

**United States
Department of
Agriculture**

Forest Service

**Grand, Mesa, Uncompahgre and Gunnison National Forest
Gunnison, CO**



The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

Table of Contents

Summary.....	3
Chapter 1 Introduction.....	4
Document Structure.....	4
Background.....	4
Purpose and Need for Action.....	6
Proposed Action.....	7
Decision Framework.....	8
Scoping and Public Involvement.....	8
Issues.....	8
Chapter 2 Alternatives, Including the Proposed Action.....	10
Alternatives.....	10
Activities Common to Alternatives 2 and 3.....	11
Design Criteria or Mitigation Measures Common to Alternatives 2 and 3.....	12
Monitoring	14
Cumulative Actions Considered in this Analysis	15
Chapter 3 Affected Environment and Environmental Consequences.....	16
Wildlife.....	16
Fisheries.....	35
Rare, Sensitive, and Endangered Plants	38
Commercial Timber.....	43
Soil, Watershed, and Riparian Resources.....	44
Air Quality	47
Recreation Resources.....	48
Livestock Grazing.....	49
Chapter 4 Consultation and Coordination.....	51
Literature Cited and References.....	53
Appendix A.....	62
Appendix B.....	68

SUMMARY

The Grand Mesa, Uncompahgre and Gunnison National Forest (GMUG NF) proposes the Taylor Sheep Prescribed Burn project to conduct prescribed fire treatments on National Forest lands, treating up to 60 percent (13,712 acres) of a 22,854 acre primary burn area over a 20 year period (\pm 1,000 acres per year). Prescribed burning will target lodgepole pine, but treatments will also take place in aspen, Douglas fir, ponderosa pine, and grassland and shrubland vegetation types. The project proposes the use of mechanical treatments to create fire control lines, which provide fuel breaks to protect resources and private property. No road construction or road reconstruction is proposed for this project.

The Taylor Sheep Prescribed Burn project is located approximately 15 air miles northeast of Gunnison, CO, within the Gunnison Ranger District of the Gunnison National Forest between Taylor River on the south, Spring Creek, Rose Bud Trail and Roaring Judy Creek on the north and west, and as far east as Taylor Park Reservoir.

The proposed action meets the goals of The Amended Land and Resource Management Plan, specifically in regards to desired conditions for fish and wildlife resources (GMUG NF 1991; page III-3). These goals include increasing or improving wildlife habitat diversity. The primary management objective is to improve habitat for Rocky Mountain bighorn sheep by opening travel corridors between summer, winter, and transitional ranges.

In addition to the proposed action, the Forest Service also proposes a no action alternative, in which none of the activities identified in the proposed action would occur. Under this alternative, management would continue under existing policies. A third alternative adjusts the proposed action to reduce boundaries of the project area to address public and internal concerns related to the identified issues.

Based upon the effects of the alternatives, the Responsible Official will decide:

- Whether or not to conduct prescribed burning on National Forest lands within the project area.
- If either of the action alternative are selected, under what conditions and by which methods should prescribed burning and associated activities be conducted.

Chapter 1 - INTRODUCTION

Document Structure

The Forest Service prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This EA discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternative. The document is organized into five parts:

- **Introduction:** The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving the purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- **Comparison of Alternatives, Including the Proposed Action:** This section provides a more detailed description of the agency's proposed action. These alternatives were developed based on significant issues raised by the public, Forest Service, and other agencies. This discussion also includes specifications for project implementation (design criteria) and possible mitigation measures if needed.
- **Environmental Consequences:** This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.
- **Agencies and Persons Consulted:** This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- **Appendix:** The appendix provides additional information to support the analyses presented in the environmental assessment.

Background

As stated in the summary, the proposed project area is located approximately 15 air miles northeast of Gunnison, CO. The proposed Taylor Sheep Burn project area comprises 22,854 acres bound by Taylor River to the south, Rosebud Gulch and Spring Creek to the North, Taylor Reservoir to the east, and FDR 813.2A (Roaring Judy Road) to the west. The project area is located within seventh order watersheds that include Rarick Gulch, Spring Creek Comp, Lower Taylor River Comp, Gandy Gulch, Rocky Brook Gulch, and Mid Taylor River Comp approximately 15 miles northeast of Gunnison, Colorado in Township 14S, Range 83W, sections 1, 2, 11-15 and 21-35; Township 14S, Range 84W, sections 23-28 and 32-36; Township 15S, Range 83W, sections 2-10 and 18; and Township 15S, Range 84W, sections 1-5, 8-17 and 21-24; 6th Principal Meridian

([Appendix A, Map 1](#)). A larger analysis area for addressing direct, indirect, and cumulative effects of project alternatives is 55,343 acres in size and is defined by seventh order watersheds, subsheds, and administrative boundaries. Elevations range from 8,380 feet near the Taylor River east of Harmel’s to 12,383 feet at the summit of Matchless Mountain.

The 55,343 acre analysis area contains diverse plant communities ([Table 1; Appendix A, Map 2](#)) ranging from grass-forb communities, sagebrush, wetland and riparian areas, to aspen stands that occur primarily along drainages, and coniferous forest. The forested portion of the analysis area is primarily lodgepole pine (62.8%) and spruce-fir (26.8%), with lesser amounts of aspen (8.4%) and Douglas fir (2%). Riparian habitats comprise approximately 4.6% (2,541 acres) of the analysis area (reflected primarily in the willow cover type but also occurs as a minor component of all other cover types).

Table 1. Acreage distribution of cover types and habitat structural stages within the Taylor Sheep Burn analysis area (current condition).

<i>Cover Type</i>	<i>No Data</i>	<i>1</i>	<i>2</i>	<i>3A</i>	<i>3B</i>	<i>3C</i>	<i>4A</i>	<i>4B</i>	<i>4C</i>	<i>Total</i>
Forbland		53								53
Grassland		3,558								3,558
Bare Soil/Rock	603	361	169	43			133			1,310
Shrubland			550							550
Sagebrush			2,265							2,265
Snow-berry			66							66
Willow			2,096							2,096
Aspen				187	2,447		168	448	573	3,824
Douglas Fir							469	377	70	916
Lodgepole				1,121	19,503	287	716	6,840	44	28,511
Spruce-fir				592	3,804		1,437	5,506	838	12,177
Water	7									7
Total	610	3,973	5,146	1,944	25,754	287	2,923	13,170	1,525	55,332

The management emphasis for the Taylor Sheep Burn analysis area, as identified in the Amended Land and Resource Management Plan for the Grand Mesa, Uncompahgre and Gunnison National Forests (USDA Forest Service 1991), is displayed below in [Table 2](#). Management emphasis for this area is heavily weighted towards motorized recreation opportunities, timber management, and wildlife habitat management for management indicator species (MIS). Prescribed burning was conducted in the proposed project area from 1983 to 1999; treating approximately 8,872 acres ([Appendix A, Map 3](#)). The Taylor Sheep Prescribed Burn project proposes to continue prescribed fire treatments, following Forest Plan direction as it relates to wildlife habitat management.

Table 2. Management emphasis areas for the Taylor Sheep Burn analysis area.

Management Area	Description	Acres of Analysis Area (%)
5A	Big Game Winter Range in Non-Forested Areas	99.70 (0.2)
No Data	No Management Area Designation	2,438.73 (4.4)
2B	Roaded Natural and Rural Recreation Opportunities	6,087.43 (11)
6B	Livestock Grazing - Maintain Forage Composition	6,434.94 (11.6)
4B	Wildlife Habitat Management For One or More Management Indicator Species	10,887.31 (19.7)
7A	Timber Management on Slopes Under 40 Percent	14,578.24 (26.3)
2A	Semi-Primitive Motorized Recreation Opportunities	14,816.70 (26.8)

Purpose and Need for Action

The purpose of the Taylor Sheep Burn Project is to improve habitat connectivity as well as visual detection of predators by opening travel corridors between bighorn sheep (Taylor River Herd Unit S26) seasonal and transitional ranges. Plant community succession, particularly on transitional ranges, is a habitat concern for the Taylor River Herd. Fire suppression allows vegetation to grow and obstruct visibility, creating densely forested areas that provide little forage and poor visibility for bighorn sheep (Beecham et al. 2007). The goal is to use fire as a management tool to produce and maintain sub-climax grassland and parkland habitats that provide greater visibility for bighorn sheep (Geist 1971, Erickson 1972, Arnett 1990, Beecham et al. 2007), as well as improve foraging habitat.

In addition to improving habitat for bighorn sheep, the proposed action is expected to improve habitat conditions for other wildlife species over the long term, as well as aid in the restoration of native vegetation by restoring fire's natural role on the landscape. The proposed action will reduce fuel loading within treatment areas, reducing the amount of downfall that may be hindering bighorn sheep movements. The proposed action will also reduce the threat that wildfires pose to the forest and adjacent landowners due to extensive fuel buildup.

Proposed Action

The Gunnison Ranger District anticipates using prescribed fire to burn in a mosaic pattern inside a 22,855 acre primary burn area. The goal is to burn approximately 1,000 acres per year, but the amount burned each year will vary depending on environmental conditions (i.e., soil moisture, fuel moisture, weather, etc.) and other factors. Within the 22,855 acre primary burn area, we anticipate a mosaic of 40-60% burned with burned and

unburned areas distributed throughout the primary burn area to maintain habitat heterogeneity and connectivity. Prescribed burning at elevations below 11,000 feet would occur from May 1 to August 30. Areas above 11,000 feet would be burned after August 30, with prescribed burning activities extending into the fall.

Burning will be implemented primarily in lodgepole pine, with stand replacement likely to occur in some areas depending on fuel buildup, fuel type, fire intensity, soil moisture, topography, wind speed, and plant community structure. In addition, there will be opportunities to burn aspen stands to stimulate aspen regeneration. Underburning will also take place in Douglas fir and ponderosa pine stands. Within the 22,855 acre primary burn area, there are 14,892 acres of lodgepole, 1,968 acres of aspen, 468 acres of Douglas fir and small, isolated pockets of ponderosa pine intermixed with Douglas fir. These acres are expected to burn in a mosaic of intensities, ranging from low intensity fires that consume only surface fuels to stand replacing fires that create gaps in the forest canopy, while other areas adjacent to burned areas remain untouched. Such a mosaic of burn intensities maintains habitat heterogeneity and vegetation structural diversity that will vary spatially and temporally as plant succession occurs following fire. Design criteria have been developed that include seasonal restrictions (i.e., avoid burning bighorn sheep lambing areas during the lambing season) and buffers to maintain wildlife resources, such as habitat connectivity, goshawk nest sites, lynx denning and winter foraging habitat (spruce-fir and large willow riparian areas), and elk security areas.

Other project activities include re-burning and maintenance of previously burned areas and future burns within the primary burn area throughout the life of the project. For example, burning may increase snag abundance in bighorn sheep travel corridors between seasonal and transitional ranges. These snags will eventually fall and may create barriers to sheep movement, as well as limit sight visibility. Maintenance of these areas would include re-burning these previously burned areas. Design criteria are incorporated into the project design to retain adequate amounts of snags and down wood throughout the analysis area, as per Forest Plan Standards and Guidelines, for wildlife that utilize these habitat components.

No road construction or road reconstruction is proposed for this project. When implementing the burn, Forest Service personnel will access burn units mainly by helicopter, walking, or horseback. ATV use will be minimized, but some areas may be accessed with ATVs using existing motorized routes designated for ATV travel.

Connected actions associated with this alternative include the protection of resources within and outside the burn area through fire control lines. For the most part, burn boundaries will utilize natural barriers such as ridgelines and perennial streams, or roads. As previously mentioned, mechanical treatments such as clearing or pruning of trees will take place as necessary to provide fuel breaks to protect resources and private property adjacent to treatment units, and to create helicopter landing pads.

Decision Framework

This document discloses the environmental consequences of implementing the proposed action and alternatives to that action. The Gunnison District Ranger is the Deciding Official. His decision will be stated in the Decision Notice. Given the purpose and need, the Gunnison District Ranger reviews the proposed action and the other alternatives in order to make the following decisions:

1. Whether or not to implement prescribed burning on National Forest lands within the project area.
2. If one of the action alternatives is selected, under what conditions and by which methods prescribed burning and associated activities would be conducted.

Scoping and Public Involvement

The proposal was listed in the Schedule of Proposed Actions for the GMUG National Forests on April 1, 2007, and scoping letters were mailed to members of the public, GMUG National Forest mailing list, and other agencies in April of 2007. Legal notices were also published in the Gunnison Country Times on April 5, 2007, and the Crested Butte News on April 6, 2007.

Using the comments from the public and other agencies, the interdisciplinary team developed a list of issues to address.

Issues

The Forest Service identified significant issues that are directly or indirectly caused by implementing the proposed action. Issue topics that were raised during scoping by the interdisciplinary team and from public comment include:

1. Effects of prescribed burning and associated activities on roads and trails.

Due to slope gradient, rolling debris is a safety concern to travelers using the Spring Creek Road, especially if soils on steep slopes are saturated by rain. Prescribed burn activities have the potential to affect soil stability on steep slopes, thus the Spring Creek Road will be closed when burn activities take place in that area. At the southern end of the Spring Creek Road, a gate exists for seasonal closure near the end of the pavement past the private residents. At the northern end, a second gate will be installed at Deadman Gulch. These gates will be utilized for road closure when burning activities adjacent to Spring Creek have the potential to facilitate rolling debris. Access to private residents will not be affected by the road closure.

Trail closures will take place when prescribed burning is implemented in areas containing trails. Notices will be posted at trailheads as to when they are open or closed.

Prescribed burning has the potential to increase snags, thus snags that occur along trails are a safety concern for trail users. Since snags are an important habitat component for

many wildlife species, mitigation will be necessary to minimize the risk of falling snags to trail users while maintaining some snags as wildlife trees.

2. Concern for wetlands, riparian habitat, and fisheries in the Taylor River.

Riparian areas comprise 2.8% of the primary burn area and 4.6% of the analysis area. Although they occupy a small percentage of the landscape, these riparian areas provide habitat for numerous wildlife species. Burning in larger wetland and riparian areas will be avoided when possible and/or practical. Fire may rejuvenate riparian vegetation by promoting regeneration and sprouting, as well as increasing plant species diversity. Thus, some riparian areas will be burned as would occur with naturally ignited (lightening) fires.

The Taylor River lies immediately adjacent to the southern boundary of the project area. Several perennial and intermittent streams occur throughout the primary burn area, which drain into the Taylor River. There is a concern that prescribed burning may reduce soil stability, creating runoff that could potentially affect fish in the Taylor River. For an analysis of effects of the Taylor Sheep Burn project on fisheries, please see the Fisheries section under Chapter 3 – Affected Environment and Environmental Consequences.

3. Potential for exotic plant species to disperse and become established in burned areas.

Absinth sage and spotted knapweed are noxious weeds that occur along the Spring Creek Road. Cheatgrass is also found on disturbed sites near Harmel's, as well as between the Spring Creek Road and Rarick Gulch at the southwest end of the project boundary. Areas containing these noxious weeds will be avoided. One of the goals of the proposed action is to use prescribed fire as a tool to promote the restoration of native vegetation, thus all necessary precautions will be taken to avoid the spread of exotic plants. This includes cleaning equipment and ATVs prior to entering the project area to prevent the introduction of noxious weeds and cheatgrass into the project area.

4. Protection of wildlife resources during burn operations, such as active goshawk nest sites, elk security areas, and bighorn sheep lambing areas.

Seasonal restrictions on burning will be applied in portions of the project area to avoid disturbance to bighorn sheep lambing areas during the lambing season, and buffers will be applied to protect goshawk nest sites. Fire should be excluded from large spruce-fir stands to maintain lynx denning and winter foraging habitat, as well as habitat connectivity within and between lynx analysis units.

5. Concern for air quality.

Smoke from prescribed burning can affect air quality, and thus public health. Smoke management techniques will be applied that disperse smoke away from smoke sensitive areas. This includes applying elevational restrictions during fall burning. An annual State of Colorado smoke permit will be required for this project.

6. Protection of private property and homes that border the National Forest adjacent to the project area.

Many private land parcels and homes border the National Forest adjacent to the project area. One of the biggest concerns from public comments was the protection of private property in the event of fire escape. One of the connected actions associated with the proposed action is the protection of private property through fire control lines. In addition, burn boundaries will utilize effective barriers such as ridgelines, streams, and roads. Clearing or pruning of trees will also take place as necessary to strengthen fire control lines and provide fuel breaks. Lastly, ignition will only take place if weather and other environmental variables facilitate the ability to manage prescribed burning with the least amount of risk of fire escape. Alternative 3 was developed to adjust primary burn boundaries away from private land or to create additional fire control lines to provide a buffer of no burn area and provide additional protection for private lands.

Chapter 2 – ALTERNATIVES, INCLUDING THE PROPOSED ACTION

Alternative 1: No Action

Under this alternative no prescribed burning would take place. There would be no change in the current condition except from natural disturbances and environmental processes, as well as natural succession of vegetation within the project area. Under this alternative, bighorn sheep movements between seasonal and transitional habitat areas would continue to be hindered by areas of extensive windblown timber and areas of dense forest.

Alternative 2 – Proposed Action

This alternative is the proposed action described in Chapter 1. It is the initial proposal developed to meet the project purpose and need ([Appendix A, Map 4](#)). The Gunnison Ranger District anticipates using prescribed fire to burn in a mosaic pattern inside a 22,855 acre primary burn area. The goal is to burn approximately 1,000 acres per year, but the amount burned each year will vary depending on environmental conditions (i.e., soil moisture, fuel moisture, weather, etc.) and other factors. Within the 22,855 acre primary burn area, we anticipate a mosaic of 40-60% burned and 60-40% unburned, with burned and unburned areas distributed throughout the primary burn area to maintain habitat heterogeneity and connectivity. Prescribed burning at elevations below 11,000 feet would occur from May 1 to August 30. Areas above 11,000 feet would be burned after August 30, with prescribed burning activities extending into the fall.

Burning will be implemented primarily in lodgepole pine, with stand replacement likely to occur in some areas depending on fuel buildup, fuel type, fire intensity, soil moisture, topography, wind speed, and plant community structure. In addition, there will be

opportunities to burn aspen stands to stimulate aspen regeneration. Underburning will also take place in Douglas fir and ponderosa pine stands. Within the 22,855 acre primary burn area, there are 14,892 acres of lodgepole, 1,968 acres of aspen, 468 acres of Douglas fir and small, isolated pockets of ponderosa pine intermixed with Douglas fir.

Alternative 3 – Adjusted Proposed Action

This alternative is derived from the proposed action, but considers public and internal comments to adjust boundaries of the project area ([Appendix A, Map 5](#)). This alternative anticipates using prescribed fire to burn in a mosaic pattern inside a 17,619 acre primary burn area. Within the 17,619 acre primary burn area, there are 14,892 acres of lodgepole, 1,968 acres of aspen, 468 acres of Douglas fir and small, isolated pockets of ponderosa pine intermixed with Douglas fir. This alternative addresses private property owner concerns for the safety of their property by moving primary burn area boundaries away from private property and constructing additional fire control lines.

Activities Common to Alternatives 2 and 3

The goal is to burn approximately 1,000 acres per year, but the amount burned each year will vary depending on environmental conditions (i.e., soil moisture, fuel moisture, weather, etc.) and other factors. Within the primary burn area, we anticipate a mosaic of 40-60% burned, with burned and unburned areas distributed throughout the primary burn area to maintain habitat heterogeneity and connectivity. Prescribed burning at elevations above 11,000 feet would not occur until after August 30, with prescribed burning activities extending into the fall.

Burning will be implemented primarily in lodgepole pine, with stand replacement likely to occur in some areas depending on fuel buildup, fuel type, fire intensity, soil moisture, topography, wind speed, and plant community structure. In addition, there will be opportunities to burn aspen stands to stimulate aspen regeneration. Low intensity burning will also occur in Douglas fir and ponderosa pine stands.

Acres proposed for prescribed burning are expected to burn in a mosaic of intensities, ranging from low intensity fires that consume only surface fuels to stand replacing fires (primarily in lodgepole pine) that create gaps in the forest canopy, while other areas adjacent to burned areas remain untouched. Such a mosaic of burn intensities maintains habitat heterogeneity and vegetation structural diversity that will vary spatially and temporally as plant succession occurs following fire. Design criteria have been developed that include seasonal restrictions (i.e., avoid burning bighorn sheep lambing areas during the lambing season) and buffers to maintain wildlife resources, such as habitat connectivity, goshawk nest sites, lynx denning and winter foraging habitat (spruce-fir and large willow riparian areas), and elk security areas.

Other project activities include re-burning and maintenance of previously burned areas and future burns within the primary burn area throughout the life of the project. For example, burning may increase snag abundance in bighorn sheep travel corridors between seasonal and transitional ranges. These snags will eventually fall and may create barriers

to sheep movement, as well as limit sight visibility. Maintenance of these areas would include re-burning these previously burned areas. Design criteria are incorporated into the project design to retain adequate amounts of snags and down wood throughout the analysis area, as per Forest Plan Standards and Guidelines, for wildlife that utilize these habitat components.

No road construction or road reconstruction is proposed for this project. When implementing the burn, Forest Service personnel will access burn units mainly by helicopter, walking, or horseback. ATV use will be minimized, but some areas may be accessed with ATVs using existing motorized routes designated for ATV travel.

Connected actions associated with this alternative include the protection of resources within and outside the burn area with fire control lines. For the most part, burn boundaries will utilize natural barriers such as ridgelines and perennial streams, or roads. As previously mentioned, mechanical treatments such as clearing or pruning of trees will take place as necessary to provide fuel breaks to protect resources and private property adjacent to treatment units, and to create helicopter landing pads.

Design Criteria or Mitigation Measures Common to Alternatives 2 and 3

1. No prescribed burning will take place below 11,000 feet after September 1 to reduce smoke potential in Spring Creek and Taylor Canyon.
2. Burning activities should not occur within 1 mile of bighorn sheep lambing areas from May 1 through June 20 to avoid disturbance and displacement of lambing ewes.
3. Doctor Park Trail (NFST424) in Unit P2 and P3. When igniting within ¼ mile either side of this trail, close the trail at either end with information signs. Also, there are numerous snags and green, rotten aspen trees along the trail. Obvious hazard trees and any trees that fall across the trail will be felled and/or bucked out of the trail after ignition.
4. Spring Creek Canyon in Unit P1. There will be rolling debris potential from Grasshopper Park north to near Rosebud Gulch along the Spring Creek Road. Post information signs at either end of the road to warn the public. The north half of P1 may be burned in the spring and avalanches usually keep the Spring Creek Road closed until late May. This will reduce public risk; however, heavy monsoon rains may cause further debris on the road so warning signs will be posted until burning season is concluded.
5. Any snags that are created that could be a safety issue along travel ways will be felled within two weeks after burning. Any lines that were constructed to mineral soil will be rehabbed which will include closing any travel ways and water barring.
6. When a helicopter will be used for ignition, flight routes, equipment use, and burning patterns should be planned to minimize disturbance to bighorn sheep utilizing migration routes and lambing areas prior to May 15 (sheep generally migrate to the lambing area in

April and early May). When practical, fly burn areas prior to ignition to determine use by bighorn sheep – avoid ignition within ¼ mile of where sheep are present.

7. If territories of threatened, endangered, or sensitive species are discovered within the project area, establish and manage these territories with adequate buffer zones and seasonal activity use restrictions around breeding sites to prevent the disturbance or displacement of those individuals.

Effectiveness: This mitigation is designed to provide some level of protection for sensitive or other species that may be discovered during actual operations. Anecdotal evidence suggests that after the fact buffers and timing restrictions have been successful in ensuring the success of a nest site the year it is discovered. In two known instances where buffers and/or timing restrictions on newly discovered goshawk nests were utilized, both nests successfully produced fledglings the year of discovery (Jackson, pers. obs.; Lefebvre, pers. comm.).

8. Maintain a minimum of 300 snags/100 acres from the largest dbh available, large live trees with broken or dead tops (snag replacement trees), and other trees showing wildlife signs (dens, nests, cavities, squirrel middens, woodpecker activity) within and adjacent to forested portion of units to provide for perching, foraging, roosting, and nesting sites for wildlife. Snags within 500 feet of water (creeks, ponds, wet meadows, seeps, springs), meadows/parks/forest openings, and ridgetops are particularly valuable to wildlife. Leave snags with a variety of heights, shapes, and decay condition. Generally, taller and larger diameter snags provide better habitat for more species. Leave snags of all species type. Aspen snags are especially valuable and all aspen snags that are not a distinct hazard should be retained to help maintain populations of cavity dwelling wildlife.

9. Maintain 10-20 tons per acre of coarse woody debris within forested portion of units to maintain soil moisture at ground level for mosses, fungi, and lichens and to encourage faster re-colonization of units by small mammals and other prey species.

10. Maintain large diameter downed logs in various stages of decomposition within forested portion of units (50 linear feet/acre of 10 inches diameter or larger at mid-point lodgepole pine and aspen logs and/or 12 inches diameter or larger spruce, fir, ponderosa pine, and Douglas fir logs) to provide habitat for small mammals.

11. All equipment and ATVs will be cleaned prior to entering the project area to prevent the introduction of noxious weeds and cheatgrass into the project area.

12. When it is suspected that more than 300 acres of high burn severity have occurred (see descriptive detail) and it is believed that damage to onsite or downstream values may occur, then the burn boss should identify the high burn severity area. Monitoring will occur post burning to determine the need for rehabilitation of the high burn severity site. Any rehabilitation seeding activities that occur will utilize only native seed as approved by the district botanist.

High Burn Severity Description

Litter and duff layer: High soil heating, deep ground char; litter and duff consumed leaving fine ash, often more than an inch or two deep and often gray or white; surface soil

may be visibly altered, often blackened or reddish and usually lacking structure; all or most organic matter is removed; fine roots and rhizomes may be consumed; reduced permeability may be pronounced (strong and/or thick water repellent layer) over much of the area; large fuels are nearly all or completely consumed. Herbaceous and shrub layer: All plant parts consumed, including fuels greater than ¾ inch, leaving some or no major stems/trunks of shrubs.

13. No prescribed burning activities will occur within the Water Influence Zone (WIZ). The water influence zone (WIZ) includes the geomorphic floodplain, riparian ecosystem, and inner gorge. Its minimum width (from top of each bank) is the greater of 100 feet or the mean height of mature dominant late-seral vegetation. (R2 Amendment, FSH 2509.25 – Watershed Conservation Practices Handbook, 2001).

14. Should cattle grazing resume in the Spring Creek allotment, areas that have been prescribed burned will not be grazed for a minimum one complete growing season after burning. Two growing seasons of rest are preferred. This will allow for adequate grass, forage, and shrub recovery after burning.

15. No prescribed burning will occur within any area that has not been surveyed, cleared for implementation by the archeology specialist, and has SHPPO concurrence.

16. Prescribed burn activities have the potential to affect soil stability on steep slopes, thus the Spring Creek Road may be closed when burn activities take place in that area. At the southern end of the Spring Creek Road, a gate exists for seasonal closure near the end of the pavement past the private residents. At the northern end, a second gate will be installed at Deadman Gulch. These gates will be utilized for road closure when burning activities adjacent to Spring Creek have the potential to facilitate rolling debris. Access to private residents will not be affected by the road closure.

Monitoring

Monitoring occurs at two levels: the programmatic or Forest Plan level and the project specific level. Following are several monitoring activities relevant to this project.

Project Implementation

General implementation of the project (implementation of design features and mitigation measures) would be completed by qualified Forest Service personnel and reviewed by the District Ranger and staff on an as needed basis and as specified in the GMUG Environmental Management System. The District Ranger would review and approve project development after completion of each major step according to Forest Service procedures and guidelines.

Noxious Weeds

Disturbed areas, such as severely burned areas, helipads, and staging areas, would be monitored for noxious weeds. Chemical, biological, cultural, and mechanical techniques would be used as appropriate to control populations of noxious weeds as described in the

1995 EA for the Gunnison District Weed Management Program. All treatments of noxious weeds would follow state and federal regulations.

Soils and Water

Monitoring of severely burned areas (if any) to determine the need for rehabilitation will occur after all burning within an area is concluded.

Wildlife

Species-specific monitoring would continue in the project area to validate the effectiveness of design features and to determine if species responses to the proposed project were those expected.

Chapter 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

WILDLIFE – TERRESTRIAL SPECIES

Affected Environment

The diversity of plant communities and structure (**Table 1**) within the 55,343-acre analysis area provides habitat for a diversity of wildlife species. Big game animals include deer, elk, and moose. Common small mammals include red squirrels, snowshoe hare, chipmunks, voles, deer mice, and bushy-tailed woodrats. Carnivores include coyote, American marten, mountain lion, bobcat, Canada lynx, weasels, and black bear. A large variety of bird species use habitats within the analysis area including songbirds, woodpeckers, blue grouse, and raptors.

Wildlife and habitat surveys consisting of northern goshawk surveys and nest monitoring (broadcast calling; Kennedy and Stahlecker 1993, Kimmel and Yahner 1990), threatened and endangered species (verification of lynx habitat; Grand Mesa, Uncompahgre and Gunnison National Forest 2001), and Sensitive and Management Indicator Species occurrence documentation were conducted during nine field seasons from 1995 to 2007 (no surveys were conducted in 1997, and 2002 to 2004). Species with documented occurrences or suitable habitat within the analysis area are presented below in **tables 3, 4, 5, and 6**, and survey results are discussed further where they are applicable to a particular species under Environmental Consequences.

Snags and downed wood are an important habitat component for many wildlife species in terms of their value for nesting, denning, resting, foraging and cover. Species such as lynx and marten depend on coarse woody debris to meet their reproductive life history requirements in terms of den sites and thermal cover for young. Woodpeckers, such as the three-toed woodpecker, depend heavily on snags for cavity excavation and foraging. Secondary cavity nesters, such as the boreal owl, utilize snags with cavities created by woodpeckers. Coarse woody debris provides micro sites and cover for many small mammals such as mice, voles, shrews, and snowshoe hare that are also prey species for forest carnivores.

Habitat quality for different animal species is based on a combination of many different factors, which is characteristic of the inherent variability, complexity, and uncertainty associated with ecosystems. Most notably, wildlife habitat quality is based on vegetative composition and structure (Thomas et al. 1979). The structure and composition of the forest affects food availability and cover (Smith 2000); in turn the availability of food and cover is affected by changing landscape patterns. Species may respond to landscape patterns in different ways depending on their habitat needs (Gergel and Turner 2002). Natural processes, such as fire, forest insect and disease outbreaks, and wind, in conjunction with management activities all contribute to changing landscape patterns and all create vegetational mosaics. These mosaics create habitat heterogeneity, or discontinuity, across a landscape which is important for maintaining faunal diversity (Smith 2000). Although some discontinuity is generally positive, at some level (which is different for each species), heterogeneity becomes habitat fragmentation (Smith 2000).

Importantly, management actions that manipulate land cover, such as prescribed fire, may have contrasting effects on different wildlife species because habitat improvements for some species may lead to a decrease in habitat quality for others (Smith 2000, Gergel and Turner 2002). These issues are addressed in this section of the Taylor Sheep Prescribed Burn Environmental Assessment for Threatened, Endangered, Sensitive, Management Indicator, and other species of concern documented within or with habitat present in the Taylor Sheep Burn Analysis Area. In addition, the effects of the Taylor Sheep Burn on wildlife habitat as well as ecosystem pattern and process are anticipated and recognized, with design criteria developed to minimize the detrimental effects of prescribed burning on wildlife.

Threatened, Endangered and Proposed Wildlife

The U.S. Fish and Wildlife Service maintain a list of federally designated threatened, endangered, and proposed species that may occur or be affected by activities occurring in Colorado. The Taylor Sheep Burn analysis area is located in Gunnison County in southwest Colorado. Federally listed species found in Gunnison and adjacent counties are listed in **Table 3** and have been considered for habitat suitability and presence within the analysis area.

Table 3. Federally listed and proposed species known or suspected to occur on the Forest, their habitat requirements, and their potential for occurrence within the Taylor Sheep Burn analysis area. Derived from a list of federally listed and proposed species for the state of Colorado, USFWS, available: http://ecos.fws.gov/tess_public/StateListingAndOccurrence.do?state=CO and http://ecos.fws.gov/tess_public/StateListing.do?status=candidate&state=CO Accessed 04/04/2007.

Species	Habitat	Potential for habitat/species occurrence
Bald Eagle (threatened)	Usually found below 8,000 ft, although they utilize suitable habitat above 8,000 ft in the Gunnison Basin. Reservoirs and rivers. Occurs along the East, Taylor, and Gunnison Rivers during winter. Also uses semi-deserts, grasslands near prairie dog colonies and big game winter ranges.	Suitable habitat exists w/in and adjacent to the planning area.
Canada Lynx (threatened)	Early successional spruce/fir and lodgepole pine forests used for foraging, mature and old growth spruce/fir and lodgepole pine containing abundant coarse woody debris used for denning. Willow riparian areas, mixed aspen/conifer and mature spruce-fir forests are also used for foraging and traveling.	Suitable habitat exists w/in and adjacent to the planning area.
Mexican Spotted Owl (threatened)	Below 9,100 ft. Large steep canyons with exposed cliffs and dense old growth mixed coniferous forests dominated by Douglas fir and/or white fir, or canyons in pinyon-juniper areas with small and widely scattered patches of old Douglas fir. Summer roost sites are in cool microclimates, generally with a closed canopy and/or on north facing slopes. Nest sites in Colorado are typically in caves or crevices on steep cliff faces.	No suitable habitat, no potential for occurrence ¹ .
Uncompahgre Fritillary Butterfly (endangered)	Above 12,000 ft. Snow willow patches ¼ acre or larger on north, northeast, east, and southeast aspects, often below a melting snowdrift.	No suitable habitat, no potential for occurrence.
4 Native Colorado River Fishes (endangered)	Bonytail, Humpback Chub, Colorado Pikeminnow, and Razorback sucker. Aquatic habitats (Rivers, streams, beaver ponds-Colorado River System)	No suitable habitat, no potential for occurrence. (Project does not involve water depletion.)
Yellow-billed Cuckoo (candidate)	Open woodland, especially with dense undergrowth, parks, riparian woodland and thickets.	No suitable habitat, no potential for occurrence.

¹A finding of “no potential for occurrence” of a species is based on lack of current occurrence and unsuitable habitat for future occurrence. If the species does not have a potential for occurrence, no further analysis is required, and a determination of “No Effect” is rendered.

Federally listed species that may use habitats within the analysis area include the **Canada lynx** (Threatened) and **bald eagle** (Threatened). The Canada lynx is a rare and elusive forest carnivore that uses large remote interior tracts of montane and subalpine coniferous forest (generally ranging in elevation from 8,000 ft to timberline) with little or no human intrusion. The Canada lynx is a year-round resident on the Gunnison Ranger District. The bald eagle is a spring and fall migrant and winter resident in the Gunnison Basin. Refer to the Biological Assessment – Taylor Sheep Prescribed Burn Project (July, 2007) for detailed discussion life history, relevance in the Gunnison Basin, and analysis of effects.

Sensitive Species

Sensitive Species are identified by the USFS Regional Forester as “those...species for which population viability is a concern, as evidenced by...significant current or predicted downward trends in population numbers or density...” or “significant current or predicted

downward trends in habitat capability that would reduce a species' existing distribution" (FSM 2670.5; USDA Forest Service 1995). Sensitive Species listed by the USFS Rocky Mountain Region that occur on the Grand Mesa, Uncompahgre and Gunnison National Forests are listed below in **Table 4**. These species were considered for habitat suitability and potential for occurrence in the Taylor Sheep Burn analysis area.

Table 4. Sensitive Species known or suspected to occur on the GMUG National Forests, their habitat requirements, and their potential for occurrence in the Taylor Sheep Prescribed Burn Analysis Area

SPECIES	HABITAT	POTENTIAL FOR HABITAT / OCCURENCE
AMPHIBIANS		
northern leopard frog <i>Rana pipiens</i>	Warm, shallow ponds, lakes, marshes generally below 9000 feet.	No suitable habitat, no potential for occurrence*
boreal toad <i>Bufo boreas boreas</i>	Breeds in shallow, permanent water bodies above 8000 feet; adults use surrounding upland habitats.	Suitable habitat exists within the planning area
MAMMALS		
American marten <i>Martes americana</i>	Old growth spruce & lodgepole pine forests with abundant dead and downed trees.	Suitable habitat exists within the planning area
fringed myotis <i>Myotis thysanodes</i>	Desert, grass, woodlands, spruce/fir from 3500-8500ft. caves, abandoned mines & buildings	No suitable habitat, no potential for occurrence
Gunnison's prairie dog <i>Cynomys gunnisoni</i>	High mountain valleys & plateaus, grasslands	No suitable habitat, no potential for occurrence
kit fox <i>Vulpes macrotis</i>	Semi-desert shrublands and pinyon-juniper	No suitable habitat, no potential for occurrence
Wolverine <i>Gulo gulo luscus</i>	Dense mixed forest, tundra.	Suitable habitat exists within the planning area
pygmy shrew <i>Sorex hoyi montanus</i>	Wetlands/riparian. Forest meadow transition areas.	Suitable habitat exists within the planning area
river otter <i>Lontra canadensis</i>	Riparian systems w/ 10cfs permanent water & abundant food base of fish & crustaceans	Suitable habitat exists within the planning area
spotted bat <i>Euderma maculatum</i>	Rough, arid, desert terrain. Variety of scrub and forest habitats. Mines, caves, buildings, rock fissures. 1,829-2,438 meters (6,000-8,000 feet).	No suitable habitat, no potential for occurrence
Townsend's big-eared bat <i>Plecotus townsendii</i>	Shrublands, pinyon-juniper woodlands, open montane forests, caves, & mines. 1,829-2,438 meters (6,000-8,000 feet).	No suitable habitat, no potential for occurrence
white-tailed prairie dog <i>Cynomys leucurus</i>	Lower elevation valleys & plateaus, grasslands	No suitable habitat, no potential for occurrence
BIRDS		
American bittern <i>Gotaurus lentiginosus</i>	Cattail marshes or wetlands, tall emergent vegetation, adjacent wet meadows. Below 2,835 meters (9,300 feet).	No suitable habitat, no potential for occurrence
black swift <i>Cypseloides niger</i>	Waterfalls, cliffs.	No suitable habitat, no potential for occurrence
black tern <i>Chilidonias niger</i>	Lakes, marshes.	No suitable habitat, no potential for occurrence

SPECIES	HABITAT	POTENTIAL FOR HABITAT / OCCURENCE
boreal owl <i>Aegolius funereus</i>	Mature – old growth spruce-fir, lodgepole pine, aspen. Above 2,804 meters (9,200 feet).	Suitable habitat exists within the planning area
Brewer’s sparrow <i>Spizella breweri</i>	Sagebrush, pinyon-juniper/sagebrush	No suitable habitat, no potential for occurrence
ferruginous hawk <i>Buteo regalis</i>	Plains, grasslands.	No suitable habitat, no potential for occurrence
flamulated owl <i>Otus flammeolus</i>	Old growth and mature coniferous forests, mixed conifer, aspen, pinyon-juniper. Elevation of 6,000-10,000 ft.	Suitable habitat exists within the planning area
grasshopper sparrow <i>Ammodramous savannarum</i>	Grasslands w/scattered shrubs, prairies	No suitable habitat, no potential for occurrence
Lewis’ woodpecker <i>Melanerpes lewis</i>	Lowland and foothill riparian forests & agricultural areas, urban areas w/ tall deciduous trees. Prefers understory of grasses for insects.	No suitable habitat, no potential for occurrence
long-billed curlew <i>Numenius americanus</i>	Riparian, short-grass meadows. Below 1,524 meters (5,000 feet).	No suitable habitat, no potential for occurrence
loggerhead shrike <i>Lanius ludovicianus</i>	Plains, low valleys, shrub lands.	No suitable habitat, no potential for occurrence
northern goshawk <i>Accipiter gentiles</i>	Aspen, mature conifer. Remote areas.	Suitable habitat exists within the planning area
northern harrier <i>Circus cyaneus</i>	Grasslands, pastures	No suitable habitat, no potential for occurrence
northern three-toed woodpecker <i>Picoides tridactylus</i>	Spruce-fir. 2,438-3,505 meters (8,000-11,500 feet).	Suitable habitat exists within the planning area
olive-sided flycatcher <i>Contopus borealis</i>	Old-growth conifers, aspen, openings with snags. Abundant dead trees bordering meadows, bogs.	Suitable habitat exists within the planning area
peregrine falcon <i>Falco peregrinus</i>	Rock, cliff, cave, canyon.	Suitable habitat exists within the planning area
purple martin <i>Progne subis</i>	Old growth aspen mixed with ponderosa pine, Douglas fir. Especially near water and open foraging area.	Suitable habitat exists within the planning area
sage sparrow <i>Amphispiza bellii</i>	Large patches (320 acres) of sagebrush generally below 1,700 meters (5600 ft.)	No suitable habitat, no potential for occurrence
trumpeter swan <i>Cygnus buccinator</i>	Riverine wetlands, lakes	No suitable habitat, no potential for occurrence
burrowing owl <i>Athene cucicularia</i>	Prairie dog towns below 2,743 meters (9,000 feet).	No suitable habitat, no potential for occurrence
white-tailed ptarmigan <i>Lagopus leucurus</i>	Alpine tundra	Suitable habitat exists within the planning area
yellow-billed cuckoo <i>Coccyzu americanus</i>	Open woodland w/ dense undergrowth, parks, riparian woodlands, urban areas w/ tall trees	No suitable habitat, no potential for occurrence

¹ Sensitive Species with potentially suitable habitat within the analysis area and potential for occurrence include the northern leopard frog, boreal toad, American marten, wolverine, pygmy shrew, Rocky Mountain bighorn sheep, boreal owl, northern goshawk, American three-toed woodpecker, olive-sided flycatcher, purple martin, peregrine falcon and Brewer’s sparrow. These species will be discussed further in this document.

² A finding of “no potential for occurrence” of a species is based on lack of current occurrence and unsuitable habitat for future occurrence. As the species does not have potential for occurrence, no impacts on the species will be incurred from the project. No further analysis is required.

The northern goshawk, American three-toed woodpecker, olive-sided flycatcher and American marten were positively confirmed within the Taylor Sheep Burn analysis area. A large stick nest, suspected as a goshawk nest, was found in the upper reaches of Brown’s Gulch in 2006, and monitoring in 2007 confirmed occupancy by goshawks through visual observations of an adult goshawk incubating as well as an adult defending the nest during a subsequent visit. Although the presence of the northern leopard frog, boreal toad, wolverine, pygmy shrew, boreal owl, purple marten, peregrine falcon, and Brewer’s sparrow were not positively confirmed, suitable habitat may exist to support these species. For this reason, the potential effects of the proposed alternatives for the Taylor Sheep Prescribed Burn will be evaluated as if these species were present.

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. Current management indicator species of the Grand Mesa, Uncompahgre and Gunnison National Forest include the Abert’s squirrel, American marten, Brewer’s sparrow, Merriam’s turkey, northern goshawk, red-naped sapsucker, Rocky Mountain elk, and the common trout species. These species were considered for habitat suitability and potential for occurrence in the Taylor Sheep Burn analysis area.

Table 5. Management Indicator Species found on the GMUG National Forests, their habitat requirements, and their potential for occurrence in the Taylor Sheep Burn analysis area based on the November 2005 Management Indicator Species Assessment for the GMUG National Forests.

GMUG National Forests MIS Species List			
Common Name	Scientific Name	Habitat Association	Potential Habitat or Species Present w/in the Project Analysis Area?
Rocky Mountain Elk	<i>Cervus elephus</i>	Early-succession spruce-fir, Douglas fir, lodgepole, aspen, mountain shrub. MIS for travel mgmt.	Yes
Abert’s squirrel	<i>Sciurus aberti</i>	Late-succession ponderosa pine	No ¹
American Marten	<i>Martes americana</i>	Late-succession spruce-fir, lodgepole pine	Yes
Northern Goshawk	<i>Accipiter gentilis</i>	Late-succession aspen	Yes
Brewer’s sparrow	<i>Spizella breweri</i>	Sagebrush, open shrublands	Yes
Red-naped sapsucker	<i>Sphyrapicus nuchalis</i>	Aspen	Yes

Merriam's turkey	Meleagris gallopavo	Pinyon and juniper woodland, Gambel oak, ponderosa pine	No ¹
Common trout species	Oncorhynchus spp.	Aquatic and riparian	Yes

¹ Species without habitat and that do not occur within the planning area will not be directly, indirectly, or cumulatively impacted by the proposed activities. No further analysis is necessary.

Management Indicator Species (MIS) with documented occurrences within the Taylor Sheep Burn analysis area include Rocky Mountain elk, American marten, northern goshawk and red-naped sapsucker. Detailed descriptions of the above species habitat and life history requirements, distribution, and population status and trend are available in the Management Indicator Species Assessment for the Grand Mesa, Uncompahgre and Gunnison National Forests, November 2005.

Other Species and Habitats of Concern

Mature or Interior Forest Species -

Mature and interior forest species are those that rely on some or all components of mature or old growth habitats for a major part of their life history requirements. Additionally, interior forest species often require large blocks of contiguous forest habitat. Habitat components such as canopy closure, canopy layers, large trees, snags, downed wood, structural diversity, or a combination of these factors may be key species requirements. Mature and old growth forest habitats (Habitat structural stages 4A, 4B, 4C, and 5) comprise approximately 17,618 acres (39%) of forested habitats within the Taylor Sheep Burn analysis area. Approximately 14,695 acres (32%) of mature and old growth habitats contain canopy closures greater than 40% (4B, 4C, and 5).

Mature or interior forest species with documented occurrences in the Taylor Sheep Prescribed Burn analysis area include the American martin, brown creeper, hermit thrush, red squirrel, ruby-crowned kinglet, golden-crowned kinglet, northern goshawk and American three-toed woodpecker.

Neo-tropical Migratory and Year-round Bird Species -

Neo-tropical migratory birds are those that breed in the U.S. and winter south of the U.S. border in Central and South America. Many passerine songbirds, hawks, owls, and shorebirds fall into this category. Nation-wide declines in population trends for neo-tropical migrants have developed into an international concern. Efforts are now underway to examine population trends on wintering habitat in Central and South America as well as breeding habitat in the U.S. Within the Taylor Sheep Burn analysis area, a total of 45 avian species were observed or heard during goshawk surveys and/or during goshawk nest monitoring conducted in 2006 and 2007. All birds with documented occurrences in the Taylor Sheep burn analysis area are shown below in Table 6.

Table 6. Avian Species Detected in the Taylor Sheep Burn Analysis Area

Hawks, Falcons, Owls	Passerines	Woodpeckers
Red-tailed Hawk	American Crow	American Three-toed Woodpecker
Northern Pygmy Owl	American Robin	Hairy Woodpecker
Long-eared Owl	Black-capped Chickadee	Downy Woodpecker
Great-horned Owl	Brown Creeper	Red-naped Sapsucker
Northern Goshawk	Cassin's Finch	Northern Flicker
Sharp-shinned Hawk	Clark's Nutcracker	Williamson's Sapsucker
Swainson's Hawk	Common Raven	
American Kestrel	Dark-eyed Junco	
Cooper's Hawk	Golden-crowned Kinglet	
American Peregrine Falcon	Green-tailed Towhee	
	Gray Jay	
	Hermit Thrush	
	Hummingbird (Rufous and/or Broad-tailed)	
	Lincoln's Sparrow	
	MacGillivray's Warbler	
	Mountain Bluebird	
	Mountain Chickadee	
	Olive-sided Flycatcher	
	Pine Grosbeak	
	Pine Siskin	
	Red-breasted Nuthatch	
	Red Crossbill	
	Ruby-crowned Kinglet	
	Stellar's Jay	
	Townsend's Solitaire	
	Western Tanager	
	White-breasted Nuthatch	
	White-crowned Sparrow	
	Yellow-rumped Warbler	

Environmental Consequences

General Effects of the Alternatives

Alternative 1 – No Action

Direct effects include the potential for a continuing decline in grass and forbs and an increase in down material throughout the project area. Immediate effects would be a loss of potential foraging habitat and an increase in barriers to movement for a variety of species including bighorn sheep as dead trees from previous burns continue to fall. Indirect impacts would include the loss of opportunity to improve habitat for bighorn sheep, improve the distribution of elk, and provide foraging and nesting habitat for a variety of small birds and mammals that utilize small open areas. The opportunity to improve habitats by providing a mosaic of age classes and openings through prescribed

fire would be foregone. Increasing fuels could result in more frequent and larger wildfires resulting in potential habitat loss for many species.

Cumulative Effects

An abundance of other activities as described in the environmental baseline (see BE, BA, or MIS Reports) will continue to occur. Habitat loss and disturbance to species related to timber harvest, recreation, roads and trails, and the potential for increased wildfire would continue to affect a variety of wildlife species. Existing, proposed, planned, and potential activities in the foreseeable future within or adjacent to the planning area include ongoing prescribed burning in the One Mile country south and west of the Taylor Sheep area, the resumption of grazing within the Taylor Sheep planning area, timber harvest in Taylor Park, travel planning across the district including the Taylor Sheep planning area, and the possibility of a major water development (dam) within Union Park. Prescribed burning in One Mile and travel planning within the Taylor Sheep have the potential to benefit bighorn sheep as well as other species with limited foraging habitat and that are impacted by motorized and other activities associated with the road and trail system. The opportunity to cumulatively and beneficially impact bighorn sheep with the proposed burning in the Taylor Sheep area in conjunction with the One Mile burns and potential closure of roads and trails that are currently impacting the Taylor Sheep area is lost.

Alternative 2 – Proposed Action

Direct effects include enhancement of aspen habitat, mature ponderosa pine and Douglas fir habitats, and lodgepole pine habitats through prescribed fire by providing a mosaic of age classes and openings. Additional effects include an increase in foraging habitat for a variety of species including bighorn sheep, reduction of fuels and barriers to movement and an increase in openings providing increased sight distance for bighorn sheep. Indirect effects include a potential increase in grass and forbs providing foraging and nesting habitat for a variety of small birds and mammals as well as the predators that will prey open these species. This alternative proposes treating approximately 22,855 acres, 14,892 acres of lodgepole pine. Stand replacement burning is anticipated primarily in lodgepole pine stands. While only a relatively small percentage of mature lodgepole pine will actually see stand replacement burning, this alternative could potentially result in the greatest amount of stand replacement burning and the resultant impacts on primarily lodgepole pine habitats. Impacts from potential stand replacement burning will occur primarily in lodgepole pine HSS 3B and 4B. It is expected that lodgepole HSS 3B could be reduced to 3A and HSS 4B could be reduced to HSS 4A with the great majority of HSS reduction occurring in HSS 3B. Prescribed burning that occurs in aspen, Douglas fir, ponderosa pine, and spruce-fir habitats is not expected to impact habitat structural stage thus minimizing impacts to these species.

Cumulative Effects

Habitat loss and disturbance to species related to timber harvest, recreation, roads and trails, and the potential for increased wildfire would continue to affect a variety of wildlife species. Existing, proposed, planned, and potential activities in the foreseeable future within or adjacent to the planning area include ongoing prescribed burning in the One Mile country south and west of the Taylor Sheep area, possible resumption of

grazing within the Taylor Sheep planning area, timber harvest in Taylor Park, travel planning across the district including the Taylor Sheep planning area, and the possibility of a major water development (dam) within Union Park. Prescribed burning in One Mile and travel planning within the Taylor Sheep have the potential to benefit bighorn sheep as well as other species with limited foraging habitat and that are impacted by motorized and other activities associated with the road and trail system. The opportunity to cumulatively and beneficially impact bighorn sheep with the proposed burning in the Taylor Sheep area in conjunction with the One Mile burns and potential closure of roads and trails that are currently impacting the Taylor Sheep area will provide continuing positive impacts through the life of the Taylor Sheep Project. Potential impacts on mature forest species that utilize mature lodgepole pine such as boreal owl, northern goshawk, three-toed woodpecker, and American marten will be cumulatively minimal given that the majority of prescribed fire treatments are spread across the project area both spatially and temporally and the majority of stand replacement burning will occur in HSS 3B in lodgepole pine.

Alternative 3 – Adjusted Proposed Action

Alternative 3 impacts are similar to alternative 2, but will have less potential impact due to the smaller size of the proposed burn area. This alternative proposes treating approximately 17,619 acres, 11,182 acres of lodgepole pine. Stand replacement burning is anticipated primarily in lodgepole pine stands. While only a relatively small percentage of the lodgepole pine will actually see stand replacement burning, this alternative will result in a lesser amount of stand replacement burning and the resultant impacts on lodgepole pine habitats.

Cumulative Effects

Cumulative impacts are similar to alternative 2 but will have less potential impact due to the smaller size of the proposed burn area.

Species Effects

Detailed descriptions of life history, habitat needs, distribution, and habitat and population condition, status and trend are available in the Biological Assessment for the Taylor Sheep Prescribed Burn (July, 2007), the Biological Evaluation and MIS Assessment for the Taylor Sheep Prescribed Burn (1/14/2008), and the Management Indicator Species Assessment, Grand Mesa, Uncompahgre and Gunnison National Forests, June 2001 and May, 2005. These documents are included in the project file and are available at the Gunnison R.D. office.

Threatened and Endangered Species

Bald Eagle

Determination: No effect.

Wintering and migratory bald eagle use is confined primarily to the Taylor River corridor in Taylor Canyon, which is adjacent to the south side of the Taylor Sheep Burn analysis

area. Bald eagle use of this area occurs from late fall (October) to early spring (March). Prescribed burning would begin on May 1, well after wintering bald eagles have left the area. Burning activities that take place in the fall would be implemented above 11,000 ft in elevation, outside the area used by bald eagles. In addition, prescribed burning operations will be completed by early to mid-fall, prior to the period of bald eagle use. There are no bald eagle occurrences documented within the analysis area during the period of proposed burn activities (late spring, summer, and early fall) and bald eagles are not known to utilize habitats within the analysis area other than the Taylor River corridor. Because prescribed fire treatments will be spread throughout the project area both spatially and temporally and will not occur within the Watershed Influence Zone (WIZ), no direct effects are expected on bald eagle prey species (fisheries) and indirect effects on prey species are expected to be minimal and discountable. As such, there will be **no effect** on bald eagles. No other direct, indirect, or cumulative effects on the bald eagle are anticipated.

Bald Eagle Information

As of July 9, 2007, the bald eagle was removed from the list of federally threatened and endangered wildlife in the lower 48 states (Federal Register/Vol. 72, No. 130; available: <http://www.fws.gov/migratorybirds/issues/BaldEagle/baldeaglefinaldelisting.pdf>). The Final Rule will officially go into effect on August 8, 2007, 30 days following delisting. Thus, once the Final Rule becomes effective, the prohibitions and conservation measures provided by the Act, particularly sections 7, 9, and 10 no longer apply to this species. Federal agencies will no longer be required to consult with the USFWS under section 7 of the Act in the event that activities they authorize, fund, or carry out may affect the bald eagle. This analysis however, completed prior to delisting, will treat the bald eagle as if it is still listed.

Canada Lynx

Determination: **May affect** but not likely to adversely affect.

High quality lynx habitat is described as a mosaic of two structurally different forest types occurring at opposite ends of a stand-age spectrum. These structurally different forest types consist of early and late successional forested habitats. Lynx require early-successional forests that support high numbers of prey (particularly snowshoe hares, the main prey item of lynx) for foraging, and late-successional forests with abundant coarse woody debris for thermal and security cover for kittens and for denning (Koehler and Aubry 1994). Intermediate successional stage forests may provide travel cover for lynx but function primarily to provide connectivity within a forest landscape (Ruggiero et al. 1994). As such, intermediate successional stages may provide connectivity between denning and/or foraging habitat patches. As discussed in the environmental baseline, the Taylor Sheep Burn analysis area has been identified as containing potential lynx denning, winter foraging, and intermediate successional stages comprising other lynx habitat. Within the 55,343-acre analysis area, there are currently 11,939 acres of denning habitat, 6,148 acres of winter foraging habitat, 28,204 acres of other lynx habitat, and 298 acres of unsuitable lynx habitat.

Proposed activities associated with the Taylor Sheep Burn project (primarily prescribed burning and pruning or clearing of trees for control lines and helicopter landing pads) will

occur only within the Fossil Ridge and Rocky Brook LAU's. There is no change in habitat within the Brush Creek and Trail Creek LAU's.

Estimated changes in habitat in the Fossil Ridge LAU include a reduction of 107 acres (0.8%) of denning habitat (lodgepole pine HSS 4B reduced to 4A) to other lynx habitat. Additionally 915 acres of other lynx habitat (lodgepole pine HSS 3B reduced to 3A) will remain other lynx habitat. Estimated changes in the Rocky Brook LAU include a reduction of 26 acres (0.2%) of denning habitat (lodgepole HSS 4B to HSS 4A) to other lynx habitat. Additionally 631 acres of other lynx habitat (lodgepole pine HSS 3B reduced to 3A) will remain other lynx habitat. See Table 7 below.

Table 7. Changes in lynx habitat distribution within LAUs

LAU Name: Fossil Ridge				
Habitat Description	Acres within project area	Affected acres	Percent change in habitat w/in LAU	*Updated percent of lynx habitat in LAU
Denning	1804	-107	-0.1%	22.2%
Other	8018	+107	+0.2%	56.7%
Winter Forage	871	N/C	N/C	21.1%
Unsuitable	12	N/C	N/C	<0.1%
Total	10,705	N/A	N/A	100.0%

*reflects the preferred alternative

LAU Name: Rocky Brook				
Habitat Description	Acres within project area	Affected acres	Change in habitat w/in LAU	*Updated percent of lynx habitat in LAU
Denning	493	- 26	-0.1%	29.4%
Other	4,204	+26	+0.1%	44.4%
Winter Forage	260	N/C	N/C	25.2%
Unsuitable	0	N/C	N/C	1.0%
Total	4,957	N/A	N/A	100.0%

*reflects the preferred alternative

Historically, wildland fire and insects played the dominant role in maintaining a mosaic of forest successional stages in lynx habitat (Ruediger et al. 2000). Stand-replacing fires were infrequent and affected large areas, taking place predominantly in high elevation forested habitats composed of lodgepole pine and spruce-fir. These fire events are often high intensity crown fires that kill trees and create gaps in forest canopy. Typically the greatest impacts in terms of stand-replacing events occur more frequently on xeric south and west facing slopes, and less frequently on mesic north facing slopes.

Plant communities within the Taylor Sheep Burn analysis area are influenced by a combination of factors, which include elevation and exposure and the effects of elevation and exposure on soil moisture. Within the 55,343-acre analysis area, there are 28,510.8 acres of lodgepole pine habitat, of which 11,549 acres occur within the 17,619 acre primary burn area. Each successional stage present in this lodgepole pine community is expected to display different reactions to fire, and reactions to fire will also vary based on topography.

Within the primary burn area, the lodgepole pine cover type comprises 11,549 acres of lynx habitat, of which 1,324 acres are identified as denning habitat and 9,858 acres are identified as other lynx habitat. Denning habitat is found within the 4B habitat structural stage and other lynx habitat includes the 3A, 3B, 4A, and a small portion of the 4B habitat structural stages. Stand replacement is likely to occur in lodgepole pine stands in the 3B and 4B habitat structural stage, depending on amount of fuel buildup, such as snags and downed logs, within those stands. Much of the lynx habitat identified as other lynx habitat will likely remain other lynx habitat following fire. In the short term, snowshoe hare populations and lynx habitat will likely be negatively affected and may experience declines in burned areas within the project area, but over the long term prescribed burning is expected to increase winter foraging habitat (approximately 10-15 yrs following fire), thus benefiting snowshoe hare populations and lynx.

Cumulative Effects

There are approximately 2,114 acres of private land within the Fossil Ridge LAU and 1,509 acres within the Rocky Brook LAU. These acres are primarily housing, summer homes and grazing lands. Most of the private land is currently developed. The current grazing lands, while not developed, could very well be developed in the foreseeable future. These lands, however, are open grasslands which are not considered lynx habitat. The baseline data for the affected LAU's includes ongoing activities. The proposed prescribed burning will affect lynx and lynx habitat together with ongoing activities as discussed above, but should not additionally affect lynx cumulatively when considering potential future activities on private lands within the affected LAU's. No other direct, indirect, or cumulative effects are anticipated.

Sensitive Species

American marten (sensitive and MIS)

Determination: **May impact** individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide

Direct effects include a potential loss of suitable marten habitat and reduced habitat quality throughout suitable marten habitat temporally and spatially spread across the project area. Proposed activities may impact marten and marten habitat due to a change in structural stage, temporarily reducing suitable habitat, and a decline in marten habitat quality. Additionally, burning activities are likely to displace marten during implementation. Indirect impacts include the potential for an increase in prey species and foraging habitat due to an expected increase in small openings and an increase in grass and forb availability providing excellent foraging habitat for a variety of small mammals and birds. Proposed activities may impact individual American marten, but are not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide. No changes in population numbers, status, or trend are expected. Cumulative effects to marten habitat and population will be small and non-quantifiable. These changes in habitat are expected to result in a non-quantifiable impact on marten individuals in the project area, and will not affect population status or trend of

the species on the Forest. No other direct, indirect, or cumulative impacts on American marten are anticipated.

The impact to marten habitat across the GMUG National Forest is minimal. The potentially impacted acres (acres of suitable habitat within the proposed burn units) of suitable marten habitat (2,711 acres) represent <0.5% of potentially suitable habitat available to marten on the GMUG N.F.

Boreal Toad

Determination: No impact

Extensive surveys of ponds and wet drainages during the 1990's and during the 2002, 2003 field seasons have not documented the occurrence of boreal toads within the planning area. Although suitable habitat exists within the planning area, it exists primarily outside of the project area. Since burning activities will not occur within suitable habitat or known locations of boreal toad, project activities are not expected to impact boreal toads or boreal toad habitat. Proposed activities will have no direct, indirect, or cumulative impacts on boreal toad.

Wolverine

Determination: no impact.

Unlike other species where habitat alteration and prey base reduction would impact their existence, the wolverine is better able to tolerate these impacts. Their large home range size and geographic isolation make it difficult for one project to impact a population although an accumulation of developments may create a negative impact. The wolverine is an inhabitant of remote wilderness areas where development is unlikely to occur. Although they probably follow their prey to lower winter elevations, their large home range and diversity in diet allow them to avoid conflicts with man. Wolverines consume such a large diversity of prey species that a reduction in one species would create a shift to a more abundant prey source.

There are no known, documented occurrences of wolverine within the planning area. Activities are not expected to impact wolverine habitat due to their large home range size. Wolverines are thought to be extirpated from the southern Rocky Mountains, thus activities are not expected to disturb or displace wolverine or impact wolverine prey. No direct, indirect, or cumulative impacts on wolverine are anticipated.

Pygmy shrew

Determination: no impact

While suitable riparian and moist and wet areas occur within the proposed units, moist and wet areas, especially where they exist within timbered stands, will not be impacted. Project design to avoid moist and wet areas, maintain large down logs and coarse woody debris within the timbered portion of burn units will maintain forest floor moisture and habitat for pygmy shrew. There are no known, documented occurrences of pygmy shrew within the planning area. No direct, indirect, or cumulative impacts on pygmy shrew are anticipated.

Northern river otter

Determination: no impact

Alternatives have been designed to avoid potential habitat areas for northern river otter, primarily the Taylor River. The Proposed Action would have no direct effects on aquatic habitat since no management activity would occur within the Water Influence Zone. The water influence zone (WIZ) includes the geomorphic floodplain, riparian ecosystem, and inner gorge. Its minimum width (from top of each bank) is the greater of 100 feet or the mean height of mature dominant late-seral vegetation (R2 Amendment, FSH 2509.25 – Watershed Conservation Practices Handbook, 2001). Excluding activities inside the WIZ is expected to protect aquatic habitat from direct effects associated with all prescribed fire treatments.

Indirect effects to aquatic habitat are expected to be minimal given that the majority of prescribed fire treatments are spread across the project area both spatially and temporally. Sediment delivery to streams surrounding the project area is expected to be minimal and discountable, since activities would occur primarily in areas outside the WIZ. Sediment delivery to streams is expected to be greatest in areas where stand replacing prescribed fire occurs. The largest portion of sediment delivery may be delivered to intermittent and perennial streams during the first 2 years following prescribed fire activities.

Implementation of the proposed action will have **no impact** on the northern river otter. No direct, indirect, or cumulative impacts are expected on northern river otter.

Rocky Mountain Bighorn Sheep (Sensitive Species and MIS)

Determination: beneficial impact

The project area includes lambing grounds and migration corridors for bighorn sheep. Design criteria to minimize disturbance to bighorn sheep during operations is included. The planning area provides only fair habitat for bighorn sheep primarily due to limited foraging habitat. Burning activities will stimulate growth of grasses, forbs, shrubs, aspen sprouts, and young conifer seedlings in the under-story and in openings, providing additional forage where it occurs near suitable bighorn escape cover. Burning activities will result in a positive effect on bighorn foraging habitat and will reduce down wood in areas that currently act as a barrier to movement. Sheep use may increase as a result of increased foraging habitat as ewes may lamb in better condition potentially affecting lamb survival. Although there may be no discernable effect on population trend or viability for this species on the GMUG NF, a population increase is possible at the local herd level. No other direct, indirect, or cumulative impacts on Rocky Mountain bighorn sheep are expected.

Boreal owl

Determination: **May impact** individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide.

Although suitable habitat exists in the planning area, no documented occurrences of boreal owl are known. Burning activities that could impact boreal owl will occur primarily in lodgepole pine habitat (SS 4B). While it is doubtful that these stands will provide nesting habitat for boreal owl due to smaller tree size and the relatively open nature of the stands, the stands could provide suitable clumps of roosting habitat. Since

some stand replacement burning may occur in these stands some potential loss of roosting habitat could occur. Due to the potential loss in SS4B lodgepole pine, the proposed activities may result in a short term decline in potential roosting habitat. These impacts are expected to be minimal given that the majority of prescribed fire treatments are spread across the project area both spatially and temporally. Although human activity generally does not disrupt boreal owls, the potential also exists for a short term disturbance to and displacement of boreal owl if present during burning activities due to smoke and heat. Prescribed burning activities may impact individuals, but are not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide. No other direct, indirect, or cumulative impacts on boreal owl are anticipated.

Flammulated owl

Determination: **May impact** individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide.

Suitable aspen, Douglas fir, and ponderosa pine stands may provide habitat within the Taylor Sheep planning area on south facing slopes on the south and west sides of the planning area. The remainder of the area is outside the elevational range of the species or does not provide the open, mature forests utilized by this species.

There are no known, documented occurrences of flammulated owl within the Taylor River planning area. Prescribed burning activities will occur within flammulated owl habitat. Burn prescriptions are designed to maintain and enhance the old growth ponderosa pine and Douglas fir that provide suitable flammulated owl habitat. However, should flammulated owls be present within the area of prescribed burning, burning activities may impact individual flammulated owls, but are not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide. No other direct, indirect, or cumulative impacts on flammulated owl are anticipated.

Northern goshawk (sensitive species and MIS)

Determination: **May impact** individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide.

Suitable goshawk habitat within and adjacent to proposed prescribed burn units was surveyed for goshawk presence in 2006 and 2007. Additional survey work, not specific to goshawk, but that included much of the suitable goshawk habitat was completed in 2004 and 2005. A single active goshawk nest was discovered in 2006 and confirmed active in 2007. An historic nest site located in the Big Gulch area has been monitored regularly since the mid 1990's, however it has not been confirmed active since 1995. The majority of habitats in the burn area may not provide quality nesting habitat primarily due to small tree size, heavy pole size lodgepole pine cover, lack of adjacent or nearby conifer cover, or large openings adjacent to or near potential nest sites do not provide suitable foraging habitat. Prescribed burning activities will occur in suitable goshawk habitats. Prescriptions, however, are designed to maintain and enhance old growth characteristics in ponderosa pine and Douglas fir and to maintain the persistence

of aspen over the landscape, providing for the maintenance and enhancement of suitable goshawk habitat. Burning activities will not occur within ¼ mile of an active nest until young have fledged and moved out of the area, nor within 1/8 mile of the nest site outside of the nesting period. If additional goshawk nests are observed in any prescribed burn area, activities will be adjusted to minimize disturbance and to avoid affecting nesting habitat. Some displacement or disruption of individual goshawks could occur due to prescribed burning activities should they be present during burning. Prescribed burning activities may impact individuals, but are not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide.

No changes in population numbers, status, or trend are expected. The proposed burning activities may impact northern goshawk should they be present in the area of proposed activities, but are not likely to contribute to a loss of viability to the population or species. Cumulative effects to northern goshawk habitat and population will be small and non-quantifiable. These changes in habitat are expected to result in a non-quantifiable impact on goshawk individuals in the project area, and will not affect population status or trend of the species on the Forest. No other direct, indirect, or cumulative impacts on northern goshawk are anticipated.

Northern three-toed woodpecker

Determination: **May impact** individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide.

Occurrences of three-toed woodpecker have not been documented within the Taylor Sheep planning area. Burning activities will occur within minimally suitable northern three-toed woodpecker habitat, primarily lodgepole pine (SS 4B). Since stand replacement burning may occur in these stands some potential loss of habitat could occur. Due to the potential decrease in of SS 4B lodgepole pine, the proposed activities may result in a short term decline in potential habitat. However, the impacts are expected to be minimal given that the majority of prescribed fire treatments are spread across the project area both spatially and temporally. In addition, the resultant dead trees will provide an abundance of foraging habitat. Although human activity generally does not disrupt three-toed woodpecker, the potential exists for a short term disturbance to and displacement of the species during burning activities due to smoke and heat. Prescribed burning activities may impact individuals, but are not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide. No other direct, indirect, or cumulative impacts on three-toed woodpecker are anticipated.

Olive-sided flycatcher

Determination: beneficial impact

Suitable habitat exists within and there are documented occurrences of olive-sided flycatcher within the Taylor Sheep planning area. Proposed prescribed burning could enhance habitat for olive-sided flycatcher by creating snags or partially dead trees adjacent to or within openings. Proposed burning activities could have a beneficial impact on olive-sided flycatcher. Population numbers could increase.

Burning activities have the potential for creating additional suitable habitat for olive-sided flycatcher. Where burning activities result in newly dead or partially dead trees adjacent to suitable openings, new habitat for olive-sided flycatcher will be created. The proposed burning activities could be beneficial for olive-sided flycatcher. No other direct, indirect, or cumulative impacts are anticipated.

Peregrine falcon

Determination: no impact

Occurrences of peregrine falcon have been documented within the analysis area in the Spring Creek drainage. Burning activities, however, will not occur within suitable peregrine falcon habitat. No direct, indirect, or cumulative impacts on peregrine falcon are anticipated from proposed activities.

Purple martin

Determination: no impact

Although suitable habitat exists, there are no known, documented occurrences of purple martin within the analysis area. Neotropical migrant bird surveys were conducted using a modification of a habitat-based point-count protocol (Huff et al. 2000). These point-count bird surveys (conducted in 2005), although not specific to purple martin habitat, and general species surveys since 2001, have not resulted in any sightings of purple martin. Many aspen stands within the allotment area are near riparian areas and perennial streams or are adjacent to large open areas.

Units prescribed for burning to reestablish aspen dominance in mixed conifer-aspen stands or stimulate regeneration may provide future habitat for purple martins. All proposed aspen rehabilitation treatments benefit the maintenance and enhancement of existing aspen clones. There is a need to implement actions designed to promote aspen regeneration because there is some indication that aspen recruitment is low, primarily due to a lack of disturbance (Wiggins 2005). The general rule of fire suppression on public lands has likely had a negative impact on purple martins by reducing the generation of new (post-disturbance) aspen stands, and by allowing encroachment of conifers into the open habitats preferred by foraging martins (Wiggins 2005). Proposed aspen burning addresses these factors and is intended to maintain aspen persistence over the long term, potentially benefiting species such as the purple martin. No other direct, indirect, or cumulative impacts on purple martin are anticipated.

White-tailed ptarmigan

Determination: no impact

Prescribed burning activities will not occur within white-tailed ptarmigan habitat. As no burning will occur within ptarmigan habitat and design criteria identified will protect ptarmigan habitat, there will be no impact on white-tailed ptarmigan. No other direct, indirect, or cumulative impacts on purple martin are anticipated.

Management Indicator Species

Red-naped sapsucker

Determination: The project may temporarily displace or alter how individuals use affected habitats through habitat alteration and/or disturbance, but these effects will not result in a change in population numbers or trends at the project or Forest scales. The proposed project is consistent with Forest Plan direction as it relates to red-naped sapsucker.

Units prescribed for burning to reestablish aspen dominance in mixed conifer-aspen stands or stimulate regeneration may provide future habitat for red-naped sapsucker. All proposed aspen rehabilitation treatments benefit the maintenance and enhancement of existing aspen clones. There is a need to implement actions designed to promote aspen regeneration because there is some indication that aspen recruitment is low, primarily due to a lack of disturbance (Wiggins 2005). Proposed aspen burning addresses these factors and is intended to maintain aspen persistence over the long term, potentially benefiting species such as the red-naped sapsucker. Implementation of burning activities in aspen habitats has the potential for creating newly dead or partially dead trees, providing future nesting habitat for red-naped sapsucker.

Direct effects include the potential to disturb and/or displace individual sapsuckers should they be present in suitable habitat within the proposed treatment areas. Indirect effects include the potential for future replenishment of suitable habitat of aspen stands with renewed health and vigor, enhance the distribution of aspen age classes and provide potential future nesting habitat in the form of newly dead or partially dead trees within the project area. No changes in population numbers, status, or trend are expected. The proposed burning activities may impact red-naped sapsuckers should they be present in the area of proposed activities, but are not likely to contribute to a loss of viability to the population or species. Cumulative effects to red-naped sapsucker habitat and population will be small and non-quantifiable. These changes in habitat are expected to result in a non-quantifiable impact on red-naped sapsucker individuals in the project area, and will not affect population status or trend of the species on the Forest. No other direct, indirect, or cumulative impacts on red-naped sapsucker are anticipated.

Rocky Mountain Elk

Determination: The project may temporarily displace or alter how individuals use affected habitats through habitat alteration and/or disturbance, but these effects will not result in a change in population numbers or trends at the project or Forest scales. The proposed project is consistent with Forest Plan direction as it relates to Rocky Mountain elk

The analysis area provides elk summer and transition range. Calving may occur within the area. The Natural Diversity Information Source (NDIS) using Colorado Division of Wildlife (CDOW) information as a source has mapped seasonal activity areas within the State, including the Gunnison National Forest. Summer activity areas including production areas (calving), concentration areas, and overall winter and summer range have been mapped. Both calving and concentrated use areas are identified within the analysis area. Elk use of available habitat is highly influenced by available forage,

presence of cattle, and lack of human activity. Elk seek areas of low human activity with abundant forage and water.

Elk populations are intensively monitored by the CDOW. Annual harvest and census data is used to estimate elk populations within specified geographic areas known as Data Analysis Units (DAU's). The analysis area is within the boundaries of Elk DAU E-43, which includes Game Management Units 55 and 551. The current population objective for this DAU is 3,000 – 3,500 elk. Population data for this DAU from year 1980 to 2004 indicates that the elk population has remained above this objective with the highest numbers occurring from 1987 through 1989. However, in 2002, the population estimate, at 3,325, dropped below the upper limit of the population objective. The population estimate for the last five years has averaged around 4,200.

Prescribed burning within suitable elk habitat types is expected to improve forage availability for elk. Additionally, burn treatments are expected to improve elk distribution by attracting them onto the uplands reducing pressure in riparian and wetland areas. Burning activities will be restricted within elk security and elk calving areas. Elk calving areas can be burned after calving season (5/1-7/1) if needed. Prescribed burning within the analysis area is expected to have little or no effect on the elk population within this DAU. Total numbers of elk within the DAU are influenced more by the severity of seasonal weather patterns and CDOW herd management practices.

Direct effects include the potential to disturb and/or displace individual elk should they be present in suitable habitat within the proposed treatment areas. Indirect effects include the potential for future replenishment and enhanced distribution of suitable foraging habitat with renewed health and vigor. No changes in population numbers, status, or trend are expected. The proposed burning activities may impact Rocky Mountain elk should they be present in the area of proposed activities, but are not likely to contribute to a loss of viability to the population or species. Cumulative effects to habitat and population will be small and non-quantifiable. These changes in habitat are expected to result in a non-quantifiable impact on Rocky Mountain elk individuals in the project area, and will not affect population status or trend of the species on the Forest. No other direct, indirect, or cumulative impacts on red-naped sapsucker are anticipated.

Mature and Interior Forest Species

Mature or Interior Forest Species

Species that rely on mature forest or interior forest habitats for which habitat capability information exists that have not been previously discussed include the brown creeper, red squirrel, red-backed vole, golden-crowned and ruby-crowned kinglet, and the northern saw-whet owl. No change in habitat capability occurs with either action alternative for any of these species. This is primarily due to the fact stand replacement burning is expected to occur primarily within lodgepole pine habitats which are not primary habitat for any of these species. Red squirrels are important prey for marten, lynx, goshawk, and other predators. Red squirrels use mature forest habitats with large trees, snags and down logs. Maintaining concentrations of down woody debris and snags within burn units as previously proposed, as well as trees or groups of trees that contain squirrel nests and/or

middens, will maintain habitat for red squirrels. Red-backed voles are important prey for boreal owls and marten. Maintenance of coarse woody debris within burn units to maintain soil moisture for mosses, fungi, and lichens will provide foraging habitat for this and other small mammal species. Habitat for northern saw-whet owl is limited within the project area primarily due to a lack of preferred foraging habitat. Mature and old growth spruce, aspen, and riparian habitats provide high quality cover for the northern saw-whet owl. As no change in habitat structural stages in spruce-fir is expected no change in habitat will occur, although activities may degrade existing cover, but improve foraging habitat quality. These units will still provide suitable, but less than optimum cover. The project area provides high quality cover and foraging habitat for canopy feeders such as the golden-crowned and ruby-crowned kinglet. Since they are canopy feeders in that they glean insects from conifer foliage, no change in habitat is anticipated, although some degradation of existing habitat may occur.

Neotropical Migrant and other Bird Species

Species that require open habitats or a diversity of different habitats distributed throughout the area will have additional available habitat with the action alternatives. Although the project area will still have relatively large blocks of mature forest and interior forest habitats, diversity within these stands is expected to increase over time because of small openings and canopy gaps that the proposed treatments will create. Species that may benefit with increased openings and more open canopy include the American robin, dark-eyed junco, great horned owl, mountain bluebird, northern flicker, red-tailed hawk, blue grouse, and others.

Species that require mature forest habitats will have adequate habitat within the analysis area, as a minimum of 50.5% of the analysis area will remain in the mature structural stages under alternatives 2 and 3. Birds of conservation concern (BCC 2002) with documented occurrences in the Perfecto analysis area include the Brewer's sparrow, red-naped sapsucker, green-tailed towhee, MacGillivray's warbler, violet-green swallow, Williamson's sapsucker, and Wilson's warbler. Birds of conservation concern are those species identified by the U.S. Fish and Wildlife Service "that represent our highest conservation priorities". Since proposed activities will only occur in forested habitat not utilized by Brewer's sparrows, green-tailed towhees, and Wilson's warblers, no impacts to these species are anticipated from the proposed activities.

Red-naped sapsuckers and violet-green swallows utilize aspen and willow riparian habitats within or adjacent to large parklands within the analysis area. The majority of proposed will occur in lodgepole pine stands and are not expected to affect these species. Since the purpose of burning in aspen is to retain, maintain persistence, and re-establish aspen dominance, red-naped sapsucker and violet-green swallow habitat will likely increase if these treatments are successful. Short-term impacts to red-naped sapsucker from activities in aspen are primarily associated with disturbance and displacement when activities take place. Red-naped sapsuckers use willow vegetation within the analysis area for foraging; this species is considered a riparian dependent (bird species that place 60%-90% of their nests in riparian vegetation or for which 60%-90% of their abundance occurs in riparian vegetation during the breeding season) bird species due to their

dependency upon willow vegetation for foraging. In addition, red-naped sapsuckers typically nest in mature aspen that is in close proximity to suitable willow riparian habitat.

The Wilson's warbler is considered a riparian obligate (bird species that place >90% of their nests in riparian vegetation or for which >90% of their abundance occurs in riparian vegetation during the breeding season). The MacGillivray's warbler utilizes dense thickets in association with streamside riparian situations (especially willow and alder) or in association with open patches within the forest where early forest succession has produced decent shrub growth. This species is considered a riparian dependent species. Treatments that favor the development of early successional vegetation may benefit the MacGillivray's warbler. Willow riparian habitat will be minimally affected from the proposed treatments. Design criteria will ensure the maintenance of aspen snags and live heart rot decayed trees for cavity nesting for red-naped sapsucker and violet-green swallow.

FISHERIES

Affected Environment

The Taylor Sheep Burn Project is located in the Deadman Gulch, Gandy Gulch, Lower Taylor River Comp, Mid Taylor River Comp, Rarick Gulch, Rocky Brook Gulch, Spring Creek Comp, Trail Creek, and Ute Gulch level 7th Level HUC. The project area includes the majority of the lower Spring Creek and Taylor River sub-watersheds. Fish-bearing streams are located adjacent to the project area in the Taylor River and Spring Creek. These streams contain good populations of rainbow, brown, and brook trout, which are MIS species. The Taylor River and Spring Creek are heavily used by recreational fisherman, and are frequently stocked by the CDOW. Colorado River cutthroat trout, a Region 2 sensitive species, have not observed in the project area, and are not present in either stream since the area is primarily managed for sport-fishing and not native trout recovery. Small runs of kokanee salmon have been observed in the Taylor River in the last 3 years.

A qualitative assessment of lower Spring Creek and lower Taylor River indicate that both streams provide good to excellent fish habitat conditions. Pool depths are frequent and deep providing good summer and over-winter habitat. The majority of cover appears to be associated with boulders and would be rated as excellent. Large woody debris recruitment is sufficient to provide additional cover and refuge spots for trout. Sediment levels appear high in some areas, but do not limit spawning and recruitment of trout. Bank disturbance was frequent in some reaches of stream, and is primarily related to the present of high-use valley bottom roads that are located next to both Spring Creek (FSR 774) and Taylor River (FSR 742).

On-going activities that may currently affect fish habitat for MIS and sensitive fish species include existing road location, dispersed recreation, timber harvest, agriculture, and regulated flows on the Taylor River. Approximately, 5 miles of road occur along Spring Creek; and 12 miles of road occur along lower Taylor River. Many sections of

these roads occur within the Water Influence Zone (WIZ). The area is heavily used by recreationists along the river corridor. Cumulative management activities in the Spring Creek and lower Taylor River sub-watersheds are considered to have minor to moderate effects to aquatic species.

Management Indicator Species

GMUG NF LRMP Amendment for MIS species (2005) has identified the assemblage of “common trout” to evaluate management affects to aquatic ecosystems. Electrofishing samples indicate that brook and brown trout are the only MIS trout species present in the analysis area. A review of Forest-wide fish sampling on the GMUG NF indicates that trout are widely distributed throughout the Forest. Statistics from GMUG NF LRMP suggests that there are approximately 1,200 miles of stream on the Forest that contain viable fish populations consisting of brook, rainbow, brown, and cutthroat trout. A total of 80 sites have been sampled on the GMUG NF since 2001, revealing that trout density ranges between 12 and 2,794 fish per mile, with a mean density of 589.8 fish per mile.

Environmental Consequences

Alternative 1: No Action

Direct and Indirect effects

This alternative would have no direct or indirect effects to local fisheries and fish habitat since there would be no change in the current condition.

Management Indicator Species

Aquatic Management Indicator Species would not be affected by the No Action alternative.

Region 2 Sensitive Species

Implementation of the Proposed Action would have no effect to Colorado River cutthroat trout since the species does not occur in the project area.

Alternatives 2 and 3: Proposed Action and Adjusted Proposed Action (Action Alternatives)

Direct effects

The action alternatives would have no direct effects to local fisheries and fish habitat since no management activity would occur within the Watershed Influence Zone (WIZ). Excluding activities inside the WIZ is expected to protect fisheries habitat from direct effects associated with all prescribed fire treatments.

Indirect effects

Indirect effects to fish habitat are expected to be minimal given that the majority of prescribed fire treatments are spread across the project area both spatially and temporally. Sediment delivery to streams surrounding the project area is expected to be minimal and discountable, since activities would occur primarily in areas outside the WIZ. Sediment delivery to streams is expected to be greatest in areas where stand replacing prescribed

fire occurs. The largest portion of sediment delivery may be delivered to intermittent and perennial streams during the first 2 years following prescribed fire activities.

Prescribed fire activities are not expected to change normal wood recruitment and nutrient input to streams within the analysis area. Habitat cover, pool depth, spawning gravels, bank stability, streamflows, and other key habitat parameters are not expected to show measurable changes following the implementation of either of the action alternatives.

Management Indicator Species

This project would not affect the viability of trout species on the Forest given the size and scale of the project. Indirect effects are anticipated to be minimal and discountable and would not result in a measurable change in downstream habitat due to the projects proximity to fish-bearing streams. Additionally, Taylor River and Spring Creek comprise a small amount of the total fish bearing streams on the GMUG NF. Since the indirect effects of the project are minimal, and the stream comprises such a small percent of the total habitat for trout Forest-wide, the viability of rainbow, cutthroat, brown, and brook trout would not be threatened by this project. Therefore, Proposed Action may temporarily displace individuals or alter how individuals use affected habitat through habitat alteration and/or disturbance, but these effects will not result in a change in population numbers or trends at the project or Forest level scales.

Region 2 Sensitive Species

Implementation of the action alternatives would have no impact on Colorado River cutthroat trout since the species does not occur in or downstream of the project area .

Rare, Sensitive, and Endangered Plants

Affected Environment

The Taylor Sheep Burn analysis area contains a diversity of plant communities. The analysis area is located primarily in lodgepole pine (*Pinus contorta*) and secondarily in Douglas fir (*Pseudotsuga menziesii*) and aspen (*Populus tremuloides*) stands. Small isolated pockets of Ponderosa pine and sagebrush (*Artemisia tridentata* ssp. *Vaseyana*) may also be burned.

Threatened, Endangered, Proposed, and Candidate Plants

An Endangered plant is one that is in danger of extinction throughout all or a significant portion of its range. A Threatened plant is one that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. A Proposed plant is one that has been officially proposed by the USDI Fish and Wildlife Service (FWS) for listing as threatened or endangered under the Endangered Species Act (ESA). A candidate plant is one that the FWS has on file sufficient information on biological vulnerability and threats to support proposals to list it as endangered or threatened.

Threatened and Endangered plants are determined and listed by the USDI Fish and Wildlife Service in 50 CFR Part 17 (available online at: <http://endangered.fws.gov/>.) There are presently no reported records or suspected occurrences of Threatened or Endangered plants on this Forest. Threatened and Endangered plants in Colorado have unique habitats or ranges that do not occur on this Forest. There are also no plants Proposed for listing or Candidates for listing that occur on the Gunnison Ranger District (available online at: <http://endangered.fws.gov/>).

Sensitive Plants

The Forest Service (FSM 2670) defines a Sensitive plant as one that is not presently listed as Threatened or Endangered by the FWS, but a population viability concern has been identified as evidenced by:

- a) Significant current or predicted downward trends in population numbers or density.
- b) Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

The Regional Forester has identified Sensitive species for the Rocky Mountain Region (R2) (Regional Supplement 2600-2005-1 to FSM 2670, April 30, 2007). Documented occurrences of Sensitive plants on the Gunnison Ranger District came from Forest files, Forest Service personnel, pertinent literature, and records from the Colorado Natural Heritage Program (CNHP). Then, an evaluation was conducted of the remaining species on the current R2 Sensitive species list to judge the likelihood of occurrence on the Gunnison Ranger District. **Table 7** displays the species either known or suspected to occur on the Gunnison Ranger District, along with a brief habitat description.

Table 7. Pre-field checklist of US Forest Service Region 2 (R2) Sensitive plant species¹ that may be affected by activities proposed in the project area.			
Scientific name	Species known to occur on the Gunnison RD?	Potential habitat in project area?	Habitat description
<i>Braya glabella</i>	Yes	Yes	alpine tundra on calcareous gravelly soil.
<i>Eriophorum altaicum</i> var. <i>neogaeum</i>	Yes	Yes	peaty wetlands >9,500 ft.
<i>Eriophorum chamissonis</i>	Yes	Yes	peaty wetlands 10,500-12,500 ft.
<i>Eriophorum gracile</i>	Yes	Yes	fens, wetlands, & pond edges 8,000-12,000 ft.
<i>Gilia sedifolia</i>	Yes	Maybe	gravelly, talus alpine slopes >11,700 ft.

Table 7. Pre-field checklist of US Forest Service Region 2 (R2) Sensitive plant species¹ that may be affected by activities proposed in the project area.

Scientific name	Species known to occur on the Gunnison RD?	Potential habitat in project area?	Habitat description
<i>Machaeranthera coloradoensis</i>	Yes	Yes	gravelly grassland slopes 8,500-12,500 ft.
<i>Ranunculus karelinii</i>	Yes	Maybe	exposed alpine rock and scree slopes 12,000-14,000 ft.
<i>Salix candida</i>	Yes	Maybe	nutrient-rich birch (<i>Betula glandulosa</i>) fens and pond/river edges 8,800-10,600'.
<i>Sphagnum angustifolium</i>	Yes	Maybe	iron or acidic fens or wetlands above 9,000' in elevation.
<i>Utricularia minor</i>	Yes	Maybe	fens, shallow ponds, lakes, and slow streams 6,600-10,500 ft.

Source: See text and Literature Cited in the Taylor Sheep Burn Project Plant BA/BE (located in the project record at the Gunnison Ranger District office) for references used to assess species' habitat affinities and potential presence in the project area.

Information on habitat, distribution, flowering period, palatability, and associated flora for the Sensitive species known from the Gunnison Ranger District can be found in Attachment 1 of the Taylor Sheep Burn Project Biological Assessment/Biological Evaluation for Plants, located in the project record at the Gunnison Ranger District office. Habitat descriptions for Sensitive species suspected to occur on the Gunnison Ranger District are also displayed in Attachment 1 of the Plant BA/BE.

Field surveys for known and suspected Sensitive plants were conducted during the 2006 and 2007 field seasons. The focus of the search was on Sensitive plants and on their habitat. No Sensitive plants were found.

Environmental Consequences

Alternative 1: No Action

This Alternative proposes no new management actions. The Taylor Sheep Burn Project would not take place. There are no known Sensitive plants being impacted by the current management situation. There are no foreseeable future actions that would be expected to impact Sensitive plants. Therefore, there would be no direct, indirect, or cumulative effect anticipated on any Sensitive plant species from this Alternative.

Alternatives 2 and 3: Proposed Action and the Adjusted Proposed Action

Plant species with potential habitat (from [Table 7](#) above) are discussed in detail below.

Braya glabella -- A search of the Project Area did not reveal any *B. glabella* plants. No direct effects and no indirect effects would occur to this plant because there will be no burning in alpine tundra areas within the project area. The effects of this, if any, are unknown. Cumulative effects would be adding this project to the past mining, grazing,

and recreational activities that have taken place in this area since the late 1800's on both private and Federal lands. However, the overall impact under the Forest's current land management is probably much less severe today than it was historically. There are no projects planned in the foreseeable future in this Project Area that would be expected to impact this Sensitive plant.

***Eriophorum* species (includes *E. altaicum* var. *neogaeum*, *E. chamissonis*, and *E. gracile*)** -- A search of the Project Area did not reveal any Sensitive cottongrass plants. There are known locations of *E. chamissonis* in the Taylor Park Reservoir area. The proposed prescribed burn mostly avoids wet areas but it may creep into these areas in a few locations. Direct effects could be from trampling by foot traffic. Prescribed burning will not affect the hydrology of these species habitats unless fireline is built near wetlands (see indirect effects). Indirect effects could arise from changes in canopy cover of associated vegetation due to burning of overstory canopy cover. The effects of this, if any, are unknown. Fireline construction above or below wetlands could change wetland hydrology and ultimately impact habitat. Other indirect effects might be invasion of noxious weeds brought in by helicopters, ATV's, or hand crews. Cheatgrass (*Bromus tectorum*) and spotted knapweed (*Centaurea stoebe*) have been located along the Spring Creek Road. Cumulative effects would be adding this project to the past mining, grazing, and recreational activities that have taken place in this area since the late 1800's on both private and Federal lands. However, the overall impact under the Forest's current land management is probably much less severe today than it was historically. There are no projects planned in the foreseeable future in this Project Area that would be expected to impact these Sensitive plants.

Gilia sedifolia -- A search of the Project Area did not reveal any *G. sedifolia* plants. There are no known locations of this plant in the project area. The nearest population is located near the Alpine Plateau. No direct effects and no indirect effects would occur to this plant because there will be no burning in alpine tundra areas within the project area. The effects of this, if any, are unknown. Cumulative effects would be adding this project to the past mining, grazing, and recreational activities that have taken place in this area since the late 1800's on both private and Federal lands. However, the overall impact under the Forest's current land management is probably much less severe today than it was historically. There are no projects planned in the foreseeable future in this Project Area that would be expected to impact this Sensitive plant.

Machaeranthera coloradoensis -- A search of the Project Area did not reveal any *M. coloradoensis* plants. The nearest known locations of this plant are down in Cochetopa Park. Direct effects could be from foot traffic trampling or fireline construction. Individual plants might be trampled or dug up. Indirect effects could arise from changes in canopy cover of associated vegetation due to burning. It is likely that this would improve habitat for this species by increasing the amount of sunshine the plant would get. Other indirect effects might be invasion of noxious weeds brought in by helicopters, ATV's, or hand crews. Cheatgrass (*Bromus tectorum*) and spotted knapweed (*Centaurea stoebe*) have been located along the Spring Creek Road. Cumulative effects would be a continuation of management practices just as they have since the late 1800's on both private and Federal lands. However, the overall impact under the Forest's current land

management is probably much less severe today than it was historically. There are no projects planned in the foreseeable future in this Project Area that would be expected to impact this Sensitive plant.

Ranunculus karelinii -- A search of the Project Area did not reveal any *R. karelinii* plants. The closest known locations of this plant are near Uncompahgre Peak. No direct effects and no indirect effects would occur to this plant because there will be no burning in alpine tundra areas within the project area. The effects of this, if any, are unknown. Cumulative effects would be adding this project to the past mining, grazing, and recreational activities that have taken place in this area since the late 1800's on both private and Federal lands. However, the overall impact under the Forest's current land management is probably much less severe today than it was historically. There are no projects planned in the foreseeable future in this Project Area that would be expected to impact this Sensitive plant.

Salix candida -- A search of the Project Area did not reveal any *S. candida* plants. The closest known locations of this plant are on Fossil Ridge to the east. Direct effects and indirect effects to this plant would be minimized due to no burning in alpine tundra areas within the project area and avoiding burning in wetlands. Green willows tend not to burn. The effects of burning on this species are unknown, although many willows resprout after burning. Other indirect effects might be invasion of noxious weeds brought in by helicopters, ATV's, or hand crews. Cheatgrass (*Bromus tectorum*) and spotted knapweed (*Centaurea stoebe*) have been located along the Spring Creek Road. Cumulative effects would be adding this project to the past mining, grazing, and recreational activities that have taken place in this area since the late 1800's on both private and Federal lands. However, the overall impact under the Forest's current land management is probably much less severe today than it was historically. There are no projects planned in the foreseeable future in this Project Area that would be expected to impact this Sensitive plant.

Sphagnum angustifolium – A search of the Project Area did not locate any *S. angustifolium*.

The closest known location of this moss is located in the Kebler Pass area. The proposed prescribed burn mostly avoids wet areas but it may creep into these areas in a few locations. Direct effects could be from trampling by foot traffic. Prescribed burning will not affect the hydrology of these species habitats. Indirect effects could arise from changes in canopy cover of associated vegetation due to burning of overstory canopy cover. The effects of this, if any, are unknown. Fireline construction above or below wetlands could change wetland hydrology and ultimately impact this species habitat. Cumulative effects would be adding this project to the past mining, grazing, and recreational activities that have taken place in this area since the late 1800's on both private and Federal lands. However, the overall impact under the Forest's current land management is probably much less severe today than it was historically. There are no projects planned in the foreseeable future in this Project Area that would be expected to impact these Sensitive plants.

Utricularia minor -- A search of the Project Area did not locate any *U. minor*. The closest known location of this plant is located in the Crested Butte area. The proposed prescribed burn mostly avoids wet areas but it may creep into these areas in a few locations. Direct effects could be from trampling by foot traffic. Indirect effects could arise from changes in canopy cover of associated vegetation due to burning of overstory canopy cover. The effects of this, if any, are unknown. Fireline construction above or below wetlands could change wetland hydrology and ultimately impact this species habitat. Other indirect effects might be invasion of noxious weeds brought in by helicopters, ATV's, or hand crews. Cheatgrass (*Bromus tectorum*) and spotted knapweed (*Centaurea stoebe*) have been located along the Spring Creek Road. Cumulative effects would be adding this project to the past mining, grazing, and recreational activities that have taken place in this area since the late 1800's on both private and Federal lands. However, the overall impact under the Forest's current land management is probably much less severe today than it was historically. There are no projects planned in the foreseeable future in this Project Area that would be expected to impact these Sensitive plants.

Determination

Threatened, Endangered, and Proposed Plants

Alternatives 1, 2, and 3 would have “**no effect**” on Threatened, Endangered, or Proposed plants. Threatened, Endangered, and Proposed plants in Colorado have unique habitats or ranges that do not occur on the Gunnison Ranger District.

Sensitive Plants

Table 8 summarizes the determination for each Sensitive plant species known or suspected to occur in the analysis area.

Table 8. Sensitive plant effects determination for the Analysis Area, by Alternative.		
Scientific name	Determination¹	
	Alternative	
	1	2/3
<i>Braya glabella</i>	NI	NI
<i>Eriophorum altaicum</i> var. <i>neogaeum</i>	NI	MAII
<i>Eriophorum chamissonis</i>	NI	MAII
<i>Eriophorum gracile</i>	NI	MAII
<i>Gilia sedifolia</i>	NI	NI
<i>Machaeranthera coloradoensis</i>	NI	MAII
<i>Ranunculus karelinii</i> (<i>R. gelidus</i> ssp. <i>grayi</i>)	NI	NI
<i>Salix candida</i>	NI	MAII
<i>Sphagnum angustifolium</i>	NI	MAII
<i>Utricularia minor</i>	NI	MAII

¹ NI = No Impact; MAII = May adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federal listing or a loss of species viability rangewide.

A **No Impact** determination made for Alternative 1 was based on the fact that there would be no new management actions or foreseeable future actions that would impact Sensitive plants. There are no current activities that are known to be impacting known Sensitive plant species in the project area.

A determination of “**may adversely impact individuals, but not likely to result in a loss of viability on the Planning Area, nor cause a trend to federal listing or a loss of species viability rangewide**” for Alternatives 2 and 3 was based on the conclusion that the action Alternatives could impact plants and/or potential habitat for these Sensitive plants in the Project Area. However, implementing any action Alternative would likely have a minimal, if any, impact on these plants by following project design criteria along with Forest Plan Standards and Guidelines pertinent to resource protection measures.

COMMERCIAL TIMBER

Affected Environment

Within the Taylor Sheep Burn analysis area there are 12,036 acres of land classified as suitable for commercial timber production (“suitable”) as defined in the GMUG Land and Resource Management Plan. Of this area only 722 acres are within the primary burn area. Further, 253 of the 722 acres of suitable land are non-forested – leaving 469 acres of commercial timber land that could be affected by burning activities. This suitable timber land is located in two separate blocks, one is south east of Rocky Point and the other is north east of Manganese Peak. Both locations lack developed road systems suitable for hauling logs at this time, and would require a significant investment in roads to provide access to this timber.

Environmental Consequences

All Alternatives

The treatment activities proposed in all action alternatives will occur mainly in the primary burn area. There is very little suitable timber land within the primary burn area with no existing access for timber removal. Additionally, burn treatments will be of a mosaic nature leaving some commercial timber available for future harvest in these suitable areas (if desired). Given these considerations, it is expected that the treatments proposed under these alternatives will have minimal to no adverse direct impacts to the commercial timber resource within the primary burn area.

Outside of the primary burn area there is a chance that burning could occur, as secondary treatment. The potential exists for a greater impact to suitable lands if extensive burning is allowed to occur in these areas where active commercial timber management is occurring. These active timber management areas mainly occur in the north east portion of the analysis area where substantial investment has been made in a road system suitable for timber hauling, and past silvicultural activities. These secondary treatments are not expected to occur extensively in these suitable timber areas, and impacts (if any) will be insignificant.

Potential indirect impacts could result from an outbreak in bark beetle activity if beetle populations increased due to burning activities and they spread outside the project area into suitable timber lands. Trees stressed from burning could be more susceptible to mountain pine beetle attack - especially mature stands of even-aged lodgepole pine. The heaviest concentrations of mature stands within the proposed treatment area are located in the north east. The likelihood of a beetle impact is low given the age of most stands in the project area. Using tree size as a surrogate for age indicates that a large portion of the analysis area is relatively young (sapling/pole sized). Young stands are less susceptible to mountain pine beetle attack. Previous burning within the project area has thinned stands which also reduces susceptibility to bark beetle attack. In addition to stand conditions, the probability of a beetle outbreak is also dependent on available moisture (precipitation), in the first few years following the fire, and the intensity of the burn. Given these variables, it is difficult to predict how bark beetle populations will respond to the burning treatment. Actions can be taken to reduce the risk of a beetle outbreak including: monitoring, salvaging infected trees where possible, and using stand replacing fire in stands of high susceptibility, or keeping fire out of these stands.

Cumulative Effects

There is very little suitable timber land within the primary treatment area and direct adverse impacts will be minimal to non-existent. The potential exists for increase bark beetle activity as a result of the burn treatments; however, the risk is low and will depend on many variables. Overall, there are no expected adverse effects to the commercial timber resource within the Taylor Sheep Burn analysis area due to the cumulative impact of the proposed actions of this project in combination with past, and foreseeable future activities.

Soil, Water, and Riparian Resources

Watershed Affected Environment

Fire is one of the most important disturbance processes influencing western landscapes. Watersheds and their associated aquatic systems are dynamic and adapted to disturbances such as fire and post-fire processes. Not all fires can be expected to have similar effects nor would the consequences of those effects be of equal concern. While effects are dictated to a great extent on fire size and severity, they are also very much dependant upon the physical environment in which they occur

Watersheds with certain physical characteristics would be expected to be more responsive to fire than others. Those factors that are important physical process drivers include basin slope, soil type, rainfall energy and soil type. Periodic large-scale disturbances of aquatic ecosystems are inevitable and often beneficial over long periods as they can result in the delivery of coarse sediment and wood that provides nutrients and habitat complexity and diversity. Beneficial affects, such as providing habitat diversity, or adverse affects, such as increased sediment delivery to a water storage facility, tend to only be of significance on large fires, often very large fires (several thousand acres or larger). While there are exceptions it has been common practice in the Forest Service to use 300 acres, of which at least 25% must be in a high burn severity category, in other

words the soil exhibits strong water repellency, as a threshold where adverse effects to soil, water and aquatic habitats may begin to occur.

All Action Alternatives

Direct effects of fire include the potential for alteration of physical and chemical soil characteristics, which may influence water repellency behavior and stability of aggregates. Other direct effects include an increase in water availability through reduction in live biomass and thus reduction in interception and evaporation losses. The loss of cover and litter has the potential to both reduce hillslope roughness; and increase solar radiation and air movement across the ground surface. The release of organic and inorganic compounds and nutrients can be expected as a result of burning. Some of these compounds are lost through: volatilization into the atmosphere; carried along with ash into receiving waters; or leached from soils into the groundwater. The magnitude and duration of these direct effects is highly variable based upon local geo-climatic and topographic characteristics. Fire severity is also a key difference in the projection of effects. With high severity burns more likely to have larger and possibly longer lasting effects than lesser severity burns.

Indirect effects are the result of onsite or downstream changes created by fire. Increases in soil erosion, surface runoff, and peak flows are the result of changes to hillslope infiltration rates and loss of water retention from litter and cover. Loss of cover can also result in changes to micro-site climate that may affect vegetative recovery and/or increases in stream temperatures due to loss of shade. Increases in sediment to stream channels may effect aquatic habitat and channel morphology. Fine sediments tend to be damaging to aquatic resources, while coarse sediments may be beneficial in the long run by creating spawning habitat and providing deposition on floodplains that are necessary for some riparian species reproduction. Increase surface runoff will contribute to large peak flow events that may occur and are typically associated with high intensity convective storms. Increases in peak flows can produce dramatic changes to channel morphology, e.g., channel incision, channel migration and material deposition, plus the potential for damage to downstream property values and even life threatening.

Another indirect effect that may follow fire is a change in vegetative type. Fire has historically been used as a tool to create desirable vegetative changes on the landscape. These changes may have beneficial affects on watershed hillslope processes. In moisture or sunlight limited systems groundcover may not be sufficient to act like the “sponge and filter” mechanism that is equated with healthy watersheds. Following fire, ground cover is often rejuvenated with vigorous germination or sprouting of both herbaceous and woody shrub vegetation that is better suited to reduce raindrop impact, anchor soil and retard overland flow, than the vegetation that existed prior. This is very evident in mature pinyon-juniper forests that are very often nearly devoid of ground cover, but following fire may see considerable increases. These changes are relatively rapid, usually occurring within 3 growing seasons and persisting for several decades.

The timing and magnitude of storm events during a period immediately following fire until vegetative recovery dissipates the risk, is a key component on determining the probability of impact. The duration of indirect effects is dependant to a large extent on vegetative recovery. This recovery varies by site and tends to progress much quicker

where good soils exist and moisture is more abundant. For example hydrologic recovery and reductions in erosion rates tend to come quicker on aspen sites and mountain shrub sites than on pinyon-juniper sites

In summary fire is a primary influence in the evolution of western landscapes that include aspects of hydrologic function, channel morphology, soil productivity, nutrient cycling and aquatic habitat. While there may be some short term impacts that could jeopardize socio-economic values in the long term fire plays an important role in the introduction of disturbance that creates renewal, species diversity and habitat complexity.

Cumulative Effects

The expanded use of fire would contribute to cumulative effects in two ways. First the disturbance related effects could be additive to management related effects that were either intentionally or unintentionally similar. There are vegetation management treatments such as commercial and non-commercial timber removal being done to reduce fire hazard and improve forest health. There are also prescribed fire projects. Both of these types of projects by design would have similar objectives, although since they are carefully designed they have a lesser potential for significant impact than might occur with wildfire. Those dissimilar activities that can affect watershed resources include the road/trail system and livestock grazing. These activities tend to produce chronic rather than episodic impacts.

The other cumulative impact aspect is the additive effect of total burned acreage distributed over many individual small events within the same watershed. However, because of the synergy of affects that occur from one large event, many small fires do not equate to one large fire of similar acreage.

Air Quality

A State of Colorado smoke permit will be required for each year's planned ignition. In addition, Gunnison County Environmental Health office will be contacted for each day's planned ignition. The State of Colorado will be notified daily of ignition via fax or e-mail. Towns of Gunnison, Almont, lower Spring Creek Canyon, and Crested Butte are population centers. Taylor Canyon is a sensitive smoke area. If smoke settles into Taylor Canyon, smoke warning signs will be installed.

To avoid population centers and sensitive areas, burn with the proper surface and upper air wind directions and smoke dispersal forecast. Prescribed burning has taken place within the area since 1983 and many of the smoke management lessons learned are incorporated within the burn plan for the Taylor Sheep Prescribed Burn and are listed as follows:

1. Burn with a S, SW, W, and a W/NW transport wind forecast. It is not recommended to burn with a NW or N wind since these winds are generally post-frontal and can cause smoke to sink or get pushed into Spring Creek and Taylor canyons.
2. Burning mid-May to the end of August takes advantage of long daylight hours and greatly reduces the chance of smoke settling into Taylor or Spring Creek canyons.

3. Burning above 11,000 after September 1 eliminates smoke sink into the above-mentioned canyons.
4. Above the canyon walls in Taylor Canyon is a thermal belt that sets up virtually ever night. Use this as a smoke management tool. When burning below the rim, try and finish up production burning early. Most of the fuels below the rim are light so the smoke should clear with little night time settle into the canyon.
5. Watch out in the area north/northwest of White Water Resort (SE corner of P2). In this area, Taylor Canyon necks down and with strong up canyon flows in the afternoon (1330-1400 to 1700), smoke can get drawn into the canyon if ignition is taking place below 9,600 feet.
6. Watch out for subsidence winds if there are snow fields above areas being ignited, especially if some cloud cover is present. Upslope surface winds will suddenly shift to down slope. In some cases, the subsidence winds can be heard. Discontinue ignition during the event, which are generally short-lived (5-10 minutes). If these winds become persistent, discontinue ignition and build checklines.
7. Watch out for down canyon winds after sunset on the northwest portion of P2 that is in Spring Creek canyon. This area is NOT in the thermal belt. Recommend that this particular area ignited in stages and done between June 20 and July 31 to take advantage of the longest daylight of the year.
8. Watch out for down canyon winds after sunset on the northeast portion of P1 that is below the rim of Spring Creek canyon. Some portions of this area are NOT in a thermal belt. Recommend that when igniting below 9,700 feet, complete ignition by 1400 hours.

The State of Colorado smoke permit system is adequate in dealing with smoke issues off-site. On-site issues (poor smoke dispersal, wind the wrong direction, etc..) can be dealt with either at the time of the test fire or shutting down the production burning and building check lines to halt further spread of fire. None of the proposed burn areas are within mapped smoke-sensitive areas.

Recreation

Affected Environment

Recreational opportunities in the Taylor Sheep Prescribed Burn area center around the motorized recreational user. South of the project area is the Fossil Ridge Wilderness Area and the Fossil Ridge Recreation Management Area (RMA). The Recreation Opportunity Spectrum (ROS) classification for the project area is Roaded Natural. The Primitive classification can be found within the interior of the Fossil Ridge Wilderness, but is not part of the project area.

Dispersed Recreation

In the summer and fall months, common activities within the project area are: 2-wheel and 4-wheel drive vehicle driving; all-terrain-vehicle (ATV), motorcycle, and mountain bike riding; horseback riding; big game hunting; firewood gathering; dispersed camping; rafting and stream fishing in Spring Creek and Taylor River. Activities, with the exception of 2-wheel drive vehicle driving and rafting, are similar within the RMA.

Other activities south of the project area within the Fossil Ridge Wilderness include: dispersed camping; horseback riding; backpacking; stream fishing; and hiking.

Within the project area, the Spring Creek Road (NFSR 794) and the Taylor River Road (NFSR 794.2B) corridors receive the major share of the recreational use. Several campgrounds occur within both corridors. Fossil Ridge Wilderness trailheads with developed parking, bulletin boards, and register boxes for visitor information occur at Summerville and South Lottis. The Spring Creek road (NFSR# 794.2B) is durable three-season gravel-surfaced road while the Taylor Canyon road is paved. Both are suitable for 2-wheel drive vehicle travel when road surface conditions are dry or wet.

Dispersed camping is relatively heavy during the summer and can be extensive during any of the big game hunting seasons. Within the project area, there are numerous identified established dispersed campsites as well as established campgrounds. Recreational use within the project area is extensive and well distributed from spring until late fall. Additionally, the Taylor Canyon road can be extensively used during the winter for access into Taylor Park for a variety of winter recreation opportunities.

Travel Management

Travel management of the project area is considered open year-long to motorized vehicles on established, open roads. Driving on or off existing roads and trails in a manner which damages or unreasonably disturbs wildlife, or vegetation resources is prohibited.

A system trail within the project area is the Colorado Trail – Gunnison Spur (NFST 424) which bisects the project area from northeast to southwest and is the only system trail within the project area. The Matchless Mountain trail (NFST 413) occurs north and east of the project area. South of the project area, Fossil Ridge system trails are Gunsight (NFST 425), Summerville (NFST 430), Fivemile (NFST 433), and Threemile (NFST 434).

Environmental Consequences

Alternative 1 – No Action

Recreational use would continue under current policies. Concerning dispersed recreation, firewood gathering and dispersed camping will continue on most or all of the currently open roads.

Alternative 2 & 3- Action Alternatives

Recreational use will be affected by concentration and redirection during prescribed burning activities in units P2 and P3 that will require the temporary closing of the Gunnison Spur (NFST 424) when burning activities will occur within ¼ mile of the trail. With up to one-quarter of the project area's existing open trail miles proposed for temporary closure, hiking, horseback, motorcycle, and mountain bike riding will be more concentrated. The temporary closure of the Spring Creek road (NFSR 794.2B) may be required during and after burning if rolling debris is a problem. Additionally, prescribed fire activities are likely to create snags adjacent to the trail posing a potential safety

hazard. All snags that are a safety hazard from burning activities along any travel way will be felled within two weeks after ignition.

Cumulative Effects

The effects of this project on recreation within the area will be temporary, mainly during operations. Given the short lived nature of recreation impacts, and the other items discussed above, there will not be any significant cumulative effects resulting from this project.

Livestock Grazing

Affected Environment

The Taylor Sheep Burn project lies within the Spring Creek and Taylor Park grazing allotments. These allotments include all of the Taylor Sheep Burn analysis area and a large portion of the LAUs encompassing the analysis area. These allotments are administered by the Gunnison Ranger District. The Taylor Park allotment comprises 18 pastures and the Spring Creek allotment consists of one fenced pasture.

The Taylor Sheep Burn analysis area comprises 5.3% of the Taylor Park allotment and includes portions of the High Pasture Unit, Dorchester Unit, Texas Creek Unit, Behind the Lake Unit, and Reservoir Pasture Unit. The Taylor Park allotment is being used under a Term Grazing Permit with variable livestock numbers and periods of use from June 15 to October 30. Up to 1,757 cows, calves, and yearlings are authorized to graze the allotment. Six hundred sixty seven cow/calf pairs are currently in non-use, although the permittee will be required to stock these numbers on the allotment in the future.

The Taylor Sheep Burn analysis area encompasses 60% of the Spring Creek allotment and contains one fenced pasture. The allotment is divided into multiple areas. When this allotment is in use, grazing is rotated among these areas in a split season. From May 15 to May 30, 511 cow/calf pairs are permitted for the Almont Triangle area, and from June 16 to October 3, 511 cow/calf pairs are permitted for the rest of the allotment. This allotment has been in non-use since 2003 for resource protection due to drought conditions or due to the permittee's personal preference. Proposed project area occurs entirely within the Spring Creek Allotment.

Environmental Consequences

Alternative 1 – No Action

There are no direct effects as there will be no change in the existing condition. Indirect effects include the forgone opportunity to enhance and increase forage availability with prescribed fire and improve the distribution of cattle across the Spring Creek allotment when and if grazing activities resume. Cumulative effects also relate to foregone opportunity. Improved forage and cattle distribution across the allotment would contribute to better grazing management across the Gunnison RD. No other direct, indirect, or cumulative effects are anticipated.

Alternatives 2 & 3 – Action Alternatives

Direct effects include enhanced and increased forage availability across the allotment due to the expected flush of new grass and forb growth and the removal of barriers that may impede cattle movement. Indirect effects include the potential to improve cattle distribution throughout the allotment. Cumulative effects include the ability to improve grazing management on the allotment, thus contributing to improved grazing management across the Gunnison RD and the GMUG NF.

The above effects assume that cattle grazing will resume at some point in the future on the Spring Creek allotment. Should cattle grazing resume, areas that have been prescribed burned will not be grazed for a minimum one complete growing season after burning. Two growing seasons of rest are preferred. This will allow for adequate grass, forage, and shrub recovery after burning.

Chapter 4 - CONSULTATION AND COORDINATION

Agencies, Organizations, and Individuals Contacted

Listed below are those agencies, organizations, and individuals who were contacted through scoping or through consultation.

Federal Agencies

Bureau of Land Management, Gunnison District
U.S. Fish and Wildlife Service, Grand Junction, CO

State Agencies

Colorado Division of Wildlife, Gunnison, CO
Colorado State Forest Service, Gunnison, CO

Local Government

Saguache County Commissioners, Saguache, CO

Elected Officials

Representative John Salazar, Grand Junction, CO
U.S. Senator Ben Ken Salazar, Denver, CO

American Indian Tribes

Business Committee Ute Indian Tribe, Fort Duchesne, UT

Businesses and Organizations

Intermountain Forest Industry Association, Rapid City, SD
Delta Timber, Delta, CO
Intermountain Forest Products Inc., Montrose, CO
Ancient Forest Rescue, San Luis, CO
Forest Guardians, Sante Fe, NM
Colorado Wild, Durango, CO
Colorado Timber Industry Association, Montrose, CO
Crested Butte Forest Rescue, Crested Butte, CO
CU Wilderness Study Group, Boulder, CO
High Country Citizens' Alliance, Crested Butte, CO
Forest Conservation Council, Santa Fe, NM
Mountain Valley Lumber, Saguache, CO

Individuals

Roy Duncan, Monte Vista, CO
Dave Mapes, Gunnison, CO
Rebie Sue Collins, Gunnison, CO
Shane Cox, Gunnison, CO
Christi & Gary Hill, Saguache, CO
John Judson, Gunnison, CO

Distribution and Review of this EA

A legal notice is being published in the Gunnison Country Times, stating that this EA is available for public review and comment. Copies of the EA are being mailed to persons, groups, and agencies that have expressed interest in this project.

List of Preparers

The following Forest Service employees comprise the ID Team that conducted the environmental analysis and prepared this EA.

Gay Austin, Range Technician, Gunnison RD, GMUG NF
Greg Austin, Recreation Technician, Gunnison RD, GMUG NF

Jerry Chonka, Fire Management Officer, Gunnison RD, GMUG NF
Matt Etzenhouser, Silviculturist, Gunnison RD, GMUG NF
Mark Hatcher, Range Conservationist, Gunnison RD, GMUG NF
Mike Jackson, Wildlife Biologist, Gunnison RD, GMUG NF
Matt Vasquez, IDT Leader, Gunnison RD, GMUG NF

The following individuals have contributed support and information to this environmental analysis.

John Almy, Hydrologist, GMUG NF
Sally Crum, Archaeologist, GMUG NF
Brandon Diamond, CDOW, Gunnison, CO
Arthur Haines, Silviculturist, Gunnison RD, GMUG NF
LeighAnn Hunt, Forest Archaeologist
Chris James, Fisheries Biologist, GMUG NF
Justin Lawrence, Archaeologist, GMUG NF

Literature Cited and References

- Anderson, David G.** 2004a. *Gilia sedifolia* Brandeg. (stonecrop gilia): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available online:
<http://www.fs.fed.us/r2/projects/scp/assessments/giliasedifolia.pdf>.
- Andrews, R. and R. Righter.** 1992. Colorado birds: a reference to their distribution and habitat. Denver Museum of Natural History, Denver, CO.
- Armstrong, D.M.** 1987. Rocky Mountain mammals. Rocky Mountain Nature Association, Inc., Estes Park, CO.
- Austin, Greg.** 2007. Personal communication. Trails Technician, USDA Forest Service (USFS), Gunnison Ranger District, Gunnison, CO
- Bate, L.J., E.O. Garton, and M.J. Wisdom.** 1999. Estimating snag and large tree densities and distribution on a landscape for wildlife management. Gen. Tech. Rep. PNW-GTR-425. Portland, OR: USDA, Forest Service, Pacific Northwest Research Station. 76pp.
- Bate, L.J., T.R. Torgersen, E.O. Garton, and M.J. Wisdom.** 2000. Appropriate log sampling methods for stand and landscape analysis. Unpublished draft manuscript. 76 p.
- Beatty, B.L., W.F. Jennings, and R.C. Rawlinson.** 2004. *Machaeranthera coloradoensis* (Colorado tansyaster): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available online:
<http://www.fs.fed.us/r2/projects/scp/assessments/machaerantheracoloradoensis.pf>.
- Chapman, Janice.** 2004. Personal communication. Roads Technician, USFS, Gunnison Ranger District, Gunnison, CO
- Chase, C.A., S.J. Bissell, H.E. Kingery, and W.D. Graul.** 1982. Colorado bird distribution latilong study. Denver Museum of Natural History, Denver, CO.
- Chonka, Jerry.** 2007. Personal communication. Fire management officer, USFS, Gunnison Ranger District, Gunnison, CO

- Colorado Native Plant Society.** 1997. Rare Plants of Colorado (Second Edition). The Colorado Native Plant Society. Falcon Press Publishing Company (Helena, MT) and the Rocky Mountain Nature Association (Estes Park, CO). 105 pp.
- Colorado Natural Heritage Program (CNHP).** 2007. County occurrence information by Colorado Natural Heritage Program. <http://www.cnhp.colostate.edu/list.html>.
- Crook, Reed Wight and Darcie J. Bacon.** 2002. Species evaluation for *Salix candida*, 4 pp. <http://fsweb.r2.fs.fed.us/rr/scp/sens/plants/>
- Decker, K., D.R. Culver, and D.G. Anderson.** 2006. *Eriophorum chamissonis* C.A. Mey. (Chamisso's cottongrass): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/eriophorumchamissonis.pdf>
- Dobkin, D. S. and J. D. Sauder.** 2004. Shrubsteppe landscapes in jeopardy. Distributions, abundances, and the uncertain future of birds and small mammals in the Intermountain West. High Desert Ecological Research Institute, Bend, OR.
- Dorn, Robert D.** 1997. Rocky Mountain region willow identification field guide. Renewable Resources R2-RR-97-01. Denver, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Region. 107 p.
- Ehrlich, P.R., D.S. Dobkin, and D. Wheye.** 1988. The birder's handbook: a field guide to the natural history of North American birds. Simon and Schuster, Inc. New York, New York. 785pp.
- Evans, D.M. and D.M. Finch.** 1994. Relationship between forest songbird populations and managed forests in Idaho. Pp. 308-314 in W.W. Covington and L.F. DeBano (tech. coords.) Sustainable ecological systems: implementing an ecological approach to land management. USDA Forest Service. Gen. Tech. Rept. RM-247. 363pp.
- Finch, D.M.** 1992. Threatened, endangered, and vulnerable species of terrestrial vertebrates in the Rocky Mountain Region. Gen. Tech. Rep. RM-215. USDA Forest Service, Rocky Mtn. Forest and Range Experiment Stn., Fort Collins, CO.
- Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong.** 1994. Mammals of Colorado. Denver Museum of Natural History and University Press of Colorado. 467pp.
- Franzreb, K.E. and R.D. Ohmart.** 1978. The effects of timber harvesting on breeding birds in a mixed-coniferous forest. Condor 80: 431-441.

- Gaines, William L, P. H. Singleton, and R. C. Ross.** 2002. Assessing the cumulative effects of linear recreation routes on wildlife habitats on the Okanagan and Wenatchee National Forests. Gen. Tech. Rep. PNW-GTR-XXX. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 93 p.
- Grand Mesa, Uncompahgre and Gunnison National Forest.** 2001. Lynx Habitat Mapping Criteria Version 2.0. Final revision July 27, 2005. Filed in: fsfiles/unit/rres/tes/2670 lynx habitat criteria.
- Hayward, G.D. and J. Verner, tech eds.** 1994. Flammulated, boreal, and great gray owls in the United States: a technical conservation assessment. Gen. Tech. Rep. RM-253. Fort Collins, CO. USDA Forest Service, Rocky Mtn. Forest and Range Experiment Station. 214pp.
- Finch, D.M.** 1992. Threatened, endangered, and vulnerable species of terrestrial vertebrates in the Rocky Mountain Region. Gen. Tech. Rep. RM-215. USDA Forest Service, Rocky Mtn. Forest and Range Experiment Stn., Fort Collins, CO.
- Hager, D.C.** 1995. The interrelationships of logging, birds, and timber regeneration in the Douglas-fir region of northwestern California. *Ecology* 41(1):116-125.
- Halfpenny, J.C., D. Nead, S.J. Bissell, and R.J. Aulerich.** 1979. Colorado wolverine/lynx verification program. *J. Colo-Wyo. Acad. Sci.:* 11 (1):89.
- Halfpenny, J.C.** 1981. History and status of wolverine in Colorado. Wildlife Research Report, part 1. Colorado Federal Aid.
- Halfpenny, J.C.** 1986. A field guide to mammal tracking in North America. Johnson Publ. Co., Boulder, CO.
- Hargis, C.D., J.A. Bissonette, and D.L. Turner.** 1999. The influence of forest fragmentation and landscape pattern on American martens. *J. of Applied Ecology* 36:157-172.
- Handley, Joy, Bonnie Heidel, and Scott Laursen.** 2002b. Species evaluation for *Utricularia minor*, 4 pp. <http://fsweb.r2.fs.fed.us/rr/scp/sens/plants/>
- Harrington, H.D.** 1954. Manual of the Plants of Colorado. Sage Books, Chicago, IL.
- Hayward, G.D., P.H. Hayward, and E.O. Garton.** 1993. Ecology of boreal owls in the northern Rocky Mountains, USA. *Wildlife Monographs* 124:1-59.
- Hatcher, Mark.** 2007. Range Conservationist. Gunnison RD, GMUG NF
- Hayward, G.D. and J. Verner, tech. Editors.** 1994. Flammulated, boreal, and great gray owls in the United States: A technical conservation assessment. Gen. Tech.

- Rep. RM-253. Fort Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. 214pp.
- Hermann, Frederick J.** 1970. Manual of the Carices of the Rocky Mountains and Colorado Basin. Agriculture Handbook No. 374. US Dept. of Agric., Forest Service. US Government Printing Office. Washington DC.
- Hoelscher, R.D. and L.D. Mullen.** 1995. Biological assessment for the peregrine falcon (*Falco peregrinus*): Assessment on the effects of livestock grazing on the peregrine falcon and its associated habitat within the Rocky Mountain Region. USDA Forest Service. Rocky Mountain Region.
- Holland, T.H.** 1995. Supplemental biological evaluation for Rocky Mountain Region sensitive species on the Grand Mesa, Uncompahgre, and Gunnison National Forest. [online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/brewerssparrow.pdf>
- Holmes, J.A. and M.J. Johnson.** 2005. Brewer's sparrow (*Spizella breweri*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region
- Hoover, R.L. and D.L. Wills, eds.** 1987. Managing forested lands for wildlife. Colorado Division of Wildlife, Denver, CO.
- Hornocker, M.G. and H.S. Hash.** 1981. Ecology of the wolverine in northwestern Montana. Can J. Zool. 59:1286-1301.
- Kennedy, P.L.** 2003. Northern goshawk (*Accipiter gentiles atricapillus*): a technical conservation assessment. 141pp.
- Keith, J.O.** 2003. The Abert squirrel (*Sciurus aberti*): a technical conservation assessment. USDA Forest Service, Rocky Mtn. Region. 71pp.
- Kingery, H.E., S.J. Bissell, and others, eds.** 1987. Colorado bird distribution latilong study. Colorado Division of Wildlife, Denver, CO. 81pp.
- Koehler, G. M.** 1990. Population and habitat characteristics of lynx and snowshoe hares in north central Washington. Canadian Journal of Zoology. 68: 845-851.
- Komarek, Susan.** 1994. Flora of the San Juans. Kivaki Press. Durango, Colorado. 244 pp.
- Ladyman, J.A.R.** 2004c. *Eriophorum altaicum* Meinshausen var. *neogaenum* Raymond (whitebristle cottongrass): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available:

<http://www.fs.fed.us/r2/projects/scp/assessments/eriophorumaltaicumvarneogaem.pdf>

- LeFevre, J.** 2003. Personal communication. Wildlife biologist, Paonia R.D., Paonia, CO.
- Le Fevre, J.** 2004. A species assessment of the northern goshawk (*accipiter gentiles atricapillus*) on the Grand Mesa, Uncompahgre, and Gunnison National Forest (Draft). Grand Mesa, Uncompahgre, and Gunnison National Forest, Paonia, CO. 22pp.
- McKay, R.** 1991. Biological assessment and inventory plan for the North American lynx (*Felis lynx canadensis*) in the Uinta Mountains. Utah Natural Heritage Program, Salt Lake City, UT.
- McKelvey, K. S., Y. K. Ortega, and G. M. Koehler [et al.].** 2000. Canada lynx habitat and topographic use patterns in north central Washington: a reanalysis. Gen. Tech. Rep. RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 307-336.
- Medin, D.E.** 1985. Breeding bird responses to diameter-cut logging in west central Idaho. USDA Forest Service, Intermountain Research Station, Research Paper INT-355. 12pp.
- Medin, D.E. and G.D. Booth.** 1989. Responses of birds and small mammals to single-tree selection logging in Idaho. USDA Forest Service, Intermountain Research Station, Research Paper INT-408. 11pp.
- Mehlquist, W.E. and A.E. Dronkert.** 1987. River otter. In: Wild Furbearer Management and Conservation in North America. J. Bedford and G. Thomas, Eds. Ontario Ministry of Natural Resources, Toronto, Ontario, Canada.
- Mullen, L.D. and A. Kratz.** 1995. Biological evaluation, sensitive plants and wildlife that for the most part are not impacted by domestic livestock grazing. USDA Forest Service, Rocky Mountain Region.
- Mullen, L.D.** 1995. Grazing permit issuance, biological evaluation of the effects on the boreal toad. USDA Forest Service, Rocky Mountain Region.
- Mullen, L.D. et al.** 1995. Biological evaluation for sensitive species in riparian areas grazed by domestic livestock. USDA Forest Service, Rocky Mountain Region.
- Murray, J.A.** 1987. Wildlife in peril; the endangered mammals of Colorado. Roberts Rinehart, Inc., Boulder, CO.

- NDIS.** 2006. Natural Diversity Information Source: white-tailed ptarmigan description. [Online] Accessed: October 31, 2006. Available: <http://ndis.nrel.colostate.edu/wildlifesp.aspx?SpCode=041200>
- NatureServe.** 2006. NatureServe explorer: An online encyclopedia of life [Online]. Version 4.6. NatureServe, Arlington, Virginia. Accessed: November 11, 2005. Available: <http://www.natureserve.org/explorer>
- Ode, David J.** 2001. Species evaluation for *Utricularia minor*, 3 pp. <http://fsweb.r2.fs.fed.us/rr/scp/sens/plants/>
- Pakmer, D.A.** 1986. Habitat selection, movements and activity of boreal and saw-whet owls. Thesis, Colorado State University, Fort Collins, CO
- Patton, D. R.** 1997. Wildlife habitat relationships in forested ecosystems. Revised edition. Timber Press, Portland, Oregon, USA.
- Poltrone, R.T.** 1987. Habitat quality evaluation and a monitoring program for the northern leopard frog (*Rana pipiens*) in southwestern Wyoming. Master's Thesis. University of Wyoming, Laramie, Wyoming. 57pp.
- Reynolds, R.T., R.T. Graham, M.H. Reiser, R.L. Bassett, P.L. Kennedy, D.A.**
- Royce, Jr., G. Goodwin, R. Smith, and E.L. Fisher.** 1992. Management recommendations for the northern goshawk in the southwestern United States. Gen. Tech. Rep. RM-217. Ft. Collins, Co: USDA Forest Service, Rocky Mtn. Forest and Range Experiment Station. 90pp.
- Ruediger et al.** 2000. Canada lynx conservation assessment and strategy. USDI Bureau of Land Management, USDA Forest Service, USDA National Park Service, and USDI Fish and Wildlife Service.
- Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, L.J. Lyon, and W.J. Zielinski, tech. eds.** 1994. The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine in the western United States. Gen. Tech. Rep. RM-254, USDA Forest Service, Rocky Mtn. Forest & Range Exp. Stn., Fort Collins, CO.
- Shenk, T.** 2005a. CDOW Lynx Update, August 15, 2005. Available online: http://wildlife.state.co.us/species_cons/Lynx/Aug1505Lynx.pdf Accessed on December 14, 2006.
- Shenk, T.** 2005b. General Locations of Lynx (*Lynx canadensis*) Reintroduced to Southwestern Colorado from February 4, 1999 through February 1, 2005. Colorado Division of Wildlife, Wildlife Research Center. Fort Collins, CO. Available online:

http://wildlife.state.co.us/species_cons/Lynx/LynxLocations_Feb2005.pdf

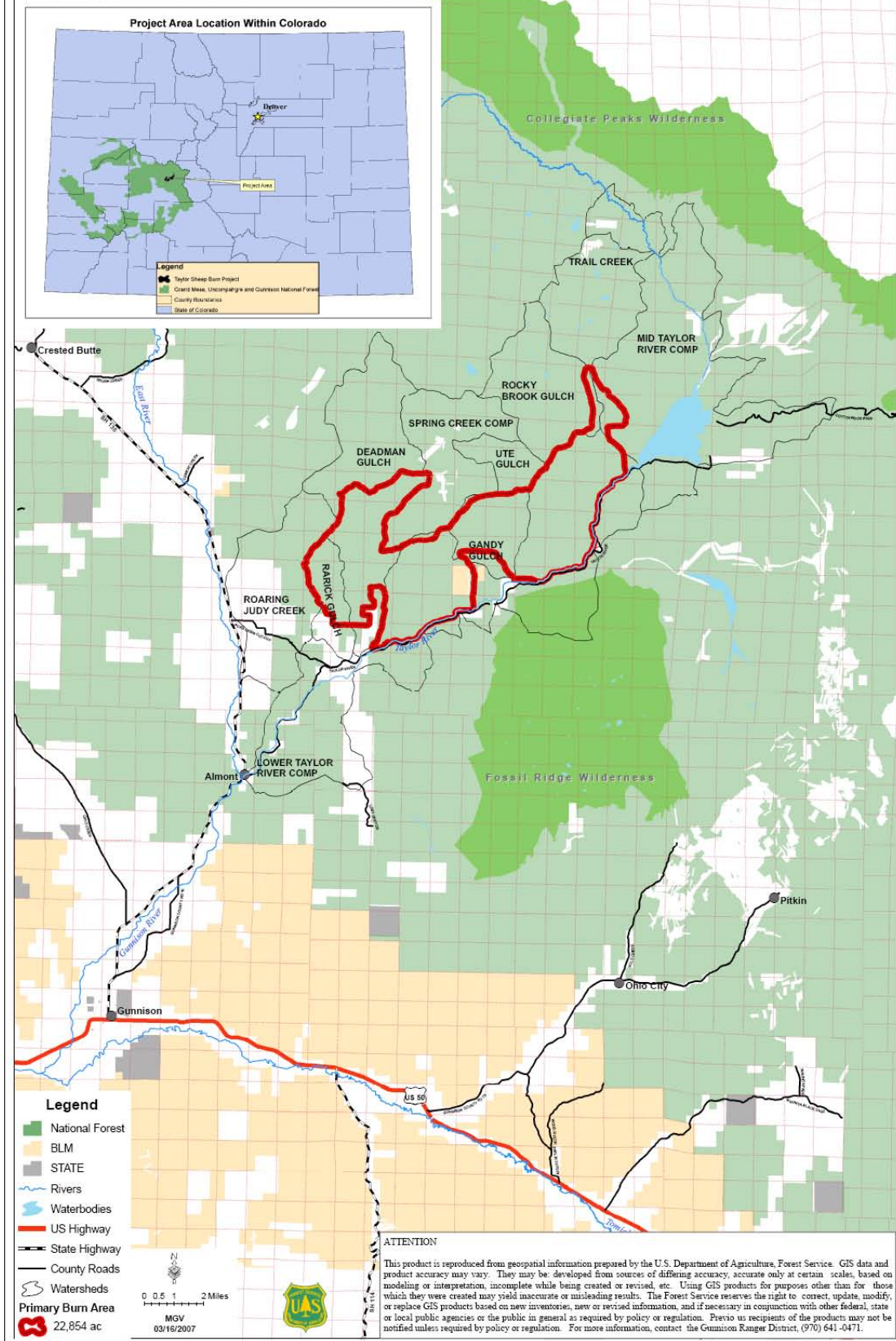
Accessed on December 14, 2006.

- Spackman, S., B. Jennings, J. Coles, C. Dawson, M. Minton, A. Kratz, and C. Spurrier.** 1997. Colorado Rare Plant Field Guide. Prepared for the Bureau of Land Management, the U.S. Forest Service and the U.S. Fish and Wildlife Service by the Colorado Natural Heritage Program.
- USDA Forest Service.** 2005. Threatened, endangered and sensitive plants and animals. Supplement No. 2600-2005-1, Forest Service Manual 2600, Chapter 2670. Rocky Mountain Region (Region 2), Denver, Colo. Effective May 17, 2005. 20 pp.
- USDA Forest Service.** 2005. Management Indicator Species Forest Plan Amendment. Grand Mesa, Uncompahgre, and Gunnison National Forests. Delta, Colorado.
- USDA Forest Service.** 2005. Management Indicator Species Assessment for the Grand Mesa, Uncompahgre, and Gunnison National Forests. Delta, Colorado.
- USDA Forest Service.** 2003. Regional forester's sensitive species list. USDA Forest Service, Rocky Mountain Region, Golden, CO
- USDA Forest Service.** 2001. Lynx habitat mapping criteria, version 2.0. Grand Mesa, Uncompahgre and Gunnison National Forest, Delta, CO. (updated Dec. 20, 2001).
- USDA Forest Service.** 2001. Management indicator species assessment. Grand Mesa, Uncompahgre and Gunnison National Forests. Version 1.0. Delta, CO. 130pp.
- USDA Forest Service.** 1995. Forest Service Manual. Title 2600-wildlife, fish, and sensitive plant habitat management. Amendment No. 2600-95-7; Effective June 23, 1995. USDA Forest Service, Washington, DC.
- USDA Forest Service.** 1994. Forest Service Manual, Chapter 2670; Threatened, endangered, and sensitive plants and animals, Region 2 Supplement No. 2600-2003-1. Effective December 1, 2003. USDA Forest Service, Denver, CO.
- USDA Forest Service.** 1991. Amended Land and Resource Management Plan for the Grand Mesa, Uncompahgre and Gunnison National Forests. Delta, CO.
- USDA Forest Service.** 1990. Forest Service Manual, Title 2600-wildlife, fish, and sensitive plant habitat management. Amendment No. 2600-90-1; Effective June 1, 1990. USDA Forest Service, Washington, DC.
- USDA Forest Service.** Gunnison Ranger District, Gunnison, CO. District wildlife observation records.

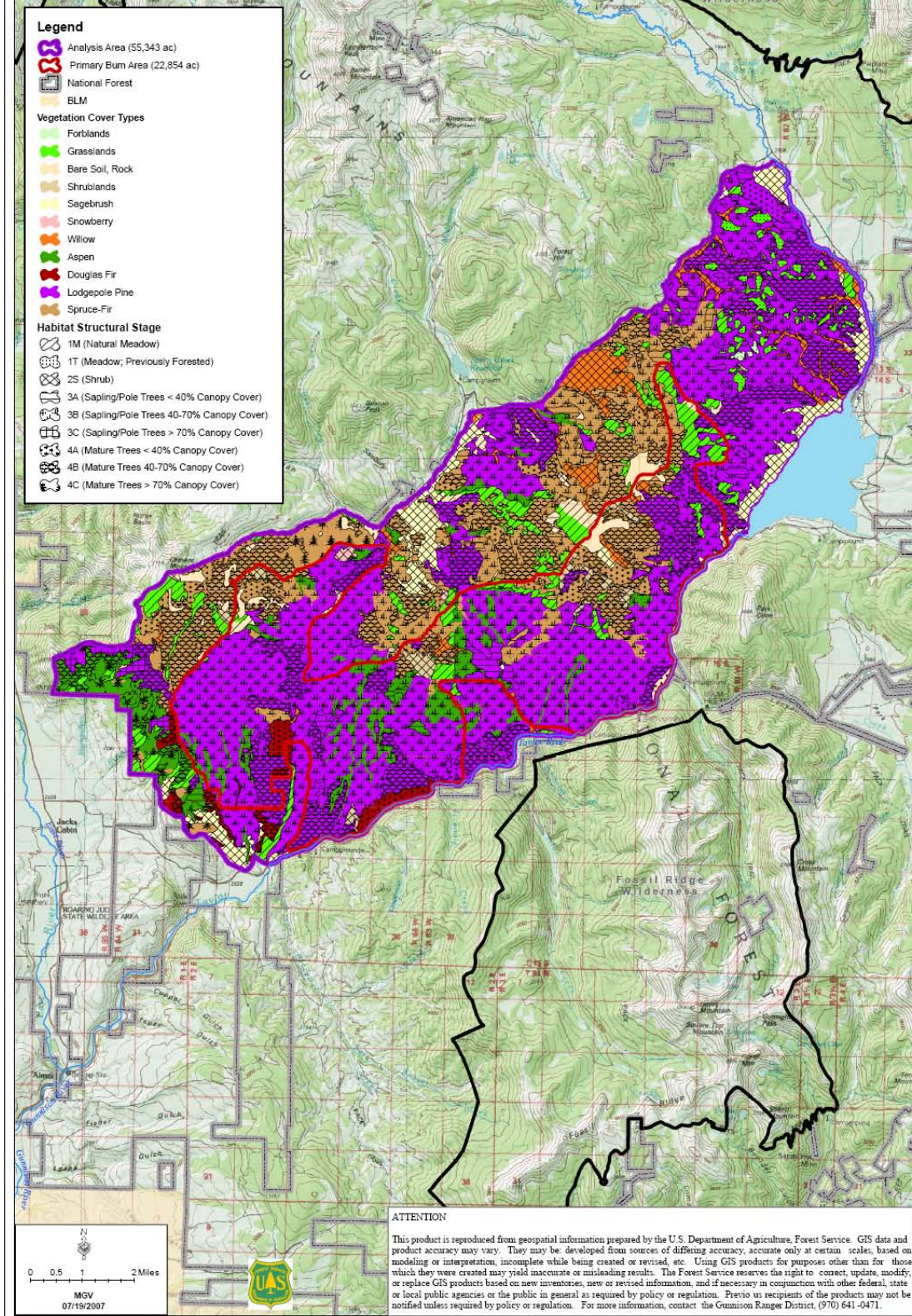
- USDI Fish and Wildlife Service.** June 30, 1998. News and information release of proposal to list lynx as threatened species. Denver, CO.
- USDI Fish and Wildlife Service.** 2002. Birds of conservation concern. Division of Migratory Bird Management. Arlington, Virginia.
- Wahl, F. and G. Patton.** May 8, 2000. Southern Rocky Mountain section 7 lynx project decision screen. Last updated June 30, 2004 by K. Broderdorp and N. Warren. USDA Forest Service and USDI Fish and Wildlife Service, Denver, CO.
- Weber, William A. and Ronald C. Wittmann.** 2001b. Colorado Flora: Western Slope (Third Edition). University Press of Colorado. Boulder, Colorado. 488 pp.
- Weins, J.A. and J.T. Rotenberry.** 1980. Patterns of morphology and ecology in grassland and shrubsteppe bird populations. *Ecological Monographs* 50:287-308.
- White, C. M., N. J. Clum, T. J. Cade, and W. G. Hunt.** 2002. Peregrine Falcon (*Falco peregrinus*). The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Laboratory of Ornithology; Retrieved from The Birds of North American Online database: http://bna.birds.cornell.edu/BNA/account/Peregrine_Falcon/.
- Wiggins, D.A.** 2005. Purple martin (*Progne subis*): a technical conservation assessment. [Online]. USDA Forest service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/purplemartin.pdf> [3/10/2006]
- Zapisocki, R., B. Beck, J. Beck, M. Todd, R. Bonar and R. Quinlan.** 2000. Three-toed woodpecker year-round habitat – habitat suitability index model. Version 6. Foothills Model Forest, Alberta, Canada.
- Zeveloff, S.I.** 1988. Mammals of the intermountain west. Univ. Utah Press, Salt Lake City, UT.
- Zielinski, W. J., and T. E. Kucera,** technical editors. 1995. American marten, fisher, lynx, and wolverine: survey methods for their detection. Gen. Tech. Rep. PSW-GTR-157. Albany, CA: Pacific Southwest Research Station, Forest Service, U. S. Department of Agriculture; 163 p.

APPENDIX A: MAPS

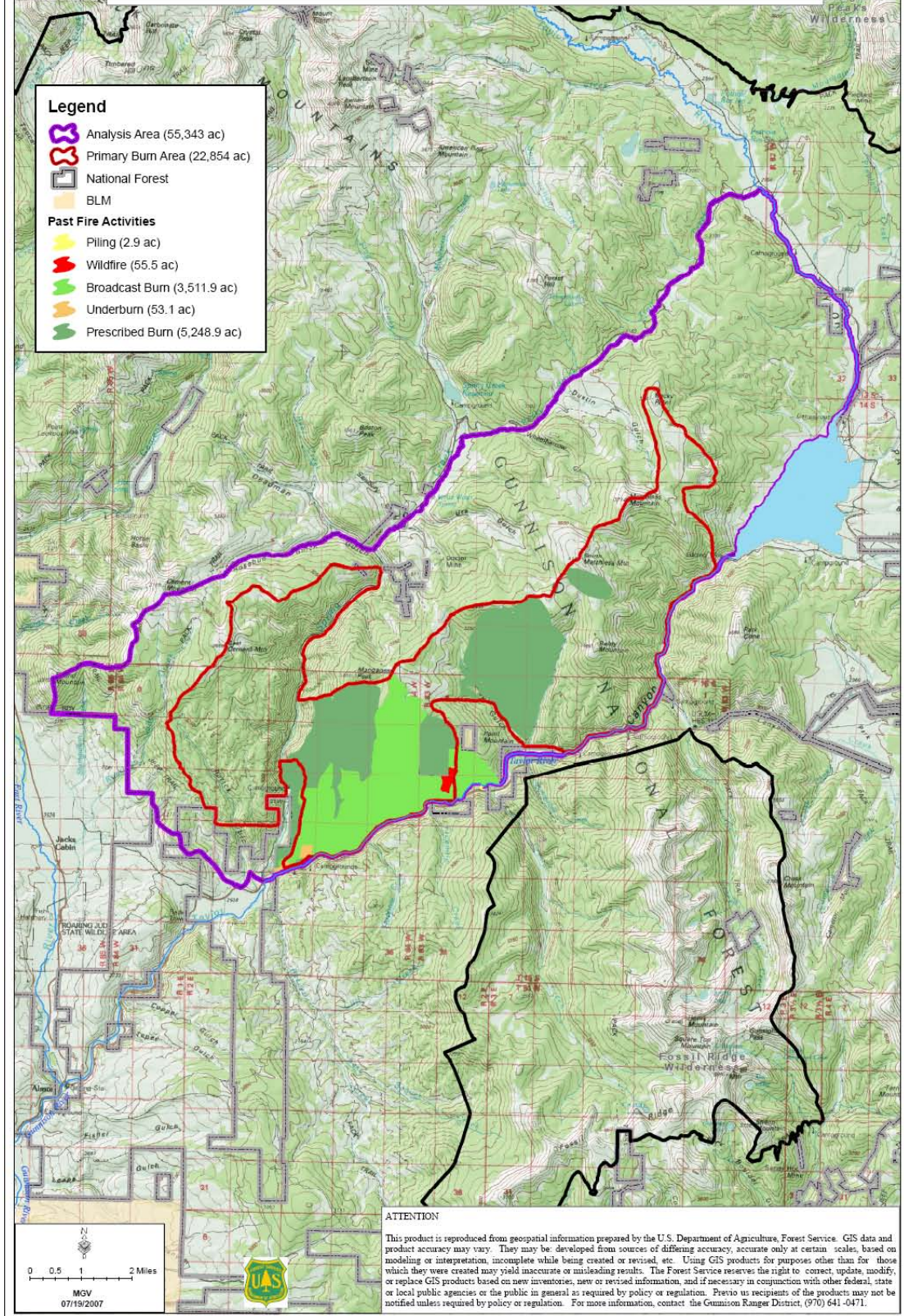
Map 1. Taylor Sheep Burn Project: Vicinity Map



Map 2. Taylor Sheep Burn Project: Vegetation Cover Types & Habitat Structural Stages






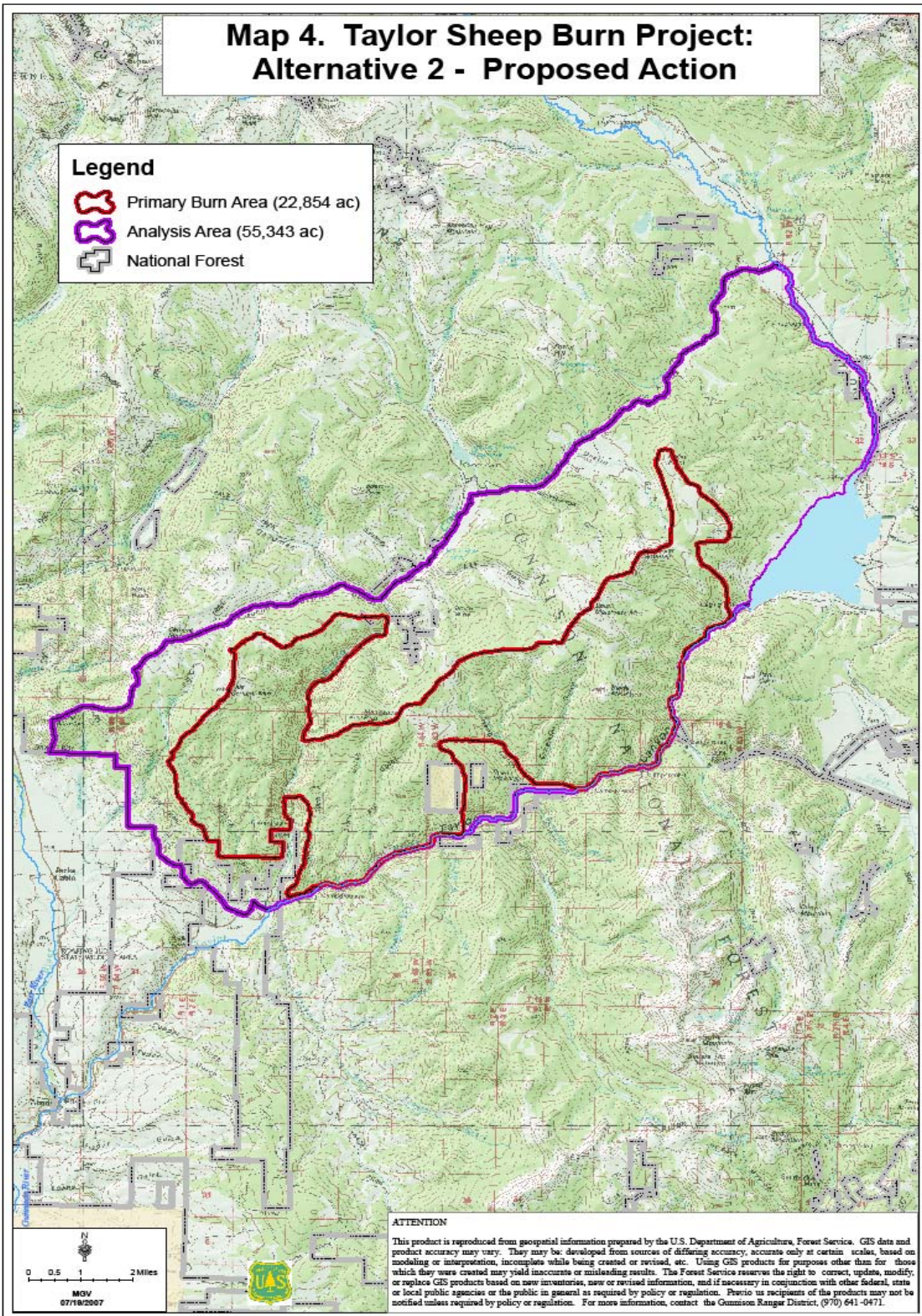
Map 3. Taylor Sheep Burn Project: Past Fire Activities From 1983 - 1999



Map 4. Taylor Sheep Burn Project: Alternative 2 - Proposed Action

Legend

-  Primary Burn Area (22,854 ac)
-  Analysis Area (55,343 ac)
-  National Forest









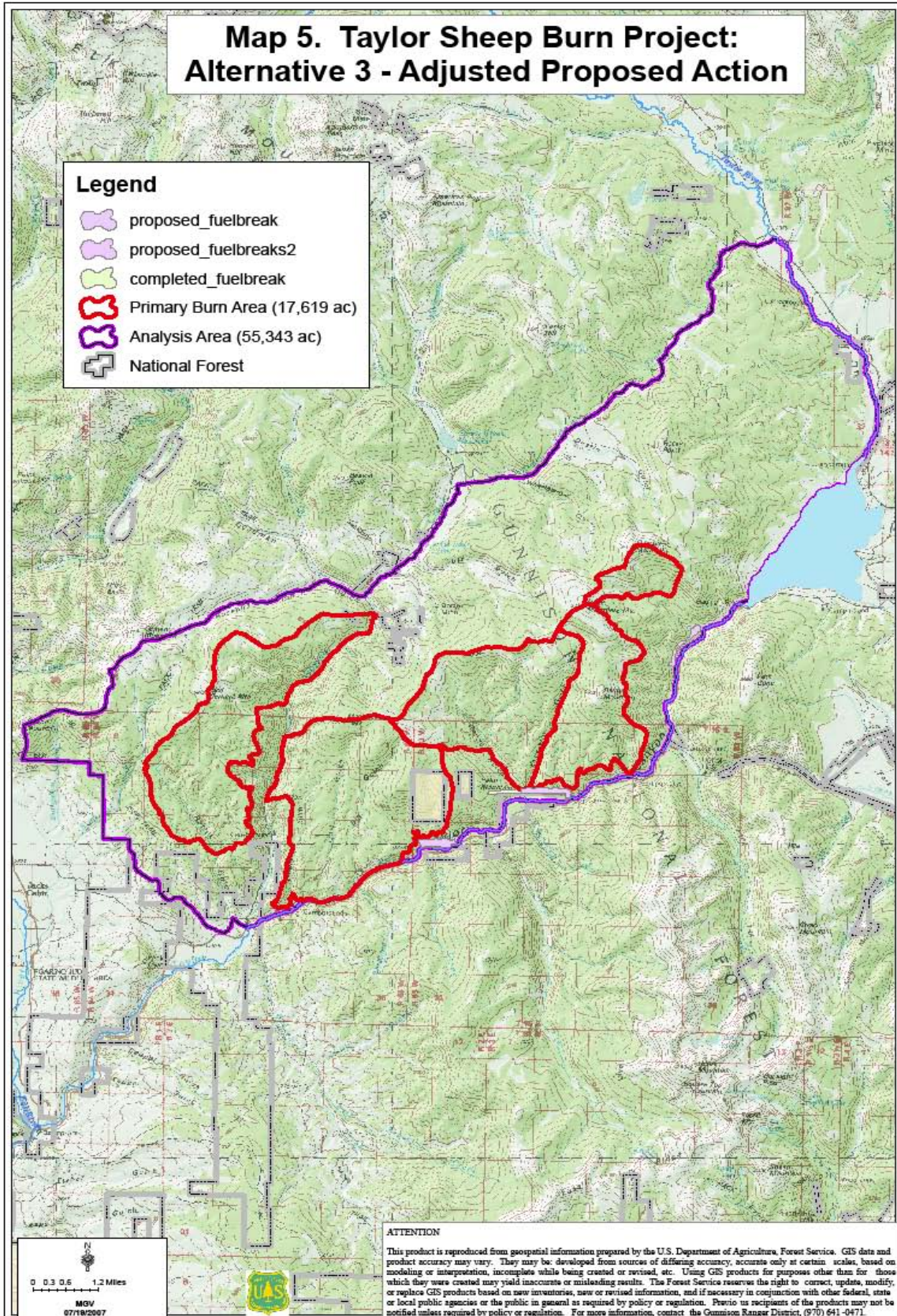
ATTENTION

This product is reproduced from geospatial information prepared by the U.S. Department of Agriculture, Forest Service. GIS data and product accuracy may vary. They may be developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, etc. Using GIS products for purposes other than for those which they were created may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify, or replace GIS products based on new inventories, new or revised information, and if necessary in conjunction with other federal, state or local public agencies or the public in general as required by policy or regulation. Prior to recipients of the products may not be notified unless required by policy or regulation. For more information, contact the Gummison Ranger District, (970) 641-0471.

Map 5. Taylor Sheep Burn Project: Alternative 3 - Adjusted Proposed Action

Legend

-  proposed_fuelbreak
-  proposed_fuelbreaks2
-  completed_fuelbreak
-  Primary Burn Area (17,619 ac)
-  Analysis Area (55,343 ac)
-  National Forest



Appendix B
Taylor Sheep Prescribed Burn
Response to Comments

A scoping letter for The Taylor Sheep Prescribed Burn Project was distributed to a list of concerned groups and citizens and to 247 private property owners adjacent to or near the project area on April 5, 2005. Fourteen responses were received containing comments regarding the proposed action. Comments provided on the proposal generally fall into five categories: support for the project; property owner concerns - private property adjacent to or near burn boundaries and the potential for fire escape, size of the burn, and notification of landowners adjacent to burn; the effects of burning on fisheries and water quality; concern regarding the USFS ability to maintain any new burn areas; and air quality. The following are the interdisciplinary team's response to these comments received regarding the proposed burn activities.

Response to Comments

Comment: *Support for prescribed burning* – Six comments are supportive of the proposed burning, although two of these had additional concerns. Those concerns are addressed below.

Response: The Gunnison RD, USFS appreciates and thanks you for your support of this project.

Comment: *Private property concerns - private property adjacent to or near burn boundaries and the potential for fire escapes, size of the proposed burn, and notification of landowners prior to burn,* – Six comments identified all or some aspect of this concern.

Response: Private property concerns were identified by the interdisciplinary team as well as by public comment as likely the single most important of issues identified. Alternative 3 (pages 11 – 14) was developed primarily to address these issues. Burn boundaries were adjusted and additional fuel breaks were added. Additionally, the project burn plan identifies specific conditions in which burning may occur and when burning activities must be shut down. The burn plan complies with all applicable federal and state regulations. A copy of the burn plan is included within the project file and can be reviewed at the Gunnison RD office. As has been identified within this Environmental Analysis, the entire burn area will not be burned in a single season. Approximately 1000 acres per year are expected to be burned. Some years may have little or no burning, depending on conditions, while other years may see up to the entire 1000 acres burned. Notification of when the burning is expected to occur is published each spring in the Gunnison Country Times. Additionally warning signs will be posted at likely vantage points at trails, motorized routes, and major access roads in, adjacent to, and within view of the prescribed burn area. Landowners may contact the district office

or Fire Management Officer, Jerry Chonka, for additional information about when burning may occur. Burning season generally begins in April or May.

Comment: *Effects on fisheries and water quality* – Two comments were concerned about the potential effects of burning on fish and water quality.

Response: Pages 35 – 38 in this Environmental Analysis discusses the impacts of the project on fisheries and water quality. Additional discussion occurs in the Soil, Watershed, and Riparian Resources section on pages 44 – 47. In brief, impacts to water and fisheries are expected to be minimal as no burning will occur within the Water Influence Zone (WIZ) and burning activities will be spread across the project area both spatially and temporally. Generally less than 1000 acres yearly will be scheduled for burning.

Comment: *Ability to maintain new burn areas* – One comment concerned our ability to maintain new burn areas when we haven't been able to maintain previous burns within the project area.

Response: The Taylor Sheep Prescribed Burn project includes maintenance burning on previously burned and newly burned areas (page 7, paragraph 2). This planning effort renews our ability to continue maintenance burning. Maintenance burning requires analysis under the National Environmental Policy Act (NEPA), previous NEPA analysis that covered maintenance burning in the project area had expired.

Comment: *Air quality (smoke)* – Two comments were concerned with air quality during burning.

Response: Smoke and air quality issues were identified by the interdisciplinary team as a concern during the planning process. The issue is addressed in detail on pages 47 and 48. A Colorado State Smoke Management Permit is required for each year's burning. Requirements and mitigation addressed within the permit and identified in the project burn plan must be met. The project burn plan and yearly smoke permit will be incorporated into the project file and will be available upon request.