rangeland recovered much more quickly in un-salvaged areas than they did in salvaged areas. This study also suggests that the percent cover of bare soil, percent cover of litter, percent cover of down wood, percent cover of annual forbs, and percent cover of total vegetation differed significantly between both with year and with the salvaged/un-salvaged areas. The study also showed that there was no statistical difference in the percent cover of annual grasses, percent cover of biennial forbs, percent cover of perennial forbs, and percent cover of perennial grasses. It appears through ocular observations that these trends have continued in 2006.

Tree planting has occurred and continues within the salvage areas. Currently there is evidence of seedling mortality via trampling and occasional removal of terminal buds

through browsing. At this time it is unclear if livestock or wildlife are responsible for this mortality.

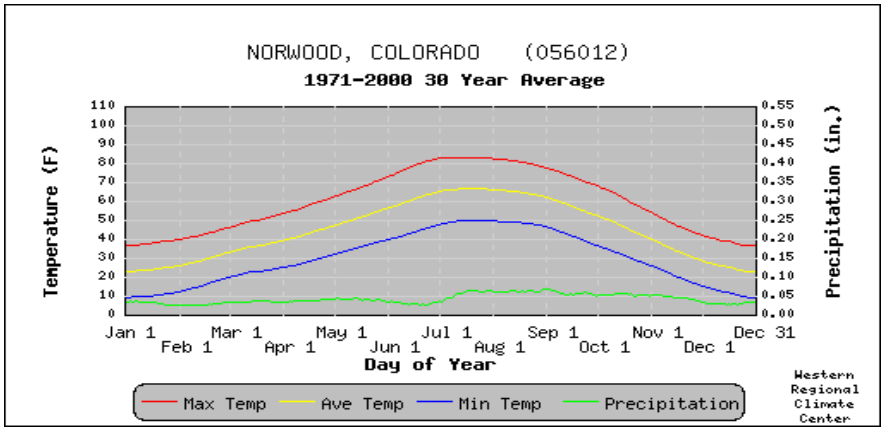
Drought has probably been the second most impactive disturbance in the project area. While the 2006 precipitation year yielded above average precipitation, many of the last ten years have been below or well below average. While the drought cycle is likely not over, 2006 had an abundant year for production of herbaceous grasses and forbs, warm season grasses did particularly well. This is perhaps due to late spring and early summer months not receiving much precipitation possibly suppressing the cool season grasses. *Figure 3.1* illustrates the recent climate including relative drought and humid seasons. This is important for assessing growing seasons and plant recovery periods following defoliations. *Figure 3.2* illustrates the trend over the last 30 years in temperature and precipitation. Mean annual precipitation stands at 15.79 inches, of course precipitation is slightly higher in the project area and increases as elevation increases. *Figure 3.3* shows precipitation bands as they relate to the project area. Three additional precipitation gauges were installed throughout the project area in 2003 and are currently being read on a consistent basis. These new precipitation gauges will assist in making annual management adjustments to livestock grazing strategies.

Figure 3.1 Climatic Diagram



N=Relative drought period
M=Relative humid period
Q=Months where mean monthly temperatures are at or below freezing.

Table 3.2 Annual Average Temperature and Precipitaion For The Years 1971-2000 for Norwood, Colorado.

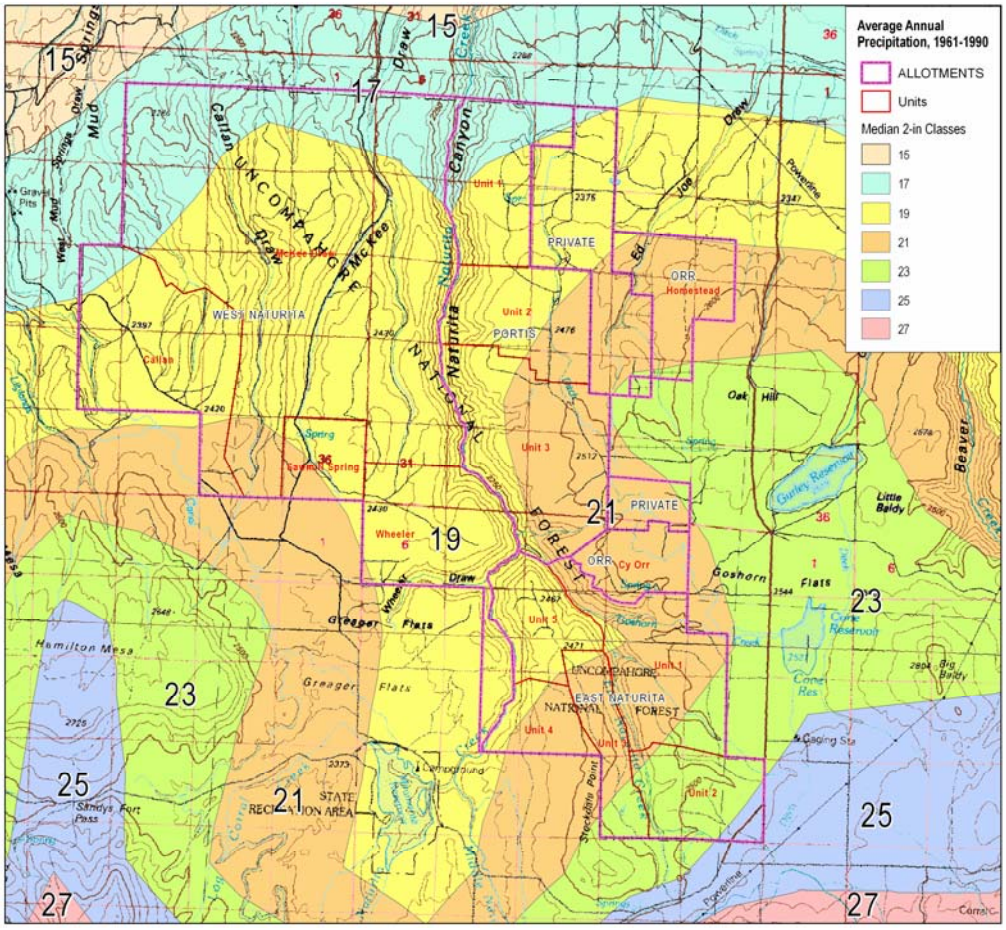


Data is smoothed using a 29 day running average.

- Max. Temp. is the average of all daily maximum temperatures recorded for the day of the year between the years 1971 and 2000.
- Ave. Temp. is the average of all daily average temperatures recorded for the day of the year between the years 1971 and 2000.
- Min. Temp. is the average of all daily minimum temperatures recorded for the

day of the year between the years 1971 and 2000.
- Precipitation is the average of all daily total precipitation recorded for the day of the year between the years 1971 and 2000.

Figure 3.3 Annual Mean Precipitation



Finally, as a result of causes yet to be determined, invasive species specifically that of Sufler Cinquefoil (*Potentilla recta*) have had a somewhat isolated but intensive effect to local rangeland conditions within the Portis allotment. This population was discovered in 2007 and has been determined to be at least 5 years of age. Current evidence suggests that this population is advancing at an exponential rate. However, extensive treatment of this species has occurred during the summer months of 2007.

Production and Utilization Analysis

Table 3.2 displays the current management system, permitted livestock number, AUM's, grazing season, and acreage (derived from current GIS databases) for each of the five allotments within the Analysis Area.

Table 3.2: Summary of Current Management for the Naturita Division Analysis Area.

Allotment	Permitted Number	Permitted AUM's	NFS Acres	Season of Use	Management
West Naturita	111	598	14679	6/16 – 10/15	4 pasture deferred rotation
East Naturita	181	850	4835	6/16 – 10/7	5 pasture deferred rotation
Portis	118	476	4915	6/16 – 9/15	3 pasture deferred rotation
Cy Orr	60	298	1716	6/16 – 10/5	2 pasture rotation

NRCS soil survey information was used to derive estimated maximum carrying capacity (in AUM's) for each allotment and pasture. This assumes a utilization level of no greater than 45% of the total production (which is an adjustment for allowable use based on the Forest Plan) and is adjusted for "favorable", "unfavorable", and "neutral" years. Moreover the potential production assumes excellent range condition at or near "climax", based on the NRCS's range site descriptions. Of course, the vast majority of the area cannot be considered to be at or near this climax condition due to a variety of past disturbances. Therefore, care must be taken when assessing the productivity of the project area. Value is not lost in the analysis, because the estimates provide a background important when considering baseline or future carrying capacity. Moreover, many comparisons can be made to current and future management.

Table 3.3: West Naturita Allotment

Pasture	Favorable	Neutral	Unfavorable	Current Use
Sawmill	1065	834	623	98
Callan	2382	1905	1414	195
Wheeler	1034	826	640	147
McKee	4684	3705	2770	158

Table 3.4: East Naturita Allotment

Pasture	Favorable	Neutral	Unfavorable	Current Use
Unit 1	1002	799	549	294
Unit 2	827	659	461	198
Unit 3	498	385	287	160
Unit 4	476	350	259	79
Unit 5	327	260	183	119
Wheeler Ridge	140	112	75	NA

Table 3.5: Cy Orr Allotment

Pasture	Favorable	Neutral	Unfavorable	Current Use
Cy Orr	599	479	349	148
Homestead	844	671	480	150

Table 3.6 Portis

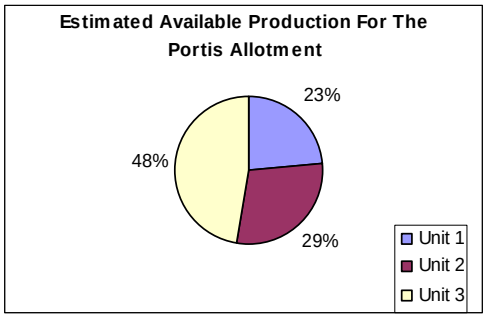
Pasture	Favorable	Neutral	Unfavorable	Current Use
Unit 1	652	521	389	160
Unit 2	817	654	463	238
Unit 3	1314	1050	742	78

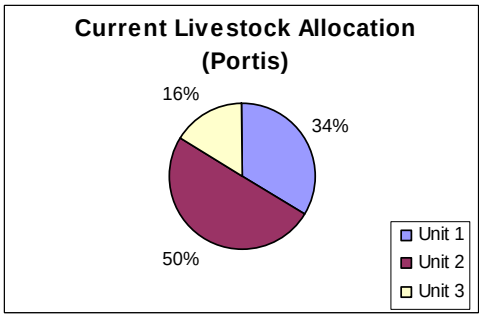
Table 3.7: Administrative Site

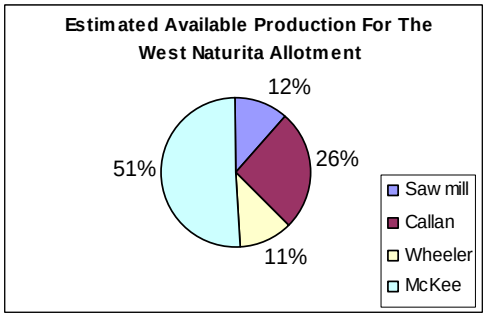
Pasture	Favorable	Neutral	Unfavorable	Actual Use
Horse Pasture	99	76	63	

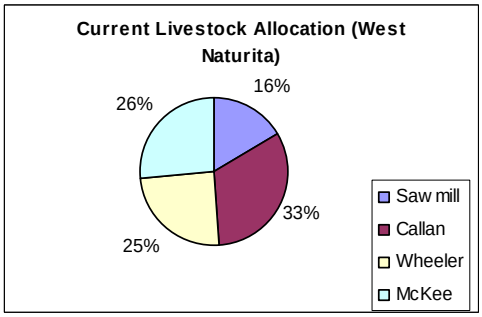
To help illustrate the above tables, each allotments distribution of production as it relates to pasture use area, and recent use as approximated by AUM's have been compared. *Figure 3.3* shows side by side charts, of which the most telling are the differences in the Portis and West Naturita allotment. One current driver of this difference is the location and availability of water. The Portis allotment has the most limited water availability of all the allotments in the project area. Current livestock stocking reflects this fact.

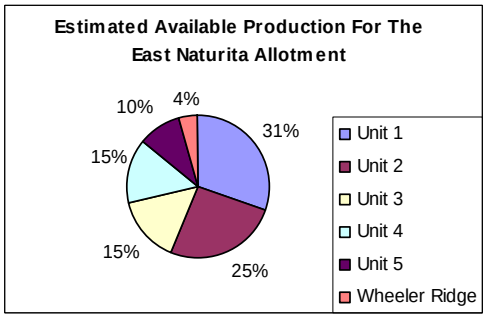
Figure 3.2: Pasture Production/Utilization Distribution Analysis

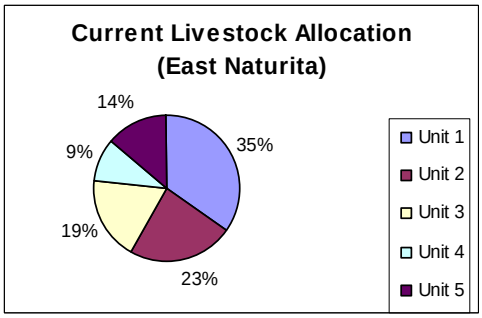


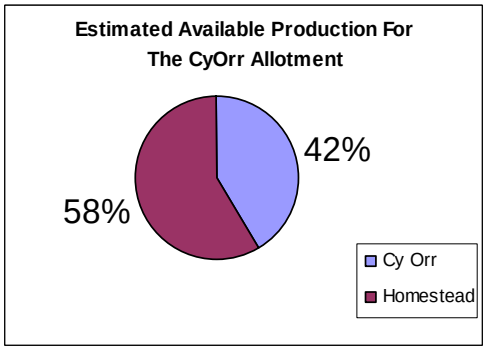


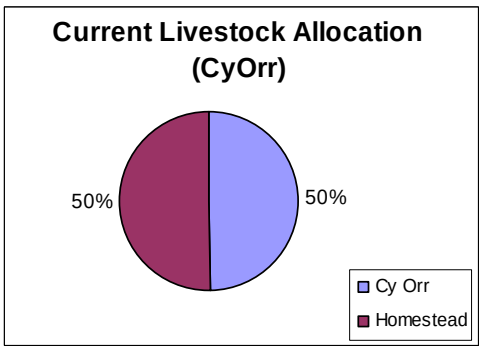










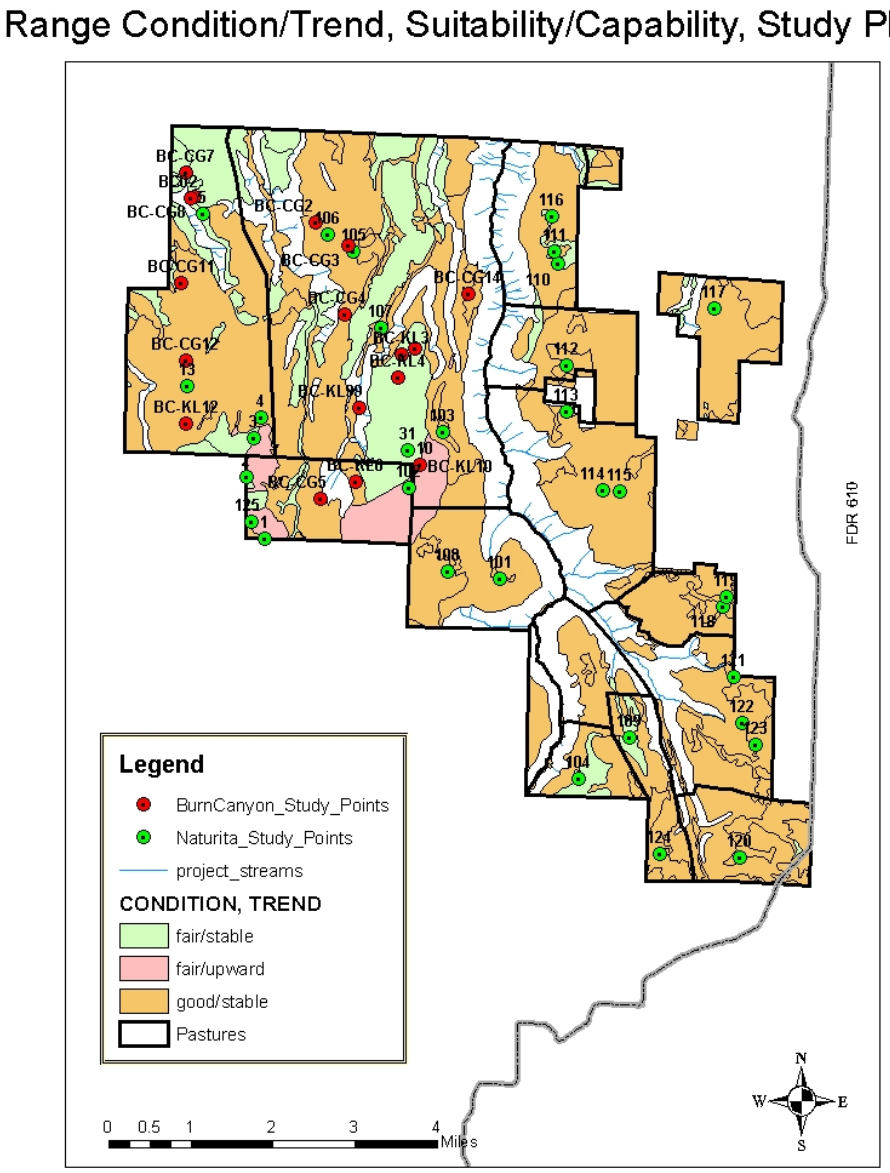


Rangeland Inventory Sites

A rangeland study was undertaken in the project area and completed in March of 2006. Sample size varies by allotment, fourteen samples were taken in the West Naturita allotment, seven in the East Naturita allotment, seven in the Portis allotment, and 3 in the Cy Orr allotment. Additional study sites added specifically for the effects related to the Burn Canyon wildfire further augmented this study; there were 16 additional sites all within the West Naturita allotment. Rangeland condition and trend was derived from these data sets. *Figure 3.3* illustrates these determinations. In addition this figure shows those areas excluded from condition and trend determinations based upon the suitability and capability of the project area as defined in the Forest Plan.

The quantity of bare ground, plant community composition, plant community diversity, and plant community richness are considered important factors when determining rangeland health. Results of the site-specific analysis were cross-referenced with the NRCS rangeland sites to assist in making determinations of rangeland health. *Figure 3.3* illustrates the locations of the study plots. The following tables display the results of this study.

Figure 3.3: Naturita Division Condition/Trend and Suitability/Capability



West Naturita C&H Allotment

The allotment has 14,679 acres, of which 11,117 are considered capable of producing forage. There is a large acreage of transitory range due to the Burn Canyon wildfire and the subsequent replanting of conifers that is still ongoing in the project area. Transitory range affects the quantity and quality of forage over time. In this case, as the area is reforested and revegetated, understory vegetation used as forage will decrease. Browse species are increasing following the fire event, but will eventually decrease in quality. Eleven ecosystems have been identified on the allotment. *Table 3.8* shows the relative diversity, which exists in this allotment.

Recent stocking of livestock on this allotment has been low to none. Historically, stocking was considered to be moderate because of the dense stands of pinyon-juniper and Gamble oak decreased the herbaceous vegetation component. However, heavy use areas do exist. Meadows and other openings are utilized frequently along the southern portions of the allotment. Large areas have been seeded with crested wheatgrass and smooth brome. Most of this work was done in the 1950's and 1960's. More currently, many areas within the Burn Canyon fire perimeter were re-seeded aerially. The predominant vegetation components in many plots are species that were included in the seed mixes.

Wild ungulates are assumed to be utilizing this allotment more frequently as winter range due primarily to the Burn Canyon wildfire. This upward trend in wildlife use is expected to continue.

While the study plots do not show it, several noxious weeds exist within this allotment. Canada thistle, musk thistle, and bull thistle exist in abundance and can be found around watering areas and throughout the burned areas. Of critical concern is the recent establishment of cheatgrass within some timber salvage units and other areas.

Table 3.8: Acres of Ecosystem Types in West Naturita Allotment Pastures.

Ecosystem Type	Wheeler	Sawmill	Callan	McKee	Total	Percentage
Aspen	28				28	0%
Cottonwood-Spruce	2	9	4	141	156	1%
Gamble Oak-Serviceberry	115	11	137	420	683	5%
Douglas fir-Spruce				131	839	6%
Douglas fir		107			107	1%
Oatgrass-Needlegrass-Sedge	13	103	55	5	176	1%
Pinyon Juniper	134	13	446	922	283	2%
Pinyon Juniper-Gamble Oak-Serviceberry	57		473	1483	1956	13%
Sagebrush	313	89		108	108	1%
Willow-Alder	6		12		2064	14%
Ponderosa Pine-Gamble Oak	893	880	2226	4583	8582	57%
Pinyon Juniper-Sagebrush		38	37		75	0%

Site #1 Sawmill Spring

Table 3.9:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
9-21-1999	51.1	46.6	0	0	62.6	88.0
9-16-2005	18.6	78.7	0	0	68.5	41.6

1999 2005

Point 9R001, looking NNW. September 21, 1999 (left) and September 16, 2005 (right).
Bare soil is no longer as evident. Some of the trees on the skyline were scorched in the Burn Canyon Fire of 2002.
1999 was a year of great rainfall during the growing season, but 2005 was about normal.

This site has been read twice, sits at 7,910 ft with an aspect of 77^{o} (magnetic north) and a slope of 4%. Existing plant composition falls outside the expected ranges for the Mountain clay loam range site. Potential natural vegetation for this site is considered to be sagebrush.

This area is a historical livestock concentration area and is currently occupied by the Tri-state gas pipeline. This area was planted with crested wheatgrass to facilitate rehabilitation of the disturbance created by installation of the pipeline. Data shows that bare soil has decreased substantially by 32.5% in the last six years which is desirable. However, the open areas have been filled in by non-native species such as Kentucky bluegrass and crested wheatgrass. All native grasses have been eliminated from the site in the last six years, but the existing species are considered desirable from a forage standpoint. This site is considered to have transitioned into a stable state.

Site #2 Sawmill Spring

Table 3.10:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
9-21-1999	58.2	35.8	0	0	68.5	41.6
9-16-2005	26.2	70.4	0	.5	104.5	14.5

1999 2005

Point 9R002, looking N. September 21, 1999 (left) and September 16, 2005 (right).
The bull thistles behind the rod in 1999 have completely gone, but several small shrubs (probably snakeweed) have started.

This site has been read twice, sits at 7900 ft with an aspect of 74^{o} (magnetic north) and a slope of 1%. Existing plant composition falls outside the expected ranges for the Ponderosa pine range site. The soil type for this site suggests that Ponderosa pine should occupy this area if no disturbances prevent it from doing so; however it is likely that the potential natural vegetation should consist of oatgrass, needlegrass and sedge communities.

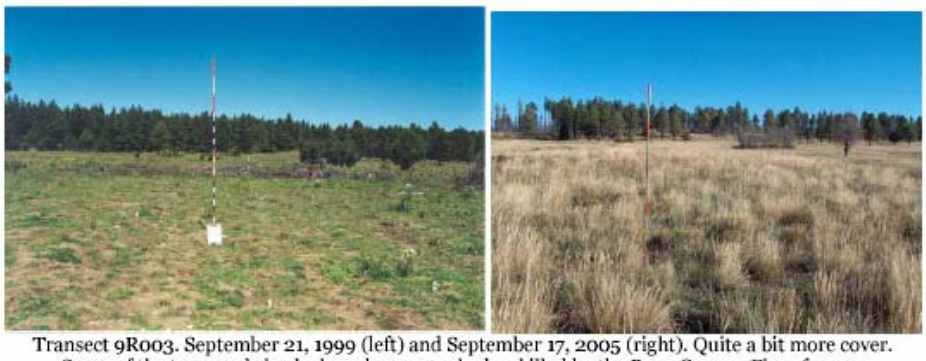
Currently the Tri-state gas pipeline occupies this site. This area was also planted with crested wheatgrass to facilitate rehabilitation of the disturbance created by installation of the pipeline. Native grasses are decreasing rapidly and will likely be extirpated from the site in time. Kentucky bluegrass is the main culprit in this case and has increased its cover by over 55% in six years. Bare soil has decreased in response to the increase in vegetative cover. A relatively stable state exists on this site as it appears an ecological threshold has been crossed. Kentuky bluegrass and crested wheatgrass will likely remain the dominant species for the foreseeable future. Forage value has increased and remains high and it appears that noxious weeds have been out competed by other existing vegetation.

Site #3 Callan

Table 3.11:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
9-21-1999	65.4	30.4	0	.3	57.6	3.2
9-17-2005	47.2	51.0	0	0	88.0	10.5

1999 2005



Transect 9R003. September 21, 1999 (left) and September 17, 2005 (right). Quite a bit more cover. Some of the trees and shrubs have been scorched or killed by the Burn Canyon Fire of 2002.

This site has been read twice, sits at 7940 ft with an aspect of 004^{o} (magnetic north) and a slope of 1%. The soil type for this area consists of the Acree-Zoltay-Nortez complex and likely falls into the Pine Grasslands rangeland site description due to the slope. Given this soil type the expected potential natural vegetation would consist of oatgrass, needlegrass, or sedge communities with some likelihood of shrub species.

Again, the Tri-state pipeline occupies this site and the area was re-vegetated with a crested wheatgrass seed mix. However, on this site native vegetation has persisted. There are only trace amounts of Kentucky bluegrass and crested wheatgrass has decreased since the last inventory. This site was moderately to lightly burned in the Burn Canyon fire in 2002 which may explain why shrubs have been extirpated from the immediate area. Bare soil remains somewhat high relative to other sites, but greater quantities of non-sodforming grasses exist which would explain this. Forage value is increasing and remains high.

Site #4 Callan

Table 3.12:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
9-21-1999	33.3	57.5	0	0	63	6.1
9-17-2005	44.9	42.8	0	0	77.5	2.0

1999 2005

Transect 9R004, looking NNE. September 21, 1999 (left) and September 17, 2005 (right).
This landscape has been considerably changed by the Burn Canyon Fire of 2002.

This site has been read twice, sits at 7950 ft with an aspect of 189^{o} (magnetic north) and a slope of 2%. Existing plant composition falls somewhat within the expected ranges for the Ponderosa pine range site. The Burn Canyon wildfire appears to have helped this occur. Slash and debris have been eliminated by the high severity of the fire in this area. Potential natural communities for this site would include Ponderosa pine and Gambel oak, although it is not expected that the latter would have a high degree of cover due to its current absence from the immediate area. Late season forbs have all but disappeared.

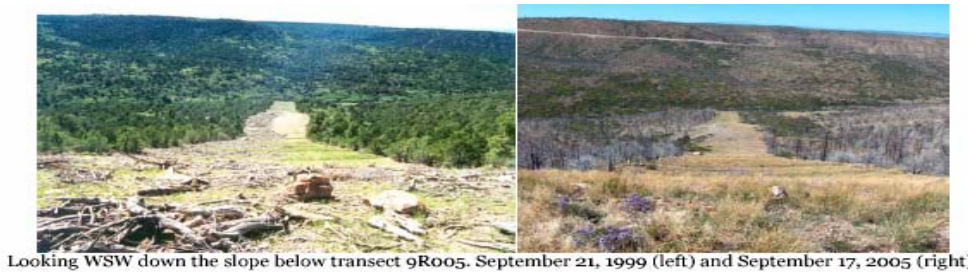
This is another Tri-state occupied site and re-vegetation work was completed using the crested wheatgrass seed mix. Bare soil has increased somewhat but can be attributed to the decrease in litter and debris that existed prior to the fire. Accessibility of the range to livestock has increased substantially and it is expected that this area will receive much more use than in the past.

Site #5 Callan

Table 3.13:

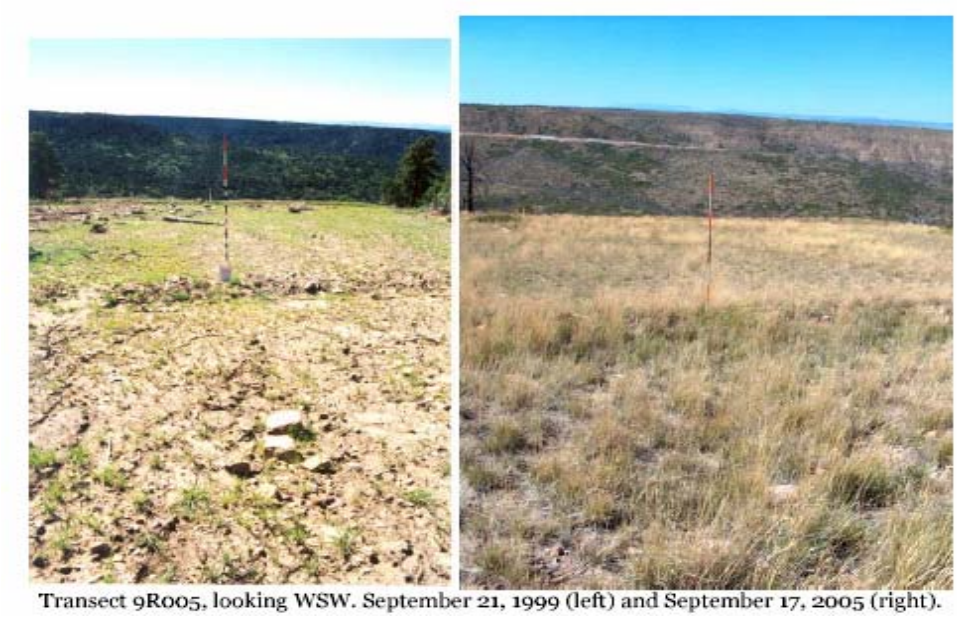
Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
9-21-1999	86.2	2.4	0	0	25.6	0
9-17-2005	54.1	18.7	0	0	40	0

1999 2005



Looking WSW down the slope below transect 9R005. September 21, 1999 (left) and September 17, 2005 (right).

1999 2005



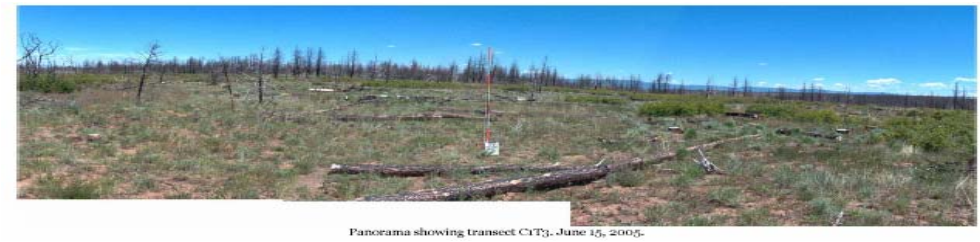
Transect 9R005, looking WSW. September 21, 1999 (left) and September 17, 2005 (right).

This site has been read twice, sits at 7650 ft with an aspect of 265^{o} (magnetic north) and a slope of 16%. NRCS rangeland site information does not exist for this specific soil type. However, potential natural vegetation should be of the pinyon juniper type. The Burn Canyon wildfire extensively altered the overall landscape at this location but the site itself has not seen much change. Seeded species such as slender wheatgrass continue to persist. This site is a characteristic rock outcrop and subsequently displays low species diversity. Forage value has increased, but is low compared to other sites in this allotment.

Site #C1T3 Callan

Table 3.14:

Method	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
Cover/Freq	37.4	55.4	0	7.1	36.8	34.4
Ocular/Macro	25.5	71.4	0	4.2	23.6	21.9



Panorama showing transect C1T3. June 15, 2005.

An established monitoring transect was originally located here, but was unable to be found. A new record was established at the same approximate location using two different methods; Cover/Frequency and Ocular Macroplot. Results are in Table 3.14 above. This site can be described as having the potential natural vegetation of the Ponderosa pine and Gamble oak type. This area was logged and planting is ongoing.

This site was read in 2005 at an elevation of 7910 ft, with an aspect of 288^{o} (magnetic north) and a slope of 4%. Existing plant composition falls within expected ranges for the Ponderosa pine rangeland site description. Species diversity is high as is species richness. The dominant plant is bottlebrush squirreltail and has a cover of only 17.2%. The cover percent of bare soil is not excessive from a functional standpoint.

Site #C3T1 Callan

Table 3.15:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-27-2003	30.2	53.2	0	10.6	10.1	18.6
06-29-2005	29.1	67.6	0	6.5	33.8	29.0

Panorama showing transect 1C4. June 29, 2005.

This site has been read twice, sits at 8010 ft with an aspect of 189^{o} (magnetic north) and a slope of 1%. Existing plant composition falls within expected ranges for the Ponderosa pine rangeland site description. Potential natural vegetation is of the Ponderosa pine, Gamble oak type the rangeland site. Species diversity remains high, western wheatgrass and interior bluegrass has gained abundance. However, cheatgrass presence has been detected. Cheatgrass currently has a relatively low percent cover of 2.7% but a somewhat high frequency of 25%. Any further increase in cheatgrass could degrade rangeland diversity and functional attributes. This area has been logged and planting in ongoing.

Site #KL-9 McKee

Table 3.16:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-21-2003	14.1	14.1	0	0.7	0.9	1.0
06-29-2005	33.2	53.7	0	3.1	18.2	24.0

From over the start re-bar, looking north (left) and east (right). August 21, 2003 (above), June 29, 2005 (below).

This ocular macroplot was established to document recovery and re-vegetation after the Burn Canyon wildfire. This site has been read twice, sits at 7,700 ft, aspect and slope were not recorded. Suitability and capability for livestock grazing in this area is considered low (due to slope, cover type, and proximity to a riparian area) and was excluded from the analysis.

Site #KL-10 McKee

Table 3.17:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-27-2003	10	89.9	10.0	6.3	5.5	6.0
06-29-2005	2.1	95.7	1.1	5.1	7.3	11.1

From over the start re-bar, looking south (left) and west (right). August 27, 2003 (above), June 29, 2005 (below).

This ocular macroplot has been read twice, sits at 8010 ft, aspect and slope were not recorded. Existing plant composition falls within the expected ranges for the Ponderosa pine range site. Potential natural vegetation is the Ponderosa and Gambel oak type. Shrubs are increasing and this trend is expected to continue. Overall plant community diversity is high especially in the grass and forb layers. Livestock may have not used this area heavily in the past due to herbaceous productivity being low resultant from dense tree canopies. It is expected that livestock and wildlife utilization of this area will increase in the short term and possibly decrease again in the long term as shrubs and re-sprouting trees fill in the gaps in the forest floor.

Site #101 Wheeler

Table 3.18:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
06-16-2005	30.2	63.4	0	27.2	69.5	14.1

Transect 101, looking southeast (147° Mag.) at Lone Cone. June 16, 2005.

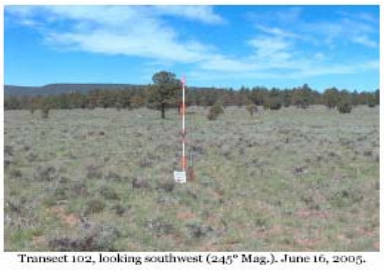
This is a new cover/frequency transect, it sits at an elevation of 8050 ft, has an aspect of 145° (magnetic north) and a slope of 2%. The soil type for this area consists of the Acree-Zoltay-Nortez complex and likely falls into the Pine Grasslands rangeland site description due to the slope. Potential natural vegetation would be the Ponderosa pine, Gamble oak type.

Crested wheatgrass has taken over as the dominant grass in the plant community, and has a cover of 54.4% and a frequency of 100%. This species was planted in the past to help induce recovery while at the same time suppling forage. Other species such as blue grama, bottlebrush squirrel, prairie junegrass, and Sandberg bluegrass still remain on the site, and are considered to be within the normal range for the soil type. Curiously, Arizona fescue does not exist here, but should be the dominant grass species according to the NRCS range site description. Shrub communities are diverse both structurally and with species, moreover many age classes exist. Wyoming big sagebrush is the dominant shrub. Bare ground appears to be within an acceptable range for rangeland health and function. Elk dropping cover and frequency are relatively high indicating a preference for this area.

Site #102 Sawmill Spring

Table 3.19:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
06-16-2005	25.9	67.5	0	9.2	64.1	18.9



Transect 102, looking southwest (245° Mag.). June 16, 2005.

This is a new cover/frequency transect, sits at an elevation of 8010 ft, has an aspect of 230° (magnetic north) and a slope of 2%. Existing plant composition falls within the expected ranges for the pine grasslands range description of the Acree, Zoltay, Nortez soil type.

Potential natural vegetation for this site is considered to be ponderosa pine and gamble oak although no gamble oak currently exists. Wyoming big sagebrush is the dominant shrub, but more than twice the cover of this species is dead or decadent compared with the living component. The apparent die-off of sagebrush is a concern as this area is Gunnison Sagegrouse habitat. Sandberg's bluegrass and prairie junegrass are by far the

dominant grasses. Western wheatgrass, blue grama, bottlebrush squirreltail, and a full compliment of forbs also exist on this site. Species diversity and richness is high. Bare ground appears to be within an acceptable range for rangeland health and function. This area receives some use by wild ungulates based on dropping cover and fequency.

Site #103 McKee

Table 3.20:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
06-16-2005	7.9	87.7	0	22.3	65.9	54.6

Panorama showing transect 103. June 16, 2005.

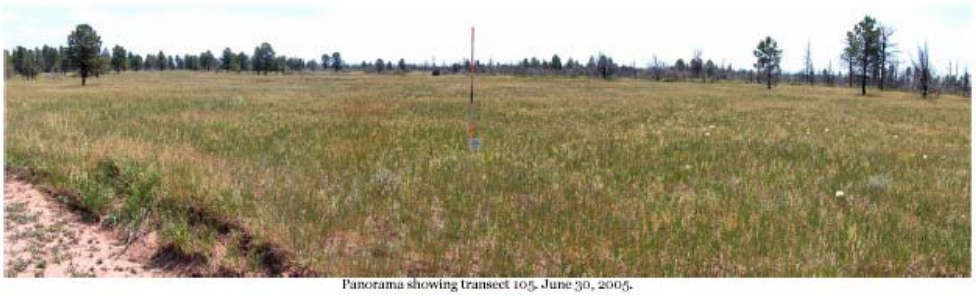
This is a new cover/frequency transect, sits at an elevation of 7820 ft, has an aspect of 343^{o} (magnetic north) and a slope of 6%. Existing plant composition falls within the expected ranges for the mountain clay loam range site description. Potential natural vegetation would be of the ponderosa pine, gamble oak type. Western wheatgrass is the dominant grass species. Western yarrow is quite abundant and many other forbs exist here. Shrubs are widely dispersed and frequent with rubber rabbitbrush dominating. Dropping cover and frequency indicate little use by wild ungulates.

Site #105 McKee

Table 3.21:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
06-30-2005	28.8	70.5	0	0	86.4	17.1

This is a new cover/frequency transect, sits at an elevation of 7850 ft, has an aspect of 016^{o} (magnetic north) and a slope of 1%. Existing plant composition falls outside the expected ranges for the ponderosa pine range site description. Potential natural vegetation would be of the gamble oak and serviceberry type.



Panorama showing transect 105. June 30, 2005.

Smooth brome and crested wheatgrass dominate this site with covers of 56% and 14.8% respectively. This would suggest that this area was planted with these species. Prairie junegrass is also fairly common along the transect. Elk and Deer dropping cover and frequency along with the high degree of smooth brome would indicate that they do not utilize this area much.

Site #106 McKee

Table 3.22:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
06-30-2005	31.0	61.4	9.3	30.9	32.6	46.8

This is a new cover/frequency transect, sits at an elevation of 7840 ft, aspect and slope were not recorded. Existing plant composition falls within the expected ranges for the ponderosa pine range site description. Potential natural vegetation would be of the ponderosa pine and gamble oak type.

Transect 106, looking east-northeast (076° Mag.). June 30, 2005.

Some ponderosa pine survived the Burn Canyon wildfire in this area. Gambel has a large presence but a little less than half of it is dead. The live plants are re-sprouting and quite vigorous. Kentucky bluegrass shows a relative high dominance compared with other grass species in the area. Native grasses include prairie junegrass, bottle brush squirreltail, western sedge, elk sedge and others. Overall diversity is quite high a total of seven grass species and twenty-three forb species were observed within the transect. This site sits on the edge of a greater slope. Large increases in bare ground could induce erosion problems.

Site #107 McKee

Table 3.23:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
06-30-2005	26.3	71.1	0	7.4	79.8	27.5

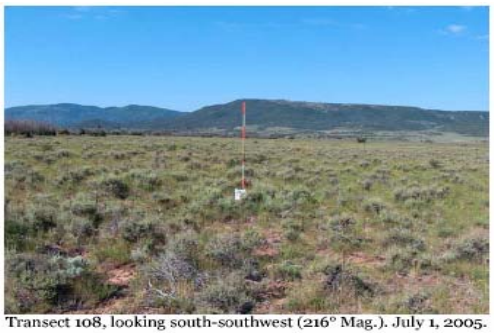
Transect 107, looking northeast (042° Mag.). June 30, 2005.

This is a new cover/frequency transect, sits at an elevation of 7580 ft, has an aspect of 315^{o} (magnetic north) and a slope of 11%. Existing plant composition falls outside the expected ranges for the mountain clay loam range site description. Potential natural vegetation would be sagebrush. Both Wyoming big sagebrush and black sagebrush exists. Native grasses dominate, but Kentucky bluegrass exists in lower amounts.

Site #108 Wheeler

Table 3.24:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-01-2005	42.5	51.6	0	26.9	51.9	13.8



Transect 108, looking south-southwest (216° Mag.). July 1, 2005.

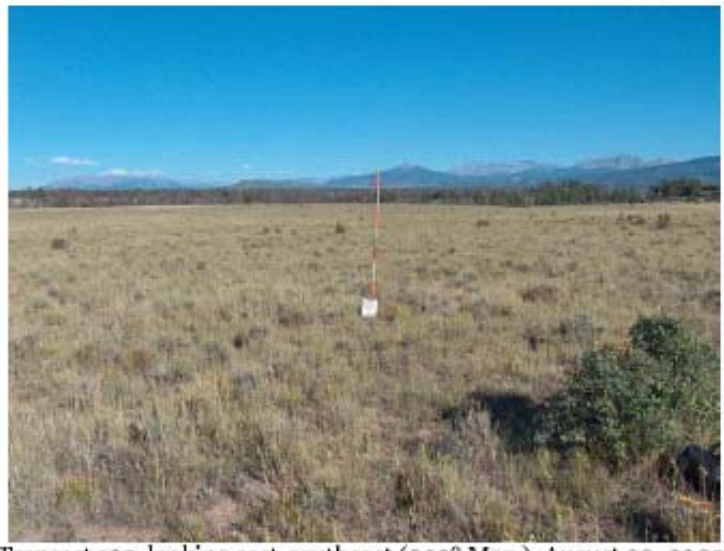
This is a new cover/frequency transect, sits at an elevation of 8010 ft, has an aspect of 242° (magnetic north) and a slope of 2%. Existing plant composition falls outside the expected ranges for the ponderosa pine range site description. Potential natural vegetation would be sagebrush.

Wyoming sagebrush makes up most of the shrub cover, however less than half of the total is alive. Crested wheatgrass persists as the dominant. A few native grasses exist in moderate to light amounts. A total of ten forbs exist here. Elk appear to use this area moderately. Bare soil is considered to be high but do to the flat landscape and species composition erosion does not appear to be a problem at this time. Still bare ground is higher than desired.

Site #125 Sawmill Springs

Table 3.25:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-30-2005	47.0	51.5	0	16.5	67.8	15.2



Transect 125, looking east-southeast (099° Mag.). August 30, 2005.

This is a new cover/frequency transect, sits at an elevation of 7930 ft, has an aspect of 110° (magnetic north) and a slope of 2%. Existing plant composition falls outside the

expected ranges for the brushy loam range site description. Potential natural vegetation would be sagebrush.

This area historically has received a great amount of livestock grazing pressure due to the proximity of handling facilities for this allotment this is expected to continue. Crested wheatgrass dominates the grass component. With the exception of interior bluegrass, only trace amounts of native grasses remain in this area these include prairie junegrass, and bottlebrush squirreltail. Wyoming big sagebrush has a larger dead component than live. Six species of forbs were observed. The amount of bare ground is considered high and outside the desired range for this site.

Site #BC-CG2 McKee

Table 3.26:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-31-2003	78.3	13.0	0	2.5	3.5	6.5
09-06-2006	16.8	66.5	16.5	21.6	20.2	2.1

This site has been read twice, sits at 7490 ft with an aspect of 004^{o} (magnetic north) and a slope of 1%. Existing plant composition falls outside the expected ranges for the pine grasslands range site description. Potential natural vegetation for this site is considered to be ponderosa pine and Gamble oak, both of which are now found in the area albeit at early seral stages.

Grasses are increasing and forbs are decreasing on this site. As expected overall diversity is declining as some species are gaining a competitive advantage over others. This appears to be especially apparent in the forb layer, many forbs were not observed in 2006 that were in 2003. However, some of the discrepancy may be due to the difference in the time transects were read. Noxious weeds were not observed on this site in 2006. Bare soil has decreased dramatically. Elk droppings were not observed.

Site #BC-CG3 McKee

Table 3.27:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-31-2003	6.5	45.0	0	26.0	2.0	8.5
08-31-2006	38.1	59.9	0	18.9	42.5	57.5

This site has been read twice, sits at 7950 ft with an aspect of 189^{o} (magnetic north) and a slope of 2%. Existing plant composition falls outside the expected ranges for the pine grasslands range site description. Potential natural vegetation for this site is considered to be ponderosa pine and gamble oak.

This transect sits on the Trans Colorado gas pipeline, which runs through the project area. Grass cover has increased substantially with two specific species; bottlebrush squirrel tail and interior bluegrass. No other graminoids were identified at this location. Forbs continue to increase in both cover and frequency but diversity appears to have decreased. Elk droppings were observed in low cover, and frequency.

Site #BC-CG4 McKee

Table 3.28:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-31-2003	71.5	6.3	0	1.0	.5	3.5
09-06-2006	38.9	48.5	0	23.6	50.5	9.2

This site has been read twice, sits at 7650 ft with an aspect of 265^{o} (magnetic north) and a slope of 16%. Existing plant composition falls outside the expected ranges for the mountain clay loam range site description. Potential natural vegetation for this site is considered to be ponderosa pine and gamble oak.

This site also sits on the Trans Colorado gas pipeline. Only two grasses were observed, these are; slender wheatgrass and western wheatgrass. Overall, diversity is decreasing. Bare ground is decreasing and litter is increasing which will increase infiltration and decrease surface runoff. Elk droppings were not observed.

Site #BC-CG5 Sawmill Spring

Table 3.29:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-31-2003	33.8	8.0	0	1.5	2.5	34.0
09-12-2006	26.8	63.3	0	33.1	85.8	31.2

This site has been read twice, sits at 7840 ft with an aspect of 290^{o} (magnetic north) and a slope of 4%. Existing plant composition falls outside the expected ranges for the ponderosa pine range site description. Potential natural vegetation for this site is considered to be ponderosa pine and gamble oak.

The wildfire burned with a moderate degree of intensity and killed all trees below 11 meters in height. Shrubs also suffered effects from drought and frost, plants above 1.3 meters showed signs of die-off. There were a high number of live species in this inventory location, 23 in all in 2006. The dominant grasses are slender wheatgrass and western wheatgrass. Live gamble oak dominates the shrub layer. Again, bare soil is decreasing and cover is increasing which should lesson the opportunity for erosion. Elk droppings were not observed.

Site #BC-CG7 Callan

Table 3.30:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-29-2003	na	na	0	12.5	2.0	4.5
09-12-2006	55.1	33.9	0	29.1	29.0	5.7

This site has been read twice, sits at 7880 ft with an aspect of 297^{o} (magnetic north) and a slope of 4%. Existing plant composition falls outside the expected ranges for the ponderosa pine range site description. Potential natural vegetation for this site is considered to be gamble oak and serviceberry. This ecotype currently exists in an early seral stage.

This area burned very hot, the entire duff layer was missing and is considered to have burned. Most of the trees and shrubs were burned over. All standing tree stems were felled and the area was replanted in 2005 with ponderosa pine. Currently, mountain mahogany and gamble oak dominate the shrub layer with Utah serviceberry present in lower cover and frequency. The grass layer is not considered to be strong as bottlebrush squirreltail dominates with only a 10% cover. Bare soil remains relatively high and the litter layer remains relatively low. Elk droppings were observed in low cover and frequency.

Site #BC-CG8 Callan

Table 3.31:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-29-2003	na	na	0	1.5	1.0	5.0
09-11-2006	40.2	23.1	0	25.1	11.0	16.6

This site has been read twice, sits at 7960 ft with an aspect of 258^{o} (magnetic north) and a slope of 10%. Existing plant composition falls outside the expected ranges for the ponderosa pine range site description. Potential natural vegetation for this site is considered to be pinyon juniper.

The fire burned hot and all litter was consumed. Mountain mahogany and gamble oak have re-sprouted and dominate the shrub layer. Only two grass species were observed, and of those only slender wheatgrass could be considered moderately frequent. This area still appears to be suffering from the effects of the fire as bare ground is somewhat high and live cover is quite low. Elk droppings were not observed.

Site #BC-CG11 Callan

Table 3.32:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-29-2003	74.7	6.7	0	3.5	0.5	4.0

08-30-2006	42.3	47.7	0	47.4	0	20.5

This site has been read twice, sits at 7690 ft with an aspect of 069^{o} (magnetic north) and a slope of 12%. Existing plant composition falls outside the expected ranges for the pinyon juniper range site description. Potential natural vegetation for this site is considered to be ponderosa pine and gamble oak.

All pinyon juniper was killed in the fire and this area burned very hot. The stand of pinyon juniper was very dense prior to the fire which may explain the complete lack of grass species which now exists. Gamble oak and Utah serviceberry dominate the shrub layer and total cover. Elk droppings were not observed.

Site #BC-CG12 Callan

Table 3.33:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-04-2003	11.7	71.2	0	5.5	4.0	37.5
09-06-2006	43.2	52.9	0	43.7	38.5	14.5

This site has been read twice, sits at 7860 ft with an aspect of 254^{o} (magnetic north) and a slope of 2%. Existing plant composition falls within the expected ranges for the ponderosa pine range site description. Potential natural vegetation for this site is considered to be ponderosa pine and gamble oak.

The wildfire burned very hot and killed all trees. The standing dead trees over 12 meters in height were felled in 2004 and the area is scheduled for replanting. Dominant grass species include bottlebrush squirreltail, and western wheatgrass. Gamble oak has resprouted and has a live cover of over 40%. Gamble oak is expected to continue to increase its cover. A total of seven forbs exist on the site with hairy golden aster being somewhat frequent. Elk droppings were not observed.

Site #BC-CG14 McKee

Table 3.34:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-05-2003	28.2	21.7	0	13.5	12.5	9.5
09-11-2006	35.5	52.2	0	16.3	84.0	30.0

This site has been read twice, sits at 7850 ft with an aspect of 004^{o} (magnetic north) and a slope of 5%. Existing plant composition falls somewhat outside the expected ranges for the ponderosa pine range site description. Potential natural vegetation for this site is considered to be gamble oak and serviceberry.

Gamble oak is increasing rapidly, no other shrubs were observed in 2006, however in 2003 five other species of shrubs existed on this transect. This area burned very intensely

and all trees were killed. The shrub layer also suffered from frost and drought as all shrubs over 1.5 meters in height were dead. Bottlebrush squirreltail is very common with needle and thread grass and interior bluegrass also being present. Kentucky bluegrass existed in low cover and frequency in 2003 and now appears to have been eliminated from the site. Eight species of forbs were observed. Elk droppings were observed in moderate cover and were somewhat frequent.

Site #BC-KL2 McKee

Table 3.35:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-31-2003	80.0	0	0	1.0	7.5	14.5
09-11-2006	26.5	71.4	0	24.3	94.5	29.5

This site has been read twice, sits at 7800 ft with an aspect of 295^{o} (magnetic north) and a slope of 3%. Existing plant composition falls somewhat outside the expected ranges for the ponderosa pine range site description. Potential natural vegetation for this site is considered to be ponderosa pine and gamble oak.

All trees were killed in the fire, shrubs over 1.7 meters were killed by drought and frost. Gamble oak and buckbrush occupy the site with gamble oak increasing its cover quickly through respouting. Ross sedge and Kentucky bluegrass dominate with bottlebrush squirreltail also being quite frequent. Bare soil has decreased and litter has increased substantially, which will assist with infiltration and limit surface runoff. Grass cover is quite high as well mostly due to sod forming grasses dominating the site. Elk droppings were not observed.

Site #BC-KL3 McKee

Table 3.36:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-04-2003	na	na	0	60.2	0.4	3.0
09-11-2006	6.0	91.8	0	18.9	29.0	25.3

This site has been read twice, sits at 7900 ft with an aspect of 105^{o} (magnetic north) and a slope of 1%. Existing plant composition falls somewhat within the expected ranges for the ponderosa pine range site description. Potential natural vegetation for this site is considered to be ponderosa pine and gamble oak.

This site burned very intensely and all trees were killed. The shrub layer over 3 meters in height was killed by drought and frost. Gamble oak dominates the shrub layer and is increasing quickly. Prairie junegrass dominates the grass and grasslikes in which four other species exist. Eight forbs were observed with mountain albert goldenrod being the most common. No elk droppings were observed.

Site #BC-KL4 McKee

Table 3.37:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-04-2003	90.0	0.1	0	50.5	1.0	2.1
09-05-2006	26.6	71.7	0	35.7	4.1	20.0

This site has been read twice, sits at 7920 ft, aspect and slope were not recorded. Existing plant composition falls somewhat within the expected ranges for the ponderosa pine range site description. Potential natural vegetation for this site is considered to be ponderosa pine and gamble oak.

The fire burned very intensely here too. Again, all trees were killed and shrubs over 1.7 meters in height were killed by frost and drought. Bare soil has decreased and litter has increased dramatically mostly due to the shrub layer. Shrub cover has decreased mostly in the gamble oak. It appears that live gamble oak is decreasing slightly and Oregon grape has filled the percent cover left open. A considerable amount of dead gamble oak still occupies the area. Only one species of grass exists which is bottlebrush squirreltail and is very sparse.

Site #BC-KL6 McKee

Table 3.38:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-05-2003	52.0	20.0	0	0.3	4.6	3.3
09-07-2006	15.6	78.6	0	0.5	101.8	20.6

This site has been read twice, sits at 7940 ft, with an aspect of 295^{o} (magnetic north) and a slope of 2%. Existing plant composition falls outside the expected ranges for the ponderosa pine range site description. Potential natural vegetation for this site is considered to be ponderosa pine and gamble oak.

This area burned hot and all trees were killed. Again, the shrub layer was affected by the lack of overstory cover and changes in microclimate. Shrubs over 1.7 meters in heights were killed by drought and frost. Gamble oak now appears to have been eliminated from this site. Slender wheatgrass and western wheatgrass dominate the grass and grasslike layer. Grass and grasslikes cover the area extensively. No elk droppings were observed.

Site #BC-KL9 McKee

Table 3.39:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover

08-21-2003	14.1	14.1	0	0.7	0.9	1.0
06-29-2005	33.2	53.7	0	3.1	18.2	24.0

This site has been read twice, sits at 7925 ft, with an aspect of 252^{o} (magnetic north) and a slope of 5%. Existing plant composition falls outside the expected ranges for the ponderosa pine range site description. This area falls within the non-suitable and/or non-capable rangeland area. Therefore this site was not considered in the overall range analysis.

Even still, this area burned with moderate intensity and most large trees were killed, however some survived. Gamble oak appears to be increasing only slightly. Of most concern here is the new presence of cheatgrass. Currently, this species is in low cover but there appears to be a large niche for this species to occupy more area.

Site #BC-KL10 Sawmill Spring

Table 3.40:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-27-2003	10.0	89.9	10.0	6.3	5.5	6.0
06-29-2005	2.1	95.7	1.1	5.1	7.3	11.1

This site has been read twice, sits at 7965 ft, with an aspect of 321^{o} (magnetic north) and a slope of 3%. Existing plant composition falls within the expected ranges for the ponderosa pine range site description. Potential natural vegetation for this site is considered to be ponderosa pine and gamble oak.

This area burned with high intensity, all trees were killed and the shrub layer suffered as well. Shrubs over 1.5 meters were killed by frost and drought. This area was re-planted with ponderosa pine seedlings. Gamble oak cover has not changed and remains uncommon at only 1% cover. Grasses and forbs also remain uncommon with low cover.

Site #BC-KL12 Callan

Table 3.41:

Dates Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-30-2003	na	na	0	3.0	3.5	10.5
09-06-2006	18.5	81.4	0	10.9	56.0	56.5

This site has been read twice, sits at 7840 ft, with an aspect of 204^{o} (magnetic north) and a slope of 16%. Existing plant composition falls within the expected ranges for the ponderosa pine range site description. Potential natural vegetation for this site is considered to be ponderosa pine and gamble oak.

This area burned with moderately high intensity, about half of all trees over 11 meters in height were killed all trees below 11 meters were killed. Gamble oak has increased only slightly. Cheatgrass dominates the grass layer and is quite common, it was found in all plots. Bottlebrush squirreltail is the only other somewhat common grass species on this site. It appears that this site is transitioning to a cheatgrass dominated stand. This is of great concern as this area is also frequented by livestock and possibly wildlife as water is nearby, although only cattle droppings were observed.

Cy Orr C&H Allotment

The allotment has 1716 acres, of which 1624 are considered capable of producing forage. Nine ecosystems have been identified on the allotment. *Table 3.42* shows the relative diversity that exists in this allotment.

Livestock grazing under historical stocking is considered to be light to moderate. Meadows and other openings are utilized for frequently. Wild ungulates do not appear to utilize this allotment as frequently as other allotments in the project area. Overall range condition appears to be high with appropriate levels of functional attributes occurring over most of the allotment.

Table 3.42: Acres of Ecosystem Types in Cy Orr Allotment Pastures.

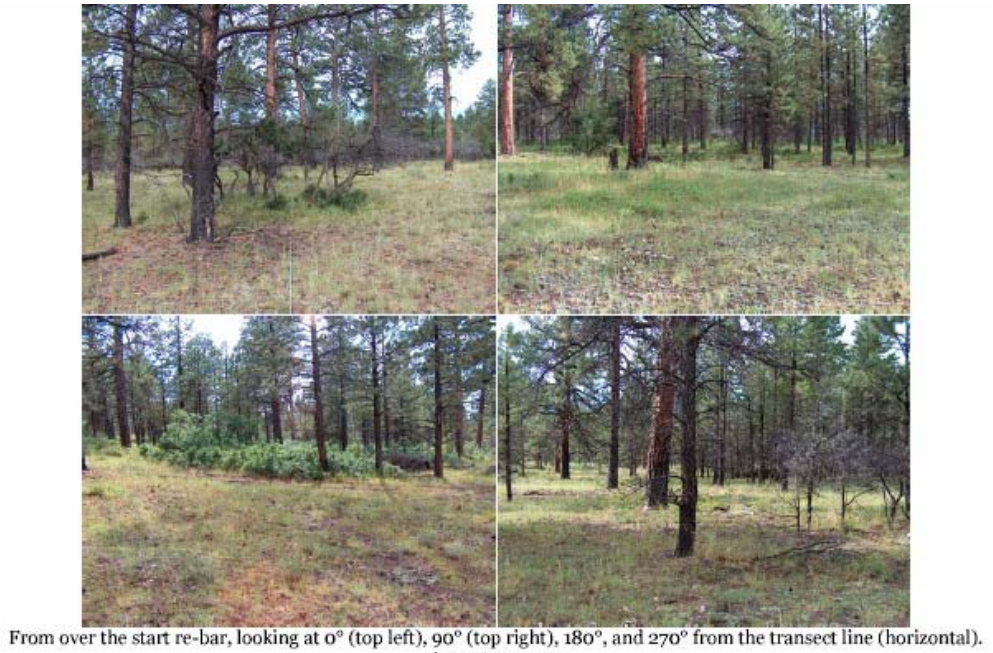
Ecosystem Type	Cy Orr	Homestead	Total	Percentage
Serviceberry	4		4	<1%
Oatgrass-Needlegrass-Sedge	162		162	12%
Pinyon Juniper	2		2	<1%
Ponderosa Pine-Gamble Oak	161	797	958	68%
Sagebrush	12		12	1%
Cottonwood-Spruce		13	13	1%
Gamble Oak-Serviceberry		233	233	17%
Pinyon Juniper-Gamble Oak-Serviceberry		15	15	1%
Thurber Fescue		3	3	<1%

Site #117 Homestead

Table 3.43:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-04-2005	16.9	78.2	45.1	26.9	48.4	12.6

This is a new cover/frequency transect, it sits at an elevation of 8010 ft, has an aspect of 305^{o} (magnetic north) and a slope of 6%. Existing plant composition falls within the expected range for the ponderosa pine range site description. Potential natural vegetation would be ponderosa pine and gamble oak.



From over the start re-bar, looking at 0° (top left), 90° (top right), 180°, and 270° from the transect line (horizontal). August 4, 2005.

This is a ponderosa pine site and gamble oak site as both exist in relative abundance. Kentucky bluegrass dominates the grasses but only slightly. Native grasses are common and their cover is fairly high. Species diversity and richness are high.

Site #118 Cy Orr

Table 3.44:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-05-2005	1.1	96.7	0	23.4	187.9	69.7

Horizontal panorama showing transect 118. August 5, 2005.

This is a new cover/frequency transect, it sits at an elevation of 8240 ft, has an aspect of 198^{o} (magnetic north) and a slope of 1%. Existing plant composition falls outside the expected range for the ponderosa pine range site description mainly due to this site being more moist. Potential natural vegetation should be oatgrass, needlegrass, and sedge plant communities and is likely a better description of the site.

Tufted hairgrass, Kentucky bluegrass, and Baltic rush are highly dominant each having a cover above 50% and a frequency above 95%. Many small quantities of timothy, bluejoint reedgrass, and other sedges also exist on this site. A total of twenty-one forbs were observed. Cinquefoils are the dominant shrubs. This is an extremely diverse range site in excellent condition.

Site #119 Cy Orr

Table 3.45:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-05-2005	45.5	48.9	0	39.4	46.2	35.5

Transect 119, looking northwest (309° Mag.). August 5, 2005.

This is a new cover/frequency transect, it sits at an elevation of 8250 ft, has an aspect of 251^{o} (magnetic north) and a slope of 3%. Existing plant composition falls outside the expected range for the ponderosa pine range site description. However, native species diversity is high. Potential natural vegetation should be oatgrass, needlegrass, and sedge species.

Needlegrasses, and sedges dominate the grasses. The shrub layer is quite diverse showing six species with Wyoming big sagebrush dominating. This site appears also to be in excellent condition.

East Naturita C&H Allotment

The allotment has 5168 acres, of which about 3766 are considered capable and suitable for livestock grazing. Twelve ecosystems have been identified on the allotment. *Table 3.46* shows the relative diversity that exists in this allotment.

Historically, there is evidence that this allotment was stocked heavily with livestock. Currently, livestock grazing in this allotment is likely near the threshold of appropriate use with some areas receiving more than appropriate use to allow for regrowth following defoliation. Moreover, it appears that some areas receive multiple defoliations and would be a direct result of the frequency of grazing.

Large areas of crested wheatgrass were planted to increase cover and limit erosion. However, this appears to have affected the native vegetation species diversity and cover potential. As a result, structural and plant composition diversity in some areas are not what is desired. Grazing management changes alone may be unable to alter this vegetation composition where this pattern exists.

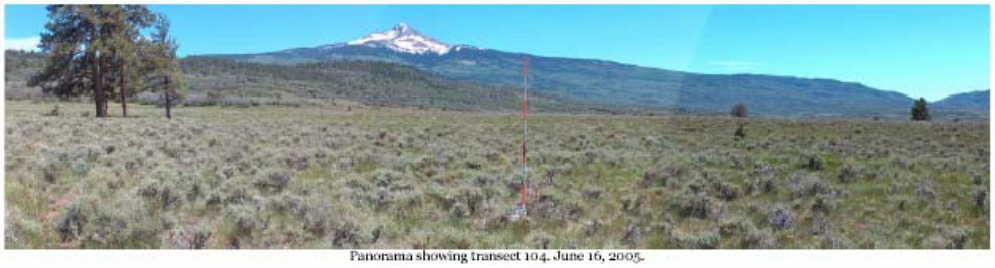
Table 3.46: Acres of Ecosystem Types in East Naturita Allotment Pastures.

Ecosystem Type	Wheeler Ridge	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Total	Percentage
Cottonwood-Spruce	2				5	1	8	0%
Gamble Oak-Serviceberry		66	158	179		18	421	8%
Douglas fir-Spruce							0	0%
Douglas fir	41	134			70	125	370	7%
Oatgrass-Needlegrass-Sedge		13	20	272	156	30	491	10%
Pinyon Juniper		64					64	1%
Pinyon Juniper-Gamble Oak-Serviceberry							0	0%
Sagebrush		226	139		132		497	10%
Willow-Alder	6	1			15	9	31	1%
Ponderosa Pine-Gamble Oak	251	1082	719	255	178	525	3010	59%
Spruce-fir-Aspen		147				72	219	4%
Thurber Fescue			7				7	0%

Site #104 Unit 1

Table 3.47:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
06-16-2005	47.5	41.6	0	26.4	48.4	5.2



Panorama showing transect 104. June 16, 2005.

This is a new cover/frequency transect, it sits at an elevation of 7980 ft, aspect and slope were not recorded at this site. Existing plant composition falls outside the expected range for the pine grasslands range site description. Potential natural vegetation for this site is sagebrush.

Wyoming big sagebrush dominates the shrub layer, however black sage and green rabbitbrush also exist and are common. Some forbs exist but are scattered and very infrequent. The amount of forb cover is far outside of the expected range for this area and is considered to be a problem for Gunnison Sagegrouse rearing. This area was planted with crested wheatgrass and smooth brome apparently in the mid 1950's. The planting was likely an attempt to re-vegetate the site after intense grazing had reduced or eliminated the primary grass species. This is apparent since there presence was not recorded in previous range studies at about that time. As a result, the expected dominant native grasses do not exist and the smooth brome was not observed on this site suggesting it has since disappeared. Secondary grass species are present and at relative expected levels. Of these, blue grama and Sandberg bluegrass are the most common. A lack of fire likely has contributed to a later seral stage of sagebrush. This area receives a high degree of livestock use as it sits between two major water sources. Finally, it appears that bare soil is greater than desired for this site.

Site #109 Unit 3

Table 3.48:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-01-2005	46.1	51.1	0	16.7	60.8	8.7

Panorama showing transect 109. July 1, 2005.

This is a new cover/frequency transect, sits at an elevation of 8190 ft, has an aspect of 336^{o} (magnetic north) and a slope of 5%. Existing plant composition falls outside the expected range for the pine grasslands range site description. Potential natural vegetation for this site has been identified as oatgrass, needlegrass and sedge and boarders the sagebrush potential natural plant community.

Crested wheatgrass and smooth brome was planted probably around the same time as site# 104. Smooth brome only exists is low infrequent amounts at this time. However, crested wheatgrass continues to persist in high amounts with a cover of 47.5% and was found in all plots. Here too forb cover is lower and bare soil is higher than would be expected for this site in good condition. Elk use this area moderately.

Site #120 Unit 2

Table 3.49:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-05-2005	25.5	67.2	0	34.9	68.4	19.1

Transect 120, looking west (273° Mag.). August 5, 2005.

This is a new cover/frequency transect, sits at an elevation of 8260 ft, has an aspect of 004^{o} (magnetic north) and a slope of 2%. Existing plant composition falls somewhat within the expected range for the pine grasslands range site description. Dominant primary grasses do not exist, however many secondary grasses and forbs do. Potential natural vegetation for this site has been identified sagebrush.

Plant species diversity is high the dominant grass species are, native bluegrasses. Bare soil is not considered excessive.

Site #121 Unit 1

Table 3.50:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-29-2005	49.6	44.9	0	19.5	56.9	27.0

Transect 121, looking east-southeast (116° Mag.). August 29, 2005.

This is a new cover/frequency transect, sits at an elevation of 8250 ft, has an aspect of 343° (magnetic north) and a slope of 2%. Existing plant composition falls somewhat within the expected range for the pine grasslands range site description. Potential natural vegetation is sagebrush.

Both crested wheatgrass and smooth brome were planted and remain in high abundance. Many native species of grasses also exist. Fifteen species of forbs were identified. Wyoming big sagebrush is the dominant shrub. Bare soil is higher than what is desired for this site.

Site #122 Unit 1

Table 3.51:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-29-2005	0	97.3	90.3	22.5	101.0	26.9

From over the start re-bar, looking at 0° (top left), 90° (top right), 180°, and 270° from the transect line (horizontal). August 29, 2005.

This is a new cover/frequency transect, sits at an elevation of 8260 ft, has an aspect of 219^{o} (magnetic north) and a slope of 3%. Existing plant composition falls within the expected range for the ponderosa pine range site description. Potential natural vegetation for this site has been identified ponderosa pine and gamble oak communities.

Kentucky bluegrass dominates the grass layer by 86.6%. Nodding brome, prairie junegrass, and bottlebrush squirreltail also exist in relative abundance. Aspen grow here intermixed with the ponderosa pine and gamble oak. Litter and duff is quite high as expected for a multi-layered canopy site. This area does not receive as much use as meadows and other open areas located on the allotment.

Site #123 Unit 1

Table 3.52:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-30-2005	40.5	49.8	0	21.8	76.4	16.2

Transect 123, looking north-northeast (016° Mag.). August 30, 2005.

This is a new cover/frequency transect, sits at an elevation of 8280 ft, has an aspect of 250° (magnetic north) and a slope of 3%. Existing plant composition falls somewhat within the expected range for the pine grasslands range site description. Dominant primary grasses do not exist, however many secondary grasses and forbs do. Potential natural vegetation for this site has been identified sagebrush.

This site was planted with crested wheatgrass and it still persists in high abundance. Several shrub species occupy this area with green rabbitbrush dominating.

Site #124 Unit 3

Table 3.53:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
08-30-2005	31.0	61.0	0	32.8	64.1	37.4

Horizontal panorama showing transect 124. August 30, 2005.

This is a new cover/frequency transect, sits at an elevation of 8140 ft, has an aspect of 026° (magnetic north) and a slope of 9%. Existing plant composition falls within the expected range for the pine grasslands range site description. Again, dominant primary grasses do not exist, but many secondary grasses and forbs do. Potential natural vegetation for this site has been identified sagebrush. Cheatgrass was observed in low amounts in one plot. Wyoming big sagebrush dominates the shrub layer.

Portis C&H Allotment

The allotment has 4915 acres, of which about 3133 are considered capable and suitable for livestock grazing. Twelve ecosystems have been identified on the allotment. *Table 3.54* shows the relative diversity which exists in this allotment.

Currently this allotment appears to be lightly to moderately stocked overall. The limiting factor is the availability of water to disperse livestock. Additional riding and herding would alleviate some of this problem. Some areas, especially around the private inholding receive frequent heavy use. Bare ground around most of this area is quite high and species composition not what is desired. Overall production in unit #2 appears to have been lowered by the current species composition. In addition, many introduced species occur in abundance around this area. Livestock grazing management changes alone may not be able to alter the species composition to what is desired. The remainder of the allotment appears to be in relatively good condition and is likely a result of little to no use occurring, do to the lack of reliable water.

Table 3.54: Acres of Ecosystem Types in Portis Allotment Pastures.

Ecosystem Type	Unit 1	Unit 2	Unit 3	Total	Percentage
Cottonwood-Spruce	88	126	62	276	6%
Gamble Oak-Serviceberry	74	7	108	189	4%
Douglas fir			182	182	4%
Oatgrass-Needlegrass-Sedge	66	106	71	243	5%
Pinyon Juniper	309	85	355	749	16%
Pinyon Juniper-Gamble Oak-Serviceberry	32	84		116	2%
Willow-Alder			1	1	0%
Ponderosa Pine-Gamble Oak	690	754	1463	2907	62%
Spruce-fir-Aspen			27	27	1%

Site #110 Unit 1

Table 3.55:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-05-2005	41.3	56.0	0	19.7	46.8	25.5

Panorama showing transect 110. July 5, 2005.

This is a new cover/frequency transect, sits at an elevation of 7820 ft, has an aspect of 014^{o} (magnetic north) and a slope of 2%. The soil type for this area consists of the

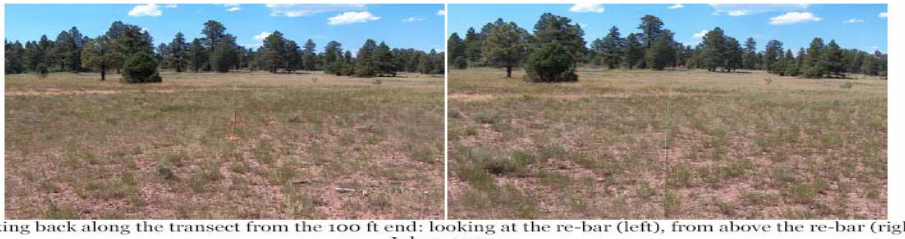
Acree-Zoltay-Nortez complex and likely falls into the Pine Grasslands rangeland site description due to the slope. Given this soil type the expected potential natural vegetation would consist of oatgrass, needlegrass, or sedge communities with some likelihood of shrub species.

Interior bluegrass dominates the grass layer. Smooth brome exists indicating this area was re-vegetated at some point but curiously no crested wheatgrass was identified. Prairie junegrass is also very common. Other grasses include western wheatgrass, needle and thread, and bottlebrush squirreltail. Eleven species of forbs were identified along with four species of shrubs.

Site #111 Unit 1

Table 3.56:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-05-2005	68.0	30.5	0	11.2	42.3	4.5



Looking back along the transect from the 100 ft end: looking at the re-bar (left), from above the re-bar (right). July 5, 2005.

From over the start re-bar, looking at the first microplot, at 3 ft. July 5, 2005.

This is a new cover/frequency transect, sits at an elevation of 7800 ft, aspect was not recorded and slope was 0%. Existing plant composition falls outside the expected range for the pine grasslands range site description. Potential natural vegetation consists of oatgrass, needlegrass, and sedge communities.

Alkali grass dominates the overall cover with interior bluegrass being more frequent. A very high degree of bare soil exists which is undesirable. It appears that rangeland function may be at risk on this site.

Site #112 Unit 2

Table 3.57:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-05-2005	11.1	85.4	0	5.5	90.9	53.6

Panorama showing transect 112. July 5, 2005.

This is a new cover/frequency transect, sits at an elevation of 8110 ft, aspect was not recorded and slope was 0%. Existing plant composition falls outside the expected range for the ponderosa pine range site description. Potential natural vegetation consists of oatgrass, needlegrass, and sedge communities.

Livestock use here is very heavy in relation to the rest of the allotment. Introduced species include common timothy, smooth brome, and Kentucky bluegrass, the later of which is dominant. Baltic rush is the second most dominant species. This combination of dominant species indicates heavy use by ungulates has occurred in the past.

Site #113 Unit 3

Table 3.58:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-05-2005	20.3	77.1	0.1	12.2	72.4	25.4

Looking back along the transect from the 100 ft end: looking at the re-bar (left), from above the re-bar (right). July 5, 2005.

This is a new cover/frequency transect, sits at an elevation of 8125 ft, has an aspect of 199^{o} (magnetic north) and a slope of 2%. Existing plant composition falls within the

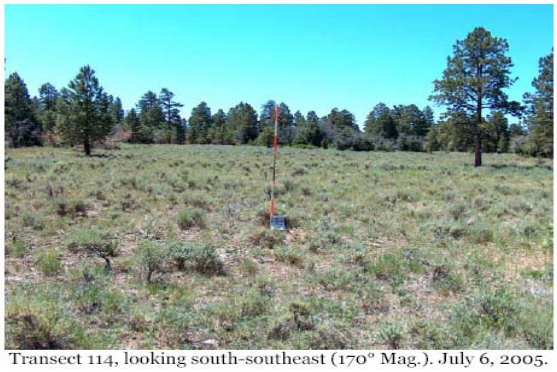
expected range for the pine grasslands range site description. Potential natural vegetation consists of oatgrass, needlegrass, and sedge communities.

At times, livestock use here tends to be higher than in other parts of the allotment. There is good cover of native grasses such as interior bluegrass, bottlebrush squirreltail, prairie junegrass, needle and thread grass, and blue grama. Moreover, there is high frequency of these species. Fifteen species of forbs occur on this site, this combined with the quantity of grass species indicate that overall species diversity is high on this site. Wyoming big sagebrush dominates the shrub layer. Litter retention is high.

Site #114 Unit 3

Table 3.59:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-06-2005	33.5	63.6	0	29.2	47.9	20.4



Transect 114, looking south-southeast (170° Mag.). July 6, 2005.

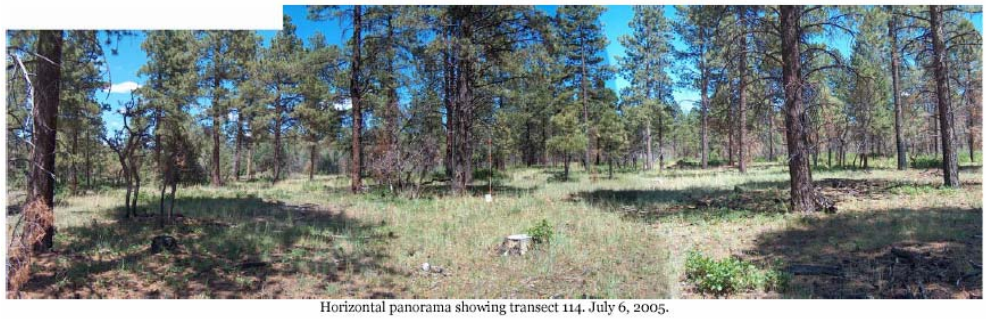
This is a new cover/frequency transect, sits at an elevation of 8180 ft, has an aspect of 287^{o} (magnetic north) and a slope of 2%. Existing plant composition falls within the expected range for the pine grasslands range site description. Potential natural vegetation consists of ponderosa pine and gamble oak.

Prairie junegrass dominates with 25% cover. Other native grasses occur here in high percentages of cover. Forb composition was similar to site 113 with fifteen forbs occurring and overall this site is in very similar condition as site 113.

Site #115 Unit 3

Table 3.60:

Date Read	% Bare Soil	% Duff Litter	% Tree Cover	% Shrub Cover	% Grass Cover	% Forb Cover
07-06-2005	7.4	91.3	60.5	24.9	52.0	18.3



Horizontal panorama showing transect 114. July 6, 2005.

This is a new cover/frequency transect, sits at an elevation of 8210 ft, has an aspect of 278^{o} (magnetic north) and a slope of 6%. Existing plant composition falls within the expected range for the ponderosa pine range site description. Potential natural vegetation consists of ponderosa pine with the exception that Kentucky bluegrass exists in some abundance. The potential natural vegetation is considered to be ponderosa pine and gamble oak and the area fits this description quite well. The tree layer is dominated by ponderosa pine with a cover of 57% and was found in all plots. The shrub layer is dominated by gamble oak and was found in almost half of all plots. Twelve forbs and six grass or grasslike species exist in this location.

EFFECTS ANALYSIS

Alternative 1- Livestock Grazing using Adaptive Management

Direct Effects: The use of adaptive management will have many positive direct effects to herbaceous plants and soil resources. Increases of residual ground cover and decreases of bare ground is likely to occur, where this is desired and outlined above in the rangeland inventory site discussion. This will lead to better infiltration and less runoff, which combined with better distribution of livestock across each allotment will allow individual desired plants to increase their vigor, cover, and frequency. Less bare ground means more plants holding the soil in place while lessening the likelihood of invasion by noxious weeds. Areas where herbaceous plant communities are at desired levels will remain strong and healthy. The *measures of success* contained within each specific objective based strategy for this alternative would provide insurance that progress is measured and allows for a rapid positive response if progress is not achieved in a timely manner. Permittee management will improve due to the greater understanding of plant phenology and response to grazing provided by the Grazing Response Index. This system encourages responsible management as it rewards the permittee for good management and penalizes poor performance. Overall utilization of rangelands by livestock will be more even across the landscape and allow for adaptations to ever changing wildlife populations and requirements. Landscape component and vertical structure will become more diverse creating opportunities for various management indicator species (including Gunnison's sage grouse) to improve their stature in the environment. Degraded stream channels and aquatic habitats will show trends toward more appropriately functioning

systems. Reforestation efforts would have maximum opportunity for success because a monitoring program would again enable a cost-effective quick response to trampling or herbivory. Seedling mortality due to livestock management will not exist in significant amounts. Allotment management plans will contain specific objectives that are designed to meet defined conditions. Overall conditions and trends of rangeland resources will be upward moving.

Indirect Effects: Improved landscape conditions could lead to increases in recreational users and conflicts associated between various user groups. Currently the area is seeing some new unauthorized trail systems and campsites being developed and this is likely to increase overtime as the view-shed becomes more desirable. Increased use by recreationists usually means that gates are left open and livestock permittees have a more difficult time in handling their livestock.

Silvicultural management within the project area currently has had a positive effect on herbaceous productivity, but over time this management will decrease the amount of herbaceous vegetative production that currently exists.

Cumulative Effects: Multiple uses of National Forest System lands would continue to allow for diverse economic development of the local community. Overall, rangeland ecosystems should develop multiple age classes and species diversity and richness should increase. Many seral stages would exist throughout the planning area.

Alternative 2- Current Management

Direct Effects: Implementation of this alternative would perpetuate the current conditions that exist within the project area as a whole. Some areas could see improvement to vegetative conditions while others could worsen. This management has led to the environmental conditions and communities seen today. Pastures or allotments that have been used improperly have lower seral conditions this is exhibited by lower herbaceous cover and higher bare ground values. During years of low production due to prolonged drought or other disturbances rangelands could be overused, some plant communities could be indefinitely harmed. Planned activities such as prescribed burns would likely not be as effective due to lack of carrying fuels. Riparian areas that have been identified as needing improvements would remain in degraded condition. Fences would need to be constructed around plantations to eliminate the potential for freshly planted tree seedling mortality caused by livestock trampling or herbivory. Wildlife habitats would see persistence at their current state or possibly decreases in quality over time. More specifically, Gunnison's Sage Grouse require high structural and component diversity to rear young, which some identified habitats currently lack. Elk populations could continue to increase causing overuse to rangelands since both elk and cattle have similar dietary needs and overlap their use areas. Overall this alternative does not allow enough flexibility to respond to changes in environmental conditions quickly enough to meet desired objectives in a timely manner.

Indirect Effecst: Since changes to herbaceous environments can happen quickly, this alternative is likely to be insufficient to meet the desired resource objectives. Monitoring is needed to verify success or failure of a given management event. Under this alternative objective based monitoring would not occur. It is probable that deterioration would occur to streams, various wildlife habitats, and possibly plantations as a result of current livestock management practices.

Cumulative Effects: Of the listed current or foreseeable actions only that of prescribed fire would be pronounced enough in the project area to have a cumulative effect to the rangeland resources under this alternative. In a prescribed burn situation the current years growth of herbaceous vegetation would see multiple disturbances thereby reducing vigor of those plants.

Alternative 3- No Action also referred to as No Grazing

Direct Effects: There would be no direct effect on rangeland resources under this alternative by livestock.

Indirect Effects: Herbaceous plant communities would likely improve overall to a threshold. Some areas would continue to deteriorate due to the presence of Sulfer Cinquefoil. Poor to Fair condition areas would likely improve ground cover quantity.

Cumulative Effects: No cumulative effect would occur to the rangeland resources as a result of removing livestock from the allotments.

WATERSHED AND AQUATIC RESOURCES

EXISTING CONDITION

The majority of the analysis area is located within the Naturita Creek watershed. It also includes the head of Barkelew Draw, a tributary of Hamilton Creek, and Ed Joe Draw, which is tributary to Maverick Creek. These watersheds all flow into the San Miguel River.

The analysis area is situated in the central portion of the Naturita Creek watershed. The upper reaches of the three main forks of Naturita Creek are located outside the analysis area, south of the Forest. The Lilylands and Cone Ditch systems divert water from the upper reaches of these main forks. Below the Lilylands Ditch West Naturita Creek flows into the Miramonte Reservoir on the Dan Noble State Wildlife Area, located about ¾ of a mile south of the Forest boundary. Flows out of the reservoir are dependent upon the inflows from above. The reservoir is not used for irrigation or power generation.
East Naturita Creek and West Naturita Creek enter the Forest as perennial streams on the south end of the analysis area. After entering the Forest they quickly drop into the main Naturita Canyon where they join to form Naturita Creek. Naturita Creek continues for approximately six miles across the Forest, and exits on the north end of the analysis area.

It then continues for an additional 15 miles through BLM and private land to its confluence with the San Miguel River.

The main stem of Naturita Creek within Naturita Canyon is classified as a Rosgen Type B2 channel. B2 type channels are moderately entrenched, with moderate width-depth ratios and sinuosity. Boulders and cobble dominate the stream channel, and boulders, logs, and beaver dams form occasional pools. These channels are naturally stable and resistant to livestock impacts. The lower reaches of West Naturita Creek and East Naturita Creek are classified as B3 channels. The stream channel in these channel types is dominated by cobble, and there are more frequent pools created by boulders, logs and beaver dams. The finer substrate makes them less stable than the B2 type, and more susceptible to livestock damage.

The upper mile of West Naturita Creek, and the upper 1½ miles of East Naturita Creek are C3 channel types. Type C channels are slightly entrenched with moderate to high width-depth ratios and sinuosity. PFC surveys conducted on East Naturita Creek and West Naturita Creek in 2000 rated both streams as properly functioning. However, additional surveys in 2006 identified problems with the current aquatic and riparian condition of the upper stream reaches. Based on this survey, it is apparent that the stream channel and riparian vegetation are below potential for the site, due to the past and current livestock grazing use. Both segments have potential to move toward a type E stream channel with inclusions of type C. This would decrease width-depth ratios, increase shrub and native herbaceous vegetation cover, and improve stream bank stability.

Fish habitat in lower Naturita Creek outside the analysis area favors native omnivores such as flannelmouth sucker, bluehead sucker, and roundtail chub (1977 CDOW sample), which are all currently listed as sensitive species. These species favor warmer water temperatures, and can generally tolerate higher levels of suspended sediment and dissolved solids, characteristic of lower elevation streams along the Colorado Plateau. In the upper portion of Naturita Creek, including the West Naturita and East Naturita Creek tributaries on the Forest, streams within the analysis area support populations of rainbow trout (MIS), mountain sucker (sensitive species), speckled dace, and mottled sculpin (2005 USFS sample). These species occur in colder waters with less sediment than the lower portion of the drainage. Rainbow trout are likely to enter the West Naturita drainage from the Miramonte Reservoir spillway during spring runoff.

Detailed descriptions of the fish species found within the analysis area are included in the following sections on Management Indicator Species, and on Threatened, Endangered, and Sensitive Species.

Three intermittent/ephemeral draws originate within the analysis area west of the Naturita Canyon and extend off the Forest into the lower Naturita Creek Canyon. The two forks of McKee Draw converge about 1½ miles above the north boundary of the Forest and continue for about 3½ miles across BLM lands to Naturita Creek. This drainage forms a large canyon at the BLM/Forest boundary that extends to the Naturita Creek Canyon.

Callan Draw enters the analysis area west of McKee Draw and quickly forms another large canyon. This drainage also continues north through BLM lands to the Naturita Creek Canyon. The third drainage is Mud Springs Draw. The analysis area includes the head of the main fork of Mud Springs Draw and a small tributary to West Mud Springs Draw. Mud Springs Draw also forms a large canyon below the Two Forks area, which continues north across BLM and private lands to the Naturita Creek Canyon. None of these drainages are fish-bearing streams, providing no seasonal habitat use by trout or other native fish species.

Within the analysis area the McKee Draw drainage is primarily classified as a Rosgen type B6 channel. The lower 2 miles of East McKee is a B4 channel type. B6 channels are moderately entrenched, with moderate width-depth ratios and sinuosity. The dominant streambed material is silt, which is highly erosive and susceptible to impacts from livestock. The entire length of McKee Draw washed out in about the mid 1930's, creating a large gully. Forest Service reports from the mid 1950's identified the need to relocate the McKee Draw road and the placement of erosion control structures in the channel to correct the situation. Early attempts were to place slab wood from a sawmill in the channel. This diverted water to the side of the channel and caused further erosion. Other attempts were made to fence off portions of the draw, construct rock and vegetative structures in headcut areas, and to reduce grazing pressure. In 2002 the Burn Canyon fire intensively burned a majority of the watershed. The first rains that came after the fire caused additional erosion of the stream channels, and moved large amounts of sediment and debris. McKee Draw continues to be an active gully with eroding banks and in-channel head cutting. The road is still in the same location and continues to contribute to the erosion problems.

B type channels also dominate the Callan Draw and Mud Springs Draw areas on the Forest. A majority of Callan Draw is classified as a B4 channel type. The upper forks of Mud Springs Draw are also B4 channel types. Below the two forks reservoir the Mud Springs drainage changes to a B3 channel type. Rosgen type B channels are moderately entrenched, with moderate width-depth ratios and sinuosity. The dominant streambed material of a B3 channel is cobble and a B4 channel is gravel. No resource problems were identified in Mud Springs Draw or lower Callan Draw.

The upper mile of Callan Draw is currently a type F6 and/or C6 channel type. The F channel type is an entrenched stream with moderate to high width-depth ratios and sinuosity. The dominant streambed material is silt, which is highly erosive and susceptible to impacts from livestock. Surveys in 2006 identified problems with the current aquatic and riparian condition of upper Callan Draw. Based on this survey, it is apparent that the stream channel and riparian vegetation are below potential for the site, due to the past and current livestock grazing use. This portion of Callan Draw has the potential to move toward a type E stream channel with inclusions of type C. This would decrease width-depth ratios, increase shrub and native herbaceous vegetation cover, and improve stream bank stability.

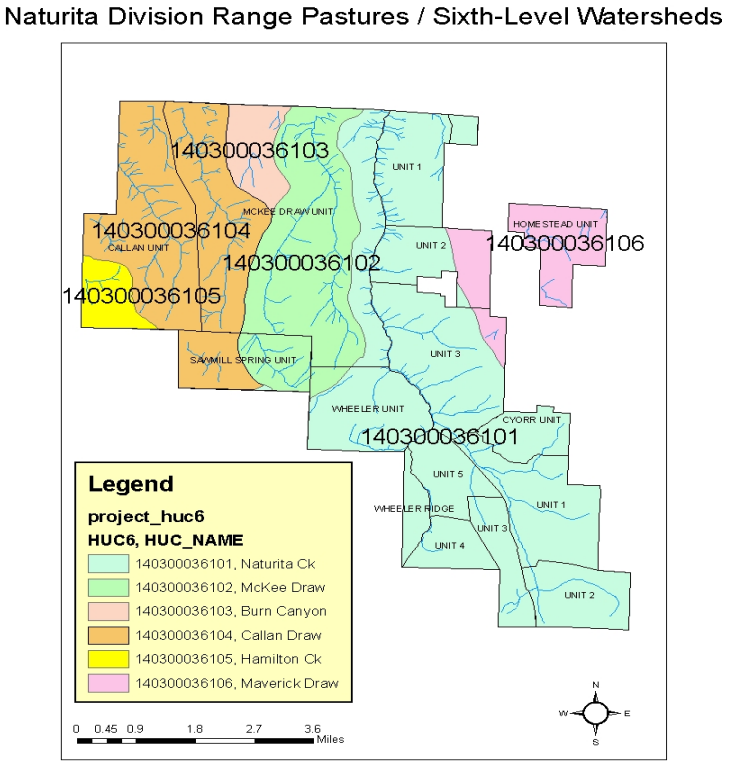
Just west of the Mud Springs Draw drainage is Barkelew Draw, which is tributary to Hamilton Creek. The upper portion of Barkelew Draw is used as part of the Lilylands Ditch system. Water from the ditch enters the draw and is then diverted back into the ditch lower in the drainage. No resource problems were identified in this area.

Ed Joe Draw is located in the northeastern corner of the analysis area. There are private land inholdings included within the upper portions of the drainage. The portion that is grazed includes about ½ mile of the draw near the northern boundary of the Forest. Ed Joe Draw is used as part of the Cone Ditch system. Water from the Cone Reservoir is diverted into the Cone Ditch and enters the east fork of Ed Joe Draw. This water continues to flow down Ed Joe Draw to Wrights Mesa where it is used for irrigation. The lower portion of Ed Joe Draw on the Forest is impacted by the additional flows from the Cone Ditch. The stream channel is down cut and has steep banks with points of active erosion. Livestock are attracted to the available water but do not appear to significantly contribute to the current condition of this reach.

Effects analysis for the aquatic and riparian resource section are contained within the Wildlife Resources section.

Management units/pastures and there corresponding watersheds are shown in *figure 3.11*.

Figure 3.11: Naturita Division Watersheds



Stream channels include all streams on U.S. Geological Survey Quad maps plus all additional channels that can be recognized from topography at 1:24,000 scale.

EXISTING CONDITION

Management Indicator Species

Management Indicator Species (MIS) are wildlife species that have been selected by a National Forest to represent the habitat needs of a larger group of species requiring similar habitats. MIS for the GMUG National Forests are identified in the 2005 Amended Species Assessment for the Amended Land and Resource Management Plan (Forest Plan). The GMUG National Forest as completed Species Assessments for eight of the species identified in the 2005 Amendment. These Assessments include the rationale for the selection of the MIS, information on biology, occurrence and distribution, habitat relationships, suitable habitat on the GMUG, monitoring results, available information on population status and trend, and source references.

The following table displays the Forest list of MIS and their relationship to the analysis area:

Common Name	**Scientific Name**	**Habitat or Species Present Within the Analysis Area?**
Rocky Mountain elk	**Cervus elaphus**	Yes
Abert's squirrel	*Sciurus aberti*	Yes
American marten	*Martes Americana*	No
Brewer's sparrow	**Spizella breweri**	Yes
Merriam's turkey	**Meleagris gallapovo merriami**	Yes
Northern goshawk	*Accipiter gentillis*	Yes
Red-naped sapsucker	*Sphyrapicus nuchalis*	No*
Common trout: Colorado River cutthroat trout	*Oncorhynchus clarki pleuriticus*	No*
Rainbow trout	*Oncorhynchus mykiss*	Yes
Brown trout	**Oncorhynchus trutta**	No*
Brook trout	*Salvelinus fontinalis*	No*

*Species without habitat and that do not occur within the planning area will not be directly, indirectly, or cumulatively impacted by proposed activities. No further analysis is necessary.

Rocky Mountain elk - utilize the entire analysis area throughout the year, with major concentrations during the winter months. The Burn Canyon fire burned approximately 31,616 acres of BLM, private, and National Forest lands in July of 2002. The National Forest portion of the burn (approximately 10,980 acres) is located entirely within the analysis area west of Naturita Canyon. A majority of this large wildfire was a stand-replacement fire affecting pinyon and juniper woodland and ponderosa pine forest. Several fire rehab projects were completed on private and federal lands in an effort to establish desirable native vegetation and alleviate erosion. The seeding projects have been very successful, and plant cover and available forage are abundant within the burn area. The entire burn area is now a significant winter concentration area for elk and mule deer. The Forest Service is also implementing travel restrictions to further encourage elk use in this area during the winter by preventing disturbance from motorized vehicles.

The area east of Naturita Canyon is a mix of intensively managed ponderosa pine forest, oak, and sagebrush openings. Elk utilize this area primarily during the spring and summer months, but also utilize it during the winter in conjunction with habitat on adjacent private lands. Human activities and private land developments on this side of Naturita Canyon are increasing, displacing elk from preferred habitats.

Elk and cattle have significant dietary overlap. There is a potential for competition between cattle and elk for available forage within the analysis area.

Abert's squirrel – is highly dependent on ponderosa pine to meet all of its life history requirements. Based upon available research they utilize all-aged ponderosa pine stands, especially trees in even-aged groups. Abert's squirrels have strong affinities for specific stand characteristics and structural attributes, which are primarily mature age class stands (structural stages 4A, 4B, and 4C). Research further indicates that Abert's squirrels prefer denser stands of mature ponderosa pine for nesting.

The GMUG National Forest is located within the range of this species, but occurs at the northwest periphery of their overall range. The Uncompahgre Plateau and Naturita Division comprise 93% of the habitat available on the GMUG, and support stable populations of Abert's squirrels. Abert's squirrels are found in ponderosa pine stands throughout the analysis area, including the unburned patches within the Burn Canyon fire area. Most habitat is available east of Naturita Canyon.

Primary factors influencing Abert's squirrel habitat and populations include a combination of forest management activities and natural events. Timber harvesting and prescribed fire, without implementing design criteria to maintain or enhance Abert's squirrel habitat, can adversely effect squirrel populations. Livestock grazing could have indirect effects to forest habitat if it is intense enough to impact tree regeneration, fungi production, or alter fire regimes.

Brewer's sparrow – is associated with sagebrush habitats on the GMUG National Forest. It is also currently listed as a sensitive species in Region 2. The Brewer's sparrow is a sagebrush obligate species that is most closely associated with contiguous,

large unfragmented blocks of big sagebrush (*Artemesia tridentata*). Brewer's sparrows occur less frequently in shrubby openings in pinyon and juniper woodland, and large shrubby parklands within coniferous forests. Factors that influence Brewer's sparrow occupancy and abundance include the amount of sagebrush cover and shrub height, sagebrush patch size, spatial distribution of patches, and the extent of disturbance and fragmentation.

The GMUG National Forest is well within the range of this species, which is largely determined by the distribution of sagebrush. The analysis area includes sagebrush habitats that are extensions of larger blocks of habitat on adjacent private and State lands. Data from the North American Breeding Bird Survey indicates populations of Brewer's sparrows in North America have declined by over 50% during the last 25 years. Within Colorado, Brewer's sparrow populations have exhibited similar long-term significant declines, exceeding National trends.

The primary threats to Brewer's sparrows Region-wide and Nationally is the conversion of sage shrubsteppe habitats to agricultural land, resulting in the loss and fragmentation of suitable habitat. Excessive livestock grazing that impacts the grass and forb understory, or increases the risk of invasive species, can result in localized habitat degradation.

Merriam's turkey – is associated with ponderosa pine, Gambel oak, and pinyon-juniper woodland. They also utilize aspen and mixed conifer habitats during the summer months. Both Gambel oak and pinyon-juniper woodland provide foraging habitat for turkeys, particularly during the winter. The ponderosa pine/Gambel oak habitat type is used extensively for nesting. Large ponderosa pine trees with full crowns are used for roosting.

The Merriam's turkey has the widest distribution and is the most common subspecies of wild turkey in North America. The GMUG National Forest is well within the distribution range of the Merriam's turkey. On the GMUG, turkeys are primarily found on the Uncompahgre Plateau and Naturita Division. Merriam's turkeys occur throughout the entire analysis area, but are more abundant in the unburned pine stands east of Naturita Canyon.

The primary factors influencing Merriam's turkey are management activities that cause habitat degradation or result in loss of habitat. Specifically, management activities such as timber harvest, mechanical treatments, prescribed fire, wildfire, and grazing are detrimental if they degrade brood rearing habitat, isolate roost trees, or result in a loss of habitat diversity. Livestock grazing can have an effect on the density and height of understory vegetation, which could reduce cover and insect production that are key habitat elements for wild turkeys.

Northern goshawk – is associated with a variety of mature forest habitat types, including aspen, mixed aspen-conifer, ponderosa pine, and lodgepole pine. This species is also listed as a Forest Service sensitive species in Region 2. On the GMUG National Forest,

nest trees within active nesting territories are highly associated with large aspen trees. However, goshawk nests have also been documented in lodgepole pine and ponderosa pine trees. Within the analysis area, active goshawk nests have been located in remnant unburned stands of mature ponderosa pine in the Burn Canyon fire area, and in mature ponderosa pine stands on the east side of Naturita Canyon.

Goshawks require a mosaic of forest structural stage conditions within their home range to meet their nesting, post-family fledging area, and foraging habitat requirements. Literature also reports a higher use of mature forest types within a mosaic of forest structural conditions. Mature forests become more important to goshawks during the breeding season, particularly for nesting and foraging habitat.

Threats to goshawk on the GMUG National Forest are management activities that cause habitat degradation or result in loss of habitat. Timber harvest, mechanical treatments, prescribed fire, and stand-replacement wildfires can result in habitat loss and/or fragmentation. Livestock grazing within the analysis area could have indirect effects to forest habitat if it is intense enough to impact tree regeneration or alter fire regimes.

Rainbow trout – are one of the "common trout" species identified as an MIS for the GMUG National Forest. The rainbow trout is an introduced species of fish that has become widespread in lakes, reservoirs, and streams on the Forest. They require cold clean water (ideally no higher than 65 to 68 degrees F). Rainbow trout generally spawn in early spring during the spring runoff. Instream cover, including pool depth, over-hanging vegetation and undercut banks, are important habitat features.

Perennial streams within the analysis area include West Naturita Creek, East Naturita Creek, and the main stem of Naturita Creek below these tributaries. Forest Service surveys were completed in 2005 and located rainbow trout in and around the confluence of these streams. It is highly likely that these fish came from the Miramonte Reservoir on West Naturita Creek when spring flows passed over the spillway of the dam.

Livestock grazing can affect habitat conditions within the stream channel and riparian vegetation associated with the stream. Surveys conducted in 2006 identified departures from potential habitat conditions are present in the upper portion of West Naturita Creek and the upper portion of West Naturita Creek (see aquatic resources section). These departures are apparently due to past and present livestock grazing practices.

Threatened, Endangered, and Sensitive Species

The Endangered Species Act of 1973 requires all federal departments and agencies to conserve threatened and endangered species and the habitats they depend upon, and to consult with the US Fish and Wildlife Service on all actions authorized, funded or carried out by such agency to ensure the action will not likely jeopardize the continued existence of any threatened or endangered species or adverse modification of critical habitat (FSM 2670).

In addition, the Forest Service requires an evaluation of effects to Forest Service sensitive species and habitat (FSM 2672.4). This evaluation is necessary to ensure that Forest Service actions do not contribute to the loss of viability of any native or desired non-native plant or animal species, nor cause any species to move toward federal listing.

The US Fish and Wildlife Service has provided a letter to the Forest Supervisor listing all federally listed species which may occur or be affected by actions occurring on the GMUG National Forest. The following table displays the current list of species and their relationship to the analysis area:

Federally Listed Species

For the GMUG National Forest
USFWS May 22, 2006

Status	**Common Name**	**Scientific Name**	**Suitable Habitat or Species Present Within the Analysis Area?**
Birds			
Threatened	Bald Eagle	*Haliaeetus leucocephalus*	No
Threatened	Mexican Spotted Owl	*Strix occidentalis lucida*	Yes
Candidate*	Gunnison Sage Grouse	*Centrocercus minimus*	Yes
Mammals			
Threatened	Canada Lynx	*Lynx Canadensis*	No
Fish			
Endangered	Bonytail Chub	*Gila elegans*	No**
Endangered	Colorado Pikeminnow	*Ptychocheilus lucius*	No**
Endangered	Humpback Chub	*Gila cypha*	No**
Endangered	Razorback Sucker	*Xyrauchen texanus*	No**
Insects			
Endangered	Uncompahgre Fritillary Butterfly	*Boloria acrocnema*	No
Plants			
Threatened	Uinta Basin Hookless Cactus	*Sclerocactus glaucus*	No
Candidate	De Beque phacelia	*Phacelia submutica*	No

* USFWS determined listing not warranted in April of 2006
** Water depletions may affect these species

The Regional Forester has designated a list of sensitive species for the Rocky Mountain Region, which includes a Unit Species List for the Grand Mesa, Uncompahgre, and

Gunnison National Forests. For this analysis, the entire Unit Species List for the GMUG was reviewed in context of the proposed action. All of the species listed were considered, and the following species were determined to be associated with the analysis area:

Forest Service Sensitive Species **Evaluated in Detail**		
Common Name	*Scientific Name*	*Habitat(s) Potentially Used Within the Project Area*
Birds		
Gunnison sage grouse	*Centrocercus minimus*	Sagebrush
Brewer's sparrow	*Spizella breweri*	Sagebrush
Sage sparrow	*Amphispiza bellii*	Sagebrush
Flammulated owl	*Otus flammeolus*	Ponderosa pine forest, P/J
Northern goshawk	*Accipiter gentilis*	Aspen, aspen/conifer mix, ponderosa pine
Olive-sided flycatcher	*Contopus cooperi*	Ponderosa pine/oak
Lewis' woodpecker	*Melanerpes lewis*	Open-grown ponderosa pine/oak, cottonwood riparian
Mammals		
Fringed-tailed myotis	*Myotis thysanodes*	Ponderosa pine, P/J, scrub oak, rock outcrops & cliffs
Townsend's big-eared bat	*Plecotus townsendii*	Mines, caves & buildings in woodlands & forests up to 9,500'
Gunnison's prairie dog	*Cynomys gunnisoni*	Meadows, open-grown sagebrush
Amphibians		
Northern leopard frog	**Rana sylvatica**	***Wetlands, beaver ponds, streams***
Fish		
Mountain sucker	**Catostomus platyrhynchus**	***Naturita Creek***
Insects, Reptiles		
No species identified		
Plants		
Wetherill milkvetch	*Astragalus wetherillii*	Canyon benches & talus derived from shale or sandstone

Mexican spotted owl - currently occupies a broad geographic area, but it does not occur uniformly throughout its range. The overall distribution includes portions of Utah, Colorado, New Mexico, and Arizona in the United States, and the central mountains of northern Mexico. Within this geographic area, the Mexican spotted owl occurs in disjunct localities that correspond to isolated mountain systems and canyons.

Mexican spotted owls nest, roost, forage, and disperse in a wide variety of habitat types. Habitat-use patterns vary throughout the range with respect to owl activity. In the northern portion of the range, including southern Utah, southern Colorado, and far northern Arizona and New Mexico, owls occur primarily in steep-walled, rocky canyons. Along the Mogollon Rim in Arizona and New Mexico, habitat use is less restricted, and spotted owls occur in mixed-conifer forests, ponderosa pine/Gambel oak forests, rocky canyons, and associated riparian forests. South of the Mogollon Rim and in to Mexico a still wider variety of habitat types are utilized including mixed-conifer, Madrean pine-oak, and Arizona cypress forests, oak woodlands, and associated riparian forests. Because of this variation in habitats and species occurrence, the current range of the Mexican spotted owl has been divided up in to 11 geographic areas called "Recovery Units". Six of these recovery units are in the United States, and 5 are in Mexico. The GMUG National Forest is located on the edge of the Southern Rocky Mountains – Colorado Recovery Unit, adjacent to the Colorado Plateau Recovery Unit.

The Mexican spotted owl reaches the northern limit of its range in the Southern Rocky Mountains – Colorado Recovery Unit. Owl habitat appears to be naturally fragmented, with most owls found in disjunct canyon systems or in isolated mountain ranges. In southern Utah and southwestern Colorado, owls apparently prefer canyon habitats, whereas owls in the rest of the recovery unit appear to utilize both montane forest and canyon habitats.

Suitable habitats in and around the GMUG National Forest are associated with the larger canyon systems of the Uncompahgre Plateau and Naturita Division. Beginning in 1990, systematic surveys were conducted on State and federal lands to locate Mexican spotted owls. Much of the suitable canyon habitat was completely surveyed at that time but no owls were located. Since then, the GMUG National Forest has continued to conduct project level surveys according to established protocol to search for the presence of Mexican spotted owls. None have been located on or adjacent to the Forest. The closest known populations are in Mesa Verde National Park.

Suitable canyon habitat within or adjacent to the analysis area includes the Naturita Creek Canyon from the forks of East Naturita and West Naturita to the confluence with the San Miguel River. This canyon has been repeatedly surveyed for the presence of Mexican spotted owls since 1993. The latest survey period was the 2001 and 2002 field seasons. No Mexican spotted owls were located before, during, or after the surveys in 2002.

Primary threats to habitat for the Mexican spotted owl are the direct loss of tree cover and riparian vegetation within canyon habitats. In this area, prescribed fire and stand-replacement wildfires can result in habitat loss and/or fragmentation. Livestock grazing

within the analysis area could have indirect effects to forest habitat for the owl and habitat for prey species if it is intense enough to impact understory vegetation composition or alter fire regimes.

Gunnison sage grouse - is a unique species of sage grouse that occurs in nine highly fragmented populations in scattered locations in southwest Colorado and southeast Utah. The largest area of contiguous distribution and, consequently, population size of this species is in the Gunnison Basin. The other larger populations are located in the San Miguel Basin, the Crawford area, and the Glade Park/Pinyon Mesa area. Smaller populations are located on Sims Mesa, Poncha Pass, Dove Creek/Monticello, and Cimarron.

Sage grouse are dependent upon sagebrush (*Artemesia spp.*), primarily subspecies of big sagebrush (*Artemesia tridentata*), and do not occur throughout the year where an abundance of this shrub are absent. The trend in habitat quality has declined over time on both public and private lands. In many locations, key components of the sagebrush ecosystem are either insufficient or have been altered. Over the years many factors have had a role in affecting sage grouse habitat conditions. The general trend in untreated sagebrush ecosystems has been an increase in the age and density of sagebrush, and a corresponding decrease in grass and forb cover. Livestock grazing on these sites often removes the available herbaceous vegetation and results in a lack of residual cover for nesting hens and their broods.

Wet meadows and riparian areas used for brood rearing are also primary foraging areas for livestock. Concentrated grazing use has caused a downward trend in vegetative composition and productivity. Those sites with springs have commonly been developed as stock ponds removing native habitat and attracting additional livestock grazing use.

Habitats currently utilized by the San Miguel Basin population are primarily located on private, State, and BLM lands, with extensions into the southern portion of the analysis area. Habitat within the analysis area is being utilized for nesting and brood rearing. Suitable habitats within the analysis area that currently utilized by Gunnison sage grouse, and their condition relative to desired habitat conditions, are displayed on the attached map. Desired habitat conditions are described in the Gunnison Sage Grouse Range Wide Conservation Plan, Appendix H (Structural Habitat Guidelines).

Potential threats to Gunnison sage grouse are varied, but numerous. Low genetic diversity, genetic drift from small population sizes, habitat issues (loss, degradation, and fragmentation from a variety of causes), the interaction of these with predator communities, and impacts of drought are the most significant threats facing Gunnison sage-grouse. Of these, by far the greatest threat is the permanent loss, and associated fragmentation and degradation of sagebrush habitat associated with urban development and/or conversion. Habitat condition is also a major threat, and is influenced by livestock grazing practices.

Brewer's sparrow - is described in the previous section on Management Indicator Species.

Sage sparrow - winter in the southwestern United States and adjacent Mexico, in creosote bush and saltbrush habitats. They breed in the Great Basin from the Columbia and Snake Rivers to southern Nevada, east to the Continental Divide and Four Corners. Records from the Colorado Breeding Bird Atlas show that sage sparrows occur on the western edge of the State, and in the San Luis Valley. It indicates that sage sparrows do not nest as high as their obligate plant, sagebrush, grows. Extensive sagebrush in Middle Park, North Park, the Roan Plateau, and upper Glade Park do not support breeding populations. Breeding bird surveys on the GMUG National Forest document their occurrence in sagebrush plant communities. There are no site-specific records of this species within the analysis area.

The sage sparrow is a sagebrush obligate species, selecting only sizeable, low-elevation stands of big sagebrush or mixed sagebrush and greasewood. Atlas records reveal that high-country sagebrush and plains sandsage, plentiful in Colorado, do not make suitable nesting habitat, nor do sagebrush parks of 30 acres or less.

Sage sparrows begin to return to Colorado in February and reach full numbers in Mid-April. Unusual among songbirds, they arrive on the nesting territory in pairs. Males with mates defend larger territories that unpaired males. Courtship continues into early June, followed by nest building and egg laying. A cup-nest is built around the mid-section of a sagebrush plant.

The primary threats to sage sparrows Region-wide and Nationally is the conversion of sage shrubsteppe habitats to agricultural land, resulting in the loss and fragmentation of suitable habitat. Excessive livestock grazing that impacts sagebrush density and continuity, or increases the risk of invasive species, can result in habitat degradation.

Flammulated owl - is a small insectivorous screech owl that is widely distributed in montane forests from southern British Columbia southward through the highlands of Mexico and Guatemala. It is assumed to be migratory in the northern part of its range. It breeds from the Rocky Mountains to the Pacific and from British Columbia south to Vera Cruz, Mexico. The winter range is thought to be from Guatemala and El Salvador north to Jalisco, Mexico.

The flammulated owl is dependent upon mature and old growth ponderosa pine forest, and is found throughout its elevational range from the P/J ecotone to the Douglas-fir mixed stands. Flammulated owls have also been documented to utilize nest cavities within other tree species that are in proximity to old growth ponderosa pine. On the GMUG this often includes aspen. The affinity of flammulated owls for old growth ponderosa pine stems from the abundance of nest cavities, the structure of the trees and stands, and the arthropods found in these forests.

Suitable habitat is present within the analysis area, and surveys conducted within the analysis area have confirmed the presence of this species. Much of the available habitat was impacted by the Burn Canyon fire in 2002 and is now concentrated on the east side of Naturita Canyon. The remaining unburned and lightly burned ponderosa pine forest habitat within the burn area is highly important to maintain habitat capability for this species. Nest sites provided by natural tree cavities and primary cavity nesting birds within or adjacent to live tree areas are a primary habitat feature of concern. Maintaining mature and old growth forest structure within the unburned areas within and adjacent to the fires are also primary habitat concerns.

The primary threats to flammulated owl habitat are the removal or alteration of mature and old growth ponderosa pine forest, and associated structural habitat features such as snags. Livestock grazing within the analysis area could have indirect effects to forest habitat if it is intense enough to impact tree regeneration or alter fire regimes.

Northern goshawk - is described in the previous section on Management Indicator Species.

Olive-sided flycatcher - breed in the boreal forests from Alaska to Newfoundland, and in the mountains of the western United States. They winter from Mexico south to Peru. In Colorado they breed in the western mountains from 7,000 to 11,000 feet.

Olive-sided flycatchers commonly breed in the solitude of the forests where two basic components are present: snags and conifers. They often inhabit parts of the forest with natural clearings, bogs, stream and lakeshores with water-killed trees, and logged areas with standing dead trees. In much of their range these flycatchers breed in old growth coniferous forests with nearby water. They occur less frequently and less abundantly in deciduous or mixed aspen/conifer forests. Records in the Colorado Breeding Bird Atlas confer a preference for conifer-dominated habitats, followed by aspen, ponderosa pine, and pinyon/juniper woodland. Breeding Bird records seem to suggest that olive-sided flycatchers depend more on forest structure than on tree species composition. They appear to prefer tall exposed perches near openings.

Olive-sided flycatchers typically arrive on their breeding territories in late May. Once established, the breeding territory is aggressively defended by the male. Nests are generally located high in the trees, and hid among the clusters of needles and twigs.

Suitable habitat within the analysis area includes the ponderosa pine and Gamble oak forests. Most of this is available east of Naturita Canyon due to the Burn Canyon fire in 2002. Unburned patches within the burn are also important habitat for this species. Surveys have not been conducted within the analysis area to determine the presence of this species. However, breeding bird surveys conducted on the District in similar habitat have documented the presence of this species. Based on the species distribution and habitat availability it is likely that the Olive-sided flycatcher occurs within the project area.

The primary threats to suitable habitat are the removal or alteration of mature and old growth ponderosa pine forest, and associated structural habitat features such as snags. Livestock grazing within the analysis area could have indirect effects to forest habitat if it is intense enough to impact tree regeneration or alter fire regimes.

Lewis' woodpecker - utilizes open-grown forests of ponderosa pine and cottonwood riparian habitats. They nest within cavities of larger trees within these habitats. The Lewis' woodpecker feeds primarily on flying insects during the spring and summer months, and on fruits, berries, and acorns in late summer and fall. They will gather food and cache it in cracks and crevices of trees for use in the winter months.

The distribution of Lewis' woodpecker in Colorado is concentrated in three main clumps: the Arkansas River watershed, the pinyon/juniper country of Las Animas and Huerfano counties, and the San Juan Basin. North of the San Juans they maintain significant breeding areas up to Grand Junction. Another concentration of Lewis' woodpeckers is located along the front range from Colorado Springs to Fort Collins.

Suitable ponderosa pine forest habitat is present within the analysis area, and surveys conducted within the analysis area have confirmed the presence of this species. Much of the Burn Canyon fire area occurred as a stand-replacement fire, resulting in extensive areas of dead-standing trees. Populations of Lewis' woodpeckers have increased in this area in response to the increase in available snags and insects. Prescribed burning activities in the ponderosa pine forests east of Naturita Canyon have also improved habitat conditions for Lewis' woodpeckers by creating additional snags. Snags in this area had been severely depleted by the combination of past timber management activities and the practice of falling snags to prevent lightning-caused fires, as well as public firewood harvest.

The primary threats to suitable habitat are the removal or alteration of mature and old growth ponderosa pine forest, and associated structural habitat features such as snags. Livestock grazing within the analysis area could have indirect effects to forest habitat if it is intense enough to impact tree regeneration or alter fire regimes.

Fringed-tailed myotis - is a western species ranging from the Isthmus of Tehuantepec in Mexico north to British Columbia, Montana, and Wyoming. They apparently occur as scattered populations at moderate elevations on the western slope, along the foothills of the front range, and the mesas of southeastern Colorado.

The fringed-tailed myotis is a species of coniferous forest and woodland at moderate elevations. Typical habitat types utilized include ponderosa pine, pinyon/juniper, Gambel oak, greasewood, and saltbush. They roost in rock crevices, caves, mines, buildings, and trees. They are known to hibernate in mines and caves, occasionally in buildings. Migration does not seem to be extensive.

Suitable habitat is present within the analysis area. Much of this habitat was impacted by the Burn Canyon fire in 2002. However, most of the Forest lies above the primary

elevation used in Colorado, so this may limit species presence. Surveys have not been conducted to determine the presence of this species. No population data is available on the current status and trend of this species on the Forest.

Habitat features of primary concern are roosting sites, particularly those used for hibernacula and nurseries. Those sites include mines, buildings, caves, and other structures. Available roosting sites within the analysis area include natural cracks and crevices in rock outcrops and rim rock. There are no mine shafts, caves or buildings in the area. Individual trees used for day roosting could include both live and dead trees with cracks or sloughing bark.

Townsend's big-eared bat - is found in western North America, ranging from southern British Columbia to southern Mexico. They can be found throughout Colorado except on the eastern plains. Its distribution seems to be determined by availability of roosts, such as caves, mines, tunnels, crevices, and masonry structures with suitable temperatures, making the conservation of suitable roosts essential to the management of this species.

The Townsend's big-eared bat is generally solitary or gathers in small groups, although during summer females form larger maternity colonies. The Townsend's big-eared bat can be found in mines, caves, and structures in woodlands and forests to elevations above 9,500 feet. They do not make major migrations and appear relatively sedentary. Hibernacula have low and stable temperatures.

Surveys have not been conducted to determine the presence of the Townsend's big-eared bat within the analysis area. No population data is available on the current status and trend of this species on the Forest. Habitats of primary concern are roosting sites, particularly those used for hibernacula and nurseries. Those sites include mines, buildings, caves, and other structures. These sites are highly susceptible to disturbance and have been determined to be declining in availability. Available roosting sites within the project include natural cracks and crevices in rock outcrops and rim rock. There are no mine shafts, caves or buildings in the area.

Gunnison's prairie dog – is one of five species of prairie dog in North America. They are found in the "Four Corners" area, namely southeastern Utah, southern Colorado, northern New Mexico and northeastern Arizona. Surveys conducted by the CDOW in 2005 identified 13,400 acres of habitat occupied by Gunnison's prairie dog in San Miguel County.

They are most present in agricultural areas, in dryland pastures, rangeland, and the edges or dry spots of irrigated hay fields. Prairie dogs have been observed on private lands near the Gurley and Cone Reservoirs, but do not appear to occupy the National Forest.

The breeding cycle of Gunnison's prairie dog is similar to other species of prairie dog. Females and males can mate at one year of age, although three-fourths of males defer breeding until their second year. Multiple breeding is fairly common. Litters are born from early April to late May and range from one to seven young. Females nurse young

until one or two weeks after their emergence from the nursery burrow, and occasionally move to another part of the colony thereafter. Most females stay in the same clan for life. Gunnison's prairie dogs hibernate during the winter, and become torpid much later in the fall than white-tailed or Utah prairie dogs. Populations in the local area experience periodic sharp declines from bubonic plague.

Suitable habitat within the analysis area includes sagebrush and grass/forb meadows. Livestock grazing can affect vegetation composition, density, and residual cover that are features of prairie dog habitat.

Northern leopard frog – ranges across much of the northern U.S. and southern Canada. It is found throughout the State of Colorado except in the Republican River drainage and southeastern Colorado south of the Arkansas River.

Within Colorado, this species inhabits the banks and shallow portions of marshes, ponds, lakes, reservoirs, beaver ponds, streams, and other bodies of permanent water, especially those having rooted aquatic vegetation. Their diet consists largely of insects, grubs, and larvae

Following hibernation, northern leapord frogs become active in April or May. Breeding takes place in the shallow, non-flowing portions of permanent bodies of water and in seasonally flooded areas adjacent or contiguous with permanent pools. Breeding pools typically contain vegetation, mats of algae, and fairly clear water. Eggs are laid on the surface of the submergent vegetation. Metamorphosis typically proveeds through the summer months and terrestrial forms appear in August or September, depending on the elevation.

Suitable habitat within the analysis area includes beaver ponds, stock ponds, and the perennial and intermittent streams. Livestock grazing can influence habitat conditions within breeding pools and in the shallow, non-flowing portions of streams.

Mountain sucker - is found throughout much of western North America, ranging from southern Canada to Utah, and from eastern California to western South Dakota. In the Rocky Mountain Region, the mountain sucker occurs throughout Wyoming and in northwestern Colorado and western South Dakota. Information regarding population trends of mountain sucker throughout its range is lacking, but the species appears to be stable in some regions while declining in others. Mountain sucker may easily be confused with the blue head sucker, especially specimens less then eight inches from small tributaries. Misidentification and lack of information make understanding mountain sucker distribution and abundance difficult.

Mountain sucker are most common in low gradient stream segments that consist of a mix of riffles, pools, and runs. Spawning occurs in June to August, in which they move into smaller streams and spawn over gravel riffles. During non-breeding periods, mountain sucker are usually found in deeper parts of streams with lower current velocities.

Mountain sucker are associated with cover such as exposed tree root masses, undercut banks, logs, and boulders. The conditions of the water that mountain sucker inhabit range from clear to easily roiled or turbid. Mountain sucker are also associated with a wide range of substrates from clay, mud, and sand, through gravel and cobble, up to boulders.

Daytime summer water temperatures for mountain sucker range from 50-82°F and are usually between 59-73°F, while in the winter, temperatures may be just above freezing. Mountain sucker is thought to be primarily a benthic feeder, browsing on stream bottoms for algae, small invertebrates, and organic matter.

The main threats to the mountain sucker generally result from anthropogenic activities, with geographically isolated populations or those that previous anthropogenic activities have adversely affected being the most susceptible to extirpation. Habitat loss due to stream impoundment has been the cause of mountain sucker population declines in some drainages, while habitat degradation from increased sedimentation has also contributed to observed declines in others. Construction of passage barriers, such as dams and culverts, results in population and habitat fragmentation, leaving populations vulnerable to extirpation. Although less well understood, the introduction of non-native fishes also appears to threaten mountain sucker populations, primarily through increased predation, but also via increased competition. Hybridization may be a concern for some populations, but little is known about hybridization between mountain sucker and other sucker species found in Region 2.

Wetherill milkvetch - is found within the States of Utah and Colorado. In Colorado, it is known to occur in Moffat, Garfield, Mesa, Montrose, Ouray, and San Miguel Counties. There are 49 records in CNHP's database from Colorado public lands, only 27 of those have been counted. More populations have been discovered recently during BLM landscape assessments, indicating this species may be more widespread than originally documented. Plant surveys conducted within the analysis area have not documented the presence of this species.

Habitat for this species includes canyon benches and talus under cliffs, in stony or sandy soils derived from shale or sandstone. The only known site on the Norwood District is on a rocky east-facing slope above a creek bed on the Uncompahgre Plateau. Most of the habitats in CNHP's database are disturbed, with "barren soil" mentioned often. The species is apparently resistant/resilient to disturbance at moderate to severe levels. The habitats occupied by this species are not narrowly specific.

Threats to this species are primarily from road construction, mechanical vegetation treatments, and off-road vehicles. Livestock grazing could result in direct impacts to individual plants from grazing or trampling.

EFFECTS ANALYSIS

Alternative 1- Livestock Grazing using Adaptive Management

Direct Effects: The use of adaptive management techniques are based on correcting existing inconsistencies between the current conditions and desired conditions on each of the allotments. Specific disparities and desired habitat conditions for wildlife have been identified and included in the purpose and need for action. Management strategies have been developed to initiate a trend toward meeting the desired habitat conditions, and monitoring would be done to assess the progress in this trend or to initiate further actions related to livestock grazing practices.

Direct effects to habitat for species associated with mature forest habitats can result from management activities such as timber harvest or fuels treatments that cause habitat degradation or loss by altering habitat structure or quantity. Species associated with mature forest habitats include the Abert's squirrel, northern goshawk, flammulated owl, olive-sided flycatcher, Lewis' woodpecker, fringed-tailed myotis, Townsend's big-eared bat, and Mexican spotted owl. Grazing practices under this alternative would not result in any habitat loss or fragmentation that could impact these species.

Livestock grazing can have direct effects upon forest understory vegetation and habitat conditions species such as the Merriam's wild turkey. Under this alternative, grazing intensity will be closely monitored and would not occur at levels that would lead to degradation of brood rearing or nesting habitat for turkeys.

Livestock grazing has a high potential of affecting those species associated with sagebrush habitat. Included are the Brewer's sparrow, Gunnison's sage grouse, and sage sparrow. Disparities between current and desired habitat conditions for sagebrush-dependent species have been identified on portions of the West Naturita and East Naturita grazing allotments. Under this alternative specific management strategies have been developed for Gunnison sage grouse to maintain or improve structural diversity and species diversity/richness to meet the desired habitat conditions specified in the Gunnison Sage Grouse Range Wide Conservation Plan. Implementation of the management strategies are anticipated to maintain or improve habitat conditions to desired conditions for the Gunnison sage grouse, and to similarly benefit habitat for the Brewer's sparrow and sage sparrow.

Meadows and open-grown sagebrush habitats within the analysis area provide habitat for the Gunnison's prairie dog. Livestock grazing can affect vegetation composition, density, and residual cover that are features of prairie dog habitat. The use of adaptive management is anticipated to increase the vigor, cover, and frequency of desired plants, and reduce the amount of bare ground. This would not affect habitat for the prairie dog in grass/forb meadows. However, this could also increase the amount of sagebrush cover on some sites which would reduce habitat quality for the prairie dog.

The entire analysis area is utilized by Rocky Mountain elk and mule deer. The area east of Naturita Canyon is used primarily during the spring and summer months, but is also used in the winter in conjunction with habitat on private land. As a result of the 2002 Burn Canyon wildfire, the area west of Naturita Canyon is now a significant winter range area. Elk and cattle have significant dietary overlap. There is a potential for competition between cattle and elk for available forage within the analysis area, especially in the burn area. Under this alternative specific management strategies have been developed for big game and livestock interaction, to encourage big game use of National Forest system lands while sustaining the health of the ecosystem. Implementation of the management strategies developed for this key feature would reduce forage competition on the analysis area and encourage big game use of National Forest system lands during the winter months.

Livestock grazing can directly affect the condition of stream channels and aquatic habitats by altering the structure and stability of stream channels, and removing riparian vegetation. Several inconsistencies have been identified between current and desired conditions that are associated with current grazing use. Species affected by these impacts include rainbow trout, mountain sucker, and northern leopard frog. Under this alternative specific management strategies have been developed for riparian and aquatic health to restore degraded stream channels identified within the analysis area. Degraded stream channels and aquatic habitats will show trends toward more appropriately functioning systems.

Indirect Effects: Livestock grazing could have indirect effects to forest habitat conditions if it is intense enough to impact tree regeneration, fungi production, or alter fire regimes. Under this alternative management strategies have been developed for rangeland health and reforestation that will prevent this level of grazing from occurring in the analysis area.

Excessive livestock grazing in sagebrush habitats results in impacts to the grass and forb understory, or increases the risk of invasive species, and can result in localized habitat degradation. Under this management alternative management strategies have been developed for rangeland health and Gunnison's sage grouse that will prevent this level of grazing from occurring in the analysis area.

Reducing competition between elk and livestock for available forage on the Burn Canyon fire area will result in more forage available to elk during the winter months. This will encourage elk to remain on National Forest system lands for a longer period of time. This increased use will be considered in combination with livestock grazing use to ensure that total forage use does not impair fire rehab efforts or rangeland health. Encouraging elk use of National Forest system lands is also anticipated to reduce use of adjacent private lands.

Cumulative Effects: Reforestation efforts in the Burn Canyon fire area will establish new tree seedlings on areas that were salvage harvested. If funding is available, additional areas of productive land will also be planted to ponderosa pine. This alternative would

alleviate damage to tree seedlings and assist in establishing ponderosa pine on the burn area. Ultimately this will result in new stands of ponderosa pine forest that were consumed in the 2002 wildfire. If successful, stands of mature forest could be available in 80 to 100 years.

The 2002 Burn Canyon wildfire affected about 32,000 acres of public and private land. Several fire rehab projects were completed on private and federal lands in an effort to establish desirable native vegetation and alleviate erosion. The seeding projects have been very successful, and plant cover and available forage are abundant within the burn area. In addition to livestock grazing management practices, the Forest Service is also implementing travel restrictions to further encourage elk use in this area during the winter by preventing disturbance from motorized vehicles.

Alternative 2 - Current Management

Direct Effects: Implementation of this alternative would perpetuate the current conditions and inconsistencies that exist on the allotments included in the analysis area. Management strategies do not exist within the current Forest Plan direction to fully resolve the habitat issues identified within the analysis area.

Direct effects to habitat for species associated with mature forest habitats can result from management activities such as timber harvest or fuels treatments that cause habitat degradation or loss by altering habitat structure or quantity. Current grazing practices have not resulted in any habitat loss or fragmentation of mature forest habitat. Similarly, excessive livestock grazing can affect forest understory vegetation and habitat conditions for the Merriam's wild turkey. Current grazing practices have not resulted in any significant habitat degradations for this species.

Under this alternative, wildlife habitat conditions in sagebrush and aquatic/riparian communities would be maintained or slowly decline over time. Habitats within the analysis area currently utilized by the Gunnison's sage grouse for brood rearing, and their condition relative to desired habitat conditions, are displayed on the map in Chapter 2. Under this alternative, the majority of sage grouse habitat on National Forest system lands is in good condition, with one area of poor condition habitat on the East Naturita allotment. At this site, key habitat components have been altered or are lacking because of past livestock grazing practices. Current livestock grazing practices will not provide effective recovery of this site, and habitat conditions will remain below desired conditions.

Aquatic and riparian areas that do not meet desired conditions within the analysis area are identified in Chapter 2. These departures are apparently due to past and present livestock grazing practices. Under this alternative, these reaches would remain in a degraded condition. Management practices such as exclosure fencing would likely have to be constructed to meet Forest Plan direction for aquatic resources.

Within the 2002 Burn Canyon fire area, elk use is likely to continue at present levels or increase as elk remain on the Forest for longer periods of time. Under the current situation, the livestock permittee is stocking the allotment at far less AUM's than is currently permitted. Increasing the AUM's without considering elk use will create a significant shortage of forage for elk, and those animals will likely move to adjacent BLM and private lands in search of feed. The combined use will exceed the capacity of the area and result in impacts to rangeland health.

Indirect Effects: Livestock grazing could have indirect effects to forest habitat conditions if it is intense enough to impact tree regeneration, fungi production, understory vegetation composition, or alter fire regimes. Under current management, it is highly unlikely that livestock grazing use would be intense enough over a large enough area to have a measurable effect on forest habitat conditions.

The distribution of livestock grazing use would not be significantly changed under this alternative. Areas of intensive use will persist, especially near water sources. This could lead to further degradation of sagebrush or aquatic habitats through the spread of noxious weeds and/or depletion of understory vegetation.

Cumulative Effects: Reforestation efforts in the Burn Canyon fire area will establish new tree seedlings on areas that were salvage harvested. If funding is available, additional areas of productive land will also be planted to ponderosa pine. Ultimately this will result in new stands of ponderosa pine forest that were consumed in the 2002 wildfire. If successful, stands of mature forest could be available in 80 to 100 years.

The 2002 Burn Canyon wildfire affected about 32,000 acres of public and private land. Several fire rehab projects were completed on private and federal lands in an effort to establish desirable native vegetation and alleviate erosion. The seeding projects have been very successful, and plant cover and available forage are abundant within the burn area. The Forest Service is in the process of implementing travel restrictions to further encourage elk use in this area during the winter by preventing disturbance from motorized vehicles.

Alternative 3 - No Grazing

Direct Effects: Under this alternative, all influences of current livestock grazing upon wildlife habitat conditions would be removed from the analysis area. Initially, this would provide a tremendous increase in available forage and herbaceous cover throughout the analysis area. All of the annual grass and forb production within the analysis area would be available to wildlife. Over time, plant vigor and annual production of herbaceous vegetation would slowly decline where it is not utilized by grazing animals.

Residual grass would be available to ground nesting birds in all habitat types. This would help achieve the desired structural habitat conditions specified in the Gunnison's Sage Grouse Range Wide Conservation Plan. Residual herbaceous cover combined with

increased willow cover in riparian areas would lead to the recovery of degraded streams identified in the analysis area.

Indirect Effects: Under this alternative, all interior range fences and other range improvements would not be maintained and would slowly deteriorate until they would be non-functional. The Forest boundary fences would be maintained by adjacent private landowners or BLM permittees to prevent unauthorized use of National Forest system lands. As the interior fences declined, they could become hazards to big game moving through the area. Existing water developments are stock ponds that would slowly fill in over time, reducing their ability to store water. Any water troughs would cease to function over time as pipes and storage troughs deteriorate. However, this effect on water sources is not anticipated to adversely impact any wildlife species.

Cumulative Effects: Other resource management activities would continue to occur within the analysis area in accordance with Forest Plan management direction. Timber sale and fuels management projects could influence seral stages of forest vegetation. The use of fire for these activities or other wildlife habitat improvement projects would maintain early seral conditions to maintain plant vigor and annual production of herbaceous vegetation or shrubs to provide forage and browse for big game.

HERITAGE RESOURCES

TERMS USED IN THE ANALYSIS

"Heritage Resources" are sites, features, and values having scientific, historical, educational, and/or cultural significance. They include concentrations of artifacts, structures, landscapes, or settings for prehistoric or historical events.

A "Range Assessment" is an analysis of the sites and conditions within grazing planning areas that is conducted according to the terms of a Memorandum of Understanding between the Colorado State Historic Preservation Office and the Rocky Mountain region of the Forest Service regarding Range management Activities, finalized in 1999. This agreement establishes a process for assessing livestock impact areas, and for consulting with the SHPO and American Indian Tribes. A "Heritage Resource Inventory" is a systematic, on-the-ground search designed to identify and formally record the content and locations of heritage resources. Heritage resources identified in such inventories are recorded on Colorado State cultural resource site forms, which include a determination of significance (National Register of Historic Places –NRHP- eligibility status) for each heritage resource site. Also recorded for each site are its condition and the types of activities that may threaten it. In this document only intensive inventories, using transects of 30 meters or less, are included in the acreage totals.

"Prehistoric sites" consist of 7 or more artifacts, usually stone tools, projectile points, and debitage, and/or grinding stones, found on the surface, with potential for subsurface cultural content. Rock shelters, constructed walls, and/or hearths may also be present.

Ponderosa pine trees that have scars from being peeled by Native Americans for food are also considered a prehistoric cultural resource.

"Historic sites" in this area generally consist of trash dumps, and structural remains from historical saw mills, range management, and homesteads .

Past Actions that Have Affected the Existing Condition

A Range Assessment was carried out for the Naturita Division allotments in 2001, and SHPO and the tribes were consulted at that time. The assessment based on past inventory results determined that livestock grazing has no ongoing adverse impacts to cultural resource sites although due to heavy grazing numbers in the distant past, there were some impacts to sites at one time. Rehabilitation work following the Burn Canyon Fire affected some sites, especially by increasing the soil protection through re-seeding.

EXISTING CONDITION

The current analysis is based on previous heritage resource inventories that have been conducted in all of the allotments within the past thirty years. After each inventory project, the Colorado State Historic Preservation Office is consulted about the sites that are found. Sites that are determined to be ineligible for the national Register are then released from further management or mitigation work. Sites that are found to be eligible or for which eligibility cannot yet be determined are subject to management recommendations and monitoring for condition.

West Naturita Allotment (6,506 acres, or 45 percent of the allotment, have been inventoried)

- 4,930 acres for Timber projects
- 760 acres for Wildlife projects
- 744 acres for Mineral Exploration projects
- 72 acres for Range projects

Results: 94 prehistoric and 4 historic sites have been recorded, 28 of which have been designated "eligible" or un evaluated for the NRHP.

East Naturita Allotment (1,762 acres, or 34 percent of the allotment, have been inventoried)

- 1,195 acres for Timber projects
- 349 acres for Mineral Exploration projects
- 110 acres for Wildlife projects
- 100 acres for Fuels projects
- 8 acres for Range projects.

Results: 24 prehistoric and 6 historic sites have been recorded, 3 of which have been designated "eligible" or unevaluated for the NRHP.

Portis Allotment (3,673 acres, or 75 percent of the allotment, have been inventoried)

- 3,600 acres for Timber projects

73 acres for Mineral Exploration projects
Results: 36 prehistoric sites have been recorded, none of which have been designated "eligible" or unevaluated for the NRHP.
Cy Orr Allotment (1,554 acres, or 91 percent of the allotment, have been inventoried)
1,554 acres for Timber projects
Results: 28 prehistoric and 3 historic sites have been recorded, one of which has been designated "eligible" or unevaluated for the NRHP.

EFFECTS ANALYSIS

Alternative 1- Livestock Grazing using Adaptive Management

Direct Effects: Under this alternative cultural resources in the allotment area would be grazed by livestock and would also receive an increase in the numbers of elk grazing to meet habitat condition objectives. Over-use by any grazing animals may affect cultural resources if the soil is bared of vegetative cover, or if many animals are present in times of soft soil conditions such as during excessive precipitation. Such conditions affect the soil matrix that contains most cultural resources and may results in mixing of strata containing artifacts, or in breakage or physical damage. Other impacts may occur to above-ground resources such as structures or individual surface artifacts if animals are present in large numbers over sustained periods of time. However, inventory assessments made prior to the fire in the analysis area did not show significant ongoing impacts due to livestock.

Under this alternative, range monitoring would be extensively used to track range conditions and to take action if objectives were not being met. Standards for range condition and vegetation cover would remain in effect. Ongoing monitoring of cultural resource sites in the analysis area show that although the wildfire and its erosional aftermath adversely affected many of the surfaces of sites in the years immediately following it, the sites are now stabilized by vegetative cover. Based on current range conditions, this alternative would protect most archaeological sites surfaces from soil impacts.

Indirect Effects: Indirect effects to sites may occur if practices cause an increase in soil erosion or cause animals to congregate in excessive numbers that could damage surface artifacts or structures. No such effects are likely to occur under this alternative.

Cumulative Effects: No adverse cumulative effects to sites in the Naturita division are likely to occur under this alternative.

Alternative 2 - Current Management

Direct Effects: Under this alternative cultural resources in the allotment area would be grazed by livestock at the current levels. Elk use would be minimal. Over-use by any grazing animals may affect cultural resources if the soil is bared of vegetative cover, or if many animals are present in times of soft soil conditions such as during excessive

precipitation. Such conditions affect the soil matrix that contains most cultural resources. Other physical impacts may occur to above-ground resources such as structures or individual surface artifacts if animals are present in large numbers over sustained periods of time. However, assessments made prior to the fire in the analysis area did not show significant ongoing impacts due to livestock under the current conditions in this alternative.

Indirect Effects: Indirect effects to sites may occur if practices cause an increase in soil erosion or cause animals to congregate in excessive numbers that could damage surface artifacts or structures. No such effects are likely to occur under this alternative. The assessment done prior to the fire inspected high-sue areas and found no significant effects were occurring.

Cumulative Effects: No adverse cumulative effects to sites in the Naturita division are likely to occur under this alternative

Alternative 3- No Grazing

Direct Effects: Under this alternative, there would be no likelihood that livestock would affect cultural resources. However, wildlife would be allowed to graze and use of the forage would still result in a slight potential for impacts to site surfaces. The number of animals predicted to graze could be lower than under Alternative 1, but this would not necessarily translate into a lower chance of impacts from over-use on any given small archaeological sites surface. Overall, the chance of impact to archaeological sites is small. Assessments done previously suggest that neither wildlife nor livestock cause ongoing significant effects in the analysis area. Monitoring of range condition would decrease, which would make it less likely that action would be taken if soil or range conditions warranted.

Indirect Effects: Under this alternative, indirect effects from not grazing livestock would be highly unlikely. However, over time excessive range fuels, if not removed through grazing by wildlife instead of livestock, could create adverse fire conditions. Another fire would probably affect surface artifacts adversely.

Cumulative Effects: No adverse cumulative effects to sites in the Naturita division are likely to occur under this alternative

REFORESTATION

EXISTING CONDITION

Timber harvest activities within the Analysis Area have included a wide range of silvicultural prescriptions from single tree selection cuts to clear cuts. Precommercial and commercial tree thinning has occurred within this area as has prescribed fire. According to the Forest Service FACTS data base, timber harvest activities have taken

place on the east side of Naturita Creek from the 1970's up to 2002. Timber harvest activities also occurred on the west side of Naturita Creek in the McKee Draw drainage. Harvest activities have likely occurred prior to the 1970's but are not in the FACTS data base. In June 2002, the Burn Canyon wildfire burned nearly 11,000 acres of National Forest land within the analysis area. This wildfire stayed on the west side of Naturita Creek. Subsequently, two salvage sales were sold, and the sales were completed in 2005. In 2004, the Forest Service began reforesting the harvest units within these two salvage sales. The Forest Service has also started reforesting burned areas outside the two salvage sale areas. The planting of ponderosa pine seedlings within the burn area will continue through at least 2009. To aid in the seedlings' survival, downed large woody debris and tree shelters have been utilized.

Young ponderosa pine forest makes up a significant portion of the forested areas on the east side of Naturita Creek. The stands of ponderosa pine range from widely spaced trees to overstocked stands. The Forest Service anticipates future harvest activities in the overstocked stands. On the west side of Naturita Creek, there are islands of ponderosa pine scattered throughout the Burn Canyon wildfire area. The Burn Canyon and Bucktail Salvage and Reforestation EA stated no future harvest activities would occur within these stands. Within the fire perimeter, the stands of dead trees have begun to break down. As the trees continue to break or blow down, it is estimated that 30 to 50 tons per acre of large woody debris will eventually cover the forest floor. In the salvage sale units, an estimated 5 to 10 tons of large woody debris was left on the ground as a contract requirement. The intent this requirement was to provide additional protection to the planted ponderosa pine seedlings, surface barriers to overland flow of water, and microhabitats for wildlife.

Comment [F1]: Check on this

EFFECTS ANALYSIS

Alternative 1- Livestock Grazing using Adaptive Management

Direct Effects: Although some level of seedling mortality would likely occur, increased monitoring coupled with the measures described in the "Detailed Sequence of Potential Allotment Management Prescriptions" section of the document would result in rapid detection and remediation of deviations from reforestation objectives.

Indirect Effects: Vegetation consumption by livestock would possibly improve seedling moisture condition, improving seedling survival. Livestock-related compaction would continue.

Cumulative Effects: Livestock damage would not likely contribute significantly (be a major cause for plantation failure) to seedling mortality.

Alternative 2 - Current Management

Direct Effects: Some level of seedling mortality would likely occur. Without increased monitoring and the "grazing toolbox" measures, mortality could possibly become significant, although there is no evidence to date that indicate the likelihood of this. *Indirect Effects:* Vegetation consumption by livestock would possibly improve seedling moisture condition, improving seedling survival. Livestock-related compaction would continue.

Cumulative Effects: Livestock damage would not likely contribute significantly (be a major cause for plantation failure) to seedling mortality.

Alternative 3 - No Action also referred to as No Grazing

Direct Effects: Eliminates grazing as a source or seedling mortality.

Indirect Effects: Less vegetation consumed by livestock would result in increased vegetation competition and possible increase in seedling moisture-stress-related mortality. The elimination of grazing would reduce livestock-caused soil compaction, which would benefit seedling growth and survival.

Cumulative Effects: Although livestock-related seedling mortality would not occur, other sources of seedling mortality – specifically, lack of moisture – would continue cause seedling death. Without livestock use, the growth of competing vegetation would be greater and might increase drought-related mortality.

ECONOMICS

EXISTING CONDITION

Out of 112 farms and ranches throughout San Miguel County in 2002, 56 were involved in beef producing farms. Inventories of beef cows in 2002 totaled 8032 head. Of these, 93% were accounted for on just 29% of all farms or 57% of beef producing farms. This same year 5,689 calves and cattle were sold leaving 2343 cattle in San Miguel County. Full permitted grazing on the allotments in the project area total 2222 AUMs. Assuming a full 12 months for each head remaining, the project area supports about 8% of the total AUMs needed.

Although most ranches in the West are only partially dependent on federal grazing land for forage, this forage source is often a critical part of their livestock operation. Greer (1994) and Taylor et al (1992) both found that while the reliance of ranchers on forage from federal land grazing can appear relatively unimportant when calculated on an

acreage or animal-unit-month (AUM) basis, they become quite important when calculated on a seasonal dependency basis. The rigidity of seasonal forage availability means that the optimal use of other forages and resources are impacted when federal AUMs are not available. Dozens of researchers over the last 25 years have found that potential reductions in income and net ranch returns are greater than just the direct economic loss from reductions in federal grazing. Because ranching operations have economic linkages with other sectors of the area's economy, changes in federal grazing can also have implications for the overall economy.
Results from ranch level analyses suggest that there are at least three possible approaches to evaluating the economic importance of federal grazing to local communities: 1) evaluating federal AUMs only, 2) evaluating federal AUMs and the effects on total ranch production, and 3) evaluating federal AUMs and their effect on the economic viability of the ranch operation. Taylor, et al (2005) found in Park County, Wyoming that the effects of federal grazing to the local economy were roughly twice as large when considering the total ranch production compared to federal AUMs only. From the perspective of ranch viability, effects to the local economy were roughly twice as large compared to total ranch production, or four times larger that federal AUMs only. Which of these approaches is the most relevant in a particular situation depends on a number of factors including the individual ranch's level of dependency on federal grazing, the magnitude of the proposed change in grazing, the financial solvency of the ranch, the availability of alternative sources of forage, and the desire of the rancher to remain in ranching. Limited information regarding some of these factors is available and discuss below. Other information is unavailable or beyond the scope of this analysis.

Ranch operations in the Norwood area have historically built their operation with reliance upon Forest Service grazing permits. Private grazing land is generally not available for replacement of federal permits, due in part to high land values throughout San Miguel County. Consequently, permittee operations are quite vulnerable to changes in Federal grazing. Should any of these ranches cease operation, land values suggest that residential development would likely replace agricultural use of these private lands.

Although a definitive assessment is not possible for this analysis, it is recognized that adjustments to federal grazing, whether in terms of AUM reductions or cost increases to permittees, can have important consequences to individual ranch operations and ranch viability, as well as implications to families, social structure, lifestyle, local economies, and land use.

EFFECTS ANALYSIS

Alternative 1 - Livestock Grazing using Adaptive Management

This alternative requires that allotments be managed more actively than alternative 2, and at a greater cost to the permittee. It is difficult to accurately predict the extent of such costs. Some operators may be effective in monitoring and using forage from Forest

Service land with new management, while other may be unable to adapt to the new conditions and remain profitable.

Alternative 2 - Current Management

No change to permittee operations or the local economy will result under this alternative.

Alternative 3 - No Action also referred to as No Grazing

The economic effect of this alternative would be the greatest for permittees and the local economy. Because all livestock grazing would cease in these allotments at least 6 jobs could be directly affected by loss of these grazing allotments.

Because this analysis does not consider the permittees' personal business and financial information (i.e., profit margin, real estate, equipment, other personal property investments, total debt, etc.), it is difficult to assess whether a ranch would become unviable under this alternative. It could compel the permittees to rent or buy additional pasture or purchase additional feed, to maintain their current livestock numbers. Although this would be an additional expense for the permittees, it would create economic opportunity for the suppliers of these products and /or needs. Under this alternative, any operation forced to sell, and therefore go out of business, would be perceived by local residents as directly caused by the elimination of livestock grazing on Federal land. When working ranches have ceased operations during the past decade, vacant ranchland has sometimes been sold to developers, thereby potentially increasing sub-divisions and loss of open space.

CONSULTATION WITH OTHERS

The purpose of this section is to list those agencies, organizations, and persons who were consulted during the development of this environmental assessment. Those who were consulted appear on the following list.

INTERDISCIPLINARY TEAM

Brian Hoefling – Rangeland Management Specialist, Norwood Ranger District, Grand Mesa, Uncompahgre and Gunnison National Forest, Norwood, Colorado.
Craig Grother – Zone Wildlife Biologist, Norwood and Ouray Ranger Districts; Grand Mesa, Uncompahgre and Gunnison Nattional Forests, Norwood, Colorado.
Tim Garvey – Zone silviculturist, Norwood and Ouray Ranger Districts, Grand Mesa, Uncompahgre and Gunnison Nantional Forests, Montrose, Colorado.

Other Agency personnel who provided information and assistance.

Robert McKeever – Archeologist, Norwood Ranger District, Grand Mesa, Uncompahgre and Gunnison National Forests, Norwood, Colorado.

Marlin Jenson – Forest Rangeland Management Specialist, Grand Mesa, Uncompahgre and Gunnison National Forests, Delta, Colorado.
Chris James – Fisheries Biologist, Grand Mesa, Uncompahgre and Gunnison National Forests, Montrose, Colorado.
Leigh-Ann Hunt – Forest Archeologist, Grand Mesa, Uncompahgre, and Gunnison National Forests, Delta, Colorado.
Katherine Peckham – Zone Recreation Specialist, Norwood Ranger District, Grand Mesa, Uncompahgre and Gunnison National Forests, Montrose, Colorado.
Denise Carrigan – Physical Science Aid, Norwood Ranger District, Grand Mesa, Uncompahgre and Gunnison National Forests, Norwood, Colorado.
Barry Johnston – Forest Botanist, Grand Mesa, Uncompahgre, and Gunnison National Forests, Gunnison, Colorado.
Terry Hughes – Forest Soil Scientist, Grand Mesa, Uncompahgre, and Gunnison National Forests, Delta, Colorado.
Clay Speas – Forest Fisheries Biologist, Grand Mesa, Uncompahgre, and Gunnison National Forests, Delta, Colorado.
Dee Clossen – Reality Specialist, Norwood Ranger District, Grand Mesa, Uncompahgre and Gunnison National Forests, Norwood, Colorado.
Diana Menapace – NEPA coordinator, Rocky Mountain Region, Lakewood, Colorado.
Dean Stindt – Rangeland Management Specialist, Uncompahgre Field Office, Bureau of Land Management, Norwood, Colorado.

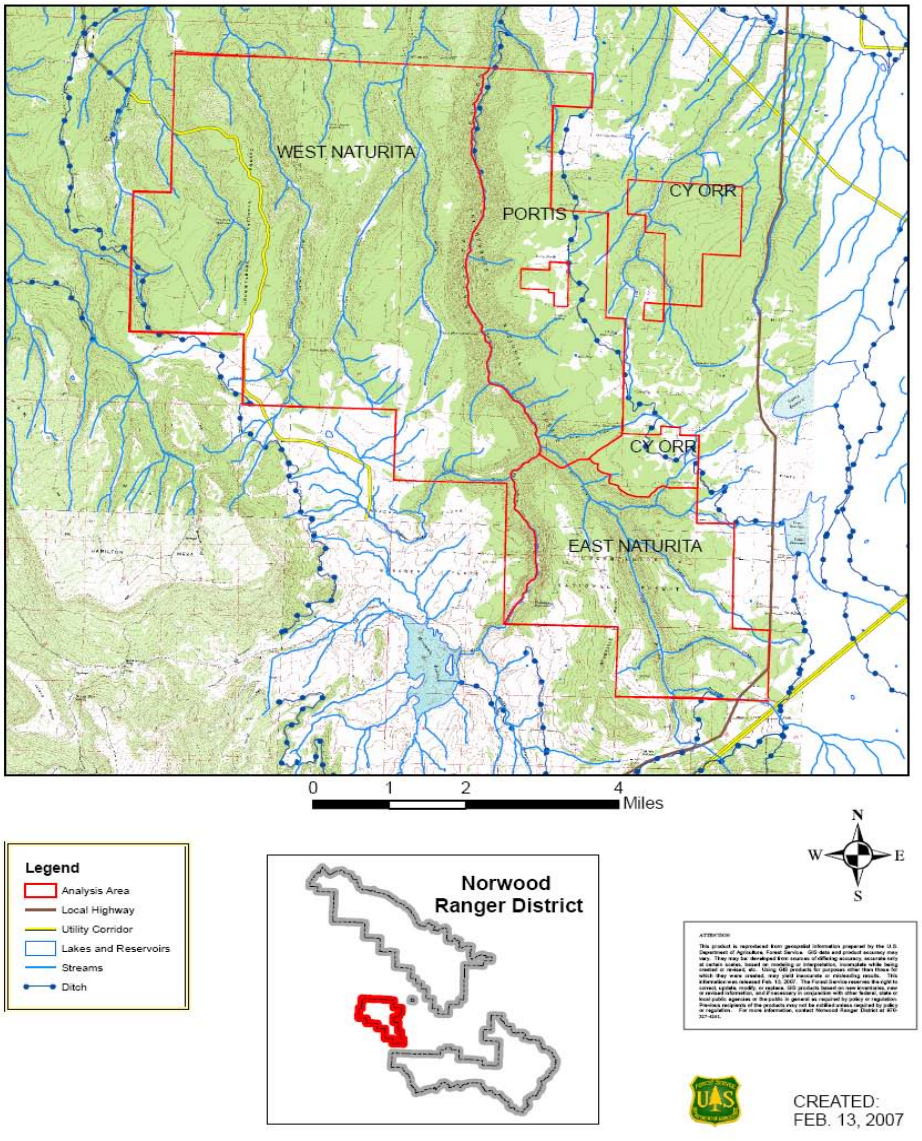
Federal, State, Local Agencies, and Tribes Contacted

Ute Mountain Tribe
Southern Ute Tribe
Colorado Division of Wildlife
Uncompahgre Field Office of the Bureau of Land Management
Natural Resource Conservation Service
United States Fish and Wildlife Service
Colorado State Extension Office

A list of others contacted through scoping is located in the project record.

Appendix A-1

NATURITA DIVISION RANGE ALLOTMENT ANALYSIS AREA **Exhibit 1-A**



Appendix A-2

Range
Condition and Trend

Exhibit 1-B

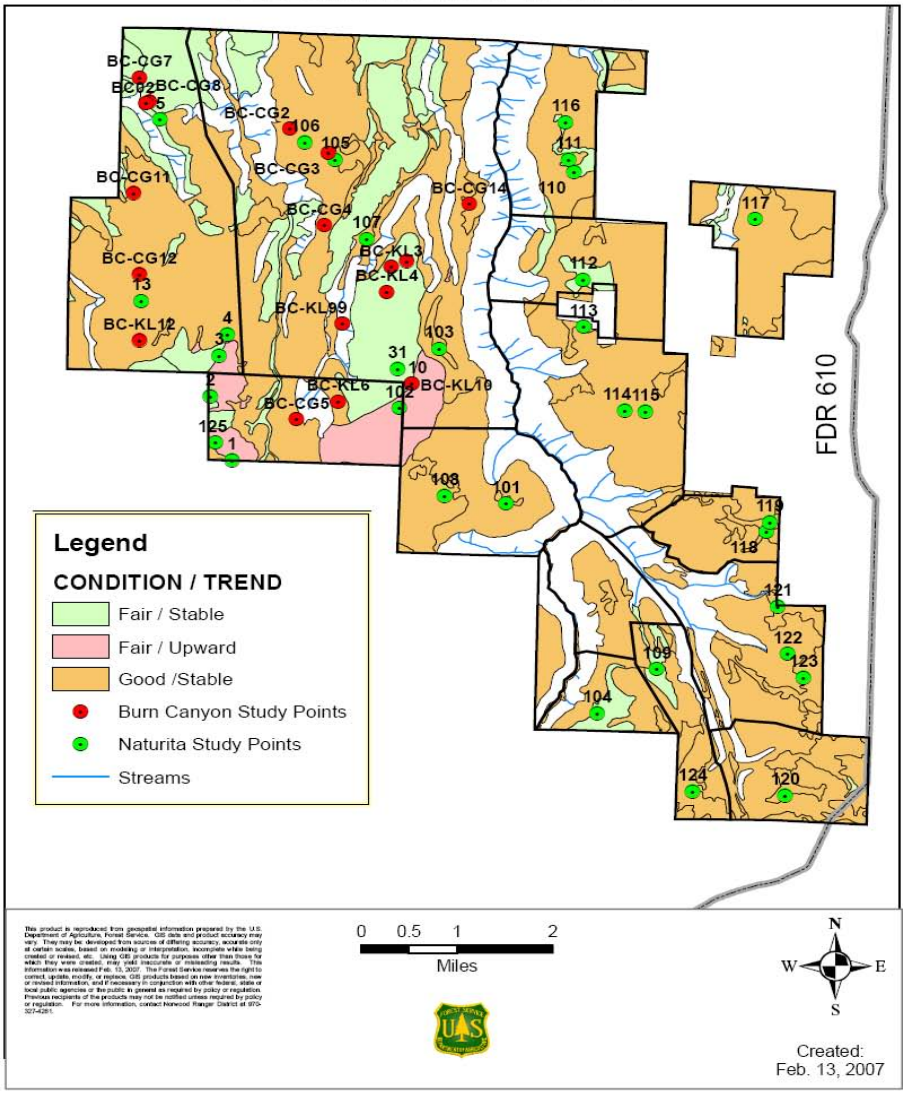


Exhibit 1-C

Gunnison Sage Grouse Habitat Condition

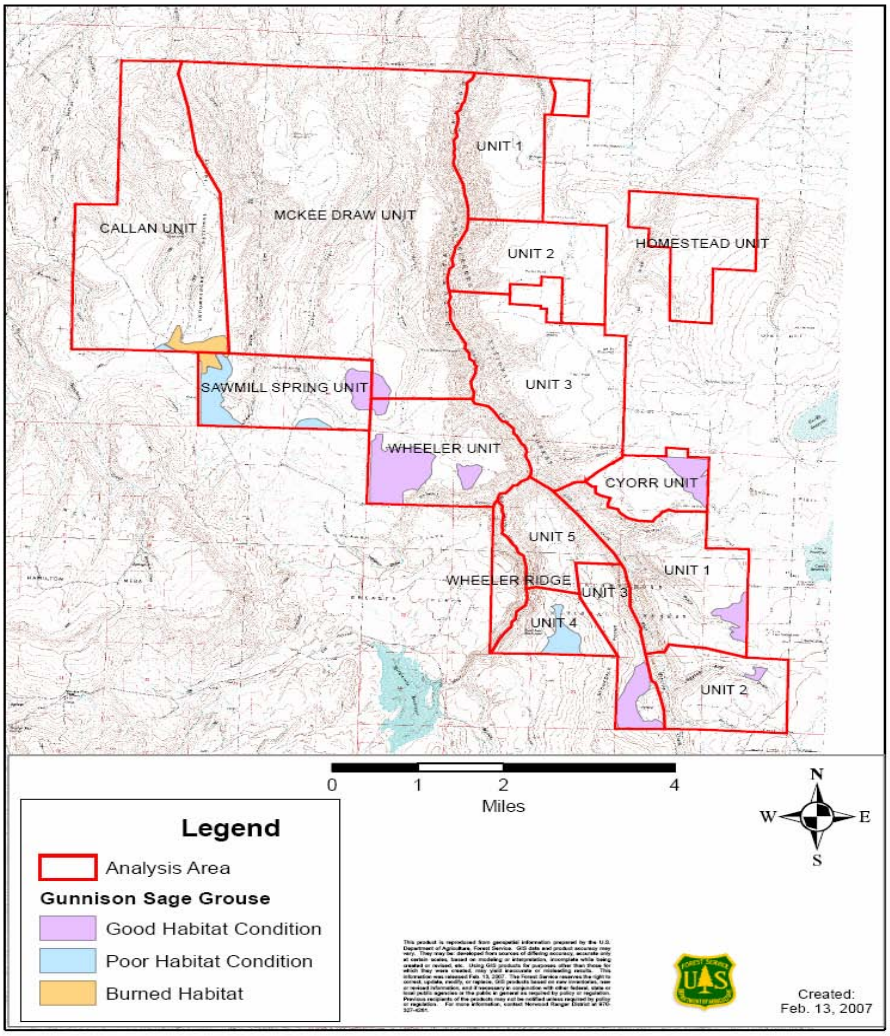
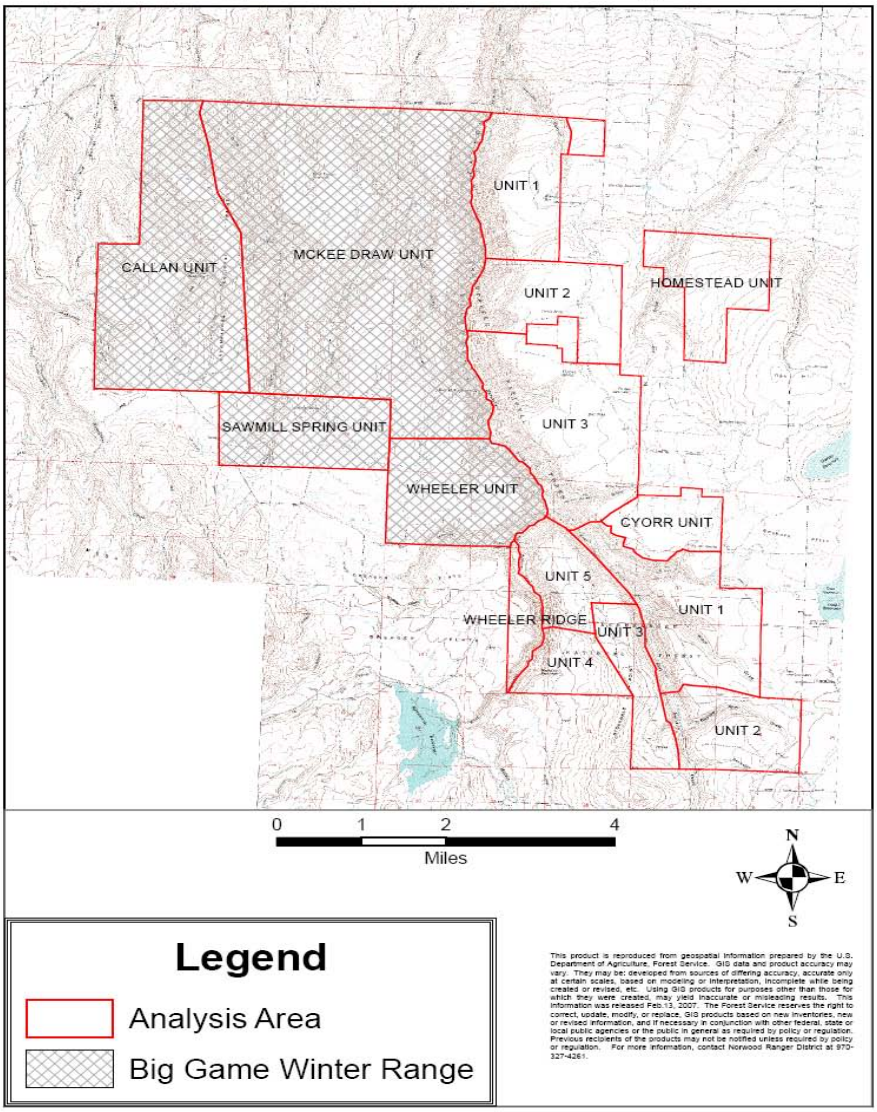


Exhibit 1-D

Big Game Winter Range



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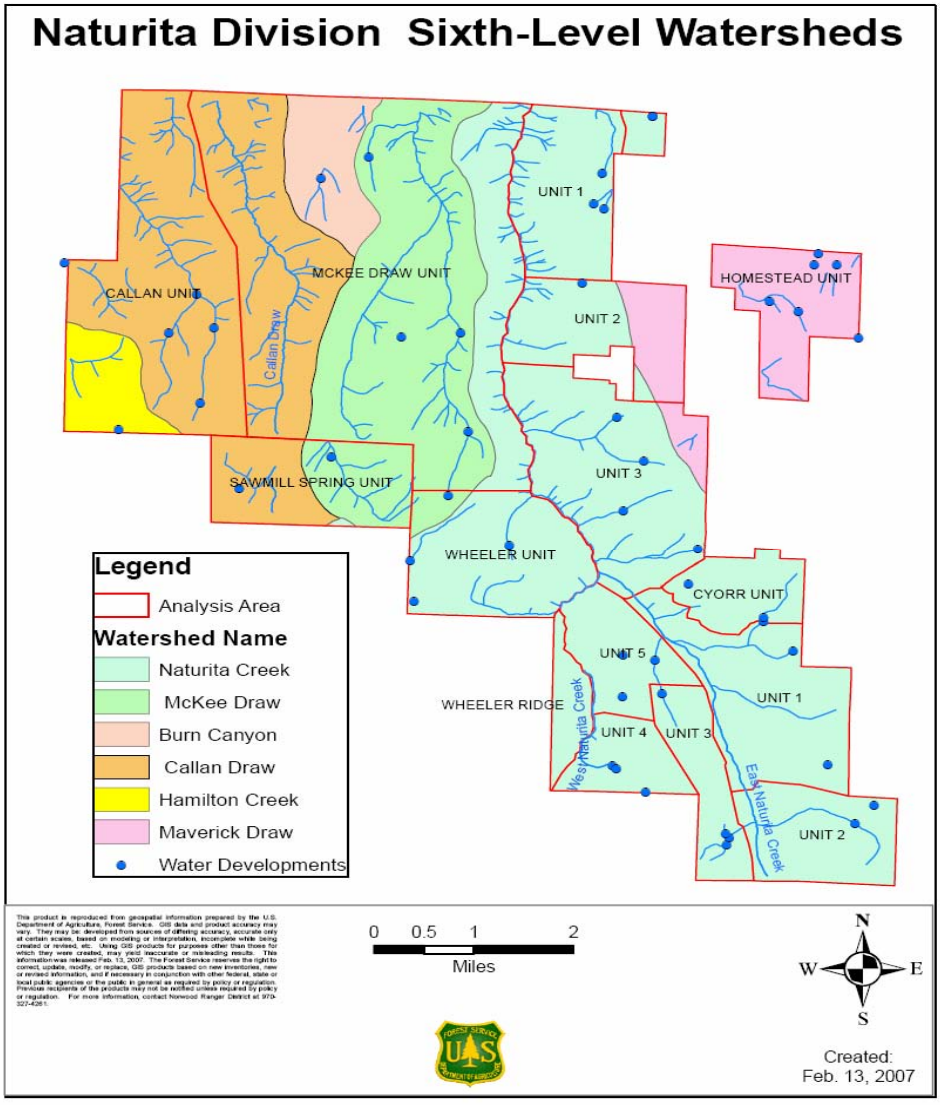
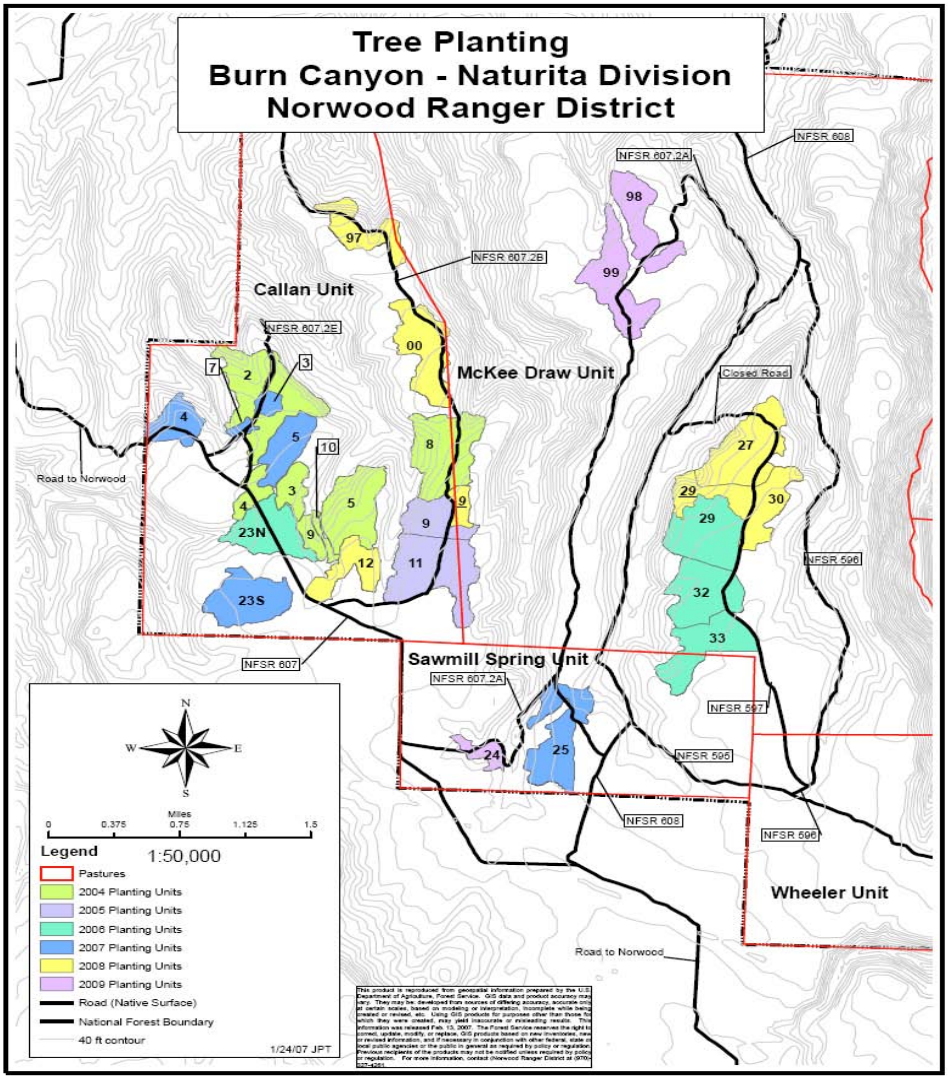

Naturita Division Sixth-Level Watersheds
UNIT 1
HOMESTEAD UNIT
MCKEE DRAW UNIT
CALLAN UNIT
Callan Draw
UNIT 2
UNIT 3
SAWMILL SPRING UNIT
WHEELER UNIT
CYORR UNIT
UNIT 5
WHEELER RIDGE
West Naturita Creek
UNIT 1
UNIT 4
UNIT 3
East Naturita Creek
UNIT 2
Legend
Analysis Area
Watershed Name
Naturita Creek
McKee Draw
Burn Canyon
Callan Draw
Hamilton Creek
Maverick Draw
Water Developments
0 0.5 1 2
Miles
N
W
E
S
Created:
Feb. 13, 2007

Exhibit 1-F


Tree Planting
Burn Canyon - Naturita Division
Norwood Ranger District
Callan Unit
McKee Draw Unit
Sawmill Spring Unit
Wheeler Unit
Road to Norwood
Closed Road
NFSR 607
NFSR 607.2A
NFSR 607.2B
NFSR 607.2E
NFSR 608
NFSR 596
NFSR 597
N
W
E
S
Miles
0
0.375
0.75
1.125
1.5
Legend
1:50,000
Pastures
2004 Planting Units
2005 Planting Units
2006 Planting Units
2007 Planting Units
2008 Planting Units
2009 Planting Units
Road (Native Surface)
National Forest Boundary
40 ft contour
1/24/07 JPT

Grazing Response Index: A Simple, Effective Method to Evaluate Plant Responses to Grazing

Monitoring gathers information about how rangelands respond to management over time. This information can be used to make changes in management. A good monitoring program provides information on maintaining or improving a resource while producing products like pounds of meat, clean water, and wildlife habitat.

When monitoring rangelands, managers routinely measure forage utilization or the amount of forage eaten. Unfortunately, monitoring utilization alone ignores other factors important to rangeland condition such as, how long animals graze, when they graze and growing conditions.

Recently, Colorado State University's Range Extension and Integrated Resource Management Programs developed the Grazing Response Index (GRI) to help managers evaluate the effects of grazing on rangelands.

What is GRI? GRI assesses the effects of grazing on plants during the current year and aids in planning grazing for the next year. GRI uses three factors related to plant health to evaluate impacts of grazing—*frequency* and *intensity* of defoliation (grazing), and *opportunity* for the plant to recover.

Frequency. Frequency is the number of times plants are grazed during a grazing period and depends on how long plants are exposed to grazing animals. Grazing the same area over an extended period of time allows animals to select the most preferred plants to their detriment.

Grazing plants three or more times during a growing season reduces productivity and weakens them.

To estimate of how many times plants could be grazed during a grazing period, divide the number of days in the grazing period by 7, up to 10 if plant growth is slower. In late spring and early summer, 7 to 10 is the number of days it takes for plants to grow enough to be grazed again. Seven is more conservative, because it produces the highest probable number of times plants could be grazed.

Number of Times Grazed	Days	Value
1	≤ 7	+1
2	7-14	0
3 or more	> 14	-1

A value of +1 indicates that plants grazed less than twice would respond positively to grazing. A 0 value indicates that plants grazed about two times would be neutral to grazing—being neither depressed nor enhanced. A -1 value indicates the plants have been grazed 3 or more times and is excessive. Continuing to graze at this frequency would negatively impact plants.

Intensity. Intensity is the amount of leaf removed during the grazing period. Intensity is described using three levels of defoliation - light, moderate and heavy. Plants regrow more quickly if they are left with more leaf area. Generally, leaving 50% or more of the leaf material

Grazing Response Index: A Simple, Effective Method to Evaluate Plant Responses to Grazing

Plant Response to Grazing -Tolerance, No. 3.1.3

Appendix B-1 cont.

provides enough leaf area for plants to meet needs and doesn't inhibit plant regrowth.

Grazing Level	% Utilized	Value
Light	< 40%	+1
Moderate	41-55%	0
Heavy	> 56%	-1

Light use, +1, promotes positive plant response because most of the leaf material remains. Moderate use, 0, enables the plant to maintain itself and its current status in the community. Heavy use, -1, would cause plants to decline in health, if this level of defoliation continues over several years. Placing cages in representative areas helps determine percent utilization during the grazing period. Cages must be moved each year.

Opportunity. Opportunity is the amount of time plants have to grow before grazing or to regrow and recover after grazing and is critical to maintaining plants. A grazing program should allow plants full growth of leaves before grazing or allow for full recovery after grazing for plants to thrive. Full growth or recovery enables plants to meet requirements during the growing period and allows plants to recover even if they are used relatively heavily or frequently.

Of the three factors used in the GRI, opportunity is most important for long-term health and vigor of plants. The opportunity for plants to grow or regrow is dependent on soil moisture and nutrients, temperature and leaf area. Since this factor is so important in sustaining healthy plants, the rankings are doubled.

Opportunity to Recover	Value
Full recovery	+2
Partial recovery	+1
Some recovery	0
Little recovery	-1
No recovery	-2

Determining opportunity is a judgment call based on the appearance of vegetation at the end of the growing season. If plants appear ungrazed or barely grazed or plants had full opportunity for growth before grazing, use a value of +2. If plants were grazed, but regrew fairly well after grazing then give a rating of +1. If an area was heavily used, with no opportunity to grow or regrow assign a -2.

Even though opportunity is based upon appearance of the vegetation at the end of the growing season, some general guidelines can help determine the rating. For example, an area that is used season-long can be expected to rate -2 (no chance for regrowth). An area with 2 pastures may provide some chance for growth or regrowth resulting in a rating of 0 or -1. An allotment with multiple pastures used and rested at different times of the year will usually receive ratings of +1 or +2.

Overall Rating—GRI. The overall rating of the expected response to grazing is the sum of frequency, intensity and opportunity. A *positive* value indicates the management is *beneficial* to the health, structure and vigor of the plants. A *negative* value indicates that management is *harmful*. A *zero* rating is *neutral*.

Recovery after grazing is based on a plant's ability to produce enough leaf surface area to regrow. GRI links mechanisms that control plant response to grazing. It uses three variables that can be managed—*length of grazing period, stocking rate and season of use.* If the frequency index indicates plant response is likely to be negative, shortening the length of the grazing period will improve plant response. If the intensity index is high on most pastures on the ranch, the stocking rate is too high. Since opportunity is based on plant growth or regrowth, it is influenced by season of use.

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REFERENCES

Grand Mesa, Uncompahgre, and Gunnison National Forest Amended Land and Resource Management Plan (1991).

Rosgen, Dave (1996(. Applied River Morphology, Second Edition. Wildland Hydrology Pagosa Springs, CO. (1996).

Johnston, Barry. (2006) Rangeland Condition and Trend Assessment of the GMUG National Forest, Norwood Ranger District, Naturita Division. A composition of ecological diversity and species richness assessments prepared for the GMUG.

Barbour M. G., Burk J. H., Pitts W. D., Gilliam F. S., and Schwartz M. W. (1999) Terrestrial Plant Ecology. Third Edition.

Vallentine J. F., 2001. Grazing Management, Second Edition.

Holechek J. L., Pieper R. D., and Herbel C. H. (2001). Range Management, Fourth Edition. New Mexico State University Las Cruces, NM (2001).

Thomas J. W. and Toweill D. E. (1982) Elk of North America Ecology and Management. Wildlife Management Institute and U.S. Department of Agriculture, Forest Service.

Soil Survey of San Miguel Area Colorado. (1986) United States Department of Agriculture Natural Resource Conservation Service, United States Department of the Interior, Bureau of Land Management , and Colorado Agricultural Experiment Station. (1986).

Grand Mesa, Uncompahgre, and Gunnison National Forest Draft Land and Resource Management Plan Revision (2006).

Satturlund D. R., and Adams P. W. (1992) Wildland Watershed Management, Second Edition. Washington State and Oregon State University (1992).

Gunnison Sage Grouse Range Wide Conservation Plan (2005). Colorado Division of Wildlife.

Monthly Climate Summaries, Western Regional Climate Center. www.wrcc.dri.edu.