UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

Southern Utah Support Area Fire Management Plan Environmental Assessment

UT-040-04-054

November 2005

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

ENVIRONMENTAL ASSESSMENT (EA) # UT – 040- 04 -054

Southern Utah Support Area Fire Management Plan EA

This unsigned FONSI and the attached EA #UT - 040- 04 -054 for the Southern Utah Support Area Fire Management Plan are available for public review and comment for 30 days beginning on January 17, 2006.

Based on the analysis of potential environmental impacts in the attached EA and consideration of the significance criteria in 40 CFR 1508.27, I have determined that with required and proposed protection measures the Southern Utah Support Area Fire Management Plan would not result in significant impacts on the human environment. An environmental impact statement (EIS) is not required.

The decision to approve or deny the Southern Utah Support Area Fire Management Plan, and if appropriate, a signed FONSI with rationale will be released after consideration of public comments and completion of the EA.

_____ _____

State Director Date

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Appendices

CHAPTER 1. PURPOSE AND NEED

1.1 INTRODUCTION

This Environmental Assessment (EA) documents results of an analysis of proposed changes to the current management of wildland fire and hazardous fuels for the Bureau of Land Management (BLM) Southern Utah Support Area (SUSA) planning area. Proposed revisions of the SUSA Fire Management Plan (FMP) serve as the Proposed Action for this EA. The revised FMP incorporates current planning requirements associated with fire management on public lands, including wildland fire suppression and fuel treatments. The EA analysis is designed to ensure compliance with National Environmental Policy Act (NEPA). It allows determinations to be made as to whether any "significant" impacts, as defined by the President's Council on Environmental Quality (CEQ) in Regulation 40 CFR 1508.27, could result from the analyzed actions.

An EA provides evidence for determining whether preparation of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) statement is necessary. A Decision Record (DR) that includes a FONSI statement is a document that briefly presents the reasons why implementation of the Proposed Action would not result in significant environmental impacts (effects) beyond those already addressed within other NEPA and BLM planning documents. If the decision-maker determines that this project would have significant impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a DR may be signed for the EA approving the alternative selected. In the present case, the DR would identify decisions associated with the FMP and would provide the language upon which future fire management planning and implementation actions could tier (as per 40 CFR 1502.20).

Issues identified for analysis within this EA are included as **Appendix A** (Interdisciplinary Team Analysis Record Checklist). This appendix includes the resource concerns identified in the EA, including those resources considered as Critical Elements of the Human Environment, and related issues derived from the BLM, affiliated agency resource reviews, and comments received during the public scoping process.

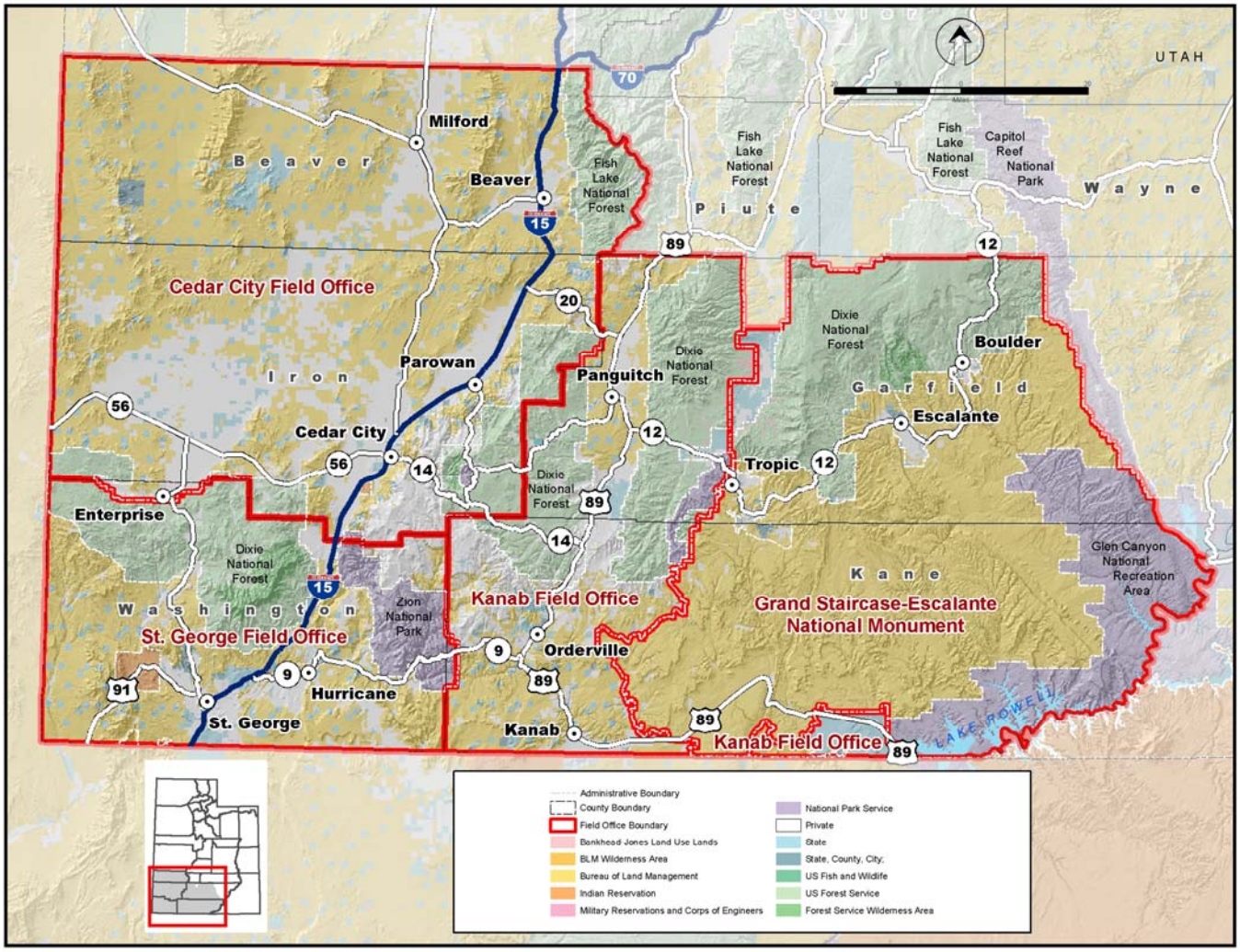
1.2 BACKGROUND

SUSA evaluated its current FMP and determined that an update was needed to comply with current federal fire management direction. Applicable federal fire management direction is outlined in *Federal Wildland Fire Management Policy and Program Review* (USDI and USDA 1995); *Review and Update of the 1995 Federal Wildland Fire Management Policy* (USDI and USDA 2001a); and *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy* (USDI and USDA 2001b). Additionally, the focus on hazardous fuel treatments called for by the National Fire Plan and Healthy Forests Restoration Act of 2003 were not known at the time the current FMP was written.

The planning area for the EA encompasses approximately 7.2 million acres of land owned and managed by various entities (e.g., federal, private, and state). BLM-administered lands within the SUSA planning area account for approximately 5.1 million of these acres. BLM lands in the SUSA planning area are administered by the Cedar City, Kanab, and St. George Field Offices, and Grand Staircase-Escalante National Monument (GSENM). **Figure 1.1** illustrates boundaries for SUSA.

Acreages presented in this EA are approximate due to slight variations in geographical information system data sets. The variations represent an insignificant quantity of land area and have a negligible effect on analyses of fire management action impacts.

FIGURE 1.1: SOUTHERN UTAH SUPPORT AREA



1.3 NEED FOR PROPOSED ACTION

National fire management policy has evolved in response to increased fatalities, property losses, local economic disruptions, risks to ecosystems associated with increasingly severe wildland fires, and increasing wildland urban interface (WUI) conflicts. National policy requires that federal fire management practices reflect protection of human life and safety and reduce risk to natural resources and private property. Revision of the FMP would result in fire management direction that is compliant with national and interagency direction.

Federal Wildland Fire Management Policy and Review (USDI and USDA 1995) and *Update of the 1995 Federal Wildland Fire Management Policy* (USDI and USDA 2001a) directed that FMPs be developed for all areas of burnable vegetation on federal lands. Management direction is further organized within the revised FMP through the use of land area subdivisions called fire management units (FMUs).

The revised FMP formally documents the fire management program and is based on existing management framework plans, resource management plans (RMPs), and the GSENM Management Plan, all of which are more broadly known as land use plans (LUPs). FMPs incorporate the broader LUP management direction and are the fire manager's primary guide for planning and implementing fire-related direction on the ground.

The revised FMP would result in a document that provides for clear fire management direction that is compliant with national and interagency direction. The revised FMP would further the ultimate goals of improving firefighter and public safety, reducing fuel loads, and maintaining the ecological functions of landscapes within the planning area.

The following underlying objectives drive the need to revise the SUSA planning area FMP:

- Protection of human life would be the prime suppression priority. Setting priorities among protecting human communities and community infrastructures, other property and improvements, and natural and cultural resources would be based on the values to be protected, human health and safety, and costs.
- A wide range of fire management actions would be used to achieve ecosystem sustainability.
- Hazardous fuels would be reduced.
- Ecosystems would be restored.
- Communities at risk would be protected.

1.4 PURPOSE OF THE PROPOSED ACTION

The Director of BLM's Office of Fire and Aviation has instructed all field offices to develop a new FMP or revise their existing FMP. The revised FMP should identify and integrate all federal wildland fire management guidance, direction, and activities required to implement national fire policy, fire management policy, and program direction from the following: *Federal Wildland Fire Management Policy and Program Review* (USDI and USDA 1995); the *Interagency Strategy for Implementation of Federal Wildland Fire Management Policy* (BLM 2003a); and *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-year Comprehensive Strategy* (USDI and USDA 2001b).

Ecosystems have evolved with, and adapted to, specific fire regimes. Control and suppression of wildfires have altered natural frequencies, sizes, intensities, and seasons of occurrence and have resulted in increased hazardous fuel loads, increases in understory and brush, and increases in stand density (Wright 1990, Covington and Moore 1994).

Two terms—fire regime and condition class—are used to describe natural fire processes and current departure from historic conditions. Fire regime is a description of natural fire return intervals associated with

vegetation cover types (a further description of fire regime can be found in the glossary in Chapter 6). Condition class is a description of vegetation conditions based on the change from natural fire regime, including effects of fire suppression (fuel loading and encroachment) and species invasion. There are three condition class categories:

- Condition Class 1: Within historical range for fire return interval and vegetation attributes.
- Condition Class 2: Moderately altered from historical range.
- Condition Class 3: Substantially altered from historical range and vegetation attributes.

Wildland fire, as a critical and necessary ecological process, must be maintained in natural systems. Where wildland fire cannot be safely reintroduced because unnaturally high fuel loads present high risk to human life or property (as in many WUI areas), some form of hazardous fuels reduction must be considered. The objective of fuels reduction is to attain desired wildland fire conditions (DWFC). The general DWFC is to have ecosystems that are at low risk of losing ecosystem components following wildfire and that function within their historical range.

Acreages presented in the description of the Proposed Action are based on achieving these goals and objectives.

1.5 CONFORMANCE WITH BLM LAND USE PLANS

The proposed FMP was determined to be in conformance with approved SUSA planning area LUPs (**Table 1.1)** as amended by USO-EA-04-01, "Utah LUP Amendment for Fire and Fuels Management EA." The Proposed Action would replace current FMP management goals, objectives, and management actions.

TABLE 1.1: SUSA LAND USE PLANS

Field Office	Land Use Plan	Year
Kanab		
	Paria Management Framework Plan (MFP)	1981
	Vermillion MFP	1981
	Zion MFP	1981
	Garfield portion of the Cedar Beaver Garfield Antimony Resource Management Plan (RMP)	1986
Cedar City		
	Cedar Beaver Garfield Antimony RMP	1986
	Pinyon MFP	1983
St. George		
	St. George RMP (formerly known as Dixie RMP)	1999
Grand Staircase-Escalante National Monument (GSENM)		
	Grand Staircase-Escalante National Monument (GSENM) RMP	
	Escalante MFP (Lands not included in the GSENM plan, but under Monument management.)	1999

1.6 RELATIONSHIP TO STATUTES, REGULATIONS, OR OTHER PLANS

This document was prepared in adherence to relevant BLM NEPA and CEQ guidance for the completion of an EA. CEQ regulations for implementing NEPA (40 CFR parts 1500-1508) detail the process of preparing NEPA documents, while the Federal Land Policy and Management Act of 1976 (FLPMA 43 USC 1711) regulates the BLM's planning process. As required by FLPMA and BLM policy, resource management planning must take into account the principles of multiple use and sustained yield.

In addition to meeting the goals, objectives and intent of BLM planning guidance, other applicable fire management goals, policy statements and specific fire management decisions addressed by the proposed action include:

- Federal Wildland Fire Management Policy (1995) and Review and Update of the Federal Wildland Fire Management Policy (2001)
- A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-year Comprehensive Strategy

In consideration of CEQ and BLM guidance and fire management requirements, the Proposed Action has been developed to also be in compliance with other applicable environmental laws, policies, and Executive Orders (EOs). These authorities include (but are not limited to) the Healthy Forests Restoration Act, Clean Air Act (CAA), Clean Water Act (CWA), Wild and Scenic Rivers Act (WSRA), Endangered Species Act (ESA), National Historic Preservation Act (NHPA), Archaeological Resource Protection Act (ARPA), Colorado River Basin Salinity Control Act, Utah's laws for air pollution, Utah BLM's Standards and Guidelines for Healthy Rangelands, Native American Trust Resource Policies, EO 11514 (Protection and Enhancement of Environmental Quality), EO 11593 (Protection and Enhancement of the Cultural Environment), EO 11988 (Management of Floodplains), EO 11990 (Management of Riparian and Wetlands), EO 12866 (Regulatory Planning and Review), EO 12898 (Consideration of Environmental Justice Issues), EO 13112 (Management of Invasive Species), and EO 13186 (Management of Migratory Birds). Specific land management and wildland fire management policies are shown in **Appendix B**.

The Proposed Action would be consistent with adjacent federal land agency, State of Utah and affiliated Native American tribal planning. These other planning efforts include the State of Utah Natural Hazard Mitigation Plan (Utah Department of Public Safety 2004) and ongoing local government planning. If inconsistencies are identified, the BLM would consider adjustments to fire and/or fuel treatments during project-specific planning through coordination with adjacent entities. Resources managed by other federal, state, and tribal agencies were also taken into consideration during the development of resource protection measures (RPMs) within the Proposed Action.

1.7 IDENTIFICATION OF ISSUES

The proposed FMP would not conflict with other resource goals and objectives in the existing LUPs. However, the potential for impacts on resources raises issues that are addressed by this EA. **Appendix A** presents the issues that were identified. These issues influenced the development of the Proposed Action. Resources that are either not present within the planning area or would not be affected by the Proposed Action are identified in **Appendix A** and are not included for analyses in this document. This section presents a summary of potentially affected resource issues.

1.7.1 ISSUES IDENTIFIED FOR ANALYSIS

Air Quality

- Potential short-term air quality impacts related to wildland fire and use of prescribed fire for hazard fuels reductions.

Areas of Critical Environmental Concern

- Impacts on the values the ACECs were designated to address as important and relevant. Relevance and importance values include values such as cultural, scenic, vegetation, threatened and endangered species, fisheries, etc.

Cultural Resources

- Impacts resulting from fire management strategies, including wildland fire suppression, prescribed fire, mechanical treatments, and rehabilitation activities that could adversely affect the eligibility characteristics of properties that are listed or eligible for listing to the National Register of Historic Places (NRHP) ("historic properties").

Environmental Justice

- Wildland fires, as well as fire and non-fire hazard fuels reduction proposals, when considered cumulatively with similar actions proposed on the Dixie National Forest and on adjacent public lands outside this planning unit, have the potential to substantially reduce regional pinyon and juniper woodland and opportunities for pinyon nut harvesting in the St. George field office.

Invasive, Non-native Species

- Potential for increased infestation/introduction of invasive and non-native species following wildland fires and fire and non-fire hazard fuels reduction projects.

- Potential human health and safety issues, property, and resource destruction due to flammability of invasive and non-native species. Tamarisk along river and stream channels in WUI zones of St. George field office represent a serious fire hazard that put the above resources at risk of high-heat, rapid-spread fires.

Native American Religious Concerns

- Potential impacts on sacred/ceremonial use sites from fire suppression actions and/or hazard fuels reduction projects.

Threatened, Endangered, or Candidate Plant Species

- Impacts on listed/candidate plant species from fire management actions.

Threatened, Endangered, or Candidate Animal Species

- Impacts on listed/candidate animal species and potential/occupied habitat.

Water Quality

- Impacts on groundwater quality not anticipated under the Proposed Action or alternatives, since natural filtering processes of the aquifer would adequately protect water quality.

- Short-term impacts on drinking water could result from non-fire fuel treatments, prescribed fires, and unplanned ignitions that remove protective vegetation cover.

Wetlands and Riparian Zones

- Impacts on riparian zone resources, including vegetation, soils, and bank morphology, from fire suppression actions or fire and non-fire hazard fuels reduction projects.

Wild and Scenic Rivers

- Impacts on outstanding remarkable values.

Wilderness Study Areas

- Impacts on naturalness, opportunities for solitude, and opportunities for primitive recreation of the wilderness study area (WSA).

Livestock Grazing

- Impacts on grazing allotment resources, livestock, and licensed operators as a result of wildland fires, fire suppression tactics, and fire and non-fire hazard fuels reduction projects.

Woodlands and Forestry

- Wildland fires, as well as fire and non-fire fuels reduction projects, have the potential to destroy or reduce the availability of forest-related products (including fuel wood, juniper posts, pine nuts, Christmas trees, etc.).

- Effects of fire suppression and prescriptive fire actions on aspen regeneration.

Vegetation Including Special Status Plant Species

- Potential for impacts on plant communities (including special status species [SSS]) as a result of fire, fire-suppression tactics, and hazard fuels reduction projects.

Fish and Wildlife Including Special Status Species

- Impacts on fish and wildlife species (including SSS) and potential/occupied habitat.

Soils

- Impact to soils related to wildland fire, fire suppression tactics, fire and non-fire hazard fuels reduction projects (erosion/sedimentation, infiltration/runoff, and compaction and sterilization of the soil).

Recreation

- Impacts on developed recreation sites and facilities.

Fire and Fuels Management

- Fire and fuels management considerations form the basis for the Proposed Action. Therefore, fire and fuels management impacts are considered and addressed in full in this EA. The objective of the FMP is to provide management direction for this resource, in consideration of other resources. As such, there is no separate section in Chapters 3 and 4 for this resource.

Socioeconomics

- Impacts on socioeconomics.

Wild Horses and Burros

- Impacts on wild horse and burro herds and herd management areas (HMAs).

Wilderness Characteristics

- Short-term impacts on the naturalness, opportunity for solitude, opportunity for primitive recreation, and any supplemental values.

CHAPTER 2. DESCRIPTION OF ALTERNATIVES

2.1 INTRODUCTION

This chapter describes and compares the Proposed Action and No Action Alternatives and address alternatives considered but dismissed. The Proposed Action complies with federal wildland fire management policy. The No Action Alternative represents current fire management direction as directed in the 1998 Southern Utah Support Center Fire Management Activity Plan (BLM 1998a).

SUSA planning area boundaries are identical for both alternatives; however the planning area is divided into 26 FMUs in the Proposed Action and four fire management zones (FMZs) with further subdivisions in the No Action Alternative. In the Proposed Action, FMUs are delineated by management objectives and constraints, topographic features, access, values to be protected, political boundaries, fuel types, fire regime condition class (FRCC), and other distinguishing characteristics. In the No Action Alternative, the four FMZs are based on vegetation type with further subdivisions based on historic fire occurrence and resources to be protected.

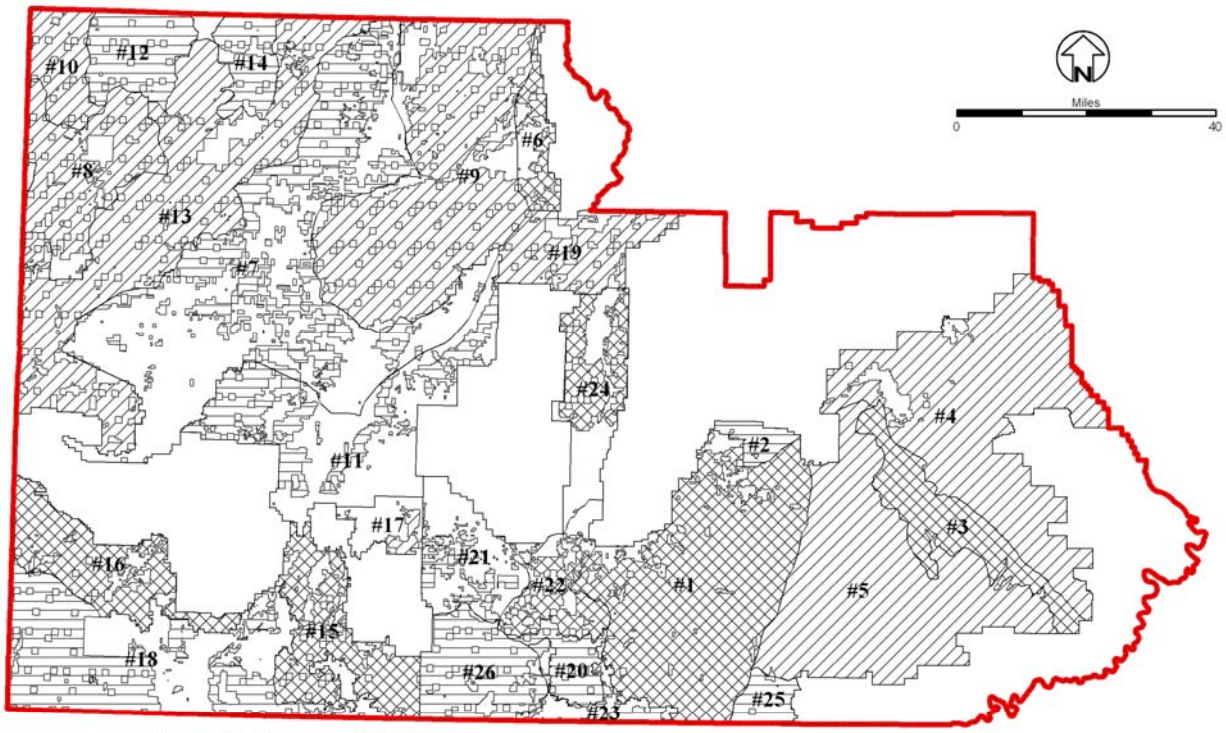
The difference in fire management subdivision boundaries and wildland fire suppression management approaches and goals does not permit a direct comparative analysis of the two alternatives in Chapter 4. However, comparative analysis of planned actions such as prescribed fire and non-fire fuel treatments can be made.

The No Action Alternative places land areas into categories (A, B, C, or D) that define wildland fire suppression goals for that area. **Appendix C** presents a definition for each of the No Action Alternative categories. The Proposed Action utilizes three category types that define vegetation treatment goals and the role fire would have in those land areas. The categories are named and based around suppression, resource objectives, and natural fire response emphases. The following section describes the Proposed Action categories in greater detail.

2.2 PROPOSED ACTION

Twenty-six FMUs that make up the planning area for the Proposed Action are presented in **Figure 2.1**. In order to more clearly compare the Proposed Action with the No Action Alternative, **Figure 2.1** also shows the planning area broken into the three fire management categories; 1) Suppression Emphasis, 2) Resource Objective Emphasis, and 3) Natural Fire Emphasis. Overall goals are discussed in Section 2.2.1. The application of fire management categories is described in Section 2.2.2, and RPMs are discussed in Section 2.2.3. **Appendix D** presents a description of the fire management actions that are available to the Proposed Action. **Appendix E** presents fire suppression, fire use, prescribed fire, non-fire fuels, and vegetation treatment acreage goals and objectives for FMUs.

FIGURE 2.1: FIRE MANAGEMENT OBJECTIVES AND FIRE MANAGEMENT UNITS FOR THE PROPOSED ACTION



ID #	Fire Management Unit
#1	Big Deer
#2	The Blues
#3	Collett/Fiftymile Mountain
#4	Escalante-Circle Cliffs
#5	Kaiparowits
#6	Beaver
#7	Escalante Desert
#8	Hamblin Valley
#9	Mineral-Black Mountain
#10	Mountain Home
#11	Parowan Front/Antelope Range
#12	Pine Valley
#13	Wah Wah Needles

ID #	Fire Management Unit
#14	Wah Wah Valley
#15	Colorado Plateau
#16	Great Basin
#17	Kolob
#18	Mohave Desert
#19	Buckskin/Dog Valley
#20	East Sands
#21	East Zion North Fork
#22	Glendale Bench
#23	Kanab-Johnson Canyon
#24	Panguitch
#25	Paria
#26	West Sands

CATEGORY

Natural Fire Response Category

Resource Objectives Emphasis Category

Suppression Emphasis Category

Note: Categories are depicted on BLM-Administered lands

2.2.1 OVERALL GOALS

The Proposed Action emphasizes strategic fire management planning that integrates resource management goals, objectives, and concerns with fire management activities. Overall criteria for development of the Proposed Action are:

- Provide for firefighter and public safety.
- Work collaboratively with communities at risk within the WUI to develop plans for risk reduction.
- Allow fire to function in its ecological role when appropriate for the site and situation to help protect, maintain, and enhance resources.
- Create an integrated approach to fire and resource management across the landscape and agency boundaries.
- Provide a program that fosters interagency interaction, cooperation, and effectiveness for all fire management activities.
- Fire management actions would take into consideration ecosystem or resource benefits and values to be protected.

2.2.2 FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION

This section outlines land areas where the preceding management actions would be appropriate and the corresponding vegetation treatment goals. SUSA is divided into three fire management categories based on the role fire would play in those areas.

- *Suppression Emphasis Category FMUs (appx. 1,200,000 acres):* These FMUs emphasize fire suppression to protect important resources. Resource improvements may be accomplished using wildfire, prescribed fire and non-fire treatments for pinyon and juniper woodland, juniper, and sagebrush on a smaller scale compared to the other FMU categories. Treatment acres by vegetation type are shown in **Table 2.1.** Treatments would convert pinyon and juniper woodland and juniper vegetation communities to sagebrush and grass plant communities. Sagebrush treatment would create a diversity of age classes within the sagebrush plant community. Resource objectives would be met by improvement of habitat for deer, sage grouse, and other species including SSS.

TABLE 2.1: SUPPRESSION EMPHASIS CATEGORY TREATMENT ACRES BY FIRE MANAGEMENT UNIT

Fire Management Unit	Pinyon and Juniper Woodland	Juniper	Sagebrush	Pinyon	*Other
East Sands	558	6,597	2,062		
East Zion-North Fork	1,000	2,000			
Escalante Desert		500	1,500		
Kanab-Johnson Canyon		2,437	564		
Mohave Desert					1,000
Paria					
Parowan Front-Antelope Range					
Pine Valley			1,000		
The Blues					
Wah Wah Valley			1,000		
West Sands	2,000		2,000		1,000
TOTAL	**3,558**	**11,534**	**8,126**	**0**	**2,000**

*Other: Non-fire fuel treatments are prescribed in the Mohave Desert FMU to reduce or eradicate salt cedar, an invasive plant species that encroaches in riparian areas. In the West Sands FMU, non-fire fuel treatments are proposed to reduce competition of woody species with ponderosa pine.

Fire management actions would include full suppression, mechanical non-fire fuel treatments, and prescribed fire. Because of the suppression emphasis, the appropriate management response (AMR) would be applied to generally keep fire sizes small and fire would not play a large role in resource enhancement. Wildland fire use is not allowed.

- *Resources Objectives Emphasis Category FMUs (appx.1,300,000 acres):* Large acreages of pinyon and juniper woodland, juniper, and sagebrush are targeted for improvements using fire management. However, these FMUs have areas where suppression is critical in order to protect communities and private property, and protect sensitive natural resources. Treatment acres by vegetation type are shown in **Table 2.2**. Treatments would convert pinyon and juniper woodland and juniper vegetation communities to sagebrush and grass plant communities. Sagebrush treatment would create a diversity of age classes within the sagebrush plant community. Resource objectives would be met by improvement of habitat for deer, sage grouse, and other species, including SSS.

TABLE 2.2: RESOURCE OBJECTIVES EMPHASIS CATEGORY TREATMENT ACRES BY FIRE MANAGEMENT UNIT

Fire Management Unit	Pinyon and Juniper Woodland	Juniper	Sagebrush	Pinyon	*Other
Beaver	9,000	2,000	1,000		
Big Deer	50,000	25,000	20,000		
Collett-Fifty Mile Mountain					100
Colorado Plateau		42,000			1,000
Glendale Bench	15,000	5,000	2,030		
Great Basin	292	24,778			3,000
Panguitch	10,000		800	5,000	
TOTAL	**84,292**	**98,778**	**23,830**	**5,000**	**4,100**

*Other: Within the Colorado Plateau FMU, selected areas (1,000 acres) of salt cedar (tamarisk) would be controlled or eradicated. In the Great Basin FMU, 3,000 acres of mountain shrub and oak would be converted to forbs and grass. Non-fire fuel treatments would be used to accomplish this objective. In the Collett-Fiftymile Mountain FMU, 100 acres are proposed for hand-cutting for regeneration of aspen patches.

Fire management actions would include full suppression within some target plant communities, non-fire fuel treatments, and prescribed fire. Using acreage limitations prescribed by the FMU, AMR is used to accomplish vegetation conversion using natural fire ignitions. The AMR allows fires from 100 to 3,000 acres depending on the FMU. Within FMUs in this category wildland fire use is not allowed.

- *Natural Fire Emphasis Category FMUs (appx.2,600,000 acres):* These FMUs contain areas where vegetation conversion and fuel reduction on larger acreages are important considerations. There are 2.6 million acres of public land in this category. Treatment acres by vegetation type are shown in **Table 2.3.** While there are sensitive resources and other values requiring suppression, there are fewer constraints to bringing back the role of fire into these systems.

TABLE 2.3: NATURAL FIRE EMPHASIS CATEGORY TREATMENT ACRES BY FIRE MANAGEMENT UNIT

Fire Management Unit	Pinyon and Juniper Woodland	Juniper	Sagebrush	Pinyon	*Other
Buckskin-Dog Valley	30,000		1,000	1,000	400
Escalante-Circle Cliffs	20,000	20,000			
Hamblin Valley	12,300	5,000	5,000	5,000	
Kaiparowits	20,000	15,000			
Kolob	1,000				
Mineral Range-Black Mountain	54,000	5,000	20,000	5,000	
Mountain Home	12,000	250		1,000	
Wah Wah-Needles	25,000	19,000	700	2,400	
TOTAL	**174,300**	**64,250**	**26,700**	**14,400**	**400**

*Other: In the Buckskin-Dog Valley FMU, non-fire fuel treatments and prescribed burns (400 acres) are proposed for the mountain fir community to promote aspen regeneration.

Treatments would convert portions of pinyon, pinyon and juniper woodland, and juniper vegetation communities to more ecologically open and diverse woodlands, sagebrush and grass plant communities. Sagebrush treatment would create a diversity of age classes within the sagebrush plant community. Resource objectives would be met by improvement of habitat for deer, sage grouse and other species including SSS.

Fire management actions would include full suppression within some target plant communities, non-fire fuel treatments, and prescribed fire. Using acreage limitations prescribed by FMU, AMR is used to accomplish vegetation conversion using natural fire ignitions. The AMR allows fires from 250 to 5,000 acres, depending on the FMU.

Wildland fire use is available as a fuels reduction/resource enhancement tool on the Kolob, Mountain Home, and Wah Wah Needles FMUs as long as values are not threatened and resource objectives are being met.

2.2.3 RESOURCE PROTECTION MEASURES

The Proposed Action potentially could adversely impact other resources. To prevent such impacts, protective measures have been incorporated into the Proposed Action by FMU as presented as **Appendix F**.

2.3 NO ACTION ALTERNATIVE

The SUSA 1998 FMP (1998a) comprises the No Action Alternative. This existing direction emphasizes fire prevention and protection of habitat for threatened and endangered species such as the desert tortoise and the Utah prairie dog. As a result, large areas in the western part of the district would be aggressively suppressed. Resource areas within the plan contain broad objectives and constraints for fire management

that often do not indicate acreage goals. **Figure 2.2** illustrates fire management objectives for the No Action Alternative on BLM-administered land.

Although the No Action Alternative has three of the same criteria as the Proposed Action—protection of life, protection of resources, and cost efficiency—it is not focused on hazardous fuel treatment and does not specifically mention wildland fire use. DWFC, FRCC, and rehabilitation and stabilization measures are also not mentioned in the No Action Alternative. Continuation of the existing direction would be out of compliance with federal and state regulations because the plan does not include all aspects of the fire management program as directed by current policy. In addition, the goals and strategies of the No Action Alternative would be inconsistent with those included in other FMPs in effect throughout Utah.

The goals, objectives, and target acres for fire management direction in the No Action Alternative are summarized in **Table 2.5.** The No Action Alternative was written in a different format, with different organization of content, than the Proposed Action, so direct comparisons are not possible. However, where planning area-wide elements common to both alternatives, such as the role and applicability of wildland fire in consideration of other resources as well as other fire and non-fire fuels treatment methods are evident, they are compared.

2.3.1 RESOURCE PROTECTION MEASURES

The No Action Alternative contains protective measures that would be implemented to reduce or eliminate the potential for resource impacts. The protective measures are shown by FMU as presented in **Appendix F**.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

Two additional fire management alternatives—the Historical Fire Alternative and the Non-fire Treatment Alternative—were considered, but were eliminated from formal analysis because they either did not meet policy guidelines or they were not ecologically or fiscally practical. The two dismissed alternatives are described below.

2.4.1 HISTORICAL FIRE ALTERNATIVE

The Historical Fire Alternative was considered but eliminated from formal analysis because it would not be ecologically or fiscally feasible. This alternative could be considered the Historical Fire Alternative as it would set treatment targets that mimic acres burned historically, while considering the restoration of natural fire regime. These acres were determined from simple vegetation and fire return interval analysis (**Table 2.4**). The primary distinctions between this alternative and the Proposed Action are the differences in treatment acres and differences in treatment types to achieve DWFC. This alternative would include larger treatment acres than the Proposed Action and only fire treatments would be employed.

The premise on which development of this alternative was based is that restoration of the natural fire regime is desirable and attainable. This premise is faulty in that, as a result of past management and the extent of anthropogenic ecosystem alteration, natural conditions no longer occur in the SUSA planning area. While it is known that there have been large vegetation alterations since historical times, the extent or severity of most of these alterations remains uncertain. As a result of ecosystem change, passive restoration techniques, such as restoring naturally occurring fires to the land, would not have the same benefit to ecosystems as in the past. For example, large portions of Utah are affected by the invasion of non-native weedy species. Without active restoration techniques (such as seeding), fires dramatically increase the risk of establishment of invasive species. Establishment of invasive species often results in the permanent loss of historical ecosystem structure and function.

Finally, the Historical Fire Alternative is unlikely to be adequately funded. Despite increases in fire management funding over the past five years, current and expected budgets for implementing fire management actions do not provide the necessary resources for accomplishing the identified treatment acres. Another reason this alternative is infeasible is because the BLM manages scattered parcels of land in many areas, allowing fires to burn in these multiple-ownership areas would increase risk to private and state lands.

TABLE 2.4: HISTORICAL ACRES BURNED

Land Use Plan	Historical Target Acres Burned (15-yr cumulative)
Kanab	
Paria MFP	9,900
Vermilion MFP	78,585
Zion MFP	47,085
Cedar City	
Cedar Beaver Garfield Antimony RMP	406,065
Pinyon MFP	475,380
St. George	
St. George RMP	144,825
Grand Staircase-Escalante National Monument (GSENM)	
Grand Staircase-Escalante National Monument (GSENM) RMP	589,005
Total	1,762,080

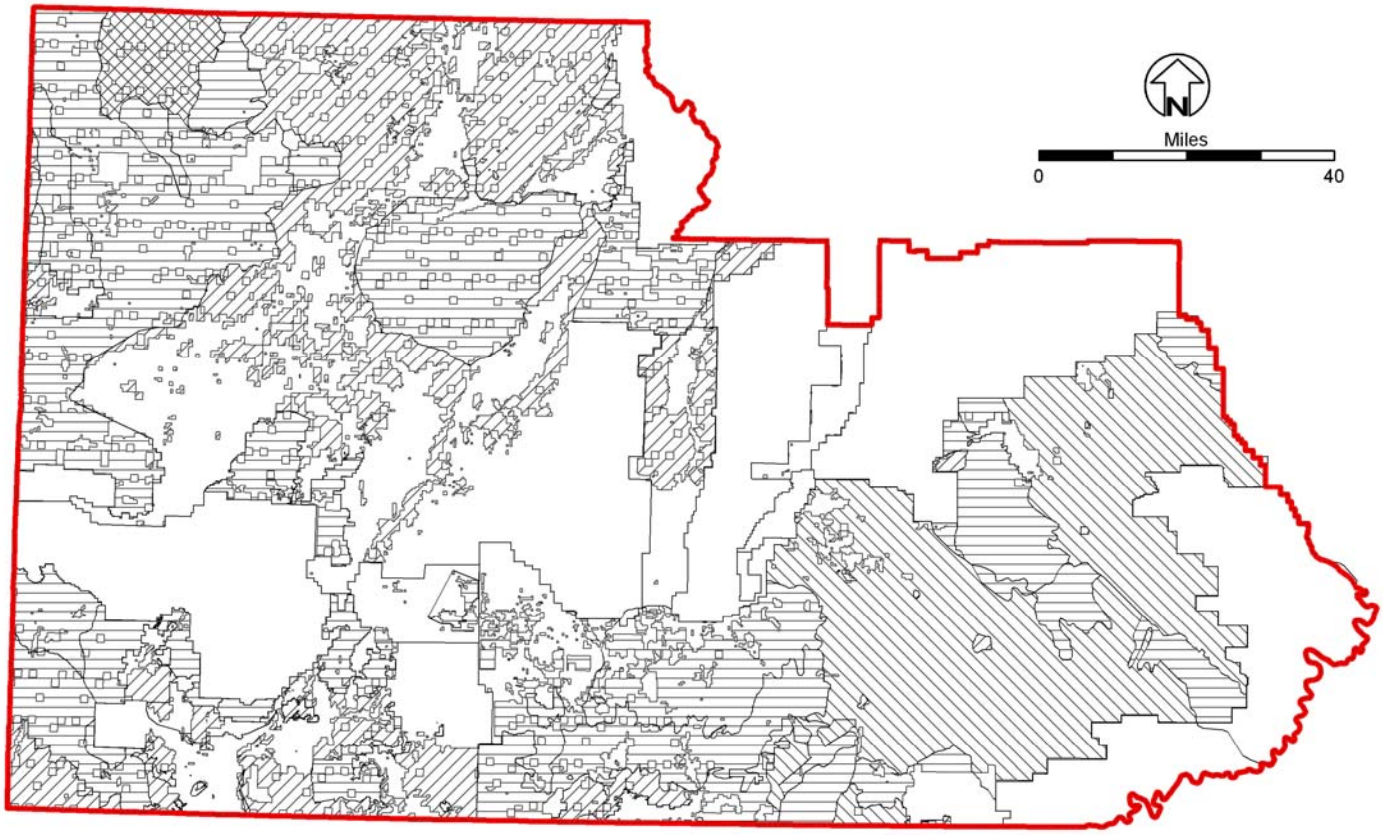
2.4.2 NON-FIRE TREATMENT ALTERNATIVE

Another alternative considered would have prioritized non-fire fuel treatments above other types of treatments. However, this alternative did not meet the Purpose and Need of the amendment and was therefore eliminated from further analysis. Federal wildland fire policy directs that fire be restored as a natural part of the ecosystem.

2.5 CONCLUSION

The alternative selected by the BLM must address potential impacts to resources within the planning area. The selected alternative would determine the tools available to manage wildland fire, hazardous fuels, and ecosystem restoration. In implementing the selected alternative, agency personnel would work collaboratively with other federal agencies, state government, county governments, tribal governments, and other interested user groups. It is acknowledged that environmental conditions are inherently variable. Fire managers would take such variability into consideration when implementing FMPs. The selected alternative would emerge as one part of an adaptive management strategy that continually evaluates and refines management strategies as new information and understanding develops.

FIGURE 2.2: FIRE MANAGEMENT OBJECTIVES FOR THE NO ACTION ALTERNATIVE



CATEGORY

- Category A - Fire is not desired at all
- Category B - Unplanned wildfire will likely cause negative effects
- Category C - Wildfire is desirable to manage ecosystems
- Category D - Wildfire is desired and there are few constraints

Note: Categories are depicted on BLM-Administered lands

TABLE 2.5: COMPARISON OF THE EXISTING DIRECTION AND THE PROPOSED ACTION

	Proposed Action	No Action Alternative
Overall Goals	Provide for firefighter and public safety. Work collaboratively with communities at risk within the wildland urban interface to develop plans for risk reduction. Allow fire to function in its ecological role when appropriate for the site and situation to help protect, maintain, and enhance public resources. Create an integrated approach to fire and resource management across the landscape and agency boundaries. This approach would be designed to meet the desired outcomes of land and resource management plans. Provide a program that fosters interagency interaction, cooperation, and effectiveness for all fire management activities.	Provide for firefighter and public safety. Hold suppression expenditures to a level commensurate with values protected, manage fire as a part of the ecosystem, and do this safely and effectively. Manage fires in accordance with current land use management plans. Suppress fires fully when power lines, fences, and other human-made structures of value are threatened in areas not otherwise identified as full suppression areas. This level of suppression would also be taken when constraints require action to prevent unacceptable resource damage or other undesirable conditions. Threatened and endangered animal and plant habitats require aggressive suppression of fires.
Organization of Alternatives	The Proposed Action divides the planning area into 26 fire management units (FMUs). FMUs are based on management objectives and constraints, topographic features, access, values to be protected, political boundaries, fuel types, fire regime condition class, and other distinguishing characteristics. The Proposed Action has placed FMUs into one of three fire management emphasis categories. The approximate acres in the planning area for each category are indicated in parenthesis. ▪ *Suppression Emphasis Category*: Wildland fire would be suppressed with non-fire treatments and prescribed fire treatments being performed at desirable locations. Wildland fire use would not be allowed. (1.2 million acres) ▪ *Resource Objective Emphasis Category*: Vegetation conversion using appropriate management response (AMR) on wildland fires, non-fire treatments and prescribed fire treatments would be performed. Wildland fire use would not be allowed. (1.3 million acres) ▪ *Natural Fire Emphasis Category*: The highest acreages of potential vegetation conversion are in this category. Fire management would include AMR on wildland fires, wildland fire use, non-fire fuel treatments, and prescribed fire (2.6 million acres).	The No Action Alternative divides the planning area into four fire management zones (FMZs) with further subdivisions. The four FMZs are based on vegetation type with further subdivisions based on historic fire occurrence and resources to be protected. The No Action Alternative has divided the planning area into one of four categories related to the suitability of fire. The approximate acres in the planning area for each category are indicated in parenthesis. ▪ *Category A*: Fire is not desired at all. (1.2 million acres) ▪ *Category B/C*: Fire is allowed but the amount of wildland fire suppression is dependent on site-specific values at risk. Constraints are applied on a case-by-case basis to wildland fire suppression and many areas may require mitigation measures be implemented for planned actions. (2.6 million acres) ▪ *Category D*: Fire is desired. Unplanned wildfire, planned prescribed fire, and non-fire fuel treatments may be used to achieve desired objectives. (1.28 million acres)

	Proposed Action	No Action Alternative
Wildland Fire Suppression	Goals are established by acres, per vegetation and fire incident (and decadal). Suppression would occur on fires from 0 to 5,000 acres in order to reach the objectives of each FMU.	Goals are: ▪ Fire would be allowed to play its natural role in the wilderness ▪ Utilize full suppression actions ▪ Contain fires to established acreage goals Total suppression goals for the planning area (when stated) are 7,100 acres a year and 2,200 acres an incident
Wildland Fire Use	6,500 acres in a ten-year period.	In certain resource areas, wildfire would be allowed to run its course unless human life, property, or critical values are at risk. Wildland fire use is not explicitly allowed.
Prescribed Fire and Non-fire fuel treatments	Prescribed fire may be applied on up to 360,970 acres and non-fire fuel treatments may be applied on up to 353,520 acres in a ten-year period.	Prescribed fire and non-fire fuel treatment objectives may apply to 10,000 acres to 20,000 acres per year.

CHAPTER 3. AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter includes a description of the environment and resources potentially to be affected by the alternatives described in Chapter 2 and **Appendices C**, **D**, **E**, and **F**. It provides the environmental resource baseline information for comparing potential impacts from the Proposed Action and No Action Alternative, which are analyzed in Chapter 4.

Resources that were identified and carried forward for analysis in this planning effort and those dismissed from further analysis are addressed in **Appendix A**. It was determined that the following resources would not be affected by the Proposed Action or No Action Alternative: farmlands (prime or unique), floodplains, wastes (hazardous or solid), rangeland health standards and guidelines, visual resource management, geology, mineral resources, paleontology, wilderness, and lands and access. No further analysis of these resources will be included in this EA.

3.2 GENERAL SETTING

The SUSA FMP planning area is located within portions of the Basin and Range and Colorado Plateau physiographic provinces of the western United States. Elevations in the planning area range from 2,400 to over 11,500 feet above mean sea level. Most of the planning area is between 2,500 to 6,000 feet above sea level.

Climatic zones throughout the region are classified under three climate types: desert, steppe, and undifferentiated highlands. Each has distinct weather patterns, temperatures, and precipitation patterns (Pope and Brough 1996). Elevation, topography, location with respect to storm paths over the region and proximity to mountain ranges help create the climate types (Garwood 1996). Precipitation varies from an average of less than 10 inches to more than 35 inches per year.

The planning area is comprised of approximately 5.1 million acres of BLM-administered lands, which represents approximately nine percent of all lands in Utah and 22 percent of BLM-administered land in Utah.

3.3 CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT AND OTHER RESOURCES BROUGHT FORWARD FOR ANALYSIS

3.3.1 AIR QUALITY

An activity that impacts air quality has the potential to also affect the air quality of the airshed where the activity is conducted, as well as potentially impacting other areas. "Airshed" is defined as a geographic area, usually with distinct topographic features such as a valley, associated with a given air supply. Six airsheds have been identified within the SUSA planning area (including Utah Airshed 16, which is located at elevations greater than 6,500 feet above sea level throughout the state). Airsheds are shared with adjacent planning areas and states.

The U.S. Environmental Protection Agency (EPA) air quality permitting system suggests that the analysis of air impacts should consider all areas within 100 kilometers (62.1 miles) of proposed projects within a planning area that may affect air quality (EPA 1992). To be consistent with this directive, the area of consideration for air quality impacts includes airsheds over lands within the planning area as well as lands within a 100-kilometer radius of the planning area. **Figure 3.1** presents a map of the planning area and identifies areas sensitive to air quality located within the area of consideration.

Air Quality Standards

Air quality within the planning area is governed by federal laws, which EPA has given Utah the authority to administer. The framework for the Utah air quality program is based on the federal CAA of 1970, as amended. Air quality within Utah is regulated by the Utah Division of Air Quality (UDAQ) within the Utah Department of Environmental Quality (UDEQ). Administrative rules governing air quality are found in the Utah Administrative Code R307, including emissions standards for general burning (R307-202), smoke management (R307-204), fugitive emissions, and fugitive dust (R307-205).

National Ambient Air Quality Standards (NAAQS) are defined in the CAA as levels of pollutants high enough to have detrimental effects on human health and welfare. The EPA established NAAQS for six criteria pollutants: carbon monoxide (CO), nitrogen dioxide, ozone (O_3), lead, sulfur dioxide, and categories of particulate matter (fine particulates with an aerodynamic diameter of 10 micrometers or less [PM_{10}] and fine particulates with an aerodynamic diameter of 2.5 micrometers or less [$PM_{2.5}$]. Particulate emissions are the primary NAAQS concern with respect to fire. When an area exceeds an ambient air quality standard, it may be designated as a non-attainment area (NAA). It is possible for a geographic area to be an attainment area for one criteria pollutant and a NAA for another.

Another provision of the CAA is the Prevention of Significant Deterioration. There are different permissible increments for criteria pollutant emissions for different areas (termed "classes"). Class I areas include: a) international parks, b) national wilderness areas that exceed 5,000 acres, c) national memorial parks that exceed 5,000 acres, d) national parks that exceed 6,000 acres, and e) national wildlife refuges and national Wild and Scenic Rivers that exceed 10,000 acres. All other areas have been designated as Class II. There are no Class III areas in Utah.

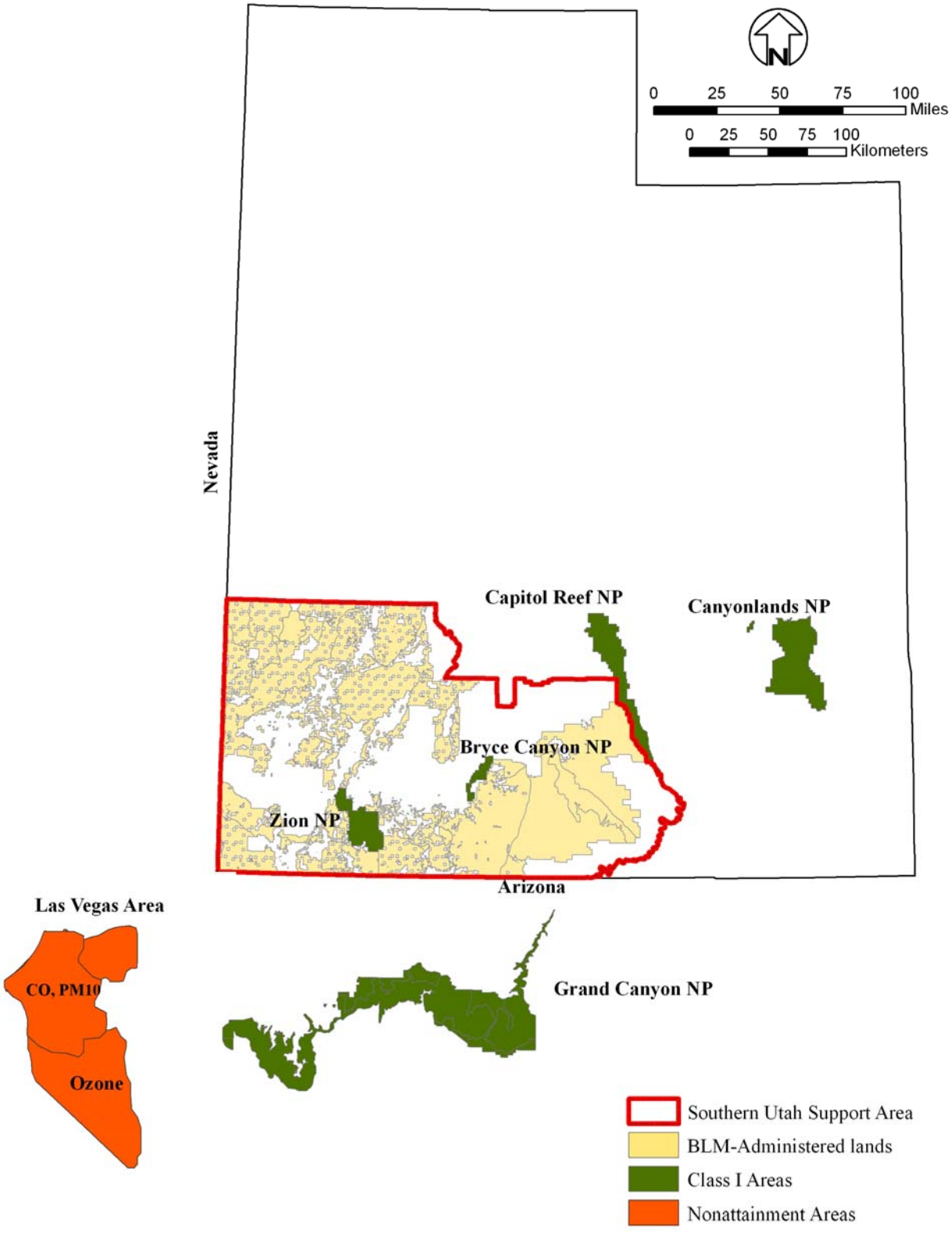
Class I areas are the most protected, having the least allowable degradation of air quality. The 1999 Regional Haze Rule calls for states to establish goals and emission reduction strategies for improving visibility in all mandatory Class I area national parks and wilderness areas. Utah's Regional Haze State Implementation Plan (SIP) has been adopted as Section Twenty of the State's existing SIP (UDAQ 2004a).

In cooperation with other federal land managers, states, and tribes, EPA issued the Interim Air Quality Policy on Wildland and Prescribed Fires (EPA 1998). One of the goals of the policy is to allow fire to function as a disturbance process on federally managed wildlands while protecting public health and welfare. The National Wildland Coordination Group has also published additional guidance for air quality management related to fire in the *Smoke Management Guide for Prescribed and Wildland Fire* (NWCG 2001a).

Smoke emissions resulting from prescribed burning projects or treatments within the planning area are managed in compliance with guidelines found in the Utah Smoke Management Plan (SMP) and Utah Interagency Smoke Management Program. The purpose of this program and the SMP is to ensure that mitigation measures are taken to reduce impacts on public health, safety, and visibility from wildland fire, wildland fire use, and prescribed fire. Utah submitted the SMP to the EPA in 1999 and received certification under the Interim Air Quality Policy on Wildland and Prescribed Fires (Utah Interagency Smoke Management 2000).

Compliance with the SMP is the primary mechanism for land managers to implement wildland fire use and prescribed burns while ensuring compliance with the CAA. Burn plans written under this program include actions to minimize fire emissions, exposure reduction procedures, a smoke dispersion evaluation, and an air quality monitoring plan. Proposed burns are reviewed on a daily basis, and burns are approved or denied based on current climatic and air quality conditions.

FIGURE 3.1: NON-ATTAINMENT AND CLASS I AREAS WITHIN A HUNDRED KILOMETERS OF THE SOUTHERN UTAH SUPPORT AREA



Air Quality Class I Areas

There are two mandatory Class I visibility areas contained within the SUSA planning area (EPA 2002): Bryce Canyon National Park and Zion National Park. There are also three Class I areas (Capital Reef Canyon National Park, Canyonlands National Park, and Grand Canyon National Park) located within the 100-kilometer area of consideration (**Figure 3.1**). All FMUs within the planning area, except the Mountain Home and Pine Valley FMUs, are partially or completely located within the 100-kilometer radius of a Class I area.

Sensitive Areas

Other areas that have been identified as sensitive to air quality include locations such as NAAs, hospitals, airports, major transportation corridors, and population centers. No NAAs have been designated within the planning area, however the Las Vegas area CO, O_3 and PM_{10} NAAs are located within 100-kilometers of the Mohave Desert FMU (**Figure 3.1**).

Several major transportation corridors run through the planning area and the area of consideration, including U.S. Interstate 15, U.S. Interstate 70, and numerous U.S. highways.

Numerous airports are located throughout the SUSA planning area and surrounding area of consideration, including 10 airports registered with the Federal Aviation Administration (Beaver, Bryce Canyon, Cedar City, Escalante, Hurricane, Kanab, Milford, Panguitch, Parowan, and St. George). Hospitals and medical centers are located in larger population centers.

3.3.2 AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Figure 3.2 identifies the ACECs within the planning area. **Table 3.1** lists ACECs totaling approximately 155,800 acres located on BLM-administered lands within the planning area.

BLM regulations (43 CFR Part 1610) define an ACEC as an area where "special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources or other natural systems or processes; or to protect life and safety from natural hazards."

FIGURE 3.2: AREAS OF CRITICAL ENVIRONMENTAL CONCERN

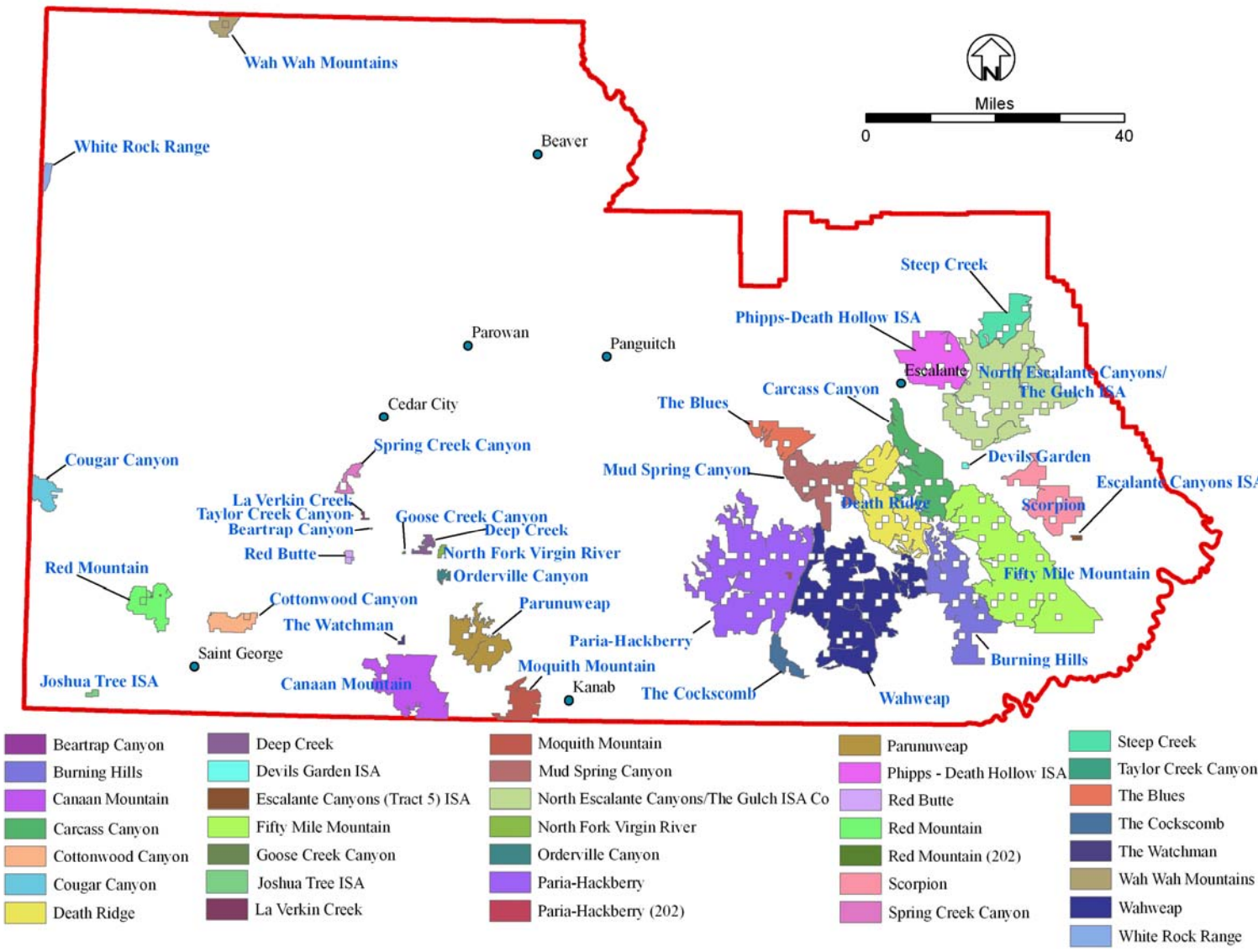


TABLE 3.1: AREAS OF CRITICAL ENVIRONMENTAL CONCERN

ACEC NAME	APPROXIMATE ACREAGE	RELEVANT AND IMPORTANT VALUES
St. George Field Office		
Beaver Dam Slope	48,516	Desert Tortoise, Desert Ecosystem
Canaan Mountain	33,941	Scenic, Cultural
Little Creek Mountain	19,302	Archaeological
Lower Virgin River	1,822	Endangered Fish, Archaeological
Red Bluff	6,168	Scenic, Endangered Plants, Erosive Soils
Red Mountain	4,854	Scenic
Santa Clara Gunlock	1,998	Riparian, Archaeological
Santa Clara Land Hill	1,646	Riparian, Archaeological
Upper Beaver Dam Wash	33,057	Riparian, Watershed, Threatened and Endangered Species Habitat
Warner Ridge Fort Pearce	4,281	Endangered Plant, Riparian
Kanab Field Office		
Water Canyon South Fork Indian Canyon	222	Watershed, Botanical, Riparian

3.3.3 CULTURAL RESOURCES

Cultural resources include archaeological, historic (older than 50 years of age), prehistoric and architectural sites where human habitation or use has occurred, and that are significant for scientific research or public preservation and interpretation. These resources include traditional cultural properties and religious sites that are important to Native American and other cultural groups. A number of legislative acts and EOs provide procedures and guidelines for federal agencies that determine affects of their projects on cultural resources, including, but not limited to, NHPA, as amended; the American Religious Freedom Act; Archeological Resources Protection Act; and EO 13007 (Indian Sacred Sites).

Section 106 of the NHPA and its implementing regulations (36 CFR 800) require federal agencies to take into account the effects of their undertakings on historic properties, defined as "any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in, the National Register of Historic Places..." 36 CFR 800.14. This definition also encompasses artifacts, records, and remains related to such properties. Compliance with Section 106 of NHPA will be completed on a project-specific basis for planned actions before decisions are made to carry out fire management activities that could affect cultural resources.

Appendix G describes the cultural resource types known to or that may occur within the planning area.

Five ACECs have been designated entirely or partly to provide management and protection of cultural resources **(Table 3.1)**. Lands administered in the planning area by the BLM include 17 NRHP listings. These properties are listed below.

- Friendship Cove Pictograph
- Hole-in-the-Rock and Trail
- Starr Ranch
- Gold Springs
- Parowan Gap Petroglyphs
- Cottonwood Canyon Cliff Dwelling
- Fort Pearce
- Parunuweap Canyon Archeological District
- Wildhorse Canyon
- Harrisburg Junction Area - Proposed NRHP
- Pots Sum Pah Spring - Petroglyphs
- Fremont Canyon Historic Signature Site

BLM's existing LUPs describe site types and general distribution throughout the individual planning areas. It is important to note that these represent known sites only, given that relatively small portions of the planning areas have been subjected to cultural resource surveys.

Prehistoric Resources

Thousands of archaeological sites representing more than 13,000 years of human occupation have been recorded on BLM-managed land in the planning area. Prehistoric sites tend to concentrate near seeps and springs in mountain ranges, and along perennial streams such as the Virgin, Santa Clara, and Beaver Rivers and their tributaries. They include a wide range of periods and cultures beginning with Paleo-Indian and including Archaic, Fremont, Anasazi, and Numic, sites. These sites consist of a diverse range of site types, including rock shelters, hunting camps, lithic scatters, material procurement sites, pueblo ruins, and rock art.

Historic Resources

Historic resources in the planning area pertain primarily to Spanish, Mexican, and Euro-American activities since 1776. They include ghost towns, historic ranches, and numerous historic trails and wagon trails, such as the Dominguez-Escalante Trail, the Spanish Trail, the Mormon Corridor, and the Hole-in-the-Rock Trail. Some historic trails, such as the 1776 Dominguez-Escalante Trail and the Old Spanish Trail, date to the period of Spanish/Mexican exploration. Resources pertaining to mining and Euro-American settlement date from 1847, and numerous "ghost towns" (i.e., abandoned settlements) occur throughout the mountain ranges. Many mining resources, such as Silver Reef, Frisco, and the Star Mining District, are considered historically significant and are accessible to the public.

3.3.4 ENVIRONMENTAL JUSTICE

In 1994, EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations,* was issued. The purpose of the order is to avoid disproportionate placement of adverse environmental, economic, social, or health effects from federal actions and policies on minority and low-income populations. The first step in analyzing this issue is to identify these populations that might be affected by implementation

of the Proposed Action or alternatives. Demographic information on ethnicity, race, and economic status is provided in this section as the baseline against which potential effects can be identified and analyzed.

Potential environmental justice populations may exist in the region of influence, particularly in Iron County. For purposes of this section, minority and low-income populations are defined as follows:

- *Minority populations* are persons of Hispanic or Latino origin of any race, Blacks or African Americans, American Indians or Alaska Natives, Asians, and Native Hawaiian and other Pacific Islanders.
- *Low-income populations* are persons living below the poverty level. In 2000, the poverty-weighted average for a family of four was $17,603 and $8,794 for an unrelated individual (U.S. Census Bureau 2002a).

Estimates of these two populations (based on 2000 census data) were developed and compared to census data available for the State of Utah (**Table 3.2**). Note that although updated (2004) population data are available for the counties in the region of influence, population and income data for the state and income data for the counties are not readily available beyond 2000.

Environmental justice populations are determined to exist in the region of influence when minority or low-income populations in the region of influence exceed the overall minority and low-income populations for the state as a whole by 120 percent.

In 2000 the region of influence contained 140,919 persons, of which approximately seven percent were minorities and approximately 18,000 were living below the poverty level. The percentage of minority populations was lower in the region of influence than for the State of Utah, therefore the minority populations in the region of influence would not be considered as an environmental justice population. However, the percentage of persons living below the poverty level in the region of influence is higher than that of the state as a whole, exceeding the state percentage by 35 percent. Over 35 percent of the persons living below the poverty level in the region of influence live in Iron County.

TABLE 3.2: MINORITY OR LOW-INCOME POPULATIONS

Population	Combined Counties[1]	State[1]
Total Population	140,919	2,233,169
Percent Minority	7.4%	13.5%
Persons of Hispanic or Latino origin	6,689	200,985
Black or African American persons	343	17,865
American Indian or Alaska Native persons	2,331	29,031
Asian persons	664	37,964
Native Hawaiian or other Pacific Islander	468	15,632
Percent below poverty	12.7%	9.4%

[1] U.S. Census, 2001.

3.3.5 INVASIVE, NON-NATIVE SPECIES

Invasive and non-native species are an increasing problem on BLM-administered lands. These plants were introduced either accidentally (such as cheatgrass in contaminated crop seed or livestock forage) or intentionally (such as tamarisk for wind-breaks and streambank stabilization). They may readily establish in highly disturbed areas, particularly burned areas. The spread of invasive non-native species poses a hazard to vegetation communities on BLM rangelands because they are aggressive, broadly adaptive, and lack the natural predators found in their native habitat. They can displace native plants as they compete for space,

sunlight, water, and nutrients, and can cause drastic changes in the composition, structure, and productivity of vegetation communities.

Cheatgrass

Introduced from Eurasia in the late 1800s, cheatgrass is an opportunistic winter annual that filled the void left vacant by the reduction of herbaceous vegetation by livestock grazing by 1900 (Pellant 2002). It germinates between autumn and spring when temperatures and soil moisture are suitable. Cheatgrass, as a winter annual, can begin growth in early spring and does not have to wait for temperatures to warm. Cheatgrass utilizes all the available moisture as it actively grows. Other reasons for its success are that its seed never goes dormant; it produces a large number of seeds per plant that remain viable for five years; and because of its long awns, it is fairly resistant to grazing. Cheatgrass may be present in relatively undisturbed plant communities, but usually becomes dominant on disturbed sites (Fielding and Brusven 2000). Although it does occur, cheatgrass has been less successful in dominating sites that are above 7,000 feet because there is more soil moisture available to native perennial grasses.

This process of shrub loss and conversion to annual grasslands is a key management problem that affects nearly every use of public rangelands. The lack of shrub cover makes for poor-quality wildlife habitat, so annual grasslands have diminished plant and animal diversity. Cheatgrass is also inferior livestock forage.

The criteria for establishing when cheatgrass becomes an invasive concern or a fire concern are not readily assigned. Limbach (2004) has offered unofficial guidance of five percent cover as an invasive concern and 15 to 20 percent cover as a fire/fuels concern (both percentages relative to associated understory species). Degraded sites are most susceptible to annual grass invasion after fire. Cheatgrass poses a serious fire hazard. An abundance of cheatgrass in the understory enhances the likelihood of fire spread and conversion of sagebrush steppe or salt desert shrub to annual grassland (Howard 1999).

Tamarisk

Tamarisk has become well established along river and stream channels in WUI zones and represents a serious fire hazard due to the potential for severe fire. It out-competes many native species and is difficult to eradicate because of its extensive root system. This species invades senescent cottonwood riparian sites that have dried out as a result of infrequent flooding.

Red Brome

This invasive, non-native, annual grass may coexist with cheatgrass in the creosote and bursage and blackbrush vegetation types. Red brome is currently expanding through wildland fire-induced expansion.

3.3.6 NATIVE AMERICAN RELIGIOUS CONCERNS

The Cedar City and St. George Field Offices conduct government-to-government consultations with the five bands that comprise the Paiute Indian Tribe of Utah under protocols contained in a memorandum of agreement signed in 1999. These consultations identify and attempt to mitigate effects to resources and concerns of the Paiute Indian Tribe of Utah. Consultations with other American Indian tribes, including the Ute Tribe, Hopi Tribe, and Navajo Nation, that claim affiliation to the southwestern Utah geographic area are conducted on an undertaking-specific basis.

Sacred or ceremonial activities are often intertwined with traditional subsistence practices. Areas where traditional resource collection occurs are often considered sacred sites by Native Americans. These would include traditional cultural properties under the context of the NHPA.

Because they are not usually recognizable to an outsider through archeological or historical investigations, the existence and locations of these sites and activities may often only be identified through consultation with members of the groups who ascribe value to those places. Many Native American belief systems require that the identity and location of traditional religious and cultural properties not be divulged. BLM has a commitment to keep specific information regarding such resources confidential to the fullest extent allowed by law.

3.3.7 SPECIAL STATUS SPECIES

The special status plant and animal species analysis has been broken out into two parts: ESA-related species and BLM sensitive species.

ESA-related species include those listed as endangered, threatened, and proposed under the ESA of 1973, as amended, some of which have designated or proposed critical habitat, as well as candidate and petitioned species (**Appendix H**). Threatened, endangered, and proposed species are under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS). Candidate and petitioned species are not under the jurisdiction of the USFWS; however, because they are given recognition as candidates and species petitioned for federal listing on the ESA, they are discussed under the ESA-related heading.

BLM sensitive species include BLM sensitive plant species, some of which may be managed through conservation agreements in which BLM participates (**Appendix I**).

ESA-related Species

Thirteen endangered, nine threatened, two candidate (one of which has been petitioned for listing), and one petitioned-only species are known to occur on or adjacent to the planning area. These 25 federally listed species can be grouped as follows: nine plants, five birds, two mammals, six fishes, two invertebrates, and one reptile. These species listed as endangered, threatened, candidate or petitioned are listed in **Appendix H** along with their scientific name, federal status, associated vegetation community/habitat type, and field office(s) having jurisdiction over potentially suitable habitat. Nine of the 25 federally protected species (one plant, one bird, six fish, and one reptile species) have designated critical habitat on BLM-administered lands in Utah. One bird and one invertebrate species have proposed critical habitat. These designations and this proposal are presented in **Table 3.3** below.

It should be noted that the California condor exists as a non-essential, experimental population [ESA, Section 10(j)] with documented records of occurrence within the SUSA planning area.

BLM Sensitive Species

Thirty-six wildlife species of concern, 43 sensitive plant species, and eight conservation agreement species are known to occur on or adjacent to the planning area. These 87 BLM sensitive species can be grouped as follows: 43 flowering plants, 11 birds, 8 mammals, 9 fish, 4 invertebrates, 2 amphibian, and 10 reptiles. These species are listed in **Appendix I**, along with their scientific name, federal status, associated vegetation community/habitat type, and field office(s) having jurisdiction over potentially suitable habitat.

Species Habitat

Habitats associated with each SSS, and their distribution, are widely variable. Some species are found throughout the planning area, while others are endemic to a single location. As noted above, Utah Gap Analysis (GAP) was used to identify cover types pertaining to this project. Utah GAP provides an indicator of vegetation coverage and habitat types at the large scale, but is not particularly accurate on the ground for site-specific projects. Consequently, it is possible that the expanse (acreage or boundary) of a cover type

could be inaccurate, and that cover types and species associated with these cover types may not actually be present at the project-specific level.

Vegetation types, and their prevalence on BLM-administered lands throughout the SUSA planning area, are identified in the vegetation section of this chapter. Water is also valuable habitat, has the potential to be impacted by the proposed project, and therefore is included in this section and the fish section of this chapter as a habitat type.

The following are the SSS (split into ESA-related and BLM sensitive species) generally associated with each vegetation community (**Table 3.4**). It should be noted that special status plant species are not necessarily associated with vegetation community types, but are more closely associated with substrate type. Therefore, plant species listed in the vegetation community associations below do not infer an actual association, but rather indicate the vegetation community surrounding each plant species. **Appendix H** and **Appendix I** present associated substrates for each plant species.

TABLE 3.3: FEDERALLY LISTED SPECIES AND THEIR PROPOSED OR DESIGNATED CRITICAL HABITAT

Species	Critical Habitat	General Location
Welsh's milkweed	Designated	Southern Kane County
Southwestern willow flycatcher	Proposed	Southern Washington County
Mexican spotted owl	Designated	Southern and eastern Utah in nine counties
Humpback chub	Designated	Eastern Utah in seven counties
Bonytail	Designated	Eastern Utah
Virgin River chub	Designated	Southern Washington County
Woundfin	Designated	Southern Washington County
Colorado pikeminnow	Designated	Eastern Utah in seven counties
Razorback sucker	Designated	Eastern Utah
Kanab Ambersnail	Proposed	Southern Kane County
Mojave Desert Tortoise	Designated	Washington County

TABLE 3.4: ESA-RELATED AND BLM SENSITIVE SPECIES BY VEGETATION TYPE GROUP

Vegetation Type Group	ESA-related	BLM Sensitive
Salt Desert Shrub	Jones cycladenia, Siler's pincushion cactus, California condor	Gumbo milk-vetch, pink egg milk-vetch, escarpment milk-vetch, mound cryptanth, Pipe Springs cryptanth, Cronquist buckwheat, Utah spurge, Cataract gilia, Franklin's penstemon, pinyon penstemon, Parry's petalonyx, Jones' globemallow, Smoky Mountain globemallow, Kanab thelypody, tropic goldeneye, spotted bat, fringed myotis, kit fox, zebra-tailed lizard, western banded gecko, common chuckwalla, sidewinder, speckled rattlesnake, Mojave rattlesnake, western threadsnake
Pinyon and Juniper Woodland	Shivwitz milk-vetch, Kodachrome bladderpod, Welsh's milkweed, Jones cycladenia, Maguire daisy, California condor, Mexican spotted owl, Coral Pink Sand Dunes tiger beetle	Pink egg milk-vetch, escarpment milk-vetch, Baird's camissonia, slender camissonia, Gould's camissonia, Pipe Springs cryptanth, pinnate spring parsley, Nevada willowherb, Cronquist buckwheat, scarlet buckwheat, Frisco buckwheat, Ostler's Ivesia, cliff jamesia, Claron pepperplant, Ostler pepperplant, Cutler's lupine, Murdock's evening primrose, Barneby's breadroot, Kane breadroot, pinyon penstemon, Cronquist's phacelia, Atwood's pretty, Chinle chia, Smoky Mountain globemallow, Kanab

Vegetation Type Group	ESA-related	BLM Sensitive
		thelypody, Frisco clover, Lewis's woodpecker, fringed myotis, western banded gecko
Sagebrush	Welsh's milkweed, California condor, bald eagle, Mexican spotted owl, Utah prairie dog, pygmy rabbit, Coral Pink Sand Dunes tiger beetle	Pink egg milk-vetch, slender camissonia, Gould's camissonia, Pipe Springs cryptanth, Frisco buckwheat, Claron pepperplant, Franklin's penstemon, pinyon penstemon, Cronquist's phacelia, Atwood's pretty, ferruginous hawk, greater sage grouse, dark kangaroo mouse
Grassland	Kodachrome bladderpod, Utah prairie dog	Slender camissonia, Paria iris, Franklin's penstemon Jones' globemallow, Smoky Mountain globemallow, short-eared owl, burrowing owl, ferruginous hawk, long-billed curlew
Blackbrush	Dwarf bear-poppy, Shivwitz milk-vetch, Holmgren milk-vetch, Siler's pincushion cactus, Mojave desert tortoise	Gumbo milk-vetch, Baird's camissonia, hole-in-the-rock prairieclover, Utah spurge, Parry's petalonyx, Chinle chia, Smoky Mountain globemallow, desert iguana, gila monster, desert night lizard
Mountain Shrub	Maguire daisy	Pinnate spring parsley, Nevada willowherb, scarlet buckwheat, Pine Valley goldenbush, cliff jamesia, Clark's lomatium, sandloving penstemon, pinyon penstemon, Atwood's pretty, black swift, Lewis's woodpecker, Townsend's big-eared bat, spotted bat, Allen's big-eared bat, big free-tailed bat, western banded gecko
Mixed Conifer	Bald eagle	Pine Valley goldenbush, Cedar Breaks goldenbush, northern goshawk, black swift, Lewis's woodpecker, three-toed woodpecker, Townsend's big-eared bat, spotted bat, Allen's big-eared bat, western red bat, fringed myotis, big free-tailed bat, boreal toad
Ponderosa Pine	Welsh's milkweed, Maguire daisy, Coral Pink Sand Dunes tiger beetle	Pine Valley goldenbush, Cedar Breaks goldenbush, Ostler's Ivesia, cliff jamesia, Claron pepperplant, Clark's lomatium, sandloving penstemon, Cronquist's phacelia, Lewis's woodpecker, spotted bat, Allen's big-eared bat
Wetlands and Riparian Zones	Maguire daisy, Ute ladies'-tresses, southwestern willow flycatcher, bald eagle, Mexican spotted owl, western yellow-billed cuckoo, Kanab ambersnail	Lori's columbine, Virgin thistle, alcove bog-orchid, northern goshawk, black swift, bobolink, Lewis's woodpecker, American white pelican, western red bat, Utah physa, desert springsnail, Hamlin Valley pyrg, Black Canyon pyrg, boreal toad, Arizona toad
Aspen	None	Pine Valley goldenbush, black swift, three-toed woodpecker
Water	Humpback chub, bonytail, Virgin River chub, woundfin, Colorado pikeminnow, razorback sucker	Bonneville cutthroat trout, Colorado River cutthroat trout, Virgin spinedace, least chub, leatherside chub, roundtail chub, desert sucker, bluehead sucker, flannelmouth sucker

3.3.8 WATER QUALITY

Surface Water

Watersheds, aquifers, rivers, and streams are ecologically dynamic interfaces of atmosphere, soils, and water. Healthy watersheds capture precipitation and runoff, store water in the soil (or bedrock) profile, and release it slowly back into the landscape surface waters. Most of the water supply to these watersheds comes from snowmelt during the spring and early summer months and precipitation from high-intensity convective storms throughout the spring, summer, and fall. There are also many ephemeral drainages throughout the watershed that flow intermittently during the year.

The major watershed management units identified in the planning area are the Lower Colorado and portions of the Colorado River West, Sevier River, Cedar/Beaver River, and Great Salt Lake/Columbia River units

(UDEQ 2005a). Major river and watersheds systems located in the SUSA planning area include the Colorado, Escalante, Paria, Sevier, Virgin, and Santa Clara Rivers. Surface water within the planning area is used for domestic, recreational, aesthetic, agricultural, stock-watering, and industrial purposes. They also are habitat for aquatic and water-oriented wildlife and fish.

The Federal Water Pollution Control Act of 1972 and CWA of 1977 and subsequent amendments/revisions are the predominant federal legislations that direct management of water quality on BLM-administered lands. CWA mandates restoration and/or maintenance of the chemical, physical, and biological integrity of our nation's waters, while Section 303 primarily dictates further compliance to state and local water quality standards. BLM must also comply with UDEQ water quality standards.

Under Section 303(d) of the CWA, UDEQ is directed to list all waters that do not meet water quality standards or have impaired beneficial uses (e.g., drinking water, recreation, etc.). Waterbodies in which water quality is impaired are referred to as "303(d)-listed streams" or "impaired waters." The sources of these impairments come predominantly from agriculture (e.g., grazing, irrigation), natural sources (e.g., bedrock), on-the-ground hydrological modification (e.g., resource extraction and road construction), and point-source discharges. When a stream is listed as impaired, the allowable total maximum daily load (TMDL) of a pollutant, such as total dissolved solids, is required to be calculated for the stream. TMDLs apply to both point and non-point sources. UDEQ is in the process of developing TMDLs for various waterbodies throughout Utah.

UDEQ Division of Water Quality has identified 13 waterbodies within the planning area as 303(d)-listed streams (UDEQ 2004), totaling approximately 294 miles of streams, rivers, reservoirs, or lakes. **Figure 3.3** presents the locations of 303(d)-listed streams identified within the SUSA planning area. TMDLs have been completed for 303(d)-listed sections of the Virgin River, Panguitch Lake, Navajo Lake, Upper Sevier River, and Beaver River watershed (UDEQ 2005b).

Several watersheds in the SUSA planning area also contain protected surface water sources used for municipal water supply. The Virgin River supplies drinking water for the town of Springdale, and Quail Creek Reservoir supplies drinking water to the St. George City and Washington City systems (Johnson 2005). These water supply sources are particularly vulnerable to changes in upstream water quality.

Groundwater

Primary recharge areas generally occur along mountain fronts where basin-fill materials erode from mountain bedrock (Baskin et al. 2002). Groundwater accumulates in these areas and flows downgradient. Further away from the mountain fronts, groundwater discharge areas occur where groundwater collects (e.g., to form playas) or flows to surface waterbodies.

Groundwater recharge areas could be particularly vulnerable to surface sources of pollution because groundwater movement is typically pulled downward by gravity, and primary recharge areas may not have protective, fine-grained layers (such as typically found in basin valleys) that serve to filter out the pollutants. In addition, groundwater could be sensitive to total dissolved solids in aquifer media (soil or bedrock) types.

Groundwater is part of the developed water supply for numerous municipalities in the planning area and supplies private water wells used for drinking water and irrigation. The location of water wells and underground water diversion rights can be obtained from the Utah Division of Water Rights at http://www.waterrights.utah.gov.

3.3.9 WETLANDS AND RIPARIAN ZONES

A riparian area is generally defined as the area alongside a perennial or ephemeral stream that is influenced by the presence of shallow groundwater. The U.S. Army Corps of Engineers (USACE) (Federal Register 1982) and EPA (Federal Register 1980) jointly define wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and which, under normal circumstance do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. BLM Manual 1737 (BLM 1992) includes marshes, shallow swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas as wetlands.

Riparian and aquatic areas comprise only a small portion of the lands managed by the BLM; however, their ecological significance is far greater than their limited physical scope as these systems form some of the most dynamic and ecologically rich portions of the landscape (Elmore and Beschta 1987). Wetlands and riparian zones play a large role in restoring and maintaining the chemical, physical, and biological integrity of the nation's water. Wildlife use wetlands and riparian zones disproportionately more than any other type of habitat.

Under natural conditions, riparian and aquatic ecosystems have a high degree of structural complexity, reflective of past disturbances such as floods, fire, ice floes, wind storms, grazing, and disease and insect outbreaks (Gregory et al. 1991).

The SUSA planning area identified the following areas as having important wetland and riparian values:

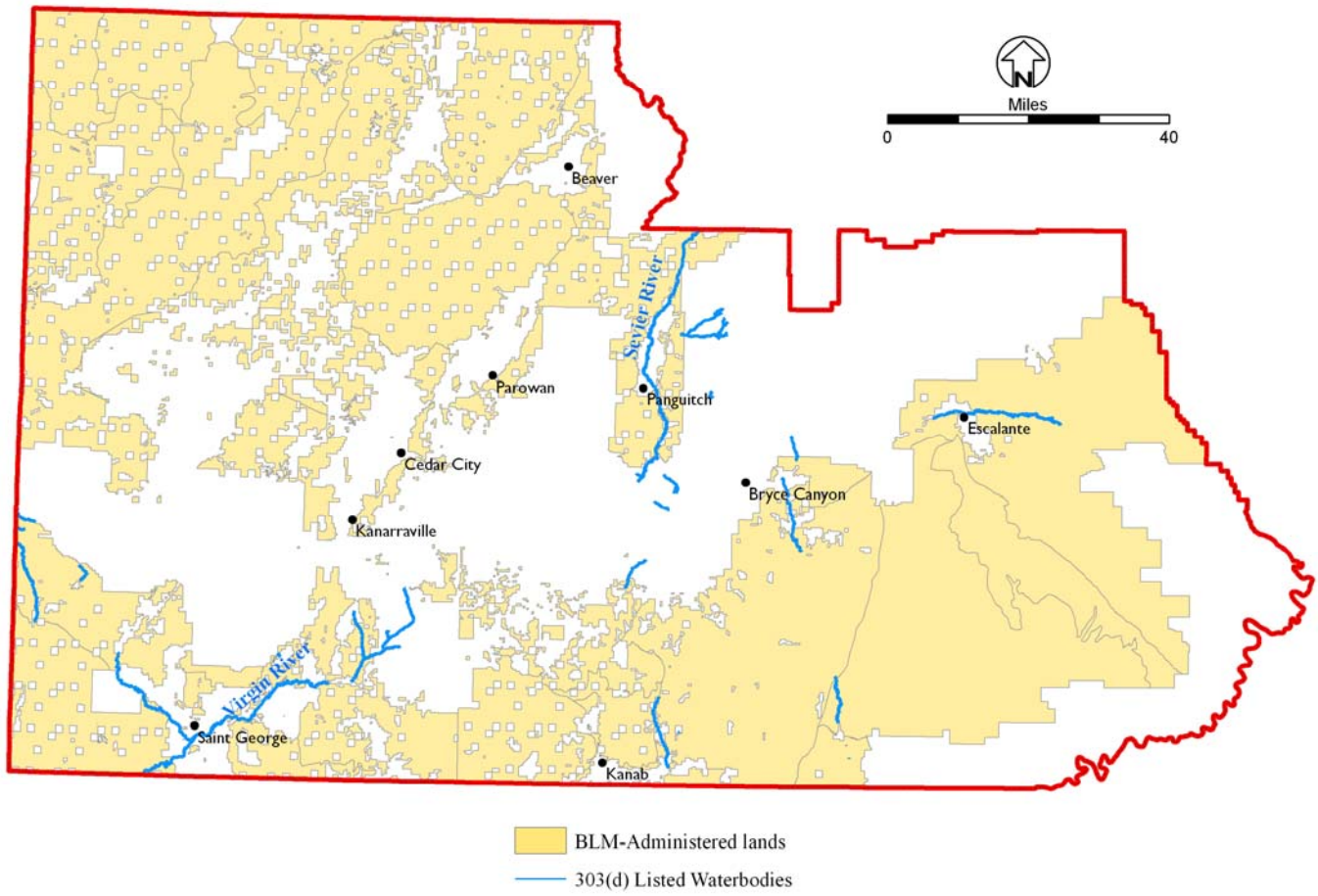
- Beartrap Canyon Creek
- Crystal Creek
- Deep Creek
- Escalante River
- Goose Creek
- Henriville Creek
- Beaver River
- Taylor Creek
- Kanab-Johnson Canyon waters
- Middle Fork of Taylor Creek
- Muddy Creek Watershed
- North Fork of Virgin River
- Upper Kanab Watershed
- La Verkin Creek
- Virgin River
- Water Canyon Waters
- Willis Creek
- Smith Creek
- Kolob Creek

Riparian areas vegetation is included in the Vegetation Section.

Functioning condition and the natural processes that affect functionality have been impaired in many areas through human disturbances and alterations and the infestation of non-native species. Humans have altered stream aquatic and riparian environments by direct modifications (channelization, wood removal, diversion, dam-building, irrigation de-watering) and indirect impacts (from timber harvest, mining, grazing, and road building). These activities have altered channels by changing the rate at which sediment, water, and wood enter and are moved through streams. Anthropogenic activities have also affected the incidence, frequency and magnitude of the natural disturbance events described above (McIntosh et al. 1991; Wissmar et al. 1994).

Invasive species such as tamarisk, tall whitetop, and Russian olive have become well established in the riparian communities and are slowly replacing the native vegetation across much of Utah. This increase in tamarisk/Russian olive within this community type has altered the intensity and size of unplanned fires, due to the increased fuel loads within the cottonwood understory, providing ladder fuels to the large cottonwood trees.

FIGURE 3.3: 303 (D)-LISTED WATERBODIES



3.3.10 WILD AND SCENIC RIVERS

WSRA (16 USC 1271-1287) established a National Wild and Scenic Rivers System and prescribed methods and standards through which additional rivers may be identified and added to the system. The purpose of the Wild and Scenic Rivers System is to preserve the free-flowing state of rivers that have outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. Rivers in the system are classified as wild river areas, scenic river area, or recreational river areas. WSRA established a method for providing federal protection of our country's remaining free-flowing rivers, preserving them and their immediate environments for the use and enjoyment of present and future generations (NPS and USDA 1982). It also established management requirements to management decisions to protect both the suitable river or river segments and the land immediately surrounding them.

No rivers in Utah are included in the National Wild and Scenic Rivers System. However, Section 5(d)(1) of WSRA directs federal agencies to consider potential Wild and Scenic Rivers in their land and water planning processes and to determine their suitability for inclusion in the System. WSRA provides that suitable rivers or river segments be administered in such a way as to protect and enhance the values that made them eligible for the national system, but not to limit other uses that do not substantially interfere with public use and enjoyment of these values (Interagency Wild and Scenic Rivers Coordinating Council 2004).

Inventories in the GSENM (BLM 1999a) and St. George field office (BLM 2004c) have identified the following rivers or river segments as suitable for designation (**Table 3.5)**. These suitable river segments may only be included in the National Wild and Scenic Rivers System through Congressional or Secretary of the Interior authority. Suitable segments are managed to protect the free-flow, outstandingly remarkable values, and recommended classification until action regarding designation is taken.

TABLE 3.5: ELIGIBLE WILD AND SCENIC RIVER SEGMENTS

Suitable River/Segment Name	Miles	Location
Escalante River – Segments 1, 2, 3	34.1	Grand Staircase-Escalante National Monument
Harris Wash	1.1	Grand Staircase-Escalante National Monument
Lower Boulder Creek	13.5	Grand Staircase-Escalante National Monument
Slickrock Canyon	2.8	Grand Staircase-Escalante National Monument
Lower Deer Creek – Segments 1, 2	10.8	Grand Staircase-Escalante National Monument
The Gulch – Segments 1, 2, 3	24.6	Grand Staircase-Escalante National Monument
Steep Creek	6.4	Grand Staircase-Escalante National Monument
Lower Sand Creek and Willow Patch Creek	13.2	Grand Staircase-Escalante National Monument
Mamie Creek and west tributary	9.2	Grand Staircase-Escalante National Monument
Death Hollow Creek	9.9	Grand Staircase-Escalante National Monument
Calf Creek – Segments 1, 2, 3	8.0	Grand Staircase-Escalante National Monument
Twenty-five Mile Wash	6.8	Grand Staircase-Escalante National Monument
Upper Paria River – Segments 1, 2	38.6	Grand Staircase-Escalante National Monument
Lower Paria River – Segments 1, 2	8.1	Grand Staircase-Escalante National Monument
Deer Creek Canyon	5.2	Grand Staircase-Escalante National Monument
Snake Creek	4.7	Grand Staircase-Escalante National Monument
Hogeye Creek	6.3	Grand Staircase-Escalante National Monument

Suitable River/Segment Name	Miles	Location
Kitchen Canyon	1.3	Grand Staircase-Escalante National Monument
Starlight Canyon	4.9	Grand Staircase-Escalante National Monument
Lower Sheep Creek	1.5	Grand Staircase-Escalante National Monument
Hackberry Creek	20.1	Grand Staircase-Escalante National Monument
Lower Cottonwood Creek	2.9	Grand Staircase-Escalante National Monument
Buckskin Gulch	18.0	Grand Staircase-Escalante National Monument
Deep Creek/Crystal Creek	11.4	St. George Field Office
North Fork Virgin River	0.7	St. George Field Office
Kolob Creek/Oak Creek	3.6	St. George Field Office
La Verkin Creek/Smith Creek	14.1	St. George Field Office
Virgin River – Segment B (within the Beaver Dam Mountains Wilderness)	6.5	St. George Field Office
TOTAL	**288.3**	

3.3.11 WILDERNESS STUDY AREAS

The Wilderness Act of 1964 (16 U.S.C. 1131-1136, 78 Stat. 890) established the National Wilderness Preservation System and guidelines for designation and management of wilderness.

Wilderness, as defined in the Wilderness Act, is an area where, in contrast with those areas where man and his works dominate the landscape, the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Wilderness Areas can only be designated by Congress, and are managed under the Wilderness Act. Within the planning area there are two designated Wilderness Areas: Beaver Dam (2,600 acres) and Paria Canyon-Vermilion Cliffs (20,000 acres).

A Wilderness Study Area (WSA) is an administrative designation designed to allow areas to be studied and considered by Congress for possible designation as wilderness. WSAs are managed to prevent impairment of their suitability for congressional designation as wilderness. BLM-administered WSAs are managed for multiple uses including protection of air and watersheds, ecological stability, habitat for wildlife, non-motorized and non-mechanized recreation, archaeological and historical sites, and continued livestock grazing in areas where grazing was established prior to wilderness designation. By policy, management of WSAs is generally less restrictive than management of wilderness areas, but activities that would impair wilderness suitability are prohibited. There are approximately one million acres that have been designated for WSAs within the SUSA planning area.

Wilderness Areas and WSAs are identified in **Figure 3.4**. **Table 3.6** lists and identifies the WSAs within SUSA.

FIGURE 3.4: WILDERNESS STUDY AREAS

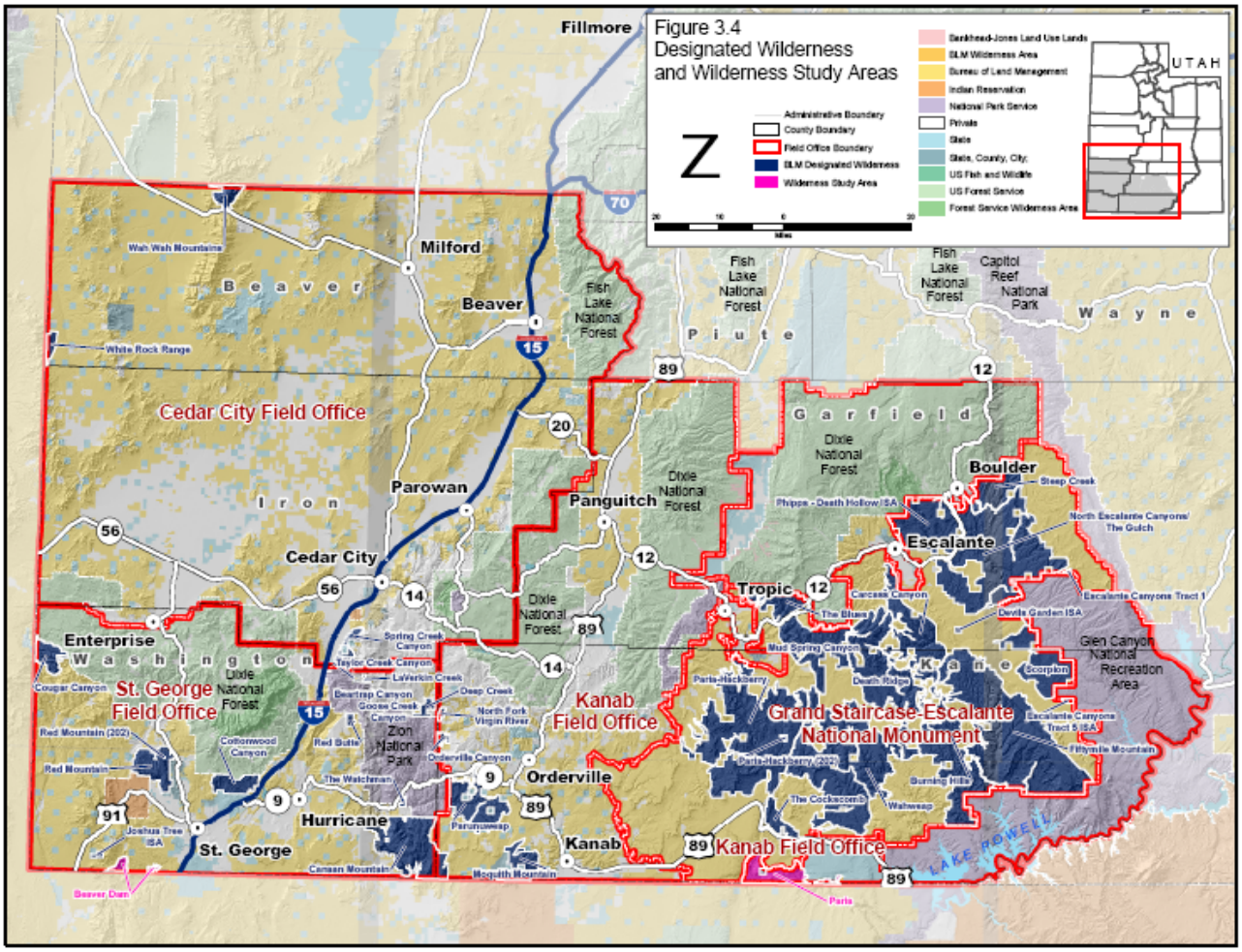


TABLE 3.6: WILDERNESS STUDY AREAS

NAME	ACRES
Beartrap Canyon	40
Burning Hills	61,550
Canaan Mountain	1,040
Carcass Canyon	46, 711
Cottonwood Canyon	11,330
Cougar Canyon	10,568
Death Ridge	62,870
Deep Creek	3,320
Devils Garden NA	640
Escalante Canyons Tract 1 NA	360
Fifty Mile Mountain	146,143
Escalante Canyons Tract 5	760
Goose Creek Canyon	89
Joshua Tree NA	1,040
LaVerkin Creek Canyon	567
Moquith Mountain	14,830
Mud Spring Canyon	38,075
North Escalante Canyons/The Gulch ISA	119,752
North Fork Virgin River	1,750
Orderville Canyon	30,800
Paria-Hackberry	136,222
Parunuweap	47, 170
Phipps - Death Hollow ISA	42,731
Red Butte	804
Red Mountain	18,290
Scorpion	35,884
Spring Creek Canyon	4,433
Steep Creek	21,896
Taylor Creek Canyon	35
The Blues	19,030
The Cockscomb	10,080
The Watchman	600
Wah Wah Mountains	7,324
Wahweap	134,400
White Rock Range	3,820
TOTAL	**1,019,364**

3.3.12 LIVESTOCK GRAZING

Allotments

Livestock grazing is permitted on approximately 61 percent (4,427,819 acres) of BLM-administered lands in the SUSA planning area. The SUSA planning area is divided into 842 allotments. **Figure 3.5** presents the location of livestock grazing allotments.

Grazing allotments are geographically unique and range in size from 186,084 public acres to small isolated parcels of public land of less than one acre. Sizing affects how the allotments are managed. Allotments with large blocks of contiguous BLM land are minimally impacted by surrounding private land. The isolated tracts are often a small component of a larger private land holding. Administrative access to these small tracts of public land sometimes exists only because of the grazing permit or lease. Allotments may be joined with private, state, other federal lands, or a combination thereof, in addition to BLM-administered lands. Allotments may be permitted to one (individual allotment) or more (common allotment) operators. More than one permit may be issued to a particular individual or company. Grazing use by livestock is measured in terms of animal unit months (AUMs). One AUM is equal to the amount of forage used to support one cow and calf for one month (approximately 800 pounds of forage). Grazing permits convey no right, title, or interest in the public lands and their resources.

Grazing Systems

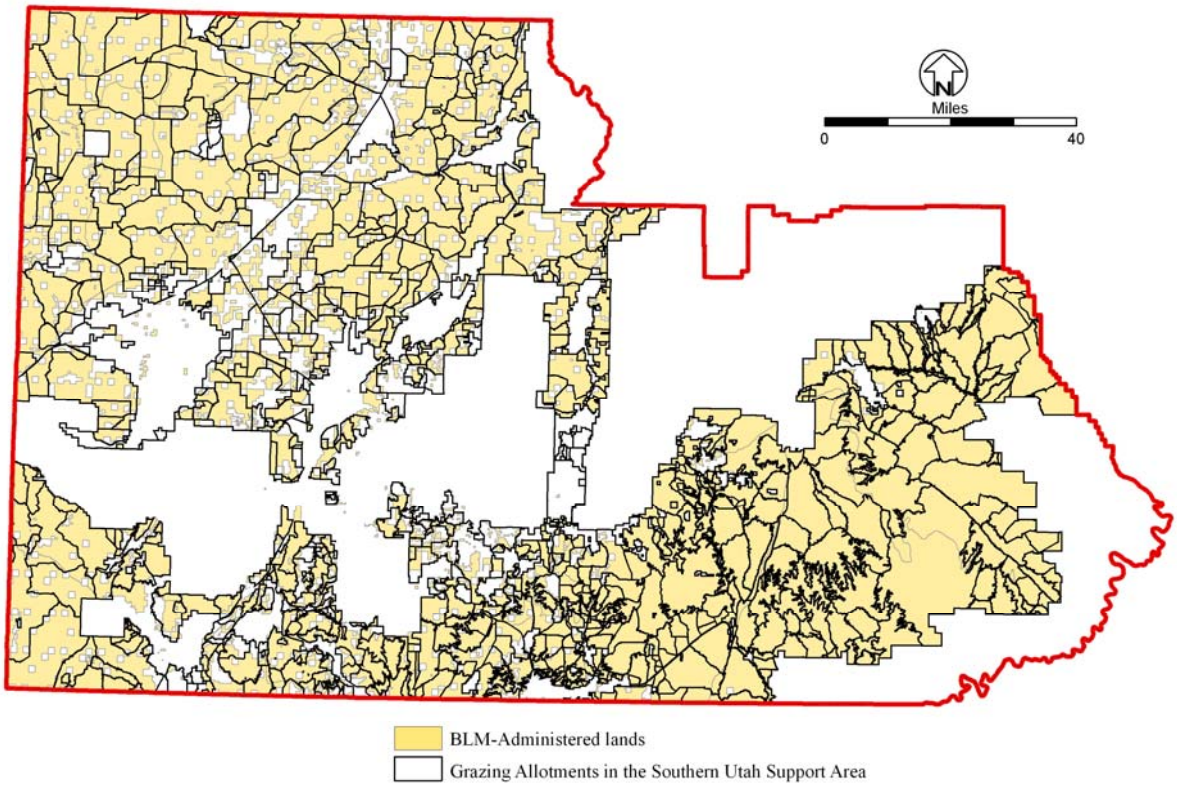
Seasons of use vary on each allotment throughout the SUSA planning area from a few weeks to a year-long season. Each allotment may have a number of pastures that are grazed in a rotation system. A deferred rotation grazing system rotates livestock use (e.g., livestock start and end in different pastures each year) through several pastures. A rest-rotation grazing system includes a full year or more of rest for one or more pastures within the allotment. Each grazing system may include periodic rest depending upon the specific management concerns and needs for that allotment. The season of use for each allotment is described in the operator's grazing permit. Season-long use entails grazing one pasture from spring or early summer to late summer or fall. Some movement of livestock use may occur within the pasture (e.g., from canyon to canyon). Deferred rotation is a technique that uses the entire allotment by rotating pasture use (e.g., livestock start in a different pasture each year). Rest-rotation of pastures is a technique that involves grazing during certain periods and resting during other periods, with some pastures rested for the entire grazing season. Grazing systems are designed based on the requirements of key forage species in the allotment, the resources of concern on the allotment, and the needs of the livestock producer and their livestock. These periods of use are referred to as treatments and are rotated so that no pasture receives the same use every year.

Rangeland Health Standards

Allotments are periodically assessed for meeting multiple use objectives and all allotments are currently being assessed for meeting Utah's Rangeland Health Standards and Guidelines. This effort is scheduled to be completed by the year 2009. Periodic allotment assessments may indicate that changes in the season of use are necessary to meet rangeland health standards. Seasons of use are allotment-specific and may be managed as season-long or using a grazing system (e.g., rest-rotation, deferred). If these assessments indicate that changes in livestock management are needed to meet the appropriate standards or other multiple use objectives after consultation with the permittee, changes to the terms and conditions of the permit would be made through agreement or by decision.

Grazing allotments typically contain improvements constructed by the permittee or by the BLM. These improvements include water troughs, guzzlers, rainwater catch basins and other water storage structures, fences, corrals, and other similar structures necessary for the successful use of the allotment.

FIGURE 3.5: LIVESTOCK GRAZING ALLOTMENTS



3.3.13 WOODLANDS AND FORESTRY

Most existing wood product use is for firewood and Christmas tree and pine nut gathering, with a minor component being for lumber and associated products. **Table 3.7** shows the occurrence of compressed forest types (the forest types correspond to the compressed GAP classes used in the vegetation section of this chapter), acreages for the planning area, and primary uses of the forests.

TABLE 3.7: FOREST TYPES, ACRES, AND PRIMARY USES

Vegetation Type	Acres in Planning Area	Uses
Pinyon and Juniper Woodland	2,500,745	Firewood, specialty lumber, pine nuts, biomass, and fence posts.
Ponderosa Pine	27,215	Lumber, firewood, log home construction, and fence posts.
Mixed Conifer/Aspen	10,481	Mixed conifer used for firewood, Christmas trees, pulp, lumber, log home construction, and fence posts. Aspen used for packing material (dunnage), pallets, erosion blanket, swamp cooler filters, matches, specialty lumber, fuel-wood, fence posts, and pulp.

As shown in the table, the predominant forest type in the SUSA planning area is the pinyon and juniper woodland category. This is the most extensive forest type in Utah, exceeding in acreage all other forests combined (Lanner 1984). On lower edges of this woodland zone, Utah juniper is frequently the only tree species. Efforts have been made to encourage non-commercial thinning of pinyon and use of juniper woodland for firewood. The mixed conifer is comprised of fir, pine, and spruce.

Old-growth forests are generally defined as being older than 150 years old. The primary forest type identified within the planning area as likely to have old-growth areas is the pinyon and juniper woodland. Harvesting or other activities affecting old-growth forests have restrictions.

3.3.14 VEGETATION

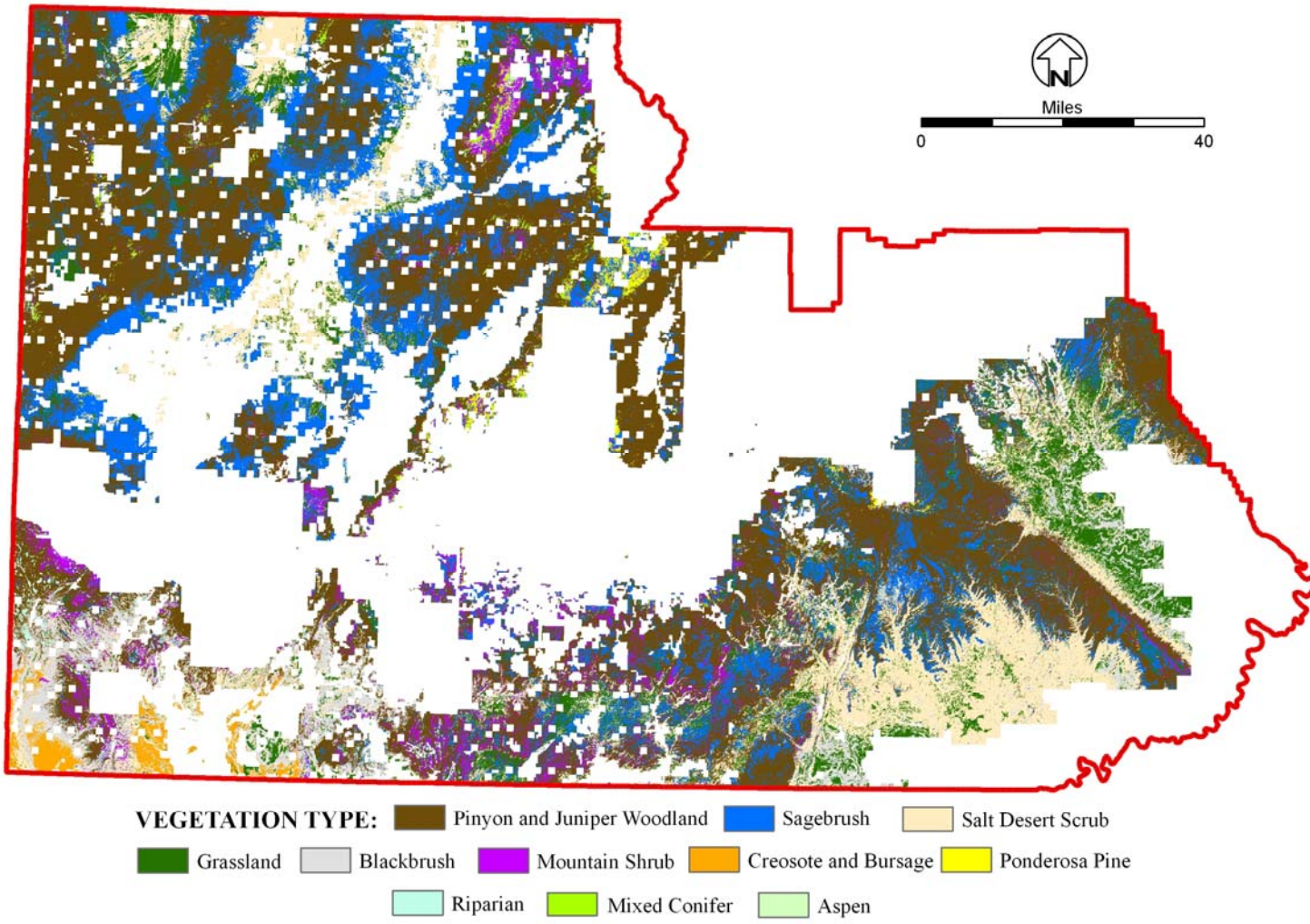
Vegetation in the SUSA planning area is grouped into vegetation types with similar fire ecology. **Table 3.8** indicates the types, extent, and percentage of the planning area they cover for BLM lands within SUSA. Vegetation types are found in **Figure 3.6**.

TABLE 3.8: APPROXIMATE FIRE REGIME CONDITION CLASS ACREAGE AND PERCENTAGES

Fire Regime Condition Class	Description	Acreage
1	Within the natural (historical) range of variability of vegetation characteristics; fuels composition; fire frequency, severity and pattern; and other associated disturbances.	40 (0 %)
2	Moderate departure from the natural (historical) range of variability of vegetation characteristics; fuels composition; fire frequency, severity and pattern; and other associated disturbances.	641,258 (12%)
3	High departure from the natural (historical) range of variability of vegetation characteristics; fuels composition; fire frequency, severity and pattern; and other associated disturbances.	4,380,549 (86%)

Note: Approximately 76,069 acres (2 percent) are unclassified.

FIGURE 3.6: VEGETATION TYPES ON BLM-ADMINISTERED LANDS



Fire Regime Condition Class

The species response (and recovery) to the presence or non-presence of a disturbance (fire) over time is referred to as succession. The stages of vegetation types or communities required to reach this recovery are referred to as seral stages, with the end result referred to as climax. This recovery is predictable over time. For example, a proper functioning grassland/sagebrush/pinyon and juniper woodland system may require approximately 35 years in its historical, natural fire regime until another disturbance (fire) pushes it back to another earlier seral (grass) stage.

The presence of non-natives (and loss of native species) can affect the climax community of succession. A good example is the non-native cheatgrass, which is a species that did not evolve with the natural fire regime and may perpetuate through time and appear as climax. This altered (shortened) fire return interval can be as little as five years in some cases and may allow the species to dramatically expand their range and coverage after fires. Cheatgrass communities may facilitate expansion of other invasive species that further displace native species, have lower biological resource values, and pose increased fire hazards by adding to the fuel load.

FRCC is an interagency, standardized tool for determining the degree of departure from reference condition vegetation, fuels, and disturbance regimes. Assessing FRCC can help guide management objectives and set priorities for treatments. FRCC was assigned to vegetation on public lands within the state through review of vegetation types identified by Utah GAP (Edwards et. al. 1998) and elevation ranges. The resulting acres for the combined vegetation types found on the SUSA planning area are presented in **Table 3.9**.

TABLE 3.9: VEGETATION TYPE ACREAGE

Vegetation Type	Acreage	Percent (BLM and Other Ownership)	Fire Regime	Fire Regime Condition Class
Pinyon and Juniper Woodland	2,500,745	49%	II or V (old growth)	2 (8%) 3 (92%)
Sagebrush	886,287	17%	II	3 (100%)
Salt Desert Shrub	773,478	15%	V	3 (100%)
Grassland	450,604	9%	II	3 (89%) Unclassified (11%)
Blackbrush	269,753	5%	V	2 (100%)
Mountain Shrub	106,254	2%	I, II, and IV	2 (100%)
Creosote and Bursage	63,652	1%	V	2 (100%)
Ponderosa Pine	27,215	1%	I	3 (35%) Unclassified (65%)
Riparian	9,655	<1%	IV	2 (<1%) 3 (86%) Unclassified (13%)
Mixed Conifer	8,923	<1%	III and IV	I (<1%) 2 (39%) Unclassified (61%)
Aspen	1,558	<1%	IV	2 (25%) Unclassified (75%)
TOTAL	**5,097,916**			

Pinyon and Juniper Woodland

Trees that are less than 33 feet in height characterize this vegetation type. The open conifer woodlands form savannah-like landscapes with moderately open to very open canopies (25 to 59 percent canopy cover). The overstory includes Colorado pinyon pine and Utah juniper as a common associate. Typically, the understory consists of shrub species like big sagebrush and native bunchgrasses like bluebunch wheatgrass. Closed woodlands (greater than 60 percent canopy cover) are dominated by the same overstory species, however the understory is drastically reduced due to competition for sunlight, water, and nutrients. Also, juniper litter may further inhibit understory growth.

On lower edges of the woodland zone, Utah juniper is frequently the only tree species with a mixture of the two in the middle and pinyon with little or no juniper in the upper elevations. Utah juniper is the more xeric of the two, often serving as nurse trees for pinyon in well-developed forests. Elevation varies from 5,000 to 8,000 feet between the lower elevation, more xeric, cool desert shrub community that is dominated by sagebrush, and the higher elevation, more mesic, mountain brush community (Welsh et al. 1993).

Junipers are considered climax species for a number of pinyon and juniper woodland, sagebrush steppe, and shrub steppe habitats. An increase in sagebrush cover following livestock grazing and past aggressive fire suppression has created a more favorable environment for juniper invasion (Knight 1994). Many areas where juniper encroachment has occurred have also been invaded by cheatgrass in the understory, which raises concerns of further cheatgrass expansion following fire.

Sagebrush

Big sagebrush grows in non-saline well-drained valleys and slopes and mostly forms monotypic stands. It is generally found above the valley bottoms, immediately below the pinyon and juniper woodland type. However, in western Utah there two zones of big sagebrush that dominate a wide belt both below and above the pinyon and juniper woodland zone (Harper et al. 1978).

Since sagebrush develops in seral stages, many of the acres of native, perennial grasslands and areas shown in **Table 3.9** may be considered early seral sagebrush communities. In addition, at the scale of mapping for this EA, many areas identified as annual and perennial grasslands may contain inclusions of remnant sagebrush steppe communities.

Healthy sagebrush is a patchwork mosaic of seral communities that range from recovering perennial grass-shrublands following natural fire, to old-growth, decadent sagebrush steppe with high canopy cover and reduced herbaceous understory (Wyoming Interagency Vegetation Committee 2002). The two main subspecies of big sagebrush found on the SUSA planning area are:

1. Wyoming big sagebrush is the most common shrub in the intermountain basins (Knight 1994). It grows in pinyon and juniper woodland and below on plains and foot-hills at elevations of 5,000 to 7,000 feet. Associated grasses are often scarce in this big sagebrush type.
2. Basin big sagebrush grows with Wyoming big sagebrush but is confined to valley bottoms in deep, well-drained sandy to loamy soils at 4,000 to 7300 feet in elevation. Basin big sagebrush grows taller (up to six feet) and blooms later than Wyoming big sagebrush.

On the drier sites, much of the sagebrush communities have degraded with extensive conversion to cheatgrass dominated understories.

During pre-settlement times, it is estimated that sagebrush steppe dominated as much as 25 percent of the land now administered by Utah BLM (Limbach 2004). Management actions, cheatgrass invasion, juniper encroachment, and drought are responsible for its decreased range.

Salt Desert Shrub

This vegetation type is perhaps the most arid vegetation type in the Intermountain West (Wood and Brotherson 1986). Salt desert shrub occurs in valleys at the lowest elevation. This vegetation type grows in areas characterized by accumulations of salt in poorly developed soils. This vegetation type includes salt tolerant, succulent shrubs like greasewood, ephedra, shadscale, four-wing saltbush, and threadleaf rubber rabbitbrush. Common grasses include inland saltgrass, alkali sacaton, bottlebrush squirreltail, and Indian ricegrass. Forbs are numerous but seldom are any one species abundant. Biological crusts are usually present and cover most of the interspaces between shrubs in intact, native species-dominated salt-desert shrub types. Salt desert shrub generally has low productivity, naturally sparse understory vegetation and light fuels.

In the past 40 years, large expanses of salt desert shrub have been overtaken by invasive annual grasslands and annual forbs. Currently, cheatgrass has invaded all of the salt desert type found on the SUSA planning area and approximately 82 percent of this vegetation type now provides sufficient fuel loading to support large, fast-moving fires. Where cheatgrass has invaded, native salt desert shrub communities have been permanently lost or are at high risk of loss.

Grasslands

Grasslands types include native perennial grasslands, seedings of native species and exotic perennial grasses (primarily crested wheatgrass), and some cheatgrass.

Native perennial grasslands are an intermediate successional stage that would eventually return to a diverse sagebrush steppe habitat after extended periods (20 to 70 years) without impacts from wildland fires. Native perennial grass species include bluebunch wheatgrass, Indian ricegrass, bottlebrush squirreltail, Sandberg bluegrass, Nevada bluegrass, thickspike wheatgrass, western wheatgrass, galleta grass, blue grama, needle-and-thread grass, great basin wildrye, sheep fescue and others.

Due to increased fire intervals and subsequent loss of topsoil, perennial grasslands dominated by crested wheatgrass and/or other non-native species are stable communities that do not trend toward recovery to sagebrush steppe habitat as quickly as native perennial grasslands. Historically, native perennial grasslands would have formed part of the seral mosaic of the sagebrush steppe habitat, although it is unclear how widespread they once may have been represented across the landscape. In addition to cheatgrass, the grassland vegetation type is prone to invasive species.

Large areas of perennial grasslands are now dominated by sagebrush as a result of fire suppression and historical livestock grazing practices. Range improvement and fire rehabilitation efforts have converted a large amount of these sagebrush-invaded grasslands to non-native seedings like crested wheatgrass.

Blackbrush

Blackbrush communities are thought to be climax and are restricted to portions of the Colorado Plateau. Widely spaced blackbrush shrubs characterize this vegetation type, with sparse vegetation in the interspace in intact native communities. These communities are often associated with shallow soils or those with hardpans near the surface; as a result they're shallow rooted (four to 12 inches). Most of the blackbrush in Utah has suffered substantial die-back due to ongoing drought conditions.

This vegetation type, which grows in areas receiving seven to 10 inches of annual precipitation, is currently being invaded by annual plants like cheatgrass or red brome. Cheatgrass readily invades areas that have burned. As a result, this type is at risk of a stand-replacing fire where cheatgrass invasion has occurred. Cheatgrass expansion into this vegetation type poses a serious threat by providing a continuous understory of fine fuel and reducing fire return intervals in an otherwise non-fire-adapted community.

Mountain Shrub

This vegetation type consists of four main vegetation types: Gambel oak, maple, mountain mahogany, and mixed mountain shrub. Mixed mountain shrub is a highly diverse community made up in part of chokecherry, serviceberry, currant, snowberry, elderberry, bitterbrush, mountain big sagebrush, nine-bark, ceanothus and others. This vegetation type occurs as a transition vegetation type between mid-elevation sagebrush and conifer types. It is found at moderately high elevations (7,000 to 8,500 feet). The mountain shrub type is usually found on north and east slopes that tend to be cooler and moister than south and west aspects (the exception is mountain mahogany and oak, which can occur on south aspects).

Creosote and Bursage

This vegetation type, which is found in the lowest desert valley bottoms (approximately 4,200 feet elevation or less) and receiving seven to 10 inches of annual precipitation is currently being invaded by annual plants like cheatgrass or red brome. Creosote was once restricted to well-drained knolls and foothills (Paysen et al. 2000), however between the mid-1800s and early 1900s, creosote had encroached into areas dominated by grasslands (Valentine and Gerard 1968). Because creosote is unpalatable to livestock, grazing (along with drought) has contributed to the expansion of creosote (Buffington and Herbel 1965; Francis 2004) due to a decrease in competition. Creosote bushes often require a nurse crop such as bursage for seedling/sapling establishment by providing a microhabitat and protection. Creosote itself will serve as a nurse plant for certain other species (Francis 2004).

Ponderosa Pine

Ponderosa pine occupies the warmest, driest forest sites away from cold air drainages. Because ponderosa pine tolerates a broader range of environmental conditions than most of its associates, this type has no particular community type, but rather the understory constitutes whatever community is growing nearby. It can occur as a climax type at lower elevations or seral with some other type (like Douglas-fir) at higher elevations.

Riparian

Riparian vegetation is typically comprised of narrow stringer communities along both sides of the rivers and streams. Native tree communities in the SUSA planning area may be dominated by Fremont cottonwoods with understories of shrubs (such as sandbar willow) and herbaceous species. Although Fremont cottonwood communities are characterized by a late seral stage (e.g., all mature to late-mature trees) with little or no representation of younger age-classes (until flooding causes more sprouting), and are not typically fire-adapted, some stand within the planning area have a mixture of age classes. The life history and ecology of cottonwoods are intimately tied with flooding, erosion, and deposition on the flood plains. Cottonwoods release their seeds during the flood season because the seeds only germinate and establish on freshly deposited, moist alluvium (point bars). This frequently creates bands of trees that provide a living record of flooding patterns and channel migration with younger age classes near the water's edge (green-line) and older trees occurring some distance from the channel in the floodplain (Knight 1994).

Due to altered stream flows that exist in the native cottonwood communities, the trend is toward a greater representation of climax vegetation with a lack of recruitment by younger age classes as well as possible mortality to older individuals. In others, many of the native riparian communities have been converted to exotic tamarisk and Russian olive and/or noxious weeds.

Mixed Conifer

This vegetation type consists of major forest community types of mixed conifer, which may include Douglas-fir, white fir, Englemann spruce, and sub-alpine fir. This type occupies less than one percent of the BLM-managed lands on the SUSA planning area. As a result of fire suppression and grazing, species like Douglas-fir (which has thick bark like ponderosa pine) will invade lower communities, otherwise most occur at elevations above 7,000 feet.

Because there are numerous community types associated with this vegetation type, the condition and trends vary. In those conifer types associated with aspen, the trend is towards a greater representation of climax vegetation, with a corresponding loss of aspen. In other conifer community types that lack the aspen component, the increasing density of shade tolerant species can place greater stress on larger older trees, mostly due to between-tree competition for water, consequently resulting in a greater susceptibility to insect and disease attack (Keyes et al. 2003). In many sites, the stocking index is 15 times greater than pre-settlement times (Baker 2001), resulting in an increased likelihood of catastrophic stand-replacing fire.

Aspen

Aspen-dominated types can be climax or seral to conifer communities and are found between 6,500 to 10,500 feet. Aspen occurring as pure stands are considered climax and when in association with various conifers such as Engelmann spruce, ponderosa pine, white fir, sub-alpine fir, and Douglas-fir, seral. Although conifer invasion is a natural pattern in seral aspen stands, fire suppression has resulted in an increased representation and dominance by conifer in aspen stands, thus reducing the extent of aspen-dominated stands (Mueggler 1989). Aspen is a fire-dependent species and because aspen is a fast-growing and short-lived species, in the absence of fire, the aboveground stems tend to become decadent and diseased.

3.3.15 FISH AND WILDLIFE

For the purpose of this document, general fisheries and wildlife refers to species and groups of similar species that do not have federal status (as defined in BLM Manual 6840, including ESA-related species), but may have other federal or state protection (e.g., under the federal Migratory Bird Treaty Act or Utah State Code) and are of concern to management authorities, Native American tribes, the general public, or groups (e.g., birders, hunters, etc.) with particular interest in a species or group of species.

General fisheries and wildlife groups considered in this document include fisheries, non-game (raptors, migratory birds, small mammals, carnivores and predators, and amphibians and reptiles), and big game (mule deer, Rocky Mountain elk, desert bighorn sheep, and pronghorn). ESA-related and BLM sensitive species are discussed separately. Scientific names and habitat associations for each of the species within SUSA planning area mentioned in this section are presented in **Table 3.10**. The water cover type is valuable wildlife habitat and has the potential to be impacted by the proposed project, so it has been included in addition to the vegetation types.

TABLE 3.10: HABITAT ASSOCIATIONS FOR GENERAL FISH AND WILDLIFE SPECIES

Species	Common Name	Habitat
Fisheries		
Rainbow trout	*Oncorhyncus mykiss*	W
Brown trout	*Salmo trutta*	W
Brook trout	*Salvelinus fontinalis*	W
Lake trout	*Salvelinus namaycush*	W
Birds		
Ferruginous hawk	*Buteo regalis*	SDS, S, PJ, S, G, B
Red-tailed hawk	*Buteo jamaicensis*	SDS, PJ, S, G, MS, MC, A
Northern goshawk	*Accipiter gentiles*	MC, A
Golden eagle	*Aquila chrysaetos*	SDS, PJ, G, MS, MC, RW, A, W
American kestrel	*Falco sparverius*	MC, PP, RW, A
Osprey	*Pandion haliaetus*	RW, W
Northern harrier	*Circus cyaneus*	G, RW
Turkey vulture	*Cathartes aura*	SDS, PJ, S, G, B, MS, MC, PP, RW, A, W
Lewis' woodpecker	*Melanerpes lewis*	MS, PP, RW
Abert's towhee	*Pipilo abertii*	RW
American avocet	*Recurvirostra americana*	RW
Mountain plover	*Charadrius montanus*	SDS
Lucy's warbler	*Vermivora lucidae*	SDS, RW
Sage grouse	*Centrocercus urophasianus*	S
American white pelican	*Pelecanus erythrorhynchos*	RW, W
Bobolink	*Dolichonyx oryzivorus*	RW
Virginia's warbler	*Vermivora virginae*	PJ, MS
Gray vireo	*Vireo vicinior*	PJ, MS
Bell's vireo	*Vireo bellii*	RW
Black rosy finch	*Leucosticte atrata*	G
Long-billed curlew	*Numenius phaeopus*	G
Sharp-tailed grouse	*Tympanuchus phasianellus*	S, G
Brewer's sparrow	*Spizella breweri*	SDS, S
Black swift	*Cypseloides niger*	RW
Black-necked stilt	*Himantopus mexicanus*	RW
Broad-tailed hummingbird	*Selasphorus platycercus*	RW
Yellow-billed cuckoo	*Coccyzus americanus*	RW

Species	Common Name	Habitat
Black-throated gray warbler	*Dendregion of influenceca nigrescens*	PJ, MS
Three-toed woodpecker	*Picoides tridactylus*	MC
Sage sparrow	*Amphispiza belli*	SDS, S
Gambel's quail	*Callipepla gambelii*	SDS, RW
Flammulated owl	*Otus flammeolus*	MC, PP, RW, A
Tree swallow	*Tachycineta bicolor*	MC, PP, RW, A
Black-capped chickadee	*Parus atricapillus*	MC, PP, RW, A
Mountain chickadee	*Parus gambeli*	MC, PP, RW, A
Mammals		
Silver-haired bat	*Lasionycteris noctivagans*	MC, PP, RW, A
Ringtail	*Bassariscus astutus*	MC, PP, RW, A
Black bear	*Ursus americanus*	MS, MC, PP, RW, A
Mountain lion	*Felis concolor*	PJ, MS, MC, PP
Coyote	*Canis latrans*	SDS, PJ, S, G, B, MS, MC, A
Mule deer	*Odocoileus hemionus*	S, MS
Rocky Mountain elk	*Cervus elaphus*	G, MS, MC, A
Desert bighorn sheep	*Ovis canadensis nelsoni*	S, G, MS
Pronghorn	*Antilocapra Americana*	SDS, S, G

Habitat Codes: SDS = salt desert shrub, PJ = pinyon and juniper woodland, S = sagebrush, G = grassland, B = blackbrush, MS = mountain shrub, MC = mixed conifer, PP = ponderosa pine, RW = wetlands and riparian zone, A = aspen, W = water

Fisheries

Seventy-three fish species and numerous species of mollusks and other macroinvertebrates are found on BLM-administered lands in Utah. Fish species found on BLM-administered lands that are not ESA-related or BLM sensitive include rainbow, brown, brook, and lake trout; suckers; shiners; dace; chubs; sculpins; and a variety of lesser known or less abundant species.

Native fish demonstrate a wide variety of life histories, including resident populations that inhabit small headwater streams with shorter migratory ranges, populations that use larger streams and main rivers, populations that are found in lake habitats, and populations that spawn in rivers or streams.

BLM-administered lands within the planning area provide the following approximate values of aquatic habitat resources: elevation, latitude, topography, substrate, water quality, and chemistry, vegetative structure, flow regimes, and patterns and disturbance regimes.

The quality of aquatic habitats varies widely across the state. Generally, aquatic habitats have declined since the settlement of the region began in the 1850s. Disturbances contributing to decline of habitat have included logging, grazing, mining, recreation, water diversion for irrigation and domestic supply purposes, other surface disturbing activities, and introduction of non-native species, as well as wildland fire, insect infestation,

disease, wind, floods, landslides, avalanches, and other surface disturbing activities. These disturbances have resulted in the loss of riparian vegetation and subsequent changes in vegetation species composition.

Non-game Species

For the purposes of this document, non-game species are identified as raptors, migratory birds, small mammals, carnivores and predators, and amphibians and reptiles.

Raptors: Raptors (birds of prey) found in and adjacent to the SUSA planning area include several species of hawks (e.g., ferruginous hawk, red-tailed hawk, and northern goshawk), eagles (e.g., golden eagle), falcons (including the American kestrel), owls, ospreys, northern harriers, and turkey vultures. These species inhabit various ecosystems and consume a wide range of prey.

During the breeding season, raptors are particularly sensitive to disturbance. Behavior during and following disturbance could result in nest abandonment or reduced productivity. Accordingly, raptors are provided with protection designed to prevent disturbance under the following federal acts: Migratory Bird Treaty Act of 1918, Eagle Protection Act of 1962 (as amended), and, for federally listed species only, the ESA of 1973 (as amended). In addition, the Utah field office of the USFWS has issued guidelines for establishment of disturbance-free buffer zones around raptor nests and identification of mitigation techniques available for use when management or development activities conflict with the buffer zones. In Utah, the largest buffer zone suggested for any raptor nest is one mile (Romin and Muck 2002).

Migratory Birds: Migratory birds travel from one region to another, usually periodically, for breeding or feeding purposes. Generally, they nest in temperate North America and over-winter in portions of Mexico and Latin America. Migratory birds represent a diversity of species, including shorebirds, waterfowl, passerines (perching birds), and raptors, and may nest in any or all of the vegetation types within the planning area.

Utah Division of Wildlife Resources (UDWR) has prepared the Partners in Flight Avian Conservation Strategy, a document evaluating the status of 231 bird species, many of which are migratory, that breed in Utah (Parrish et al. 2002). Twenty-four bird species have been prioritized for management and protection, and occur mostly within four habitat types that have been designated by UDWR as priority habitats. These habitats correlate with Utah GAP cover types and include salt desert shrub, pinyon and juniper woodland, sagebrush, and wetlands and riparian zones (Parrish et al. 2002). The 24 priority bird species include the Lewis' woodpecker, Abert's towhee, American avocet, mountain plover, Lucy's warbler, sage grouse, American white pelican, bobolink, Virginia's warbler, gray vireo, Bell's vireo, black rosy finch, long-billed curlew, sharp-tailed grouse, Brewer's sparrow, black swift, black-necked stilt, broad-tailed hummingbird, ferruginous hawk, yellow-billed cuckoo, black-throated gray warbler, three-toed woodpecker, sage sparrow, and Gambel's quail.

Some migratory birds are cavity nesters and may be found in forested habitat of varying elevation throughout the state. Cavity-nesting birds include several species of woodpecker. Woodpeckers are considered primary cavity nesters because they typically excavate their own nest cavities. Secondary cavity nesters are often incapable of excavating their own nest cavities and, therefore, rely upon existing cavities that have been previously established by woodpeckers. Secondary cavity nesters include species such as the American kestrel, flammulated owl, tree swallow, and black-capped and mountain chickadees. While cavities may be excavated in live trees, standing dead trees (snags) are typically preferred by primary cavity nesters and may be easier for secondary cavity nesters to access. Trees in the mixed conifer, ponderosa pine, aspen, and wetlands and riparian habitat types each contain important nesting resources for cavity-nesting species.

Small Mammals: Small mammals include species groups such as prairie dogs, bats, squirrels, mice, and rabbits. Because these groups fill a variety of niches, small mammals are found in most habitat types within the planning area. Although the term "cavity nester" typically refers to bird species, it may also include small

mammals that use tree cavities for denning purposes. Small cavity-nesting mammals include species such as the silver-haired bat and ringtail.

Carnivores and Predators: These species are generally large, long-lived, solitary species. Although they are considered here to be non-game species, a variety of carnivores are managed by UDWR. More plentiful carnivores are often hunted for food, for sport, or as a management technique to allow prey species to thrive. Utah predators include species such as the black bear, mountain lion, and coyote. Although the black bear and mountain lion tend to remain more secluded in the mountain shrub and mixed conifer communities of mountains and foothills, the coyote may venture into urban and agricultural areas as a means of finding prey. In general, where there is a prey source, there are predators. Because predators consume birds and small mammals and often travel over large distances, they may be found anywhere within the planning area.

Amphibians and Reptiles: Because the majority of Utah's wildlife habitats are arid or semi-arid and such a small percentage of habitats are associated with water, reptiles are more prominent than amphibians. Reptiles are found throughout the planning area and may occur in any habitat type. Amphibians are found in and adjacent to wetlands, rivers and streams, mountain lakes, runoff pools in rock formations, and both ephemeral and permanent livestock watering ponds.

Big Game Species

Big game species include large, hunted animals such as mule deer, Rocky Mountain elk, and pronghorn. Given the economic importance of big game, this group is typically managed more closely than other wildlife groups. Accordingly, UDWR has identified critical seasonal use ranges within the planning area for mule deer, Rocky Mountain elk, desert bighorn sheep, and pronghorn. **Table 3.11** shows big game species and the acres and percentage of seasonal use areas per species within the planning area. These acreages refer only to those big game habitats that are considered most important by UDWR.

Mule Deer: Mule deer occupy most ecosystems but are characteristically found in shrublands with rough, broken terrain and abundant browse and cover. Mule deer winter diets consist primarily of browse in the form of sagebrush, bitterbrush, mountain mahogany, and other shrubs, as well as a small amount of grasses and pinyon or juniper. During the other three seasons, there is much wider distribution of nutritional resources. Mule deer summer-use habitat primarily consists of mixed conifer, aspen, wetlands and riparian zones, and grassland, while winter habitat primarily consists of low-elevation sagebrush or sagebrush and mountain shrub habitats on south-facing slopes.

TABLE 3.11: BIG GAME SEASONAL USE AREAS

Seasonal Use Range and Rank	Approx. Acreage	Approx. % of Seasonal Use Area per Species
Mule Deer		
Summer Critical	3,820	0.2
Winter Critical	497,476	8.8
Rocky Mountain Elk		
Winter Critical	79,515	2.0
Year-long Critical	13,833	5.8
Desert Bighorn Sheep		
Year-long Critical	667,488	22.7

Pronghorn		
Winter Critical	5,529	2.9
Year-long Critical	230	<0.1

Rocky Mountain Elk: The Rocky Mountain elk is a generalist, feeding on forbs and grasses during the spring and summer and grasses and shrubs throughout the fall and winter. These feeding relationships are variable and depend largely on location. Various habitats include winter ranges, calving areas and summer ranges. Calving areas are used from mid-May through June. They are typically located at higher elevations than wintering grounds; consist of grassland, mountain shrub, mixed conifer, and aspen; and occur near cover, forage, and water resources (Fitzgerald et al. 1994).

Desert Bighorn Sheep: Bighorn sheep inhabit remote, mountain, and desert locations, and are often found on cliffs and rocky slopes in rugged canyons. They are most closely associated with sagebrush, grassland, and mountain shrub habitats (Chapman and Feldhamer 1982). Bighorn sheep are active during the daytime and feed on grasses, trees, and shrubs, depending upon availability, succulence, and nutrient content. The desert bighorn sheep is found in the central and southern part of the state, as well as some of the west desert mountain ranges (UDWR 2004).

Pronghorn: The pronghorn is typically associated with salt desert shrub, sagebrush, and grassland habitats throughout its entire range (UDWR 2004). It is most active during the daytime and consumes sagebrush, thistle, cacti, grass, and forbs (UDWR 2004). There are 24 pronghorn management units within the state. Pronghorn population levels are subject to drought, and most units have suffered a substantial population decline during the current, six-year drought. Pronghorn populations are expected to rebound as the drought subsides.

3.3.16 SOILS

Soils in the planning area have developed from bedrock, volcanic activity, rocks, and minerals deposited by rivers and glacial activity, windblown silt, and sand. They are derived primarily from the sedimentary, metamorphic, and volcanic rocks of the mountain ranges and highlands in the region. Weathered substrates from these source materials have chemical and physical characteristics that may favor certain vegetation types and, combined with climatic influences, can provide habitats for various plant species. Soil source materials or substrates found in the planning area fall into the soil types such as alluvium, calcareous, clay, conglomerate, duff, granitic, gravelly loam, gypsiferous, igneous, limestone, loam, quartzite, sandstone, sandy, and shale.

The presence of biological crusts in arid and semi-arid lands influences the soil environment by reducing soil erosion (from both wind and water), fixing atmospheric nitrogen, retaining soil moisture, and providing living organic surface mulch. This crust consists of a variety of cyanbacteria, green algae, lichens, mosses, microfungi and other bacteria (Belnap and Lange 2003). A crust's development is strongly influenced by soil texture, soil chemistry, and successional colonization by crustal organisms. In some ecosystems, such as those characterized by highly erosive marine sediments and little vegetative cover, physical crusts such as vesicular chemical crusts and desert pavement can also provide protection from wind erosion.

Erosion and Run-off

Soils may be eroded by water or wind. Water erosion is influenced by the intensity and duration of precipitation, soil texture, soil organic matter, permeability, topography, and vegetative (or artificial) cover. Areas with soils on steep slopes, low infiltration rates, and minimal vegetative cover have the highest erosion

hazard. Wind erosion also has the potential to move large volumes of soil and primarily a function of wind velocity and grain size (Ritter et al. 1995).

Erosion may decrease soil productivity, expose plant roots, impede revegetation efforts, and increase salinity downstream. Many soils throughout the planning area have features that make reclamation and revegetation difficult. These limiting features involve salinity, sodium content, clay and sandy textures, drought conditions, alkalinity, low organic matter content, shallow depth to bedrock, stones and cobbles, propagule-rich soil, and high wind erosion potential. Certain geological formations, such as the Tropic shale, tend to form highly erosive soils. The hazard for soil erosion by water and wind is rated at the county level soil surveys conducted by the National Resource Conservation Services (http://soildatamart.nrcs.usda.gov).

Soil Quality and Health

The capacity of a soil to sustain plant and animal productivity is related to its inherent physical, biological, and chemical properties as well as its current health or condition. Three key attributes of soil and rangeland health (site stability, hydrologic function, and biotic integrity) have been identified that may assist in assessing the status or health of an area. Site stability relates to the ability of the soil to resist erosion (and loss of nutrients) by wind and water. Hydrologic function is the capacity of the site to capture, store and safely release water from rainfall and snowmelt. Biotic integrity is the capacity of a site to support both functional and structural plant, animal and soil biological communities within the range of variability for that site (BLM 2000a).

Since effects of soil health and erosion are often associated with wetlands and riparian zones and water quality, they are discussed in the wetlands and riparian zones and water quality sections in this chapter.

3.3.17 RECREATION

Recreation is one of the major resource uses within the SUSA planning area. The term "recreation" includes a variety of activities that affect and are affected by resources and other resource uses. The planning area offers a wide variety of recreational opportunities, especially for dispersed use requiring undeveloped open space. These activities include wildlife viewing, hunting, hiking, backpacking, horseback riding, OHV use, fishing, bicycling, photography, camping, orienteering, river running, rock climbing, mountain biking, and sightseeing.

Recreational use is counted as visitor use and is measured in "visitor days." A visitor day represents one person doing an activity for all or part of one day. For example, if one person spent one night camping on public lands, it is counted as two visitor days. More than 7 million visitor days occurred on Utah public lands in 2002 (BLM 2003c).

Recreation resources include recreation sites and dispersed public lands, wildlife resources, visual resources, waterways, lakes, and other resources (physical, historical, etc.), each of which provides different recreational opportunities. In areas where recreation resources receive heavy use, developed recreation sites are often constructed to aid in managing impacts. Consequently, developed recreation sites are primarily located near high-use recreation attractions.

These developed recreation areas may include such permanent features as:

- Picnic tables
- Drinking water facilities
- Vault toilets/shower facilities
- Shade structures

- Parking lots with traffic flow controls such as striping, islands, boulders, and rope fences
- Water drainage systems
- Signage, including maps, brochures, speed limits, recreation safety, wildlife and noxious weed information
- Bulletin boards and visitor registration/fee stations
- Traffic counters

Recreation sites and areas present within the SUSA planning area are shown in **Table 3.12**.

TABLE 3.12: RECREATION SITES BY ADMINISTRATIVE OFFICE

Site Name	Field Office	Recreation Features
Parowan Gap	Cedar City	Scenic views, listed on National Register of Historic Places
Rock Corral Campground	Cedar City	Camping
Blues Overlook	GSENM	Scenic views, wildlife viewing
Buckskin Trailhead	GSENM	Hiking
Calf Creek Campground	GSENM	Camping, hiking
Canyons of the Escalante	GSENM	Camping, hiking, biking, equestrian, off-highway vehicle use
Deer Creek Campground	GSENM	Camping, hiking
Devils Garden	GSENM	Scenic views, wildlife viewing
Eagle Sinkhole	GSENM	Scenic views, hiking
Escalante River Trailhead	GSENM	Hiking
Grosvenor Arch	GSENM	Scenic views, wildlife viewing
Paria Canyon/River	GSENM	Camping, hiking, biking, equestrian, off-highway vehicle use
Paria Movie Set	GSENM	Cultural values
Paria Townsite	GSENM	Historic and cultural values
White House Trailhead	GSENM	Hiking
Willow Tank Trailhead	GSENM	Hiking
Wire Pass Trailhead	GSENM	Hiking
Wolverine Petrified Wood Area	GSENM	Scenic views, geologic values
Coral Pink Sand Dunes	Kanab	Picnicking, camping, off-highway vehicle use
Paria River	Kanab	Camping, picnicking, ranger station, hiking, wildlife viewing, scenic byway
White House Trailhead	Kanab	Year-round hiking
Baker Dam	St. George	Camping, fishing
Joshua Tree National Landmark	St. George	Wildlife viewing, scenic byway
Red Cliffs/Sand Mountain	St. George	Camping, hiking, off-highway vehicle trails, wildlife viewing
Smithsonian Butte/Canaan Mountain	St. George	Hiking, wildlife viewing, scenic byway
Special Recreation Management Areas		
Escalante Canyon	GSENM	Scenic views, hiking, wildlife viewing
Fifty Mile Mountain	GSENM	Scenic views, hiking, wildlife viewing
Highway 12 Corridor	GSENM	Scenic views, hiking, wildlife viewing
Highway 89 Corridor	GSENM	Scenic views, hiking, wildlife viewing

Paria-Hackberry	GSENM	Scenic views, hiking, wildlife viewing
Paria Canyon-Vermillion Cliffs	GSENM	Scenic views, hiking, wildlife viewing
Deep Creek	St. George	Scenic views, hiking, wildlife viewing
LaVerkin Creek	St. George	Scenic views, hiking, wildlife viewing
Red Mountain	St. George	Scenic views, hiking, wildlife viewing
Sand Mountain	St. George	Scenic views, hiking, wildlife viewing

Note: GSENM – Grand Staircase-Escalante National Monument

3.3.18 SOCIAL AND ECONOMIC CONDITIONS

The SUSA planning area, which encompasses Beaver, Garfield, Iron, Kane and Washington Counties, represents the region of influence for social and economic activities pertaining to the planning area. The region of influence is defined as the geographical area in which the principal direct and indirect socioeconomic effects of the Proposed Action and the No Action Alternative are likely to occur.

The primary socioeconomic issues in the SUSA planning area region of influence include potential impacts to rights-of-way holders, grazing resources, American Indian tribes, local communities, and other governmental entities, including federal, state, county, and municipal units. Impacts to individuals, local communities, American Indian tribes, and others can be both short term and long term and either positive or negative.

Population and Employment

Baseline data for the SUSA planning are region of influence includes population and demographic data as well as current business and economic statistical information for the state obtained from the Bureau of Labor Statistics and Bureau of the Census, based on 2000 census data. Additional information was obtained from population, employment, earnings, and personal income trends-derived data compiled from the Sonoran Institute database prepared for the BLM (Sonoran Institute 2005).

The region of influence counties collectively had a total population in 2004 of 173,230 (Utah Department of Workforce Services 2004). Over half of the total population lives in the primary population centers: St. George, Cedar City, Washington, and Hurricane (Utah Department of Workforce Services 2004). The remainder of region of influence is predominantly rural, comprised of small towns with populations generally less than 3,000 people.

Collectively, the majority of the employment in the region of influence counties is in the services and professional industry sector, with most of those jobs found in the health, legal, or other business services and in retail trade. The growth in these industry sectors is due in part to the recreational amenities in the area and the area's desirability as a retirement spot. Although farming and other agricultural enterprises comprise only a small percentage of the total employment in the region of influence, most of the farm and agricultural-related activities are associated with cattle ranching. Approximately 66 percent of the total farm acres in the region of influence are dedicated to pasture land for cattle or other livestock (USDA 2002b). Federal grazing allotments are also heavily relied upon for livestock forage (as discussed in the livestock grazing section of this chapter).

Local American Indian and Hispanic populations rely upon public lands in the region of influence for harvesting forest products such as pinyon pines nuts. Pinyon nuts are collected for individual use and to sell or trade. In addition, commercial harvesters provide local employment opportunities in the region of influence. Pinyon nut harvesting and other subsistence activities at risk from the Proposed Action are further discussed in the Native American religious concerns section of this chapter.

Other economic uses of public lands in the region of influence include rights-of-way for utility corridors, roads and pipelines, and a wide breadth of recreational uses that provide a major tourist draw to the region.

3.3.19 WILD HORSES AND BURROS

In 1971, Congress passed legislation to protect, manage, and control wild horses and burros on the public lands. The Wild Free-Roaming Horse and Burro Act declared these animals to be "living symbols of the historic and pioneer spirit of the West." The SUSA planning area contains 10 HMAs and two herd areas (HAs). The appropriate management level for each HMA and HA with SUSA is presented in **Table 3.13**. **Table 3.14** lists the current acreages of the HMAs by ownership within the planning area. Current HMA boundaries are shown in **Figure 3.7**.

TABLE 3.13: HERD MANAGEMENT AREAS, HERD AREAS, AND APPROPRIATE MANAGEMENT LEVELS

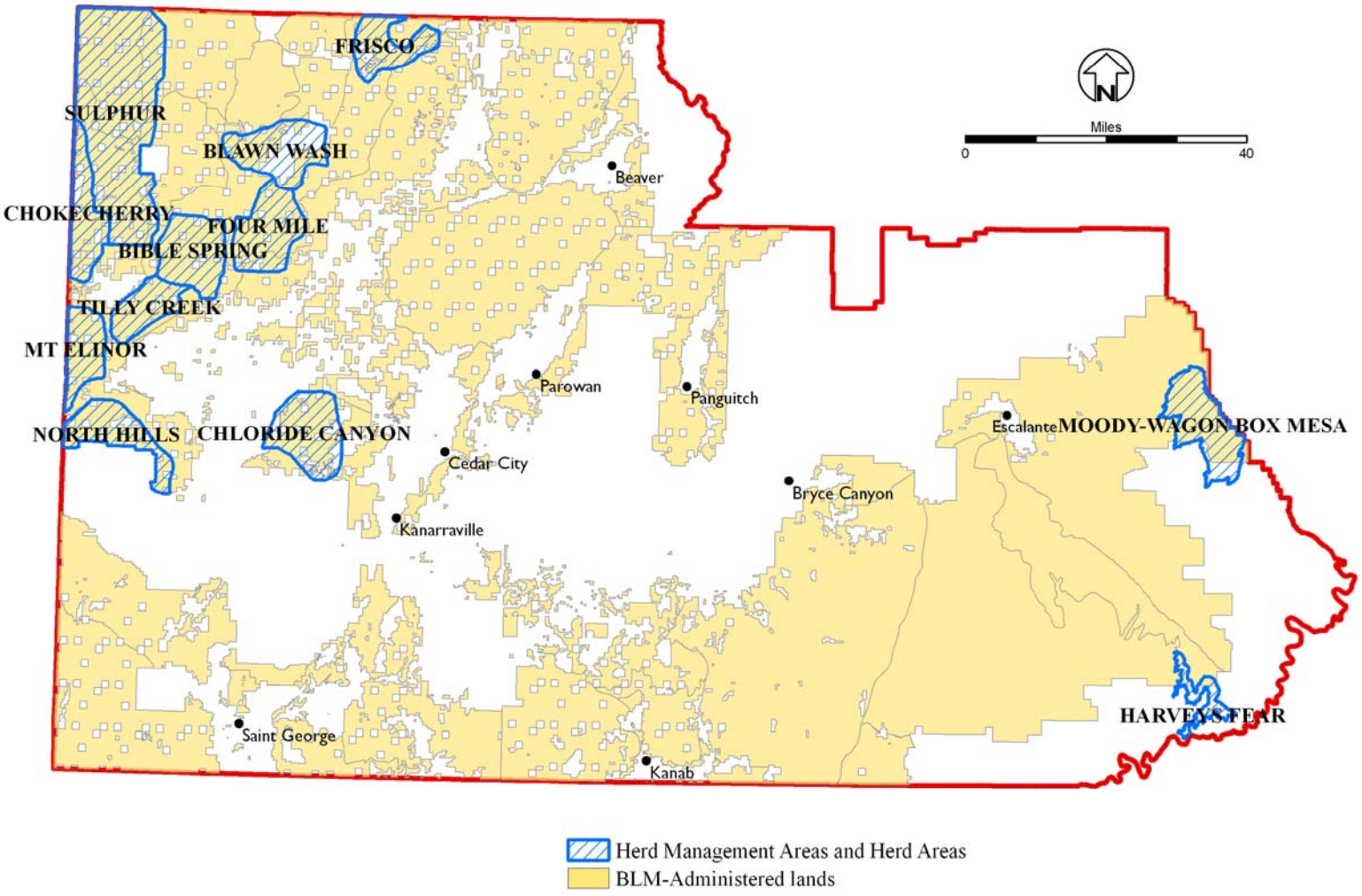
Herd Management Areas/Herd Areas	Appropriate Management Level		Current Estimated Population	
	Horses	Burros	Horses	Burros
Bible Springs HMA	60	0	50	0
Blawn Wash HMA	0	0	10	0
Chloride Canyon HMA	30	0	53	0
Chokecherry HMA	30	0	35	0
Four Mile HMA	60	0	30	0
Frisco HMA	60	0	50	0
Mt. Elinor HMA	25	0	30	0
North Hills HMA	60	0	80	0
Sulphur HMA	250	0	350	0
Tilly Creek HMA	50	0	73	0
Harvey's Fear HA	0	0	25	0
Moody – Wagon Box Mesa HA	0	0	0	0
TOTAL	625	0	786	0

TABLE 3.14: HERD MANAGEMENT AREAS AND HERD AREA ACREAGE BY LAND OWNERSHIP

Herd Management Area/Ownership	Approximate BLM Acres Acres		
	BLM	State	Private
Bible Springs HMA	53,370	3,380	1,140
Blawn Wash HMA	34,097	25,970	492
Chloride Canyon HMA	42,652	5,505	15,525
Chokecherry HMA	38,991	3,598	4,934
Four Mile HMA	50,841	5,691	2,179
Frisco HMA	31,626	3,278	5,671
Mt. Elinor HMA	34,045	2,868	1,259
North Hills HMA	40,692	5,858	3,301
Sulphur HMA	184,779	20,602	7,874

Tilly Creek HMA	32,010	1,663	2,290
Harvey's Fear HA	5,635	0	0
Moody – Wagon Box Mesa HA	53,776	0	0
TOTAL	602,514	78,413	44,665

FIGURE 3.7: HERD MANAGEMENT AREAS AND HERD AREAS



3.3.20 WILDERNESS CHARACTERISTICS

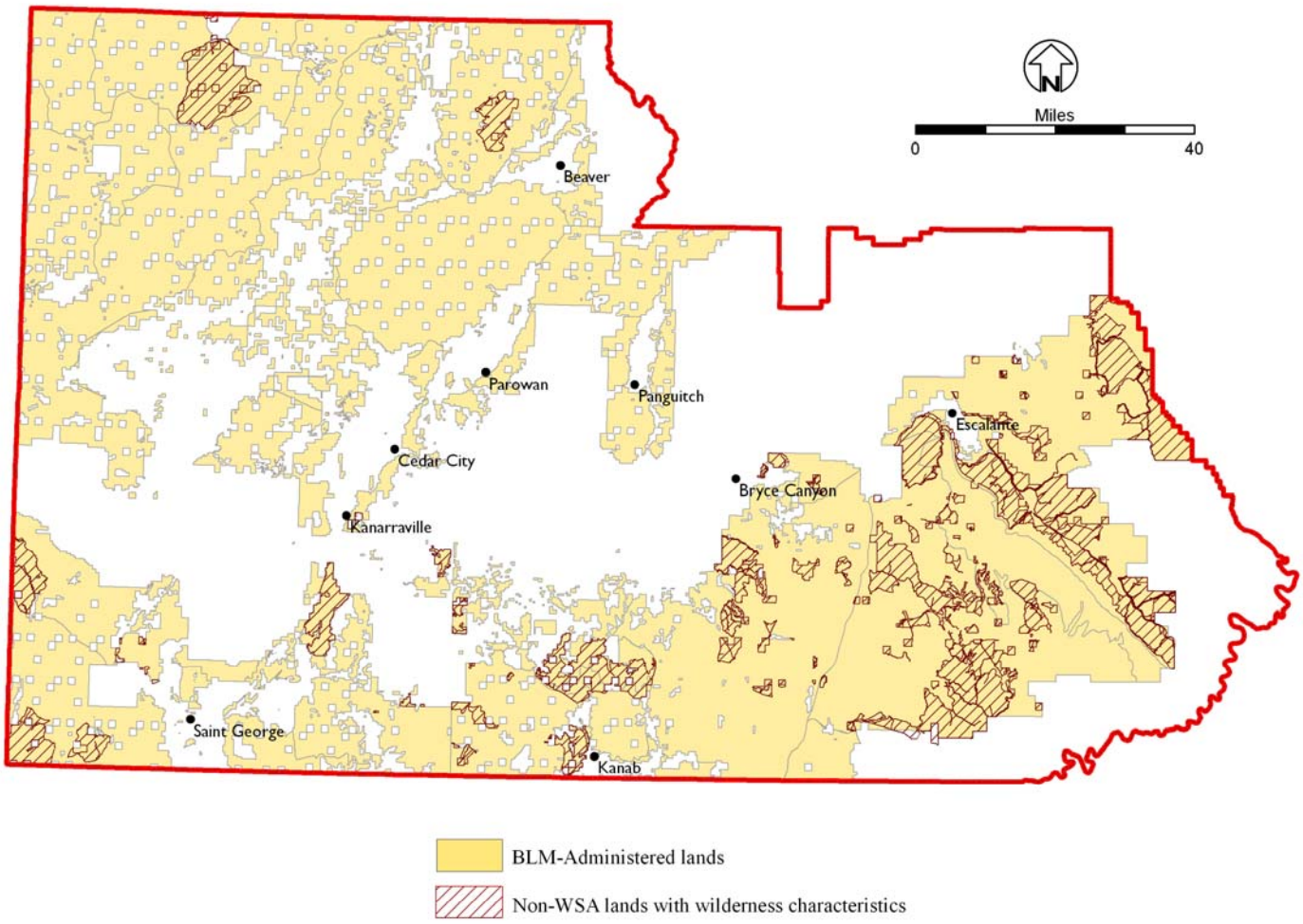
"Wilderness characteristics" are defined as features of the land associated with the concept of wilderness (see the wilderness study areas section of this chapter for the definition of wilderness). Lands with wilderness characteristics may be managed to protect and/or preserve some or all of those characteristics. This may include protecting certain lands in their natural condition and/or providing opportunities for solitude, or primitive and unconfined types of recreation (USDI 2003).

Forty-eight areas within SUSA planning area, totaling 858,524 acres (17% of planning area), have been identified as having wilderness characteristics (BLM 1999b). These areas are listed in **Table 3.15** and shown on **Figure 3.8**.

TABLE 3.15 : NON -WSA LANDS WITH WILDERNESS CHARACTERISTICS

Name	Acreage	Name	Acreage
Beaver Dam Wash	25,207	Moquith Mountain	13,110
Black Ridge	21,861	Mud Spring Canyon	22,305
Box Canyon	2,928	Nipple Bench	29,538
Burning Hills	13,061	North Escalante Canyons	26,227
Canaan Mountain	3,786	North Wah Wah	11,996
Carcass Canyon	34,221	Orderville	10,439
Cave Point	5,178	Paria-Hackberry	33,583
Central Wah Wah	58,910	Parunuweap	7,717
Colt Mesa	28,329	Phipps-Death Hollow	4,724
Cougar Canyon	162	Red Mountain	2,104
Deep Creek	4,609	Scorpion	13,666
East of Bryce	867	Spring Creek Canyon	1,498
Fiftymile Bench	12,890	Squaw Canyon	14,686
Fiftymile Mountain	32,111	Steep Creek	7,955
Fremont Gorge	553	Studhorse Peaks	22,437
Granite Peak	18,222	Sunset Arch	5,470
Grand Staircase-Escalante National Monument	703	The Cockscomb	1,426
Horse Mountain	12,428	The Narrows	20,347
Horse Spring Canyon	31,709	Upper Kanab Creek	186,295
Hurricane Wash	9,790	Wahweep-Death Ridge	43,691
Joshua Tree	10,252	Warm Creek	24,198
Lamp Stand	3,503	Watchman	40
Little Egypt	22,400	White Rock Range	1,392
TOTAL: 858, 524 acres			

FIGURE 3.8: NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS



CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter discloses the predicted direct, indirect, and cumulative effects of the alternatives described in Chapter 2 and **Appendices C, D, E, and F.**

This chapter is organized with discussions of direct and indirect impacts on each resource (as defined in BLM Land Use Planning Handbook H-1601-1, as amended; BLM 2004b) under both the Proposed Action and No Action Alternative. The analyses of impacts of fire management actions on each resource are discussed in a short and long-term context. The cumulative effects section of this chapter (Section 4.4) analyzes the effects of past, present and reasonably foreseeable actions along with the effects of the Proposed Action and No Action Alternative.

To provide additional context in the analysis of impacts from fire management actions associated with both alternatives, a general description of fire's effects on each resource is presented as **Appendix J**. These effects are present in the environment regardless of what alternative is selected. The alternative selected would increase or decrease these effects and that difference forms the basis of the analysis of impacts.

Locations, geographic extent, and intensity of future FMP actions and wildland fire events are not known. Therefore, the effects analysis is focused on impacts across the entire SUSA planning area and not on particular sites or FMUs. Additional environmental analyses for site-specific proposals would occur prior to implementation of management actions. The following assumptions were used in the effects analysis:

- Fire management actions analyzed for potential impacts on resources of concern were: wildland fire suppression, wildland fire use, prescribed fire, and non-fire fuel treatments.
- As it is used in this analysis, short-term is considered 0 to 5 years, and long-term is 6 to 15+ years.
- If the Proposed Action were implemented, a measurable reduction in occurrence or severity of wildland fires would not be expected in the short term across the entire planning area. However, an overall increase in the size of a wildland fire event is locally possible in the Proposed Action, due to differing suppression goals.
- References to impacts from wildland fire suppression include emergency stabilization and rehabilitation (ESR).
- The Proposed Action allows for a less aggressive suppression response as compared to the No Action Alternative.
- Planned fuel treatments include prescribed fire, mechanical, biological, seeding, and chemical treatments. Although SUSA could use chemical and biological treatments as part of their non-fire fuel treatments, less than 50,000 acres would be used over ten years. Impacts from chemical or biological treatments would be discussed in greater detail in subsequent, site-specific analysis. Because possible acres for chemical and biological treatments would only occur on less than 1% of the planning area, impacts will not be discussed in this EA.
- Planned actions are implemented only in areas with a low risk of noxious weed infestation or when the action includes a component (e.g., seeding) to reduce the risk of infestation.
- Planned fuel treatments in the Proposed Action would cover two to four times the acreage compared to the No Action Alternative.
- Seeding actions often follow wildland fire suppression (these are considered ESR actions) and sometimes occur in conjunction with prescribed fire and non-fire fuel treatments (mechanical, biological, and chemical). Seeding actions would be implemented to stabilize soils, improve establishment of grass, forb and shrub communities, and prevent establishment of non-native invasive species.

- Wildland fire use areas represent less than 0.1% of the acres in the planning area. Impacts are discussed in Chapter 4 because site-specific wildland fire use actions do not undergo additional project-specific analysis.

4.2 PROPOSED ACTION

4.2.1 AIR QUALITY

Short-term Impacts

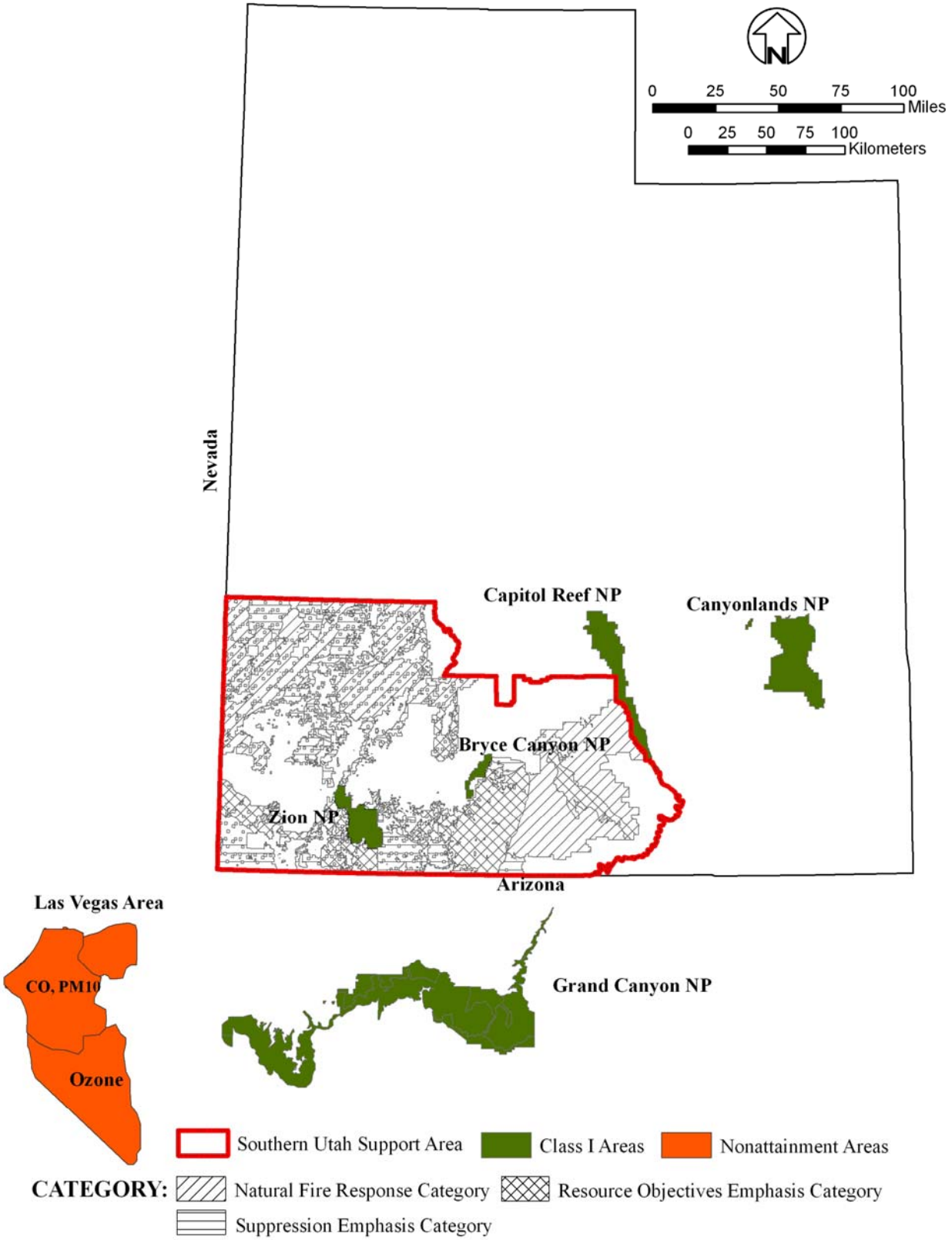
The Proposed Action includes several air quality RPMs to minimize air quality impacts, including visibility, to sensitive areas such as NAAs and Class I areas. Potential impacts, both long and short term, would be minimized through action specific analysis and permitting and coordination efforts with the Utah Interagency Smoke Management Program to ensure compliance with all local, state, and federal regulations, as described in Chapter 3. With these laws and protection measures in place, fire management activities associated with the Proposed Action would not unlawfully exceed air quality standards or impact NAAs or other sensitive areas in Utah. However, circumstances beyond the BLM's control (e.g., uncontrollable wildland fires) may impact air quality, but these acts of nature are outside the scope of the Proposed Action.

Figure 4.1 presents the location of NAAs and Class I areas located in the area of consideration for the planning area with BLM-administered lands categorized by proposed fire management levels. Under the Proposed Action, approximately 3.9 million acres are located in the Natural Fire and Resource Objective Emphasis categories where fire management goals may allow for the more liberal use of fire and are located within 100 kilometers of areas that have been identified as sensitive to air quality (such as the Las Vegas area NAAs and the National Park Class I areas). Smoke from wildland fires in the planning area may affect air quality in these sensitive areas. Impacts on air quality in these areas would be mitigated through an AMR, RPMs, and coordination with the Utah Interagency Smoke Management Program. Coordination with the Utah Interagency Smoke Management Program would also minimize impacts where regulations are not specifically applicable or where broader goals (such as minimizing visibility impacts on transportation corridors and Class I areas) are in place.

Planned and permitted prescribed fire and non-fire fuel treatments can be effective methods for reducing heavy fuels loads that could adversely impact air quality during a wildland fire (NWCG 2001b). When properly executed, managed fires would be much smaller, involve less combustion, and occur when weather conditions and fuel characteristics are optimal to enhance efficient fuels consumption and air pollutant dispersion (NWCG 2001b). The anticipated increase in prescribed fire would be coordinated with the SMP program coordinator to prevent exceedance of air quality standards and to minimize impacts on NAAs and other sensitive areas (Utah Interagency Smoke Management 2000). Impacts of prescribed fire events are anticipated to increase slightly from current conditions, but each event would be planned and would undergo environmental review to quantify and minimize those impacts.

Mechanical and other non-fire treatments could cause minor short-term increases in exhaust and fugitive dust during and immediately after application of treatments. However, non-fire treatments are planned events and would therefore undergo environmental review to ensure compliance with air quality standards and to minimize impacts on sensitive areas. Impacts on air quality would be reduced by utilizing non-fire options for fuels reduction.

FIGURE 4.1: NON-ATTAINMENT AREAS, CLASS I AREAS, AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



Long-term Impacts

The Proposed Action would decrease the potential for the occurrence of severe and uncontrollable wildland fires and create a trend toward a more "natural" fire occurrence on BLM-managed lands, which would enable the agency to manage wildland fire and associated emissions more effectively. Such management would decrease the potential for negative impacts on human health. The use of planned treatments would continue to have minor impacts on air quality. Due to their planned nature, the BLM could schedule and locate such events for optimal control of emissions.

4.2.2 AREAS OF CRITICAL ENVIRONMENTAL CONCERN

ACECs make up 3% of the planning area. As shown in **Figure 4.2**, 58 percent of ACEC lands are found within Resource Objectives Emphasis FMUs, and 42 percent are found within Suppression Emphasis FMUs. Management activities in all FMU categories would be carried out in a manner that would minimize impacts to the values of each ACEC.

Short-term Impacts

Short-term impacts resulting from management response to wildland fire may include ground disturbances associated with suppression and control efforts (e.g. hand lines and spike camps). The short-term impacts from suppression efforts would likely be less than allowing fires to burn and potentially harm the values the ACECs were designated to protect. Short-term, limited impacts of wildland fire suppression could include disturbance to soils, watershed functions, vegetation conditions, and habitats for SSS and fish and wildlife. RPMs have been built into the Proposed Action to protect natural resources (e.g., soil, water, SSS, and cultural resources) which would generally help protect the ACEC values. Impacts to these resources are discussed in their respective sections.

ACECs within Suppression Emphasis FMUs would likely see more short-term impacts from suppression activities than those ACECs in resource objective emphasis FMUs. AMR would be used during a wildland fire event to minimize adverse impacts or impairment of the values inherent to each ACEC. An AMR may include limiting the use of mechanical suppression activities, recommending smaller fire camps, or removing tracks and traces of fire suppression actions. Suppression would be prioritized to avoid impairment of values by wildland fire.

Impacts on ACECs would also be minimized by post-fire rehabilitation efforts. ESR activities, including seeding, would be prioritized within these areas to stabilize wildland fire areas, minimize the establishment of invasive and noxious weed species, and to preserve the natural and unique values inherent to each ACEC. ESR efforts may be noticeable after fire events as the areas become revegetated. Suppression and restoration efforts would be designed, when possible, to avoid impairment of the relevant and important values the ACECs were designated to protect.

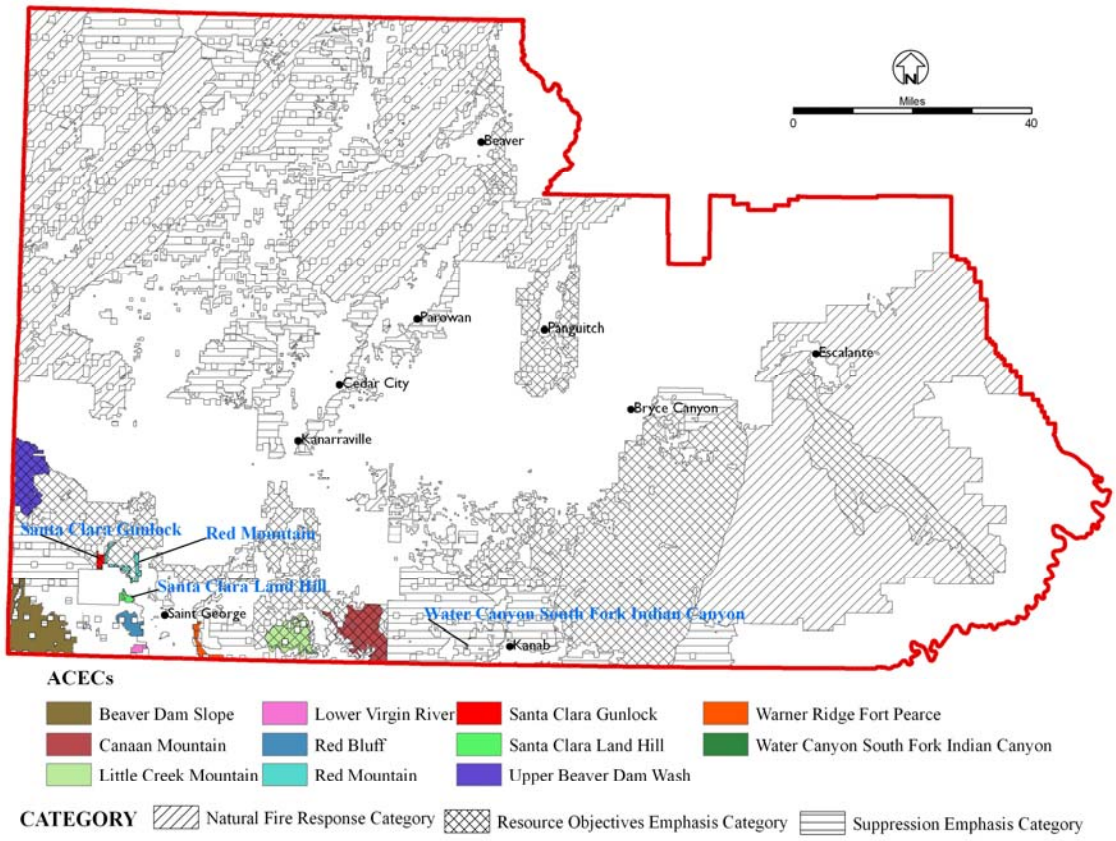
Compared to current management, more acres are identified under the Proposed Action as appropriate for prescribed fire and non-fire fuel treatments. All planned management activities, including prescribed fires and non-fire fuel treatments, would undergo a site-specific environmental evaluation to determine potential impacts to the ACEC prior to approval.

Long-term Impacts

The Proposed Action would result in modification of the current condition to a DWFC that would be more representative of the historical vegetation across the landscape. The primary long-term impact associated with the use of prescribed fire, non-fire fuel treatments, and wildland fire would be the decreased risk of large severe wildland fire events. The long-term, metered removal of hazardous fuels would direct a trend

toward lower probabilities of unplanned, undesirable wildland fire events. Such a trend would positively affect ACECs by preserving their valued characteristics.

FIGURE 4.2: AREAS OF CRITICAL ENVIRONMENTAL CONCERN AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



4.2.3 CULTURAL RESOURCES

Short-term Impacts

Cultural resources include archaeological, historic, and architectural sites that are important for scientific research, preservation, and interpretation. Fire suppression efforts (including ESR actions), wildland fire use, prescribed fire, and non-fire treatments could impact the thousands of cultural resource sites on BLM-administered lands within the SUSA planning area, including the eligibility characteristics of sites that are listed or eligible for listing on the NRHP. Effects would be minimized by application of RPMs (e.g., Utah State Protocol Agreement 3-7-01, pre-treatment surveys and subsequent avoidance) incorporated into the Proposed Action. Because not all cultural resources are known, or easily detectable or avoidable, the potential for impacts on cultural resources (particularly historic properties) does exist throughout the SUSA planning area.

Cultural resources are often at greater risk of impacts from fire suppression activities than from wildland fire itself. **Appendix J** presents impacts from fire on cultural resources. Suppression efforts (e.g., establishment of firelines, helicopter bases, safety zones, and fire camps) may be ground-disturbing and could destroy artifacts and the integrity of cultural resource sites. Water, foam detergents, and fire retardants could damage artifacts and features by causing swelling and subsequent contraction. Other potential short-term impacts would include rapid cooling and subsequent damage (e.g., breakage, spalling, corrosion, staining, rusting) of archaeological materials. Discoloration or warping of metallic surfaces could also occur. Rock art is particularly sensitive to retardants. Due to the exposure of sites, post-fire vandalism and artifact collection could occur after wildland fires or prescribed fires.

Like the current wildland fire management direction, the Proposed Action would decrease the impact on cultural resources through its emphasis on resource protection. Protections are incorporated into the Proposed Action through RPMs. Over the short term, minimal differences in fire severity would be expected between the Proposed Action and No Action Alternative. However, the Proposed Action has the potential to have more wildland fire use and prescribed fire acres than the No Action Alternative. Under the Proposed Action, historic-aged resources are more susceptible to impacts from wildland fire relative to prehistoric-aged resources (SHPO 2005). Consultation with a cultural resource specialist during suppression activities in areas containing sensitive cultural resources would help to minimize impacts.

Wildland fire use has the potential to have minor impacts on cultural resources. Impacts are minimized through the utilization of wildland fire use in areas where important resources are not present or have a small potential to be impacted and where lower temperatures and durations of fire are expected.

Prescribed fires typically burn at a lower temperature and shorter duration than wildland fire, therefore potential impacts from prescribed fire would be less severe than unmanaged wildland fire. Prescribed fire events are occasionally preceded by non-fire fuels reduction actions to obtain a smaller, more manageable, and less intense planned burn.

Non-fire fuel treatments and other planned actions with the potential to affect cultural resources are subject to the requirements of Section 106 of NHPA, as amended (36 CFR 800, consultation with the Utah State Historic Preservation Officer). Areas affected by surface disturbance would be subject to a cultural resource inventory. Inventories would lower the potential for impacts on cultural resources.

Non-fire fuels reduction treatments can directly impact cultural resources, depending upon their location and type. Ground-disturbing treatments (e.g., brush crunching) are more likely to impact cultural resources than chemical treatments. Some types of historic properties, such as historic mining-related features, could benefit from implementation of hazardous fuel reduction projects that would lessen the potential for severe, high intensity wildland fires that can damage or destroy fire-susceptible sites.

The potential for proposed prescribed fire, non-fire fuel treatments, and ESR actions to impact cultural resources would be considered during all phases of planning and implementation on a project-by-project basis. The most commonly selected method for the management of cultural resources located in an area of potential effect is complete avoidance of known resources. Because of the effectiveness of pre-treatment planning, the potential for negative impacts on cultural resources is considered negligible to minor for prescribed fire and non-fire fuel treatments.

Long-term Impacts

The continued trend toward a decrease in fuel loads would decrease the number of large severe fires, which would, in turn, result in a decrease in the level of suppression required on an average wildland fire. A decrease in impacts on cultural resources from ground-disturbing and other suppression activities would be realized in the long term. Heat and duration-related impacts would be similarly reduced over time.

Wildland fire use and prescribed fire typically burn at a lower temperature and duration than large wildfire events, so potential impacts from prescribed fire would be less severe than unmanaged wildland fire. The potential impacts from these methods would typically have less long-term impacts than those from an unmanaged wildland fire event. Though loss of or damage to cultural resources during all planned fuel treatments is possible, proper planning and consultation with a cultural resource specialist would reduce these impacts to a negligible level. The long-term impact under the Proposed Action would be greater protection of susceptible or sensitive cultural resources than under the No Action Alternative.

4.2.4 ENVIRONMENTAL JUSTICE

Short-term Impacts

Under the Proposed Action, negligible disproportionate impacts to minority or low income populations are anticipated for all planned and unplanned management actions. Potential impacts to all populations would be related to the loss of pinyon nut harvesting opportunities. One of the treatment objectives for juniper and pinyon woodlands would be to breakup continuous stands of the woodlands to achieve a mosaic of more open and diverse woodlands and sagebrush grasslands. Approximately 260,000 acres of pinyon and juniper woodland (approximately 10% of the total acres of that vegetation grouping in the SUSA planning area, comprising 5% of the total planning area) would be treated over the life of the plan. Approximately one percent of pinyon and juniper woodland would be converted per year. This conversion would leave the vast majority of woodlands available to pinyon nut harvesting. Site-specific impacts to pinyon nut harvesting would be considered during the process of planning prescribed fire and non-fire fuel treatments.

Long-term Impacts

Long-term impacts from the Proposed Action would trend toward a decrease in fuel loads in pinyon and juniper woodland. This would decrease the likelihood of severe fire events and of the associated direct impact of a loss of pinyon nut harvesting opportunities due to large wildland fires. This would help offset the overall decrease in pinyon and juniper woodland due to planned actions.

4.2.5 INVASIVE, NON-NATIVE SPECIES

Short-term Impacts

Invasive and noxious weed populations often increase after wildland fires due to seed banks in the soil that are quickly capable of utilizing the post-fire flush of nutrients and lack of competition with native vegetation species. Aggressive seeding, rehabilitation, monitoring, and weed treatment after wildland fire events would help minimize the impact from weed invasion after a wildland fire.

Because wildland fire use would only occur in areas with low potential for noxious and invasive weed occurrence or increase, the spread of noxious and invasive weeds would be minimal. Prescribed fire and non-fire treatments would be planned to aid in the removal of noxious and invasive weeds. In some cases where weeds have been identified as an issue, seeding would follow planned fire and non-fire fuel treatments. Under the Proposed Action, the spread of invasive and noxious weeds using these types of actions would be minimal.

After any surface disturbing treatment, proper rehabilitation would be essential to deter the reestablishment of weeds. Implementation may include seeding desirable native and non-native species. Application of appropriate seed mixtures at appropriate times may quickly establish desirable vegetation and may not allow weed seedlings to take root. Encouraging the growth of desirable vegetation may inhibit the re-establishment of invasive weeds. The degree and type of rehabilitation management required would depend on the nature and severity of the weed treatment and the severity of the invasion prior to the treatment.

Long-term Impacts

The appropriate application of wildland fire use and prescribed fire, coupled with the likelihood of less severe or smaller wildland fires, would reduce the potential for post-fire weed increases when implemented with ESR following wildland fire suppression and a planned rehabilitation program including continuing seeding, rehabilitation, monitoring, and weed treatment.

4.2.6 NATIVE AMERICAN RELIGIOUS CONCERNS

Short-term Impacts

Landscape characteristics valued in Native American religious beliefs and practices may be at greater risk of impacts from fire suppression activities than from the wildland fire itself. Suppression efforts (e.g., establishment of firelines, helicopter bases, safety zones, and fire camps) may be ground-disturbing and could impact the integrity of sites and vegetation used by Native Americans in their religious practices.

In contrast to current fire management, implementation of the Proposed Action may decrease the level of wildland fire suppression and associated ground-disturbing suppression actions in several areas. A resultant decrease in the potential to impact Native American religious concerns through ground disturbing and other suppression activities would be realized. The decrease in suppression efforts in areas that previously required more aggressive suppression may lead to a short-term increase in fire size and would increase the exposure of vegetation use areas and religious sites to heat and associated impacts.

Many areas used traditionally for hunting would be revegetated following a wildland fire event. In localities where food, medicinal, or raw plant materials are gathered, the threat of invasive species occupying those areas would be a concern. ESR actions would minimize these impacts.

Wildland fire use would be allowed only in areas where impacts to vegetation and other resources would be acceptable. Ground-disturbing actions (including seeding) are not associated with wildland fire use, thereby eliminating the potential for associated impacts.

An increase in planned fuel reduction treatments would be implemented. Potential impacts from prescribed fire would be lessened because prescribed fire events occasionally are preceded by non-fire fuels reduction actions to obtain a smaller, more manageable, and less severe prescribed fire. Because prescribed fire events are planned, appropriate Native American consultation would occur to minimize potential impacts.

Non-fire fuels reduction treatments could impact Native American religious concerns, depending upon their location and type. As with prescribed fire events, the potential for non-fire fuel treatments to affect Native

American religious concerns are considered during all phases of planning and implementation on a project-by-project basis.

Long-term Impacts

A trend toward a decrease in fuel loads would decrease the number of large severe fires. This would decrease the level of suppression required on an average wildland fire. A decrease in the impact to Native American religious concerns from ground-disturbing and other suppression activities could be realized in the long term. As more vegetation trends toward a lower FRCC, opportunities may exist to expand wildland fire use.

Impacts from prescribed fire and non-fire fuel treatments would be minor. Consultation with Native American entities would be conducted for planned actions. Wildland fire use and prescribed fire in the long term may result in beneficial effects for places of traditional cultural importance by returning native vegetation to a condition more representative of historical states. However, Native American places of religious importance may be compromised if culturally important native plant species were replaced by non-native plant species used for reseeding.

4.2.7 SPECIAL STATUS SPECIES

Short-term Impacts

ESA-related Species

In accordance with Section 7(a) 2 of the ESA of 1973, as amended, the Utah BLM engaged in formal Section 7 consultation with the USFWS. This process involved preparing a BA that included impact analyses and subsequent determinations for all federally listed and proposed species. The BA considered potential project-related effects (direct and indirect) to each species and their habitat (including those areas designated as critical habitat) from the fire management actions presented in the SUSA FMP Proposed Action.

Effects determinations within the BA include May Affect, Not Likely to Adversely Affect (NLAA); May Affect, Likely to Adversely Affect (LAA); and Not Contribute to Federal Listing (NCL). Each determination was based on a combined analysis of potential effects from the Utah LUP Ammendment for Fire and Fuels Management EA and the five FMP EA Proposed Actions (Salt Lake, Vernal, Moab, Southern Utah Support Center, and Richfield). For any species with designated or proposed critical habitat, the determination for effects to that habitat was combined with the determination for effects to the species. In this EA, a determination for each species, identified in **Table 3.3** and included as **Appendix H**, which is known to occur within, or has potential to occur within, the SUSA FMP planning area is presented. Determinations take into consideration the RPMs and potential short-term, long-term, and cumulative impacts from wildland fire suppression, wildland fire use, prescribed fire, and non-fire fuel treatments.

Nineteen species were given a determination of LAA, three species were given a determination for NLAA, and three species were given a determination of NCL, see **Table 4.1.** For detailed discussion on the effects determinations for each ESA-related species and the two BLM sensitive species, refer to the BA associated with this project.

TABLE 4.1: EFFECTS DETERMINATION FOR ESA-RELATED SPECIES

Effect Determination	Species
Likely to Adversely Affect	Utah prairie dog; Southwestern willow flycatcher; California condor; bald eagle; Mexican spotted owl; desert tortoise (Mojave population); humpback chub; bonytail; Virgin River chub; woundfin; Colorado pikeminnow; razorback sucker; dwarf bear-poppy; Shivwitz milk-vetch; Holmgren milk-vetch; Kodachrome bladderpod; Maguire daisy; Siler pincushion cactus; and Ute ladies'-tresses.
Not Likely to Adversely Affect	Kanab ambersnail; Welsh's milkweed; and Jones cycladenia.
Not Contribute to Federal Listing	Pygmy rabbit; western yellow-billed cuckoo; and Coral Pink Sand Dunes tiger beetle.

Additional consultation with the USFWS would still be required for all implementation-level fire management activities if they would occur within suitable or potentially suitable habitat for federally listed species. The Alternative Consultation Agreement to Implement Section 7 Counterpart Regulations could be employed to enhance the efficiency and effectiveness of the consultation process for projects supporting the National Fire Plan.

BLM Sensitive Species

In addition to RPMs designed to protect ESA-related species and their habitat, RPMs to protect BLM sensitive species (identified in **Table 3.4** and included as **Appendix I**) have been designed and built into the Proposed Action. These RPMs include the review and inclusion of appropriate management, conservation, and plan direction into project proposals, as well as adherence to management direction contained in the BLM 6840 Manual (SSS Management). The RPMs would also assure that any proposed project would conserve BLM sensitive species and their habitats, and that any action authorized, funded, or carried out by the BLM would not contribute to the need for any SSS to become listed. RPMs would be implemented during wildland fire suppression, wildland fire use, prescribed fire, and non-fire fuel treatment activities, as applicable.

General Short-term Effects on ESA-related and BLM Sensitive Species

The potential for short-term adverse impacts to SSS would be off-set by long-term beneficial effects of rehabilitation activities (built into the Proposed Action for soil disturbing activities), protected ecological resources (remaining after a suppression event), and reduction of fuels (following implementation of wildland fire use, prescribed fire, or non-fire fuel treatments). The subsequent, gradual return to a more natural fire regime would result in long-term beneficial effects to species and habitat.

Despite varied life histories and habitat requirements of each SSS, some potential short-term effects can be generalized based on the types of fire management activities being proposed and general ecological principles. The items presented below include potential general impacts that could occur following implementation of the Proposed Action with its RPMs. RPMs are typically designed to minimize effects (particularly from pre-planned fire management activities such as prescribed fire and non-fire fuel treatments).

Wildland fire suppression has the highest potential for negative effects on SSS because RPMs would not necessarily be fully implemented due to risks to firefighter or public safety, and also because the nature of the emergency fire suppression action sometimes requires a quick response without detailed, site-specific data or analysis. These short-term impacts could include the following:

- Visual or auditory disturbance or displacement of individuals (affecting foraging, roosting, and/or reproductive behavior) from vehicles, heavy equipment, firefighters, and low-flying aircraft during fire suppression operations. This includes nest/den abandonment or mortality of young or eggs.
- Mortality or injury of adults, young, or eggs from smoke inhalation during firing operations, or from vehicles or equipment used during fire suppression operations.
- Mortality of adults, young, or larvae of aquatic species from using occupied water sources for fire suppression operations.
- Injury or mortality due to inadvertent strikes during aerial drops of fire retardant.
- Illness or mortality due to inadvertent chemical contamination of terrestrial or aquatic species' habitats during aerial applications of fire retardant.
- Heat stress or mortality to special status plants from firing operations.
- Crushing of special status plants, resulting in damage or mortality, from human foot traffic or use of vehicles or heavy equipment in fire suppression operations.
- Damage to the seedbank of special status plants from severe fire or mechanical disruption during fire suppression operations.
- Removal of key habitat components for nesting, denning, foraging, roosting, or cover due to equipment use or operational tactics, including: snag removal for safety reasons; tree and shrub removal and associated soil disturbance during fireline construction; vegetation removal and associated soil disturbance during helipad, base camp, or road construction; vegetation removal and soil disturbance during temporary road construction for access; and decreased water quantity for aquatic species from dewatering during low flow periods.
- Damage or loss of riparian or upland vegetation or downed woody debris, and increased surface run-off from fire suppression operations or emergency rehabilitation and stabilization activities, resulting in; decreased channel stability and alteration of channel morphology; increased erosion, sediment, and ash levels within and adjacent to the stream channel; increased water temperatures; degraded water quality (based on nutrient levels, temperature, and sediment levels); reduced riparian habitat, in-stream habitat cover, and woody debris that is typically necessary for properly functioning riparian areas and aquatic habitat; altered water velocities and substrate composition; and altered composition and decreased abundance of aquatic and terrestrial food sources.
- Increased risk of predation from removal of cover.
- Changes in foraging habitats and/or food and prey quality and quantity.
- Spread of disease or non-native, predatory species within previously uninfected water sources.
- Soil erosion of special status plant habitat following fire suppression operations.
- An increase in invasive plant species (from firing operations during fire suppression tactics) that could out-compete special status plant species.

Because of specific operational prescriptions for wildland fire use and prescribed fire, RPMs would be incorporated into site-specific project plans for prescribed fire, and the identification of areas suitable for wildland fire use have been broadly mapped. This would allow BLM to minimize or avoid many negative short-term effects to SSS. Conversely, this type of fire would have a greater potential for positive long-term benefits to SSS and their suitable habitat (including designated and critical habitat), than wildland fire suppression. Thus, the short-term effects on SSS that could occur from wildland fire use and prescribed fire are the same as those listed above for wildland fire suppression.

Direct and indirect effects from non-fire fuel treatments would be similar to those for wildland fire use and prescribed fire. Because of pre-planning and specific operational prescriptions for non-fire fuel treatments, RPMs would be incorporated into site-specific project plans and operations, as necessary. This would allow BLM to avoid or minimize negative short- and long-term effects to federally protected species. Conversely, these planned treatments (and wildland fire use) would have a greater potential for beneficial long-term effects to SSS and their suitable habitat (including any designated critical habitat) than wildland fire suppression. Thus, the following short-term impacts from non-fire fuel treatments could affect SSS:

- Visual or auditory disturbance from vehicles, heavy equipment, and humans.
- Displacement or crushing of small animals (SSS or their prey) and special status plants from vehicles, heavy equipment, or piling of slash during treatments.
- Removal of key habitat components for nesting, denning, foraging, roosting, dispersal, or cover from clearing vegetation, snags, or downed woody debris during treatments.
- Soil or ground disturbance from vehicles or heavy equipment during treatments, resulting in disturbance or destruction of vegetation (federally protected plant species and habitats for wildlife or fish) and subsurface dens or burrows.
- Damage to the seedbank of federally protected plants due to mechanical disruption during manual or mechanical treatments.
- Increased risk of predation from removal of cover.
- Changes in foraging habitats or food and prey quality and quantity.
- Soil erosion of special status plant habitat following mechanical treatments in which seeding is unsuccessful, inappropriate, or infeasible.
- An increase in invasive plant species that could out-compete federally protected plant species following treatments in which seeding is not implemented or is unsuccessful.

Short-term Effects on ESA-related and BLM Sensitive Species Habitat

SSS have suitable habitat and are known to occur within all 11 vegetation types within the SUSA planning area. Habitat for these species would be vulnerable to any of the impacts discussed in Section 4.2.14 (Vegetation). Although fire management activities would vary among vegetation communities, they could affect species and species habitat to varying degrees within all of the vegetation/habitat types. The largest habitat type within the SUSA planning area (pinyon and juniper woodland) would be proposed for about the same amount of acres of wildland fire use, prescribed fire, and non-fire fuel treatments as all other habitat types combined. Approximately 48 percent of acres designated as the natural fire emphasis category are comprised of pinyon and juniper woodland habitat. Therefore, species found in this habitat would be more likely to incur project-related impacts, be they adverse or beneficial, than species found in the remaining habitat types.

The goals and objectives of the proposed fire management actions are based on the types and condition of the various vegetation communities within the SUSA planning area. In turn, these vegetation communities provide the key habitat components for the various SSS. Many habitats within Utah have been altered by human-caused changes in the structure or composition of the vegetation communities, resulting in a change in the historical fire regime. Some habitats that are fire-adapted have had fire excluded, while noxious weed infestations now carry wildland fires in some non-fire-adapted habitats. Heavy fuel loads or invasive non-native plant species put these vegetation communities, and thus the species that inhabit them, at greater risk from severe fires.

Changes in vegetation structure and composition can alter both the quality and quantity of various habitats for the federally protected species that occupy them. For impact analyses to SSS, the baseline for each species is not a condition of "no wildland fires," but rather the current condition of the vegetation communities in which the species live, and the current risk of severe wildland fire (as described in Section 3.3.14). That current condition, in turn, provides the basis for analysis of the Proposed Action. The list of habitat associations in Chapter 3 links the SSS that may be affected by the Proposed Action with each vegetation community. **Table 3.4** in Section 3.3.7 shows ESA-related and BLM sensitive species by vegetation group.

Pinyon and Juniper Woodland: The largest habitat type within the SUSA planning area, pinyon and juniper woodland would be proposed for about the same amount of acres of wildland fire use, prescribed fire, and non-fire fuel treatments as all other habitat types combined. Approximately 48 percent of acres designated as the natural fire emphasis category are comprised of pinyon and juniper woodland habitat. Therefore, species found in this habitat would be more likely to incur short-term, project-related beneficial or adverse impacts. In addition, species in this habitat would incur greater impacts than those in some other habitats because the expanse of this habitat type would decrease. Short-term impacts from implementation of fire management activities could consist of species mortality and temporary displacement, and could lead to habitat loss.

Sagebrush and Salt Desert Shrub: Species found within sagebrush and salt desert shrub habitats would be more likely than those in other habitats to incur short-term, project-related impacts because this habitat is relatively far-removed from its natural fire regime. Short-term impacts from implementation of fire management activities could consist of species mortality, temporary displacement, or habitat loss.

Grassland: Because grassland is resilient, species found within grassland habitat would be less likely than those found in many other habitats to incur short-term, project-related impacts associated with suppression activities than from any other fire management action. Short-term impacts could result in species mortality, temporary displacement, or habitat destruction.

Blackbrush (including Creosote and Bursage): Species found within blackbrush habitat could incur short-term, project-related impacts during fire management actions designed to maintain or lower the current FRCC, including mortality, temporary displacement, or habitat destruction associated with wildfire suppression and non-fire fuel treatments, as discussed above.

Mountain Shrub and Ponderosa Pine: Species that are found within mountain shrub and ponderosa pine habitats could incur short-term, project-related impacts during fire management actions designed to maintain or lower the current FRCC. Short-term impacts could include mortality, temporary displacement, and habitat destruction.

Wetlands and Riparian Zones and Aspen: Species that are found within wetlands and riparian zones and aspen habitat could incur short-term, project-related impacts during fire management actions, including mortality, temporary displacement, and habitat loss or destruction.

Mixed Conifer: Species that are found within mixed conifer habitat could incur short-term, project-related impacts during fire management actions designed to maintain or lower the current FRCC. Short-term impacts associated with these fire management actions could include species mortality, temporary displacement, or habitat destruction.

Water: Direct effects to water and aquatic inhabitants could occur from wildland fire suppression and wildland fire use. Direct effects could include the introduction of fire retardant, aviation fuel, or lubricants into streams and wetlands; erosion of exposed soils from fireline construction on steep slopes adjacent to streams; damaged riparian vegetation and soils (resulting in erosion) from the use of heavy equipment and establishment of fire camps; and reduced natural stream flow during drafting and pumping. These impacts

would adversely impact water quality of various fisheries throughout the SUSA FMP planning area. The collective short-term impacts of increased sedimentation (from erosion) could have watershed-wide effects including changes in temperature, turbidity, and water chemistry. However, RPMs that were developed for wetlands and riparian habitat and specific SSS would minimize the potential for short-term adverse impacts to aquatic species and their habitat.

Because RPMs would ensure limited acres of prescribed fire and would impose constraints on non-fire fuel treatments in and adjacent to wetlands and riparian zones and water habitats, short-term adverse impacts from these fire management activities would be minimized or eliminated.

Long-term Impacts

General Long-term Effects on ESA-related and BLM Sensitive Species

With suppression being implemented where unplanned wildfire is not desirable, and wildland fire use, prescribed fire, and non-fire fuel treatments being used to minimize fuel loading, vegetation communities and wildlife habitats would transition over time to more closely reflect conditions associated with a habitat's natural fire regime. This would create a more balanced (diverse) and stable ecosystem that would have a reduced threat of severe wildland fire. Mortality or long-term displacement of species would likely be avoided because wildland fire use and prescribed fire would not likely consist of large fires. Populations could be displaced over the long term if management activities were implemented repeatedly within the same treatment area (e.g., mechanical treatment followed by prescribed fire followed by seeding). However, to the extent that suitable habitat were available nearby, these impacts would be off-set by the beneficial reinstatement of habitat conditions consistent with a natural fire regime.

Implementation of RPMs would minimize or prevent negative long-term effects to habitat quality or quantity. For many species, long-term negative effects could be greater from wildland fire itself, rather than from wildland fire suppression operations. The following beneficial effects on SSS could occur from wildland fire suppression:

- Federally protected species and their designated critical habitat could benefit from wildland fire suppression actions that would prevent the loss of designated critical habitat or suitable habitat from severe wildland fires.
- Federally protected species and their designated critical habitat could experience positive effects of post-fire ESR efforts.

Suppression-related actions have the highest potential (of all fire management actions) for negative effects on SSS because RPMs would not necessarily be fully implemented due to risks to firefighter or public safety, and the emergency nature of suppression action sometimes requiring quick response without detailed, site-specific data or analysis. Long-term adverse impacts on federally protected species and their designated critical habitat could occur from inadvertent mortality of individuals or long-term changes (alteration, removal, damage, or fragmentation) to suitable habitat components. However, RPMs are designed to minimize these changes.

For situations where extensive or aggressive fire suppression would be appropriate, or when species or habitat components would have a long recovery rate, long-term negative effects could occur. For example, short-term effects could become long-term effects when a species has relatively few individuals, is extremely localized, is specialized in its habitat, or has a slow reproductive rate. Furthermore, direct mortality of individuals in small or endemic populations, or alteration of potentially suitable habitat, could cause long-term negative effects. Because wildland fire suppression operations are typically localized, even under extreme

conditions, this activity would generally not affect wide-ranging species in the long term, unless they have a low reproductive rate.

Long-term impacts on key habitat components that could affect the ability of SSS to continue occupying a site, could include the following:

- Damage, removal, or fragmentation of nesting, roosting, foraging, dispersal, or cover habitats for terrestrial wildlife (particularly in pinyon and juniper woodland, mixed forest, or sagebrush habitats).
- Long-term changes in water quality or quantity; removal of riparian or upland vegetation, or downed woody debris; increased surface run-off; or introductions of disease or non-native, predatory species (in reference to fish and other aquatic species and their habitats).
- Extensive or severe damage to seedbanks, substrates, vegetative composition, or structure of habitats for plant species.
- Long-term changes in prey populations when key habitat components are slow to recover.
- An increase in invasive plant species that could out-compete federally protected plant species or alter sensitive (or non-fire adapted) habitats of terrestrial wildlife species following fire suppression. RPMs or ESR activities would typically mitigate this potential effect to prevent it from becoming a long-term impact.

Pre-planning (including pre-project surveys and consultation with the USFWS) and implementation of RPMs, would typically prevent mortality of individual species during prescribed fire and non-fire fuel treatment activities. Additionally, identification of areas suitable for wildland fire use would prevent mortality of individual species. These actions would minimize or prevent alteration of, damage to, removal of, or fragmentation of key habitat components within designated critical habitat or suitable habitats for SSS. Thus, negative long-term effects to species or suitable habitat would generally be avoided or limited in scope and/or intensity.

Conversely, if key habitat components were targeted for permanent change in structure or composition by fire management or resource objectives (e.g., restoration of altered habitats or historical fire regimes), long-term effects could be negative or beneficial for a species, depending on its particular habitat needs. Short-term effects could become long-term effects when a species has relatively few individuals, is extremely localized, is specialized in its habitat, or has a slow reproductive rate. Furthermore, direct mortality of individuals in small or endemic populations, or alteration of potentially suitable habitat, could cause long-term negative effects.

In some cases, long-term beneficial effects of wildland fire use, prescribed fire and non-fire fuel treatments could potentially benefit species' reproduction, numbers, or distribution, facilitating the return of a species to its historic range. Long-term beneficial effects to species could result from (1) decreased risk for large, severe fire events through fuels reduction and the gradual transition to a more natural fire regime, or (2) restoration of habitats that have been altered by either invasion of non-native species or long-term exclusion of fire (in fire-adapted vegetation communities).

Long-term Effects on ESA-related and BLM Sensitive Species Habitat

Pinyon and Juniper Woodland and Salt Desert Shrub: Long-term beneficial effects would include the transition to a more stable ecosystem (habitat) with less risk of severe wildland fire.

Sagebrush: Long-term impacts would include expanded acreage of sagebrush (from removal of pinyon and juniper woodland) and an overall transition to a lower FRCC. Because this transition would indicate a lower risk for severe wildfire, these impacts would be beneficial to species and associated sagebrush habitats.

Grassland: The establishment of a lower FRCC would produce the long-term beneficial effect of a lower risk for severe wildfire. Additionally, because this habitat would eventually be expanded by removal of pinyon and juniper woodland and shrubland encroachment, SSS that utilize grasslands would benefit from increased acreage of those habitats.

Blackbrush (including Creosote and Bursage): Long-term impacts would be beneficial and would include maintenance or lowering the FRCC and the subsequent reduction in the likelihood of a severe wildland fire.

Mountain Shrub: Long-term impacts to mountain shrub habitat and its associated species would be beneficial. Wildland fire use, prescribed fire, and non-fire fuel treatments would begin to restore a more diverse mountain shrub ecosystem, trending it toward a lower FRCC with lower risk for severe wildfire and removal of both pinyon and juniper woodland and Douglas-fir encroachment. Additionally, this habitat would be diversified and increased acreage of this vegetation community would result.

Ponderosa Pine: Because long-term effects would eventually produce a more stable ecosystem with a lower FRCC, maintenance of habitat size and a lower risk of severe wildland fire (e.g. limiting pinyon and juniper woodland encroachment), would result. These impacts would be beneficial to ponderosa pine habitats and the species associated with them.

Wetlands and Riparian Zones: Long-term effects would be beneficial and include a more diverse ecosystem with a reduced risk for severe wildland fire.

Mixed Conifer: Because the long-term effects of the proposed project would eventually produce a more stable ecosystem with a lower FRCC, lower risk of severe wildfire and greater species diversity, would result. These impacts would be beneficial to mixed conifer habitats and the species associated with them.

Aspen: Fire management actions would serve to lower the existing FRCC and, subsequently, reduce the risk of a severe wildland fire. Additionally, fire management actions within mixed conifer habitat could increase the aspen component. Collectively, fire management actions within mixed conifer and aspen habitats could increase overall aspen habitat throughout the SUSA FMP planning area. These impacts would be beneficial to some SSS and the aspen habitats with which they are associated.

Water: Long-term impacts to water and aquatic inhabitants would be beneficial. With a reduced risk for severe wildland fire in upstream and adjacent habitats, the ecosystems would be less likely to incur such large-scale adverse impacts from fire as to decimate any entire aquatic populations.

4.2.8 WATER QUALITY

Short-term Impacts

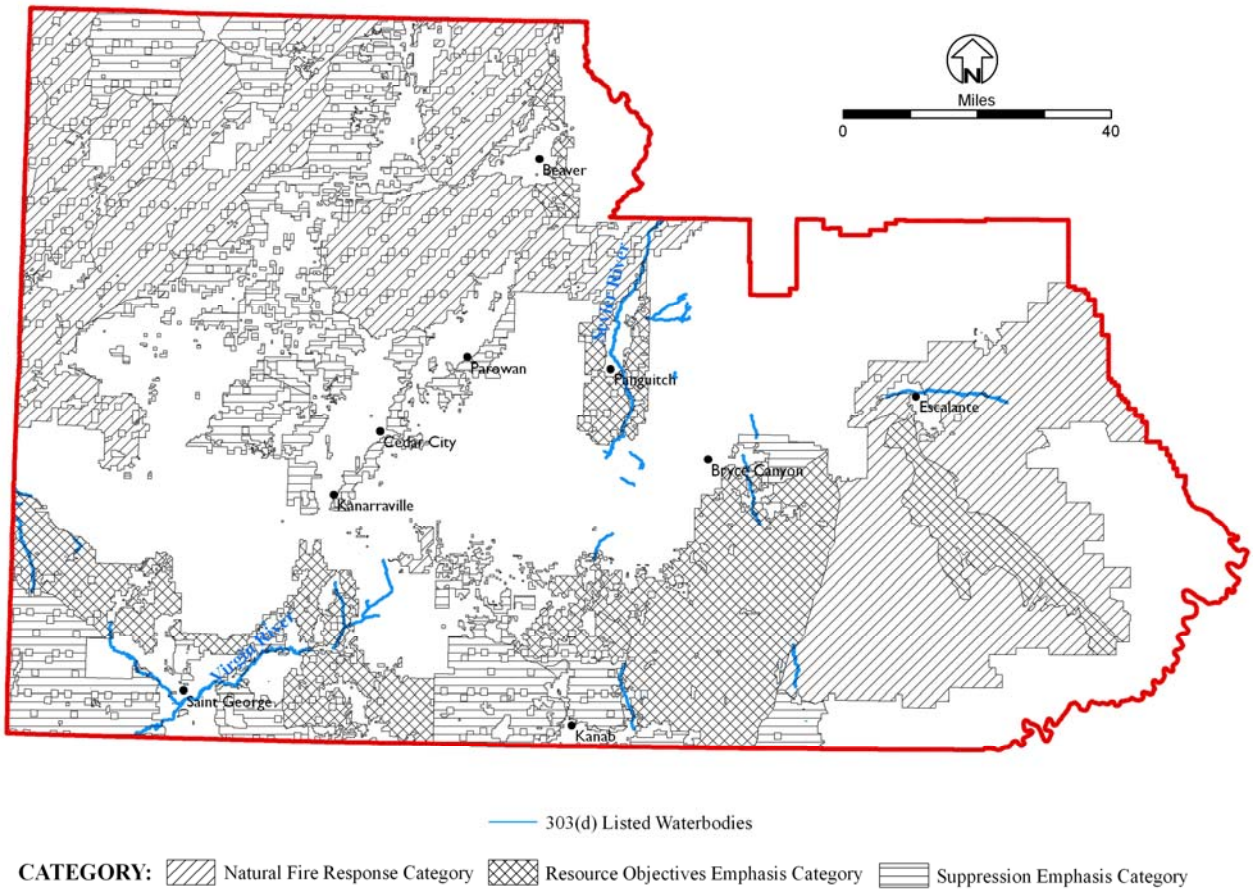
Surface Water

Figure 4.3 presents the location of impaired (i.e., 303(d)-listed) waterbodies identified in the planning area by fire management categories. Impaired waters on BLM-administered land are located primarily in the proposed natural fire and resource objective emphasis fire management areas. Wildland fire suppression efforts and planned fuel reduction projects would have minimal impacts on impaired waters, as implementation would be consistent with compliance strategies for restoring or maintaining the restoration of water quality impaired waterbodies. Proposed RPMs would restrict activities in the vicinity of sensitive areas (such as impaired waterbodies and municipal watersheds) in order to reduce further degradation of the surface water conditions.

Under the Proposed Action, the potential increase in wildland fire acres (including wildland fire use), prescribed fire, and non-fire fuel treatments could increase runoff, erosion, and stream temperatures. Increased erosion and runoff would result in greater nutrient concentration and turbidity in surface waters. Disturbance associated with prescribed fire and non-fire fuel treatments would be evaluated through an environmental planning and review process that would consider impacts related to surface runoff, soil loss, and sediment input to surface waters. Often these impacts are short term and conditions return to pre-fire levels once vegetation is re-established.

The Proposed Action would allow more flexibility in planned activities to manage fuel loads and would implement RPMs to reduce potential effects to water resources. Potential impacts to water resource issues would be considered before implementing prescribed burns, non-fire fuel treatments, or emergency stabilization and rehabilitation efforts.

FIGURE 4.3: 303 (D)-LISTED WATERBODIES AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



Groundwater

Minor impacts to groundwater quality may result from altered water absorption patterns (due to a decrease in vegetation cover following wildland fire or fuel treatments) and soil compaction (due to mechanical equipment). Additionally, infiltration capacity could temporarily decrease after a fire due to the formation of a hydrophobic soil layer. Altered water infiltration rates could temporarily increase or decrease the chemical levels (i.e., dissolved solids) in shallow aquifers (Allison et al. 1994). The impact to groundwater would be dependent on the depth to groundwater below ground surface and the type of sediments or bedrock it passes through. The change in the infiltration capacity of the soil would be dependent on fire severity, soil type, pervasiveness of vegetation root structures, and vegetation's ability to reoccupy a site following fire.

Long-term Impacts

Surface Water

Wildland fires would be less severe, resulting in relatively fewer impacts to storm flows and nutrient and sediment loads. A trend towards fewer severe wildland fires would maintain soil stability and would enhance overall stream bank and channel stability and Proper Functioning Condition of watersheds. Some areas would have a more sustainable supply of woody debris or stream bank vegetation, both of which would also increase stream bank stability.

Under the Proposed Action, planned fire actions and eventual restoration of natural fire regimes would improve water resources by reducing the risk of high severity wildland fire and promoting self-sustaining native vegetation types. The Proposed Action would reduce erosion potential in the long term by fostering a healthy, native understory. The Proposed Action would allow more flexibility in implementing and timing planned actions that would protect water resources.

Groundwater

A trend towards fewer large, severe wildland fires, that otherwise may cause damage to soil resources and possible resultant impacts to groundwater, would occur. A related reduction in the alteration of infiltration rates and would be realized through greater vegetation surface cover, greater root zone presence, and less fire-caused hydrophobicity.

4.2.9 WETLANDS AND RIPARIAN ZONES

Short-term Impacts

Under the Proposed Action, burning of native wetlands and riparian zones would generally be avoided, thereby minimizing fire-related impacts on riparian functions and values. However, low intensity fires may be allowed to burn when they would enhance riparian areas and increase stand diversity. The Proposed Action includes RPMs that would help protect wetlands and riparian resources. However, the potential exists for impacts to wetlands and riparian resources due to wildland fire suppression and other fire management actions. Proposed RPMs would restrict ground-disturbing suppression activities in the vicinity of wetlands and riparian zones. Short-term impacts of suppression activities could include vegetation damage or destruction, increased streambank and shore erosion, and increased sedimentation. The impacts may degrade fish habitat and water quality. Increased stream temperatures resulting from the loss of streamside vegetation could degrade habitat for fish and other aquatic species. Potential impacts on riparian areas would be minimized through resource specialist consultation during the fire event.

More acres are identified as appropriate for potential prescribed fire, and non-fire fuel treatments under the Proposed Action than under current management. These treatments may be applied in riparian areas to

reduce tamarisk and restore native vegetation. Vegetation disturbance associated with these actions would be evaluated through an environmental planning and review process that would consider impacts related to vegetation loss and increased erosion. Often these impacts are short term and conditions return to pre-fire levels once vegetation is re-established. Efforts would be made to protect vegetation and restore native species after a disturbance.

Long-term Impacts

Potential for long-term beneficial impacts on wetlands and riparian zones would be greater under the Proposed Action than under current management. Overall, conditions would improve through the removal of undesirable vegetation, reducing the likelihood of high severity wildland fire, and promoting the growth and natural succession of native vegetation types.

Wildland fires would be smaller and less severe resulting in fewer impacts on vegetation and sediment loads. Low intensity fires may be allowed to burn with some suppression control to reduce the likelihood of a severe fire, which would cause greater damage. A trend towards fewer severe wildland fires would increase soil stability and would enhance overall bank and channel stability and proper functioning condition of the watershed. Some areas would have a more sustainable supply of woody debris or streambank vegetation, which would also increase bank stability. Riparian areas would have fewer disturbances from severe wildland fires, which would allow greater stability and increased functionality of floodplains. Greater floodplain stability would increase resilience to flashflood events.

Planned fire management and fuels reduction actions would improve riparian resources and reduce erosion potential in the long term by fostering a healthy, native understory. The Proposed Action would allow more flexibility in implementing and timing planned management actions that would protect wetlands and riparian zones.

4.2.10 WILD AND SCENIC RIVERS

Short-term Impacts

Short-term impacts on suitable river segments resulting from wildland fire suppression may include ground disturbances (e.g., hand lines and spike camps) and would be minimized by following management guidelines for Wild and Scenic Rivers. Short-term and limited impacts for wildland fire suppression could include disturbance to soils, watershed functions, vegetation conditions, and habitats for SSS and fish and wildlife. Those river segments within Suppression Emphasis FMUs would likely see more short-term impacts from suppression activities than those river segments in Natural Fire Emphasis FMUs. The AMR to a wildland fire would seek to minimize, when possible, adverse impacts or impairment of the values inherent to each river segment; it may include limiting the use of mechanical suppression activities, recommending smaller fire camps, or removing tracks and traces of fire suppression actions. Suppression would be prioritized to protect the unique values threatened by wildland fire and, when possible, would be designed to avoid impairment of values. Suppression efforts would not likely impact or impair the suitability of river segments.

Impacts would also be minimized by ESR and other rehabilitation efforts. ESR activities, including seeding, would be prioritized within these areas to stabilize wildland fire areas, minimize the threat of invasive and noxious weed species becoming established, and preserve the natural and unique values inherent to suitable river segments. ESR efforts may be noticeable after fire events as the areas become revegetated. Rehabilitation and restoration efforts would be designed, when possible, to avoid impairment of outstandingly remarkable values; therefore, they would not likely impact or impair a segment's suitability for designation as wild, scenic, or recreational.

Naturally-ignited wildland fires may be managed to accomplish specific resource management objectives for some FMUs. Such objectives are generally designed to have positive long-term impacts (as described below), though short-term impacts may include impaired air quality near or in river segments. Impacts on the quality of visitor experience would be limited to the duration (reduced visibility) and area of the fire (burned landscape) and would not likely affect overall use and appreciation of the unique values present within other portions of these designations.

Prior to approval and implementation, all planned management activities, including prescribed fires and non-fire fuel treatments, would undergo a site-specific environmental evaluation to consider impacts to suitable river segments.

Long-term Impacts

The Proposed Action would result in modification of current conditions to a DWFC that would be more representative of the historical vegetation. The decreased risk of large severe wildland fire events is the primary long-term impact associated with use of an AMR to wildland fire suppression, wildland fire use, prescribed fire, and non-fire fuel treatments. A trend toward a lower likelihood of undesirable fire events would result from the progressive, metered removal of hazardous fuels. This trend generally would positively affect river segments by preserving their outstandingly remarkable values (especially those affected by vegetation changes).

By reducing hazardous fuels to restore natural ecosystems and by using fire to achieve DWFCs, the array of outstandingly remarkable values associated with Wild and Scenic River segments would be enhanced and preserved.

The Proposed Action would not alter the free-flowing nature of any river segment.

4.2.11 WILDERNESS STUDY AREAS

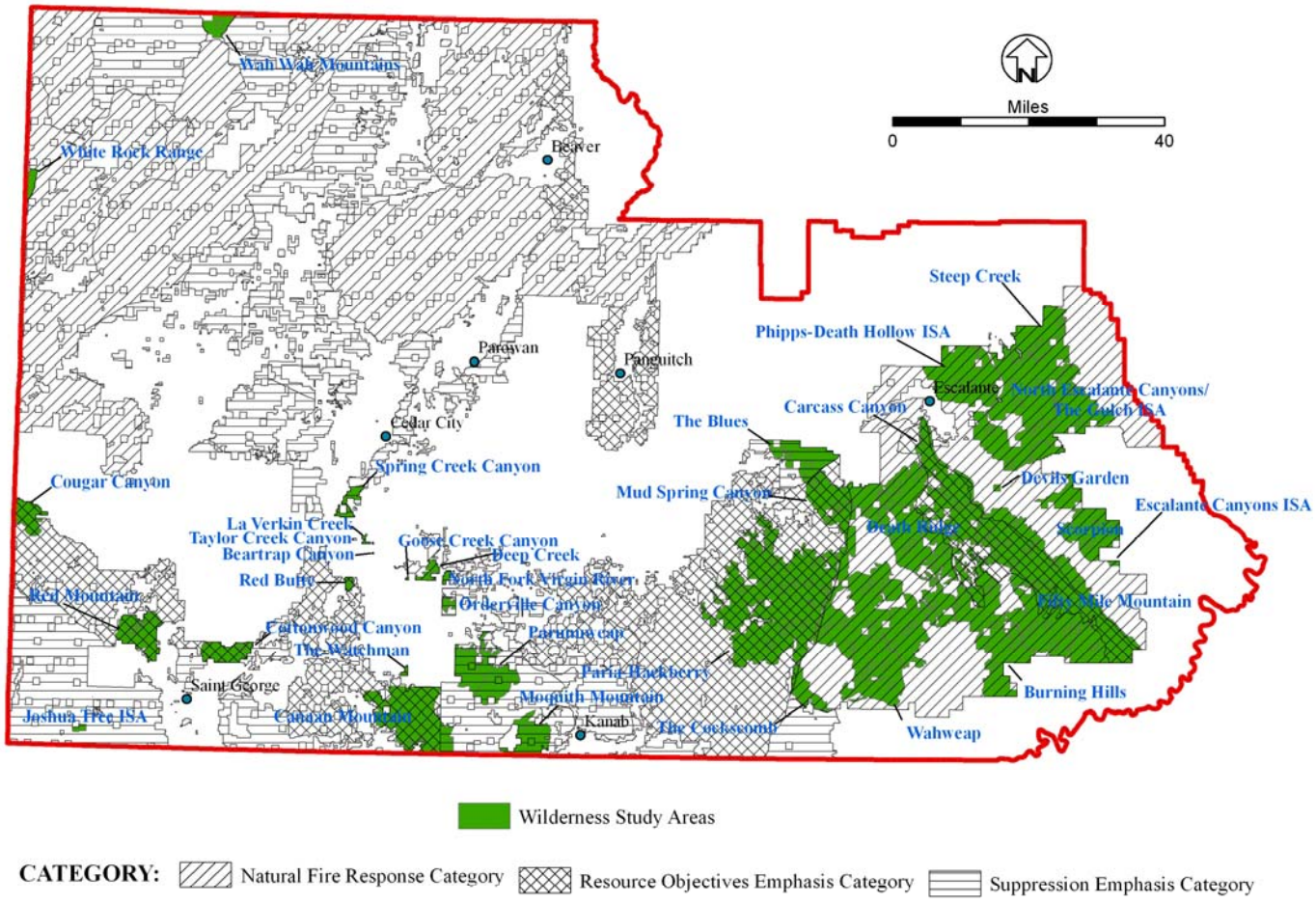
Wilderness Study Areas comprise approximately 20% of the planning area. As shown in **Figure 4.4**, approximately seven percent of WSA lands are found within Suppression Emphasis FMUs, approximately 37 percent are found within Resource Objective emphasis FMUs, and approximately 56 percent are found within Natural Fire Emphasis FMUs. In all categories, management activities would be carried out in a manner that would minimize impacts to the wilderness suitability of each WSA.

Short-term Impacts

Short-term and limited impacts for wildland fire suppression could include disturbance to soils, watershed functions, vegetation conditions, and habitats for SSS and fish and wildlife. Short-term impacts, though minimized by following management guidelines for WSAs, may still include ground disturbances associated with suppression and control efforts (e.g. hand lines and spike camps). RPMs have been built into the Proposed Action to protect WSAs. WSAs within Suppression Emphasis FMUs would likely have more ground disturbing short-term impacts from suppression activities than those WSAs in Natural Fire Emphasis FMUs.

The AMR to a wildland fire would minimize, when possible, adverse impacts or impairment to WSA values. An AMR may include limiting the use of aircraft and minimizing and/or removing tracks and traces of fire suppression actions.

FIGURE 4.4: WILDERNESS STUDY AREAS AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



Impacts would also be minimized by ESR and other rehabilitation activities. ESR and other rehabilitation activities, including seeding, would be used within WSAs to stabilize wildland fire areas, minimize the threat of invasive and noxious weed species, reduce erosion and to preserve the natural and unique values inherent to each WSA. ESR efforts may be noticeable after fire events as the areas become revegetated. Suppression and restoration efforts would be designed with resource specialist input, when possible, to avoid impairment of a WSA's suitability for wilderness designation.

Other short-term impacts may include impaired air quality and reduced visibility and aesthetics near or in WSAs. A burned or modified landscape and limited visibility may be aesthetically displeasing to recreationists, but these impacts on the quality of visitor experience would be limited to the duration and area of the fire and would not likely affect overall use and appreciation of the unique values present within other portions of these designations.

Prior to approval and implementation, all planned management activities, including prescribed fires and non-fire fuel treatments, would undergo a site-specific environmental evaluation to consider impacts to WSAs. It is typically uncommon to have non-fire fuel treatments in WSAs.

Long-term Impacts

The Proposed Action would result in modification of current conditions to achieve DWFCs that may be more representative of the natural range of variation in vegetation FRCC and fuel load. The decreased risk of large severe wildland fire events is the primary long-term impact associated with use of an AMR to wildland fire suppression and prescribed fire. This trend would positively affect WSAs by preserving their wilderness suitability. By reducing hazardous fuels to restore natural ecosystems and by using fire to achieve DWFCs, the values and opportunities associated with WSAs would be enhanced and preserved.

4.2.12 LIVESTOCK GRAZING

The primary objective of fire management actions on rangelands within the SUSA planning area is to reduce fuels, the cover of encroaching undesirable vegetation species, and decadent sagebrush stands. Multiple benefits would be obtained by low intensity and duration wildland fire events and planned fuel reduction treatments. Increased forage production, nutrient quality and diversity, and palatability of herbaceous plants are typically observed after a burn. Fire breaks up large tracts of sagebrush and pinyon and juniper woodland-dominated landscapes and can establish a mosaic of vegetation types. The creation of openings and more nutritious, palatable forage would attract livestock concentration and result in minor to moderate shifts in livestock utilization and distribution patterns.

The most substantial impact on grazing after a wildland fire or fuel treatment is the temporary loss of allotment use. Grazing would be curtailed on the impacted areas for a minimum of one growing season or for a minimum of two growing seasons if the rangeland had been reseeded. This delay in access to forage could cause a negative economic impact on a permittee and would require alternative grazing or feeding arrangements. Management of livestock use on a burned area is most critical in the first growing season after wildfire or prescribed fire (Trlica 1977). If livestock have premature access to the burn, the full benefits of fire may not be realized and negative impacts may occur (Bunting et al. 1987).

The Proposed Action and the varied level of suppression of wildland fire would result in more acres of vegetation being burned than in the No Action Alternative. Following the post-fire recovery period, increased production, nutrient quality, and palatability of herbaceous plants may be realized. Aggressive suppression would be used in areas susceptible to cheatgrass invasion and expansion, giving the Proposed Action the flexibility to manage impacts associated with invasive species.

Under the Proposed Action, approximately 51 percent of grazing allotments fall into the natural fire response category, 25 percent are found in the resource objectives emphasis category and 24 percent are in the suppression category. As indicated by this distribution, the majority of grazing allotments are located in areas where wildland fire management goals allow fire, when appropriate, to meet resource objectives. **Figure 4.5** presents the location of grazing allotments relative to fire management categories.

Prescribed fire actions and non-fire fuel treatment actions would be coordinated with the permittee to reduce impacts from the loss of grazing use of the impacted portion of the allotment. A net benefit to desirable vegetation composition following prescribed fire would occur following the recovery period. Pre-fire rest from grazing may be required to allow the accumulation of enough fine fuel to carry a prescribed fire. This pre-fire rest is important in the shrub, grass, and pinyon and juniper woodland types and where grass and shrub litter may be the main carrier fuels (Jones and DeByle 1985).

Non-fire fuel treatments (including primarily mechanical and some chemical treatments) would impact permittees by eliminating grazing from an allotment for a minimum of two years. Post recovery use of the grazing allotment would benefit through improved forage composition.

Long-term Impacts

Under the Proposed Action, long-term impacts from increased burned and treated acres would be expected to result in more productive and stable grazing resources. The removal of hazardous fuels would reduce the risk of severe wildland fire, which would decrease the likelihood that such an event would result in longer recovery periods for impacted allotments. Wildland fire use, prescribed fire, and non-fire fuel treatments would affect a similar trend toward increases in ecosystem health and stability, result in improvement of grazing resources, and reduce the potential for longer recovery periods.

4.2.13 WOODLANDS AND FORESTRY

Short-term Impacts

Under the Proposed Action, less aggressive wildland fire suppression may result in more acres of woodlands and forests being burned. This would decrease the amount of biomass, timber, firewood, and pinyon nut harvesting opportunities in the areas affected by wildland fire events.

In the SUSA planning area, woodland vegetation types have departed from historically natural conditions, so they would be more likely to be targeted under the Proposed Action. In the short term, the change in suppression efforts is not expected to significantly reduce the acreage of pinyon and juniper woodland that has encroached outside of its historical range. Overall, impacts to forested areas would be similar to current management.

The use of wildland fire, prescribed fire and non-fire treatment methods in mature forests (not pinyon and juniper woodland) would bring the forests to a lower FRCC level and reduce the associated burn intensity. In the short term, the use of prescribed fire would increase the opportunity for the harvesting of biomass and firewood.

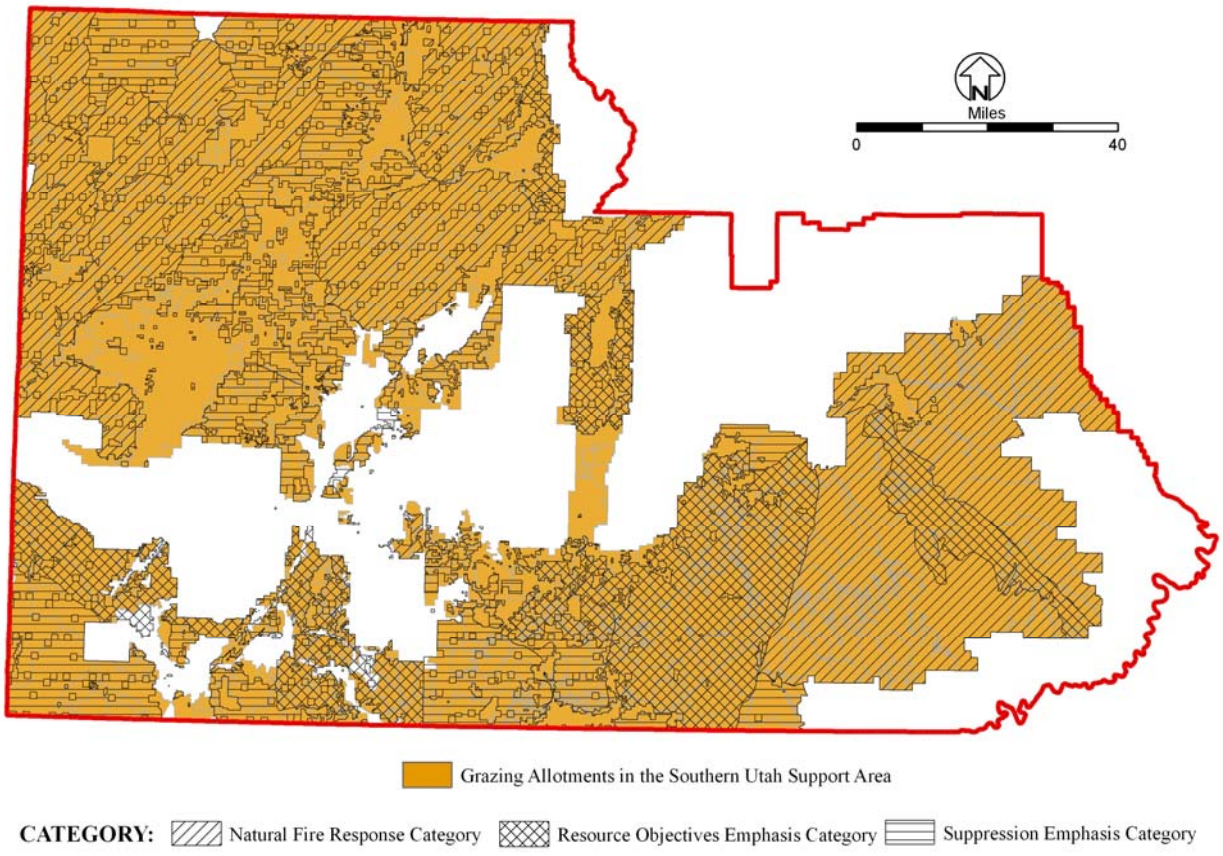
The use of non-fire treatment methods to reduce the occurrence of younger age classes in areas of old growth could increase the survivability of old growth forests during fire events (Howard 2003). This could increase the availability of higher economic value forest products, particularly in mixed conifer and ponderosa stands. The use of seeding and the planting of seedlings would increase the occurrence of desirable forest and woodland types.

Long-term Impacts

Long-term wildland fire use and prescribed would reduce the acres of pinyon and juniper woodland encroaching on land outside of its historic range and acres within its historic range where they have become the dominant species. This would directly decrease the availability of biomass and firewood collection in this vegetation type. This impact would be less pronounced in other forested areas.

Prescribed fire and non-fire treatments would initially result in an increase in the opportunity for the harvesting of biomass and firewood, however, a trend toward less biomass availability would eventually occur. The use of non-fire treatment methods to reduce the occurrence of ladder fuels in areas of desirable old growth forests, particularly ponderosa stands, would also decrease the fire severity and increase the survivability of old growth forests during fire events (Howard 2003) in the long term. This would increase the availability of higher economic value forest products, particularly in mixed conifer and ponderosa stands. The use of seeding and the planting of seedlings would increase the occurrence of desirable woodland types.

FIGURE 4.5: GRAZING ALLOTMENTS AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



4.2.14 VEGETATION

Short-term Impacts

All Vegetation Types

In addition to impacts from fire itself, wildland fire suppression has the potential to disturb all vegetation types due to fireline construction or other initial attack actions. **Table 4.2** shows the percent of each of the vegetation type groups. Effects are described under each type (mountain shrub and oak discussions are together due to similarity of treatments and effects on the types). **Figure 4.6** displays the location and FMUs for the vegetation type groups discussed below.

Pinyon and Juniper Woodland: As with all vegetation types, wildland fire suppression and wildland fire use have the potential to disturb this vegetation type due to fireline construction or other initial attack actions, and from fire itself. Provided ESR as anticipated in Chapter 2 and RPMs are applied for the prevention of invasive species (see **Appendix F**), cheatgrass and noxious weed invasion would be reduced.

The majority of this vegetation type group is in FMUs with objectives to allow fire to play more of its natural role in the ecosystem. This would result in a conversion of some pinyon and juniper woodland to sagebrush and grass where encroachment has occurred. Prescribed fire would reduce the density of pinyon and juniper woodland. Prescribed fire would probably be lethal to many small or young juniper trees.

Non-fire fuel treatments would reduce densities of juniper and pinyon, and would consequently reduce fuel loads. These treatments would also likely reduce invasion of cheatgrass. Provided that RPMs and ESR following wildland fire suppression are employed for the prevention of invasive species (Appendix C), cheatgrass and noxious weed invasion may be reduced.

TABLE 4.2: PERCENTAGE OF VEGETATION TYPE GROUPS AND FMU OBJECTIVE UNDER THE PROPOSED ACTION

Vegetation Type	Percent of Vegetation Type by FMU Objective		
	Natural	Resource	Suppression
Pinyon and Juniper Woodland	55%	31%	13%
Sagebrush	53%	18%	28%
Salt Desert Shrub	54%	15%	31%
Grassland	48%	17%	35%
Blackbrush	26%	30%	44%
Mountain Shrub	21%	43%	36%
Oak	41%	35%	24%
Creosote-Bursage	0%	2%	98%
Ponderosa pine	63%	13%	23%
Riparian	14%	56%	31%
Mixed Conifer	71%	10%	19%
Aspen	86%	2%	12%

Sagebrush: The majority of this vegetation type group is in FMUs with objectives to allow fire to play more of its natural role in the ecosystem. This would result in a diversity of age-classes in sagebrush and the conversion of some pinyon and juniper woodland to sagebrush and grass where encroachment has occurred. The use of non-fire fuel treatments in the other FMUs would have the same effect.

Provided ESR, as anticipated in Chapter 2, and RPMs are applied for the prevention of invasive species (see **Appendix F**), cheatgrass and noxious weed invasion would be reduced and the appropriate vegetation seeded in this vegetation type. Although sagebrush does not re-sprout with fire, it is a prolific seeder (a healthy, mature plant may produce 500,000 seeds). If seed source is present, natural post-fire re-establishment may occur.

Wildland fire use and prescribed fire would reduce crowded and decadent sagebrush and encourage seedlings to sprout (Paysen et al. 2000). RPMs designed to avoid colonization by invasive species and noxious weeds following prescribed fire may restrict the amount of new cheatgrass in these areas. Because noxious weed and cheatgrass invasion are the main reasons that the vegetation type is in FRCC 2 and 3, seeding should improve the conditions and possibly reduce the FRCC.

Non-fire fuel treatments could be used to both reduce the existing FRCC of this type from a 2 or 3 to a FRCC of 1 or 2, and to also control/reduce existing and potential noxious weed invasion through mechanical and/or chemical methods. Non-fire fuel treatments would also remove any encroaching pinyon or juniper that has also led to a distorted FRCC.

Salt Desert Shrub: The majority of this type falls in FMUs with the objective that fire plays more of its natural role. Wildland fire use is allowed.

Provided ESR is applied after wildland fire suppression, and RPMs are applied after fire treatments for the prevention of invasive species (see **Appendix F**), cheatgrass and noxious weed invasion would be reduced and the appropriate vegetation seeded in this vegetation type. Because noxious weed and cheatgrass invasion is the main reason that 100 percent of this vegetation type is in FRCC 3, ESR should improve the conditions and possibly reduce the FRCC.

Non-fire fuel treatments could be used effectively to reduce the cheatgrass invasions occurring in these vegetation types, reducing FRCC.

Grasslands: In the short term, wildfire suppression in this vegetation type with existing or potential invasive species would help to limit further degradation due to cheatgrass invasion and expansion. ESR efforts would further help to limit cheatgrass invasion and expansion and start to trend these areas toward lower FRCC (100 percent is currently in FRCC 3). Allowing wildfires and prescribed fire in areas of this vegetation type with low potential for cheatgrass invasion would help reduce FRCCs and reduce encroachment by juniper.

Non-fire fuel treatments would convert pinyon and juniper woodland to grasslands under any of the FMUs, which would also prevent further expansion of juniper and trend this vegetation type toward a lower FRCC. In resource objective FMUs, non-fire fuel treatments would convert mountain shrub and oak to forbs and grass.

Blackbrush: Because blackbrush is not well adapted to fire, much of this vegetation type (44 percent) occurs in FMUs where suppression is the goal. Wildland fire suppression and lack of wildland fire use and prescribed fire in this vegetation type would help to preserve existing blackbrush communities and limit further degradation attributable to cheatgrass invasion and expansion. ESR and other seeding efforts would further help to limit cheatgrass invasion and expansion. Non-fire fuel treatments would reduce FRCC by reducing invasion by non-native plant species.

Mountain Shrub and Oak: If the Proposed Action were implemented, a measurable reduction in occurrence or severity of wildland fires would not be expected in the short term across the entire planning area. However, an overall increase in the size of a wildland fire event is locally possible in the Proposed Action, due to differing suppression goals. Mountain shrub and oak types are at high risk of cheatgrass invasion following fire. ESR would reduce this risk. Most mountain shrub and oak species resprout following fire. The primary beneficial effects of fire would be fuel reduction and increases in age-class diversity.

Effects from prescribed fire, or potential wildland fire use, would be much the same as wildland fire suppression. RPM to reduce invasive species would reduce the risk of cheatgrass invasions. Non-fire fuel treatments would reduce both the fuel loadings in these vegetation types and the risk of cheatgrass invasion.

Creosote and Bursage: Because this vegetation type in not adapted to fire, almost all of it (98 percent) would occur in FMUs where suppression is the management goal. Wildland fire suppression and lack of wildland fire use in this vegetation type would help to limit further degradation due to invasive species. Aggressive post-fire ESR would help to reduce the threat of invasive species expansion and would help bring creosote and bursage areas to a lower FRCC.

It is possible that prescribed fire may be used in this vegetation type in FMUs with natural fire goals. Prescribed fire would reduce crowded and decadent sagebrush and encourage creosote and bursage seedlings to sprout (Paysen et al. 2000). RPMs to avoid and reduce invasive species and noxious weeds following prescribed fire would reduce the amount of cheatgrass. Because noxious weed and cheatgrass invasion is the main reason that the entirety of this vegetation type is in FRCC 2, ESR should improve the conditions and possibly reduce the FRCC.

Ponderosa Pine: In the short term, wildland and prescribed fire in FRCC 1 and FRCC 2 areas of this vegetation type would help to decrease fuel loadings (particularly in forest understories), thereby maintaining or improving FRCCs. In FRCC 3 areas, use of non-fire fuel treatments may be used to help reduce excessive fuel loadings prior to the re-introduction of fire as a management tool. Reintroducing fire use would also reduce encroachment by juniper into ponderosa pine areas. Seeding and tree planting following fire would help restore and rehabilitate burned areas.

Mixed Conifer: Most (71 percent) of this vegetation type occurs in Resources Objectives Emphasis and Natural Fire Emphasis FMUs. Effects from prescribed fire and potential wildland fire use would be much the same as wildland fire suppression. Non-fire fuel treatments would reduce fuel loadings in this vegetation type, and reduce the risk of noxious weed and cheatgrass invasion.

A measurable reduction in occurrence or severity of wildland fires would not be expected in the short term across the entire planning area. However, an overall increase in the size of a wildland fire event is locally possible in the Proposed Action, due to less aggressive suppression. Beneficial effects of fire and fuel treatments in mixed conifer vegetation types include reductions in fuel loads and stand density.

Aspen: As with all vegetation types, wildland fire suppression has the potential to disturb this vegetation type due to fireline construction or other initial attack actions, and from fire itself. A large proportion (approximately 86 percent) of this vegetation type group would be in FMUs where natural fire is the objective. Wildland fire use and prescribed fire would reduce fuels and encourage regeneration of aspen. FRCC would be reduced as fire treatments occur. Conifer encroachment into aspen stands would be reduced.

Non-fire fuel treatments in aspen stands would reduce fuel loadings and the risk of noxious weed and cheatgrass invasion.

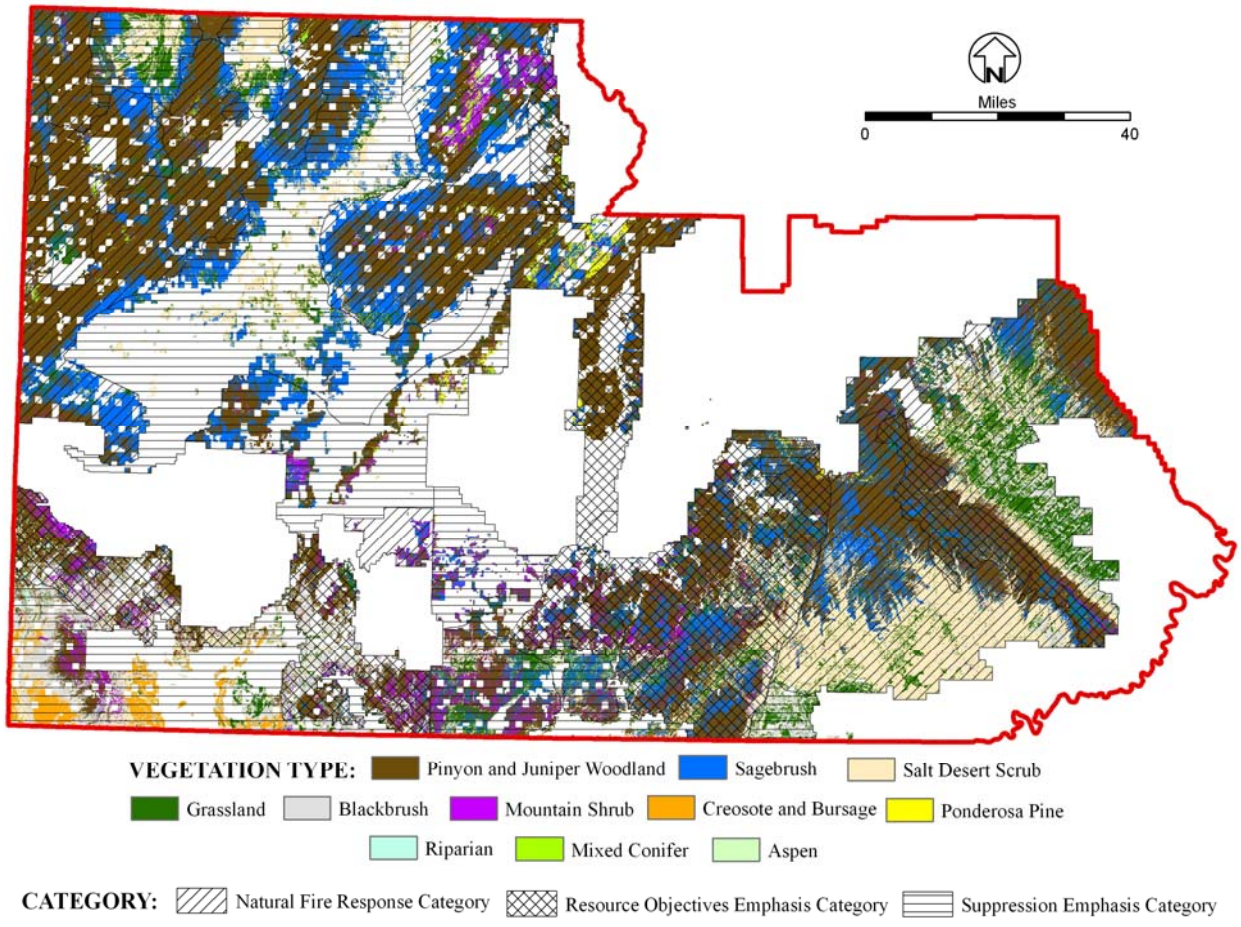
Long-term Impacts

All Vegetation Types

All vegetation types would exhibit long-term reductions in stand densities, fuel loadings, and risk of invasion from noxious weeds. An overall reduction in FRCC would be attained. Many of these long-term effects discussed here would result from the application of ESR or RPMs under the Proposed Action.

Where management actions occur, a long-term improvement in FRCC would result in less risk of wildland fires with characteristics (fire behavior, size, severity, or frequency) beyond the natural range of variability. More natural fire regimes (fire return interval and severity) would benefit all vegetation types found in the SUSA planning area.

FIGURE 4.6: VEGETATION TYPES AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



4.2.15 FISH AND WILDLIFE

Fire management activities have the potential to directly and indirectly affect fisheries and wildlife throughout the SUSA planning area. Effects would be dependent upon treatment timing, extent, location, elevation, duration, fuel, and severity of fires, as well as vegetation community and soil type of treated area. Effects to vegetation communities are discussed separately in Vegetation section. Any effects to vegetation components of fish and wildlife habitats have the potential to directly or indirectly affect dependent species.

RPMs were built into the Proposed Action in order to minimize or eliminate adverse effects to species and their habitats for each of the proposed management actions. As applicable, RPMs (e.g., scheduling non-fire fuel treatments outside of the nesting season for raptors) would be implemented during wildland fire suppression activities and non-fire fuel treatments. The following discussion focuses on residual effects to species and habitat.

The Proposed Action aims to enhance, maintain, and protect ecological resources and to restore historical habitats and native plant species. These goals would be accomplished through implementation (post-wildland fire or post-treatment) of rehabilitation activities, where practical and applicable, thereby resulting in long-term beneficial effects.

Generally, direct adverse impacts would be short term and would diminish over time. In the long term, overall hazardous fuels reduction would gradually reduce the risk of a severe fire event and restore ecosystems that exhibit the influences of a more natural fire regime.

Short-term Impacts

Fish

RPMs included in the Proposed Action would limit the potential for impacts to fisheries and aquatic resources. However, direct negative effects could occur from wildland fire suppression and ESR. Direct adverse effects may result from the introduction of fire retardant, aviation fuel, or lubricants into streams and wetlands; erosion of exposed soils from fireline construction on steep slopes adjacent to streams; damaged riparian vegetation and soils (resulting in erosion) from the use of heavy equipment and establishment of fire camps; or reduced natural stream flow during water drafting and pumping. These impacts could adversely impact water quality of the various fisheries throughout the SUSA planning area. The collective short-term impacts of increased sedimentation (from erosion) could have watershed-wide adverse effects including changes in temperature, turbidity, and water chemistry.

Because RPMs and project-specific analyses would limit impacts of prescribed fire and would place constraints on non-fire fuel treatments in and adjacent to wetlands, riparian zones and water habitats, short-term adverse impacts from these fire management activities would be minimized or eliminated.

Non-game and Big Game Species

Short-term adverse impacts to non-game and big game species (e.g., direct species mortality, habitat destruction, and habitat displacement) would be minimized by RPMs. Rehabilitation, stabilization, and restoration activities would be conducted in treatment areas as practical and necessary. However, fire management activities could still result in short-term adverse impacts. These impacts would likely affect suitable habitat utilized by raptors, migratory birds, small mammals, carnivores and predators, amphibians and reptiles, and a variety of habitats used by big game species.

Direct effects from wildland fire suppression could include damaged vegetation (including forage resources) from the use of heavy equipment and establishment of fire camps, weed invasion, an increase in acres of

undesirable habitat types, a decrease in understory diversity and overall species richness, an increase in insect herbivory, and suppressed flowering from introduction of fire retardant or foam (Adams and Simmons 1999). These effects could cause species displacement and potential mortality.

Indirect impacts could include changes in the survival or successful reproduction of aquatic prey species (e.g., for birds and carnivores) due to increased sedimentation and subsequent habitat modification as a result of upstream erosion.

Approximately 48 percent of acres in the Natural Fire Emphasis category are comprised of pinyon and juniper woodland. Species utilizing this habitat would be more likely to incur short-term adverse impacts (e.g., mortality, habitat destruction, and temporary displacement to nearby suitable habitat) from fire management activities. Species that are found only in the remaining habitats (sagebrush, salt desert shrub, grassland, blackbrush, mountain scrub, ponderosa pine, wetlands and riparian zones, mixed conifer, aspen, and water) would be less likely to incur short-term adverse impacts, unless the species' habitat is geographically limited in extent and is greatly impacted by one or more fire events. ESR actions would be implemented to encourage the growth of native species and to preserve habitats at risk for each of the wildlife species discussed in this section. Direct effects from prescribed fire and non-fire fuel treatments could include mortality to individual animals, habitat alteration or damage, species displacement, and modification or destruction of forage or prey resources.

Big Game: Wildland fire use, prescribed fire, or non-fire fuel treatments could affect approximately 75 percent of mule deer habitat, 91 percent of Rocky Mountain elk habitat, 88 percent of desert bighorn sheep habitat, and 100 percent of pronghorn habitat associated with critical seasonal use areas. Short-term adverse impacts could include mortality, habitat destruction, and temporary or permanent displacement, and could result from wildland fire use, prescribed fire, or non-fire fuel treatments. All critical seasonal use areas could be affected by suppression activities.

Raptors and Migratory Birds: Raptors in mountainous and forested habitats (e.g., mountain shrub, mixed conifer, ponderosa pine, and aspen), and migratory birds that generally breed at higher elevations would likely incur few short-term impacts because these habitats more closely reflect a natural fire regime and would likely be a lower priority for wildland fire use, aggressive suppression, prescribed fire, and non-fire fuel treatments. Raptors and migratory birds found within salt desert shrub and wetland and riparian habitats would be more likely to incur impacts from the Proposed Action because these habitats are relatively far-removed from their natural fire regime and would likely be prioritized for fire management activities.

Small Mammals: Because the various habitats utilized by small mammals would be prioritized for fire management actions based on how closely they reflect a natural fire regime, small mammals would be affected differently throughout the planning area. Vegetation communities for which RPMs have been developed (e.g., sagebrush and wetland and riparian zones), would likely maintain populations of small mammals during the short term. Vegetation communities for which RPMs have not been explicitly could exhibit a decrease in small mammal abundance in the short term (i.e., for the duration of a fire event or non-fire fuel treatment).

Carnivores and Predators: Carnivores and predators would be less likely to incur short-term adverse impacts than species found in some other habitats because mountainous and forested habitats (in which carnivores and predators are found) would be a lower priority for prescribed fire and non-fire fuel treatments (because they more closely reflect a natural fire regime). However, carnivores and predators could incur adverse impacts from wildland fire suppression. Impacts from the Proposed Action could include mortality, habitat alteration or destruction, displacement, and a reduction in food sources.

Amphibians and Reptiles: The habitats upon which amphibians and reptiles rely are relatively far-removed from their natural fire regime. Thus, it is desirable to restore these habitats. Species in this habitat could incur

short-term adverse impacts including mortality, habitat destruction, and displacement from wildland fire and fire and non-fire fuel treatments. RPMs would be implemented in wetland and riparian habitats, as appropriate, to limit direct impacts to amphibians and reptiles.

Long-term Impacts

Fish

Long-term impacts to fisheries and aquatic resources would be minimized or avoided by implementation of RPMs. Long-term beneficial effects to fisheries would include an incremental reduction in the risk of severe wildland fire and a reduction in adverse impacts from wildland fire suppression activities that would be associated with wildland fire in fisheries habitat (regardless of severity). This would mean a decrease in temperature, turbidity and chemistry impacts following wildland fires and management actions.

Non-game and Big Game Species

The long-term effects of the Proposed Action on wildlife species found within the SUSA FMP planning area would be similar to the long-term effects described for special status animal species (see Section 4.2.3). Because long-term effects to non-game and big game species groups (raptors and migratory birds, small mammals, carnivores and predators, amphibians and reptiles, and big game) would be common to all, they are summarized below.

Mortality or long-term displacement of species would likely be avoided because wildland fire use and prescribed fire would not likely consist of large fires, and rehabilitation would be implemented as necessary and appropriate. Populations could be displaced for longer periods of time if management activities were implemented repeatedly within the same treatment area (e.g., mechanical treatment followed by prescribed fire followed by biological treatment).

Because the establishment of noxious weed populations would be minimized or eliminated (through RPMs and project-level stipulations), long-term effects on habitat would include a gradual increase in species diversity that would more closely reflect that associated with a natural fire regime, as opposed to a mono-culture or species composition consisting of invasive and/or noxious weeds.

4.2.16 SOILS

Short-term Impacts

Under the Proposed Action, it is likely that more acres of BLM-managed land would be affected by less aggressive fire suppression, wildland fire use, prescribed fire, and non-fire fuel treatments. Loss of vegetative cover due to wildland fire could affect soil quality through the loss of soil structure and temporary reduced porosity of soils in these impacted areas. This reduction in porosity and structure could result in a change in infiltration rates and increased erosion and runoff (Ralston and Hatchell 1971). RPMs associated with the Proposed Action would reduce imacts associated with soil loss and the potential for sediment loading and sedimentation. Erosion controls and seeding may be proposed as post-fire treatments (ESR or other) that would serve to stabilize these sites and to contain and control soil loss.

Where expected fire severity could adversely impact sensitive soils, an aggressive initial attack AMR would be implemented. Some level of ground disturbing activities associated with suppression, prescribed fire and non-fire fuel treatments would be likely to occur. Indirect impacts include potential soil loss from wind and water erosion. Planning flexibility afforded by the Proposed Action would allow implementation of RPMs to minimize potential direct and indirect effects to soil.

Long-term Impacts

A trend toward less severe wildland fires would result in fewer impacts to soil quality (including microbial populations, soil temperatures, and the chemical and physical structure of the soil). The flexibility of the Proposed Action would continue to allow for aggressive suppression in areas (1) with sensitive soils, and (2) where fire has not played a significant role in the past.

By fostering healthy, native understory communities, planned fire management and fuel reduction actions would be implemented to improve the soil resources and reduce erosion potential in the long term. Decreased potential for destruction of biological crusts due to severe fire events would also reduce the erosion potential. Planned actions (prescribed fire and non-fire fuel treatments) would continue to reduce the likelihood of severe wildland fires that result in loss of soil structure and altered porosity and infiltration rates. As the role of fire returns to a more natural pattern, there would be fewer indirect impacts from large, severe wildland fires including wind and water erosion.

4.2.17 RECREATION

Short-term Impacts

Because the Proposed Action includes RPMs that would preferentially protect developed special recreation management areas and recreation site infrastructure from wildland fire, wildland fire that presents a threat to a developed recreation site would be fully suppressed. This would occur if other more critical resource values and human health were not at risk. The potential exists for wildland fire suppression to impact developed recreation sites and infrastructure.

Infrastructure most likely to be damaged by wildland fire and suppression efforts includes interpretive and directional signage, and developed campgrounds and sanitation facilities. Visitor experience may also be impacted by aesthetic qualities of the recreation area, degradation of air quality from smoke, and road, trail, and route closures during and following wildland fire suppression. The most abrupt impact to potential recreationists is the complete or partial closure of recreation sites and facilities or even evacuation of those recreationists. If recreationists are allowed to enter or stay in the area, other impacts might include noise and visual impacts from ground equipment, helicopters, and air tankers delivering water, fire retardants, fire fighting equipment and personnel. Indirect impacts of wildland fire at developed facilities may include mass wasting on slopes, increased erosion, and hazards associated with dead standing vegetation. ESR and revegetation efforts may temporarily close areas to use.

The potential exists for OHV use to occur along constructed firelines to access previously unused areas. RPMs would require that vehicle tracks created off of established routes would be obliterated in order to reduce unauthorized OHV travel. Some areas may need to be temporarily closed to allow for revegetation and prevent the establishment of unauthorized and unplanned OHV trails.

A resultant impact from the Proposed Action could be lost visitor days at developed facilities. The RPMs implemented would decrease the potential for impacts to developed facilities. Higher value sites and facilities would take precedence for protection. Under an AMR, however, the emphasis for protection is placed on other resources, with human health and safety of fire fighters and the public identified as most important.

The increase in prescribed fire and non-fire fuel treatments could negatively impact the aesthetic quality of developed recreational sites and facilities. Prior to approval and implementation, all planned management activities, including prescribed fires and non-fire fuel treatments, would undergo a site-specific environmental evaluation to consider impacts to recreation. Therefore, no impacts to the infrastructure or natural features at these sites are anticipated. Additional impacts from the Proposed Action may include temporary site

closures and the presence of crews performing fire management actions. Positive impacts include the removal of fuels, which left in place would create a wildland fire danger to the site and facilities.

Long-term Impacts

Wildland fire suppression management direction may impact developed recreation sites and facilities by burning more of the surrounding vegetation, relative to the No Action Alternative, and creating aesthetic changes to the landscape. However, a trend toward DWFC and the associated reduced likelihood of less severe fire events would make the potential for the loss of these resources and visitor use days less likely.

Prescribed burns and non-fire fuel treatments would reduce excess fuels in the planning area, which would reduce the risk of large, severe wildland fire and the associated impacts to site use and characteristics these sites are intended to offer (NPS 2000). The reduced fuel load makes it less likely that a wildland fire would burn the entire site. This increases both the level of safety for recreationists and available visitor days.

4.2.18 SOCIAL AND ECONOMIC CONSIDERATIONS

Short-term Impacts

In the short term, a variety of public land users may be impacted. Suppression efforts would continue to prioritize higher value infrastructure or land uses reducing direct impacts from fire to these resources. Wildland fire use and less aggressive suppression could negatively impact forest product values as well as grazing permittees. Grazing allotment permittees would be impacted for a growing season if no re-seeding takes place. If seeded, permittees could be impacted for at least two growing seasons or more, depending on the success of forage re-establishment. Air quality impacts to the local populations in the vicinity of wildland fires could alter activities. Altered transportation routes, disruption of subsistence activities, and temporary increases in noise could also be short-term adverse impacts. Short-term beneficial effects could include an increase in revenue for communities from increased utilization of local services during suppression activities and ESR actions and planned fuel reduction treatments.

Long-term Impacts

Long-term beneficial effects could include a reduction in the cost of suppression, increased payroll benefits for fuel reduction treatments, and more protection in communities and WUI areas. A decreased long-term potential for severe wildland fire would lead to increased fire fighter and public safety, and may reduce suppression expenses and property losses (from severe fire events).

Impacts from fire or treatment procedures would be beneficial for livestock, resulting in an increase in the quantity and quality of forage reducing costs for livestock owners to supplement feed or move stock as frequently. Over time, there would likely be fewer economic losses in the SUSA FMP planning area from severe wildland fires. The subsequent decrease in fires would result in an overall increase in safety for the general public and less risk to the WUI.

4.2.19 WILD HORSES AND BURROS

Short-term Impacts

Approximately 86 percent of HMAs acres are in the Natural Fire Emphasis category and 14 percent are in the Resource Objectives Emphasis category. All HMAs are located in areas where wildland fire management goals allow fire to meet resource objectives. **Figure 4.7** presents the location of HMAs relative to fire management categories.

Less aggressive wildland fire suppression and planned fuel reduction treatments could cause a temporary loss of forage for wild horses and burros. Because wild horses and burros prefer watering areas near forage, temporary loss of watering area use could occur. High-severity fires in or around any of the 10 HMAs or 2 HAs could cause local displacement of herds to areas outside of the HMAs. Altered migration routes and temporary increases in noise could also be short-term effects.

Long-term Impacts

Impacts from the Proposed Action would benefit wild horse and burro habitat, due to an increase in the quantity and quality of forage resulting from achieving desired vegetation conditions.

4.2.20 WILDERNESS CHARACTERISTICS

Seventeen percent of the planning area has wilderness characteristics. As shown in **Figure 4.8**, approximately 11 percent of lands with wilderness characteristics are found within Suppression Emphasis FMUs, approximately 21 percent are found within Resource Objective Emphasis FMUs, and approximately 68 percent are found within Natural Fire Emphasis FMUs. In all categories, management activities would be carried out in a manner that would minimize impacts to the wilderness characteristics of each area.

Short-term Impacts

Short-term impacts resulting from management response to wildland fire may include ground disturbances associated with suppression and control efforts (e.g. hand lines and spike camps). Short-term and limited impacts for wildland fire suppression could include disturbance to soils, watershed functions, vegetation conditions, and habitats for SSS and fish and wildlife.

Due to the increased emphasis on suppression, those lands within Suppression Emphasis FMUs would likely see more short-term impacts from suppression activities than those lands in Natural Fire Emphasis FMUs. Impacts would be related to impairment of naturalness and opportunities for solitude and primitive recreation.

ESR activities, including seeding, would be used to stabilize burned areas and minimize the spread of invasive and noxious weed species. ESR efforts may be noticeable after fire events before they are revegetated, impacting the naturalness of the area. A short-term and minor impairment of wilderness characteristics would occur due to suppression and ESR related activities.

A burned or modified landscape and limited visibility may be aesthetically displeasing to recreationists seeking naturalness and opportunities for solitude and primitive recreation, but these impacts on the quality of visitor experience would be limited to the duration and area of the fire and would not likely affect overall use and appreciation of these or adjacent areas.

Prior to approval and implementation, all planned management activities, including prescribed fires and non-fire fuel treatments, would undergo a site-specific environmental evaluation to consider impacts to recreation.

Long-term Impacts

The Proposed Action would result in modification of the current condition to a DWFC that may be more representative of the historical vegetation.. A decreased risk of large, severe wildland fires is the primary long-term impacts associated with the use of an AMR to wildland fire suppression, wildland fire use, and the planned actions of prescribed fire and non-fire fuel treatments. The removal of fuels and reduced risk of

severe wildland fire events would preserve naturalness and opportunities for solitude and primitive recreation. Therefore, the Proposed Action would positively affect lands with wilderness characteristics.

By implementing the proposed fire management goals of reducing hazardous fuels to restore the role of fire, wilderness characteristics contained within these areas would be enhanced and preserved.

FIGURE 4.7: HERD MANAGEMENT AREAS, HERD AREAS, AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION

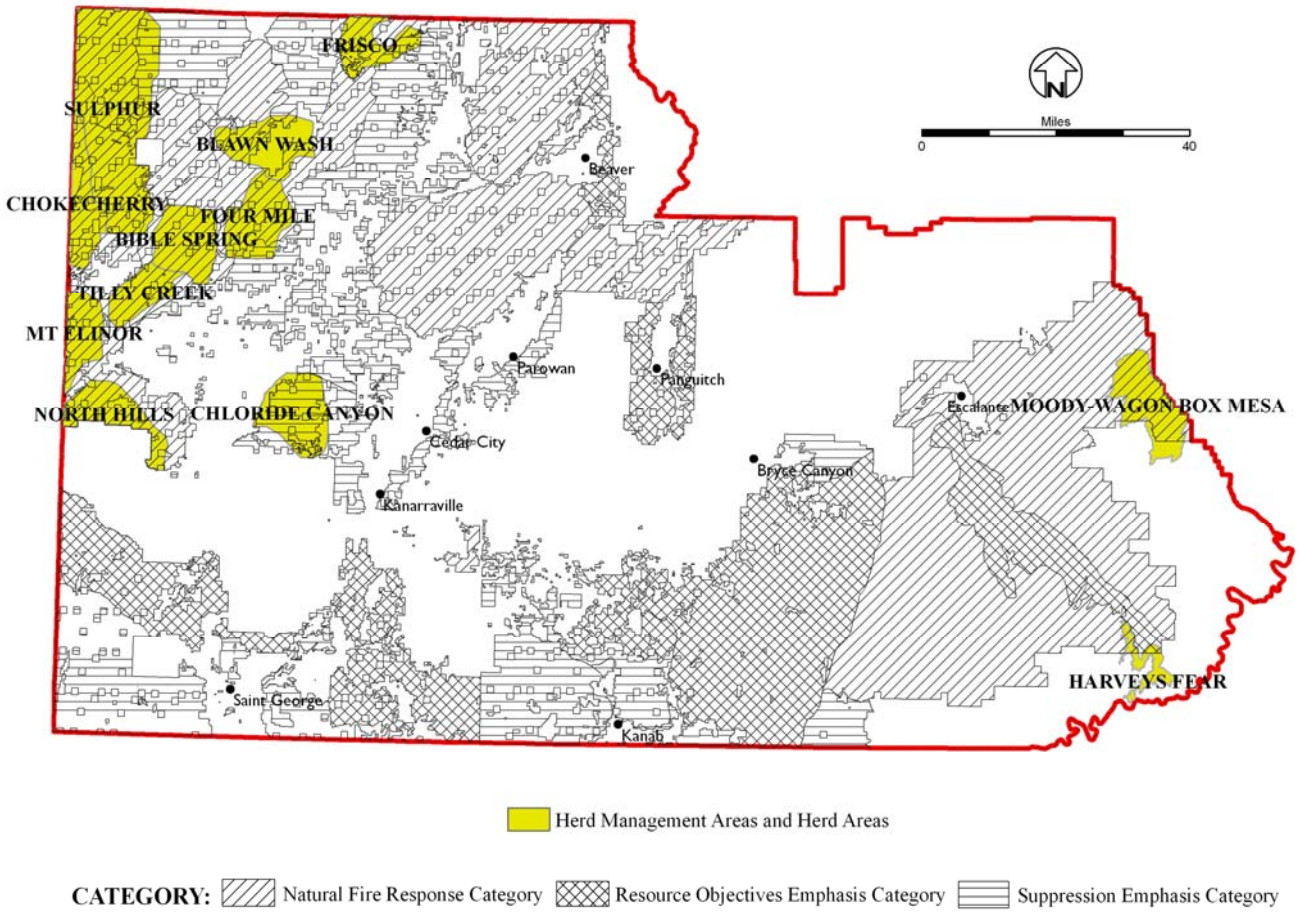
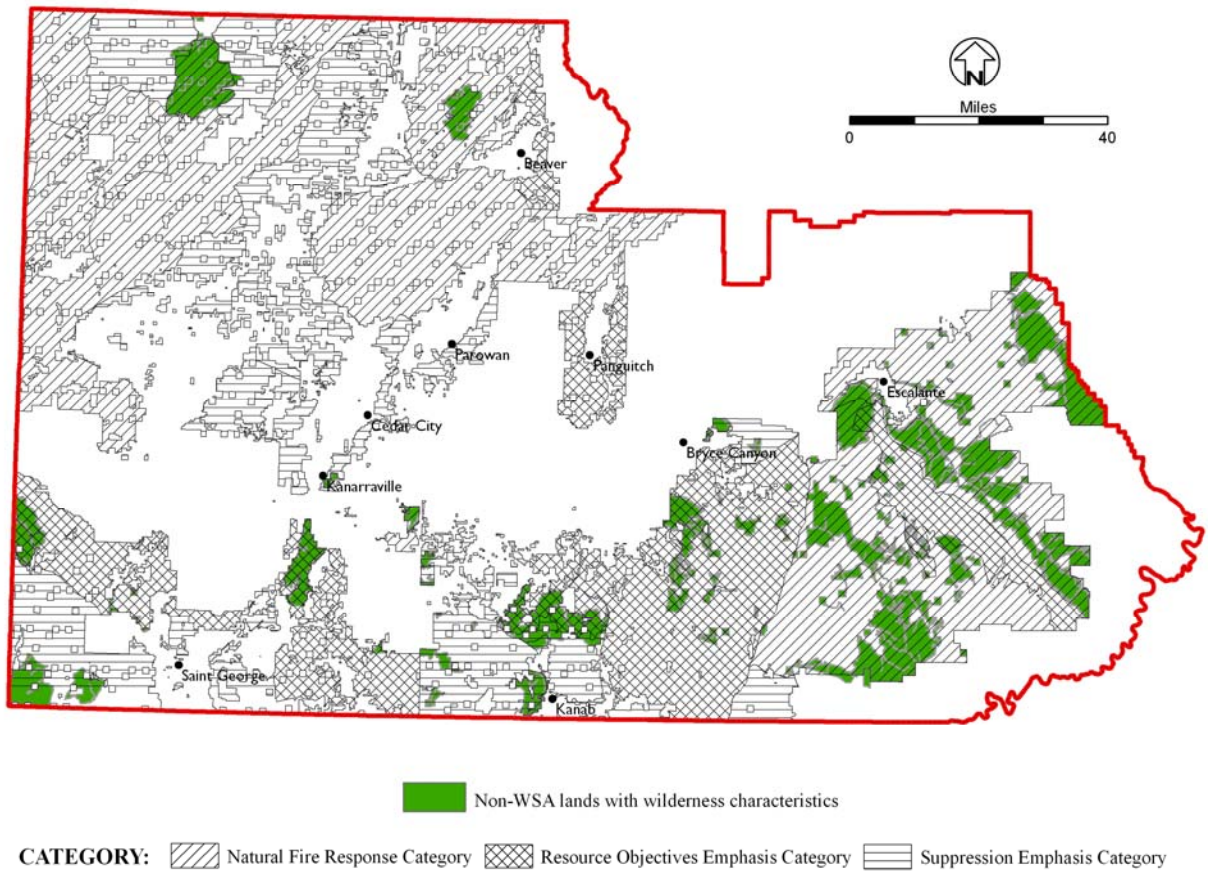


FIGURE 4.8: NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS AND FIRE MANAGEMENT CATEGORIES FOR THE PROPOSED ACTION



4.2.21 MITIGATION MEASURES

RPMs under the Proposed Action would minimize or avoid impacts on resources. No mitigation for impacts would be necessary because of the protection already afforded by the protection measures and the Biological Opinion's Terms and Conditions.

4.2.22 RESIDUAL IMPACTS

No mitigation measures are proposed with the Proposed Action, therefore, no residual impacts from mitigation measures would be present.

4.2.23 MONITORING AND COMPLIANCE

To ensure an adaptive management response to fire planning needs within the state, monitoring measures and compliance with the goals and objectives of this plan would be maintained. This would be achieved through future planning associated with fire management implementation actions. These fire management actions would be evaluated for adherence to the goals and objectives established by this Proposed Action, as well as specific resource requirements contained within the LUP. Wildland fire impacts would be compared to FMP goals and, if necessary, revisions to the FMP would be incorporated to reflect the impact of non-planned wildland fire events on the planning area resources. Implementation-level fire management actions would be developed to meet all resource requirements and may include additional monitoring to evaluate and ensure conformance to plan-level decisions. The frequency and duration of monitoring would be determined on a case by case basis.

4.3 NO ACTION ALTERNATIVE

4.3.1 AIR QUALITY

Short-term Impacts

Figure 4.9 presents the location of NAAs and Class I areas located in the area of consideration for the planning area with BLM-administered lands by current fire management categories. The No Action Alternative FMZs (approximately 3.8 million acres) are located in areas where wildland fire may be desirable (Categories C and D), and these areas are located within 100 kilometers of a Class I area or NAA. Short-term impacts of the No Action Alternative, such as smoke from unplanned wildland fire and fugitive dust from emergency suppression efforts, would continue at current levels.

Similar to the Proposed Action, the No Action Alternative requires the use of standard operating procedures (including participation in the Utah Interagency Smoke Management Program) and would minimize potential air quality impacts. BLM-planned activities would not violate applicable federal, state, tribal, and local air quality regulations.

Long-term Impacts

Under the No Action Alternative, a trend toward more severe and uncontrollable wildland fires is anticipated. Such fires would have the potential to generate more smoke emissions than smaller, controlled fires. Wildfires cannot be timed to minimize impacts on air quality conditions. Increased pollutant concentrations, and impacts on NAAs and other sensitive areas could increase. Impacts on human health would also increase, particularly from exposure to particulate matter, and some fire events would likely require special precautions to protect human health. The No Action Alternative's minimal use of wildland fire, prescribed fire, and non-fire fuel treatments would keep direct impacts from these actions at a minimum,

but allow for larger wildland fires and increased smoke emissions. Trends in vegetation and fuel conditions in the planning area would lead to further departure from DWFCs.

4.3.2 AREAS OF CRITICAL ENVIRONMENTAL CONCERN

As shown in **Figure 4.10**, approximately 71 percent of ACECs are found within Category A FMZs, and approximately 29 percent are found within Category C FMZs.

Short-term Impacts

Short-term impacts from the No Action Alternative would be similar to those described under the Proposed Action. The increased emphasis on suppression could lead to more severe short-term impacts than those anticipated under the Proposed Action. The greater focus on suppression efforts could potentially decrease the amount of ACEC acres that burn. Fewer burned acres may lessen impacts to ACEC values. However, in some ACECs where private lands or critical values are not threatened fires may be allowed to burn. The effects of these fires would be similar to those seen under the Proposed Action. Fewer acres would have prescribed fire and non-fire fuel treatments under the No Action Alternative. Fewer acres of treatment results in greater accumulation of fuels and trends away from DWFC.

Long-term Impacts

This alternative would result in continued trends of fuel buildups in or around ACECs. If heavy fuel loads were ignited, then a fire of high severity and temperature could damage historic, cultural, scenic, or other relevant and important values. Suppression efforts to protect ACECs may increase impacts on the values present. The exclusion of fire from ecosystems, as would be directed under the No Action Alternative, runs counter to managing areas for naturalness. Effects from planned actions would be less than in the Proposed Action, due to the lower acres targeted for those treatments.

4.3.3 CULTURAL RESOURCES

Short-term Impacts

Under the No Action Alternative, short-term impacts from fire management activities would be similar to the Proposed Action. Impacts from prescribed fire and non-fire fuel treatments would be less likely under the No Action Alternative than under the Proposed Action due to fewer acres identified for planned treatments.

Long-term Impacts

The No Action Alternative's trend away from DWFCs would result in vegetation fuel load conditions that could support high severity wildland fire events. Aggressive suppression efforts would be required to contain wildland fire. The long-term impact from the No Action Alternative could be moderate to major heat-related damage or destruction of resources by suppression equipment in areas where cultural resources have not been previously identified. Indirect impacts from the No Action Alternative include the exposure of cultural features to collectors and increased levels of erosion of soil containing those features.

FIGURE 4.9: NON-ATTAINMENT AREAS, CLASS I AREAS, AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE.

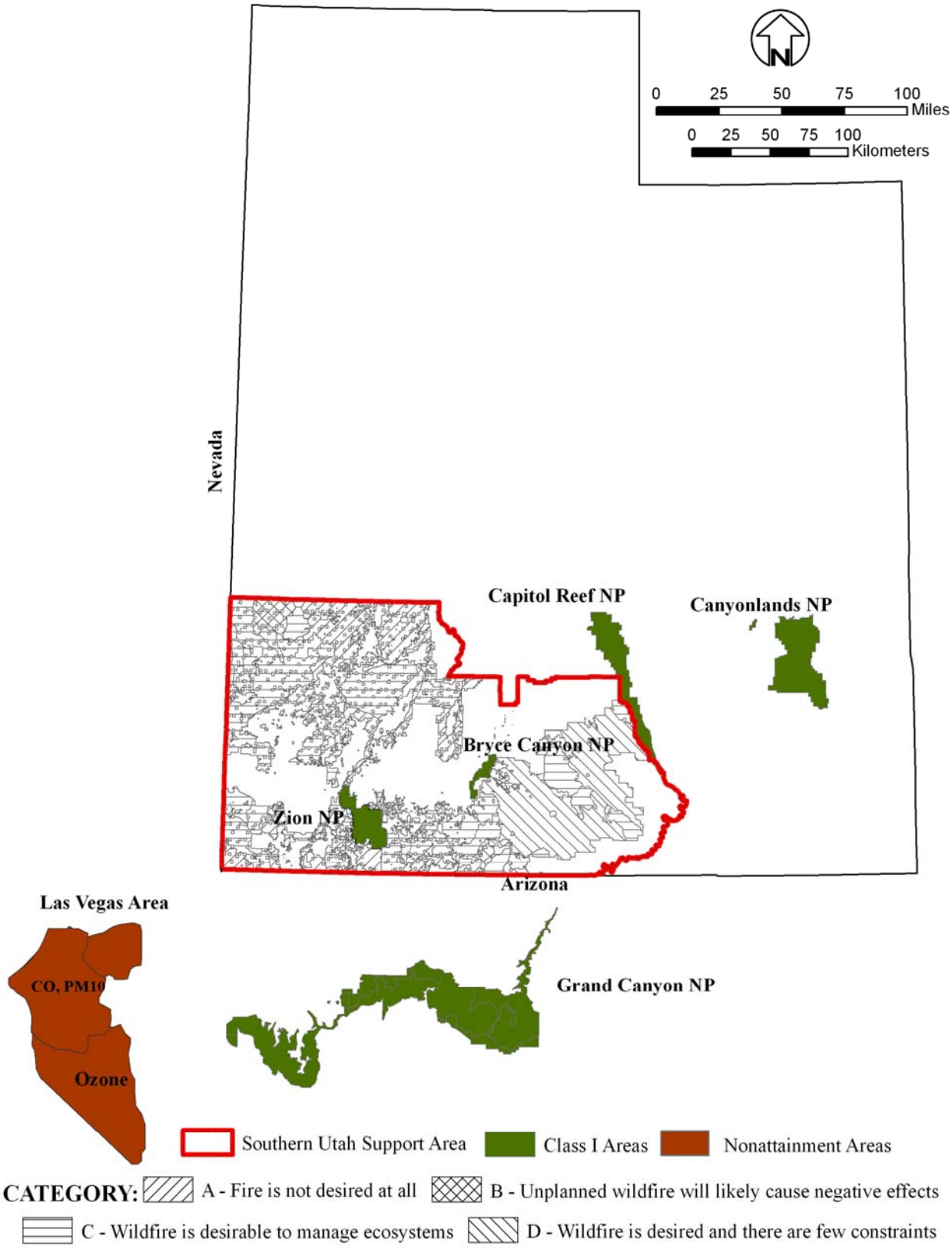
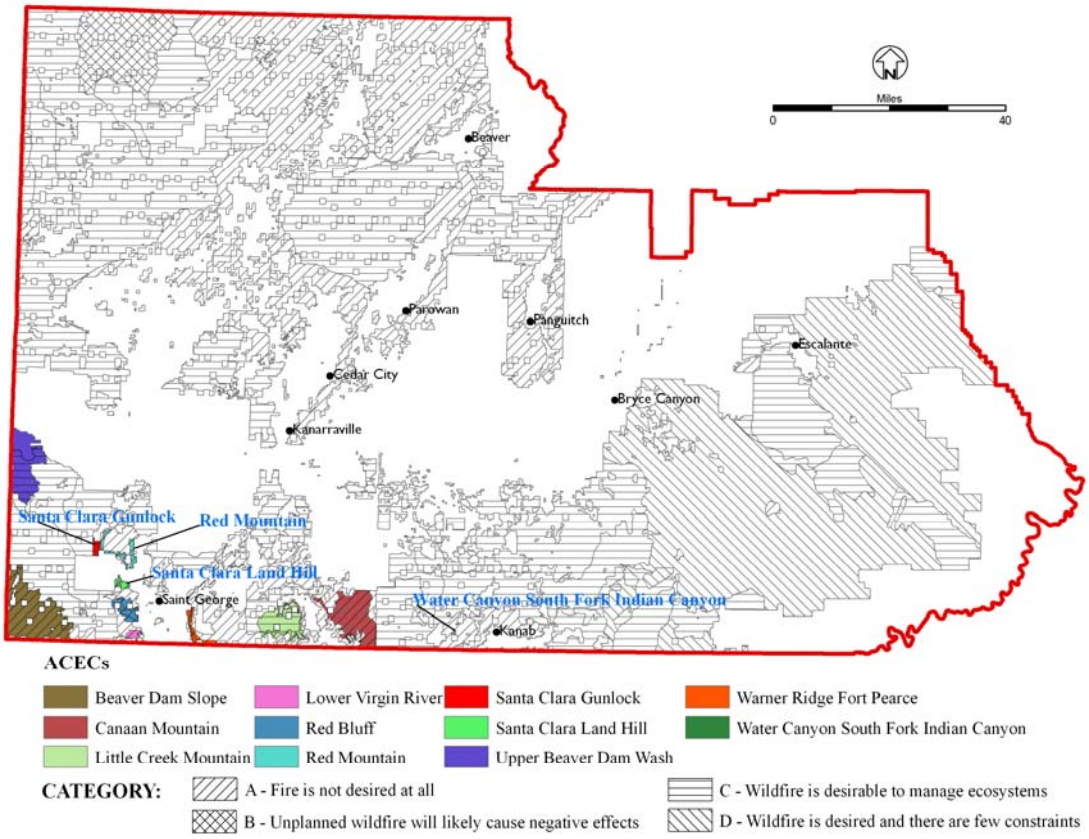


FIGURE 4.10: AREAS OF CRITICAL ENVIRONMENTAL CONCERN AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



4.3.4 ENVIRONMENTAL JUSTICE

Short-term Impacts

Under the No Action Alternative negligible disproportionate impacts to minority or low-income populations are anticipated. Potential impacts would be related to the loss of pinyon nut harvesting opportunities. Wildland fire suppression efforts would be more aggressive than in the Proposed Action. Pinyon nut and other juniper and pinyon woodland harvesting opportunities would be maintained in the short term.

The project-level environmental evaluation for prescribed fire and non-fire fuel treatments would consider impacts to pinyon nut harvesting. These planning efforts would minimize disproportionate impacts to minority or low income populations.

Long-term Impacts

Long-term impacts from the No Action Alternative would include a continued increase in fuel loads in juniper and pinyon woodlands. This would increase the likelihood of severe fire events and the resultant direct impact of the loss of pinyon nut harvesting opportunities.

4.3.5 INVASIVE, NON-NATIVE SPECIES

Short-term Impacts

There would likely be no short-term effect on noxious weeds under the No Action Alternative. This alternative would continue current ESR practices, which would minimize the effects of wildland fire on invasive, non-native species.

Long-term Impacts

An increase in the geographic range of invasive weeds is expected to continue. The likelihood of larger and more severe wildland fires would allow invasives like cheatgrass to progressively colonize new areas. More aggressive seeding and rehabilitation programs would be required to control infestations. Management actions would comply with EO 13112 (Invasive Species), however, that compliance would be much more difficult in response to larger fires compared to the Proposed Action.

4.3.6 NATIVE AMERICAN RELIGIOUS CONCERNS

Short-term Impacts

Fuel loads would likely continue to increase. The potential for severe wildland fires is similar to that in the short term under the Proposed Action. However, a concerted effort to suppress wildland fires to a greater degree under the No Action Alternative would occur in most of the planning area, thereby increasing the likelihood of impacts to Native American religious concerns from suppression-related activities. This includes the potential for moderate suppression-related impacts to sites used for religious and ceremonial purposes. Assuming initial suppression efforts would be successful, the size of follow-up restoration and rehabilitation actions would be smaller than under the Proposed Action. In that case, Native American religious concerns would be subjected to fewer widespread impacts.

Prescribed fire and non-fire fuel treatment methods would be conducted on a smaller scale in the No Action Alternative. This would potentially decrease the impact to Native American religious concerns from ground-disturbing activities.

Long-term Impacts

With the continued buildup of hazardous fuels, wildland fire is expected to trend toward larger and more severe events. These severe events would likely include major impacts on Native American religious concerns, such as alteration of vegetation composition in use areas and increase direct and indirect impacts to religious and ceremonial sites. These events would have a greater likelihood of impacting Native American religious concerns than the Proposed Action. Aggressive suppression efforts would be required to control impacts from severe events, thus increasing the potential for impacts to Native American religious concerns from ground-disturbing activities. Extensive restoration and rehabilitation actions would be required following these events potentially altering the religious value of the impacted area.

Under the No Action Alternative, prescribed fire and non-fire fuel treatment methods would be conducted on one quarter to one half of the acres that would receive treatment under the Proposed Action. While fewer planned actions would decrease the impact to Native American religious concerns due to ground-disturbing activities, it would exacerbate the trend toward an increase in fuel loads and more severe fires.

4.3.7 SPECIAL STATUS SPECIES

Short-term Impacts

Under the No Action Alternative, the BLM would continue its current fire management practices. As with the Proposed Action, the BLM would be required to conduct timely or emergency Section 7 consultation with USFWS for all site-specific fire management activities that would be implemented within suitable or potentially suitable habitat for federally listed species. The Alternative Consultation Agreement to Implement Section 7 Counterpart Regulations could be employed for consultation on projects that support the National Fire Plan.

Impacts from wildland fire suppression would be greater than those described under the Proposed Action because wildland fire suppression under the No Action Alternative would consist of more aggressive suppression. Short-term impacts (e.g., habitat modification, plant mortality, and/or displacement of animal individuals or populations) could come from suppression-related activities (e.g., establishment of firelines, helicopter bases, safety zones, and fire camps).

Though prescribed fire and non-fire fuel treatments would be limited under the No Action Alternative, short-term impacts would be similar to those under the Proposed Action. Both alternatives would require consultation with the USFWS, which would likely ensure protection of species and their habitat, prior to implementation of fire management activities. Accordingly, few adverse impacts to species (plant and animal) and their habitat would likely occur.

Long-term Impacts

Long-term, ecosystem-wide, beneficial effects of the Proposed Action on SSS and their habitat would not be attained under the No Action Alternative. With implementation of full suppression efforts in many cases, fuel build-ups would continue and the subsequent risk of a severe wildland fire would increase. Indirect adverse effects to individuals, populations, and habitats (due to changes in vegetation composition and structure caused by aggressive fire suppression and potentially severe wildland fires) would continue.

4.3.8 WATER QUALITY

Short-term Impacts

Surface Water

Surface water would be at risk from soil disturbance and increased erosion potential related to more aggressive fire suppression activities such as fireline construction, road construction, and other uses of heavy equipment in the No Action alternative.

Figure 4.11 presents the location of 303(d)-listed waterbodies located in the planning area and the current FMZ categories under the No Action Alternative. Those impaired waters that are located on BLM-administered land would be primarily located in areas where wildland or unplanned fire is generally considered desirable (Categories C and D).

The use of best management practices in the vicinity of sensitive areas such as 303(d)-listed impaired water would likely result in limited impacts on water quality, similar to those described under the Proposed Action.

Groundwater

Short-term effects to groundwater would be similar to those seen under the Proposed Action for all management actions.

Long-term Impacts

Surface Water

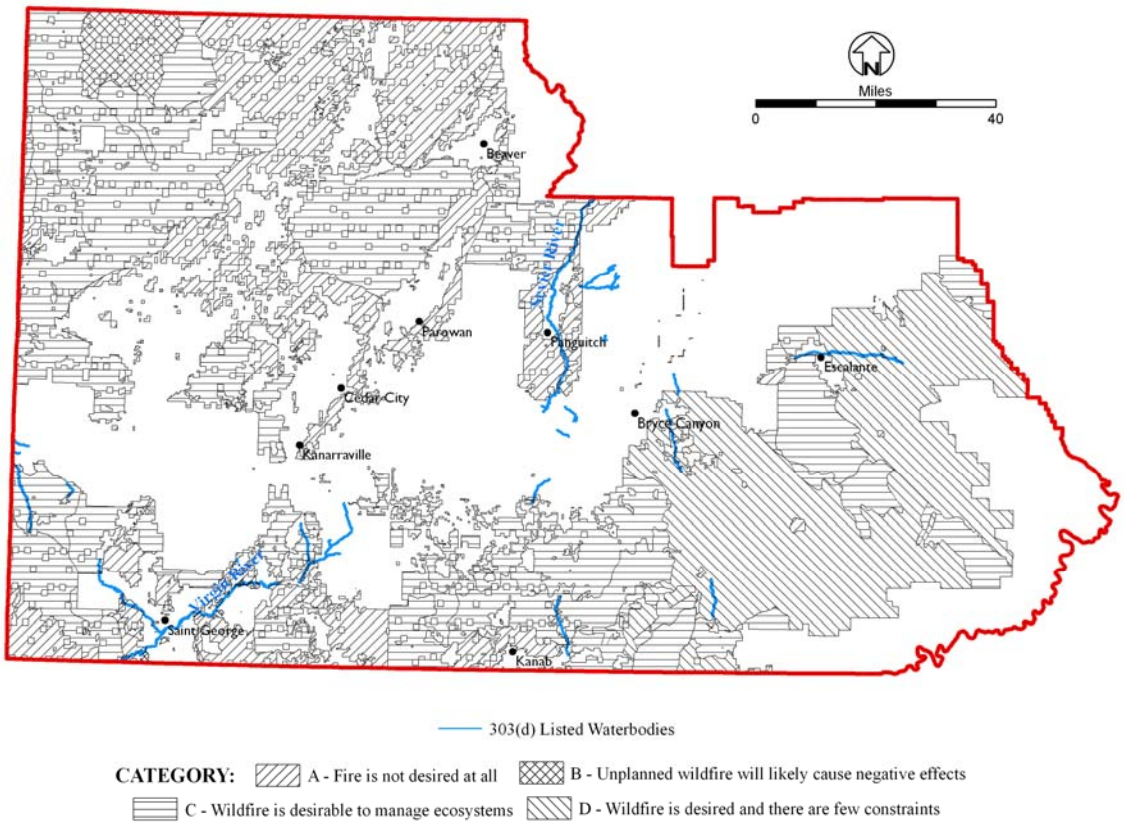
Surface water resources would experience a trend toward greater impacts. Full suppression would remain as the principal response to wildland fires. The effort to fully suppress wildland fire could lead to an increase in fuel loads. This may result in the increase of uncontrollable high severity fires, which could increase erosion, result in the loss of vegetation cover and organic matter, and degrade stream banks. There could also be increases in dissolved and suspended solids, nutrients, and temperature variations outside of normal conditions.

The use of best management practices in the vicinity of sensitive areas such as 303(d)-listed impaired waters and municipal watersheds would likely result in limited impacts on water quality, similar to the Proposed Action. However, the expected increase in severe and uncontrollable wildland fires would make the ability to follow these guidelines less feasible, potentially resulting in a decrease in water quality during and following these events.

Groundwater

The increasing occurrence of high severity fires could decrease infiltration capacity of soils. Surface runoff could obtain an increased nutrient load as it passes through burned vegetation and physiochemically altered shallow soils.

FIGURE 4.11: 303(D)-LISTED WATERBODIES AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



4.3.9 WETLANDS AND RIPARIAN ZONES

Short-term Impacts

Short-term effects to wetlands and riparian resources would be similar to those described under the Proposed Action. Short-term impacts of suppression activities could include vegetation damage or destruction, increased stream bank and shore erosion, and increased sedimentation in streams that degrades fish habitat and water quality. The loss of streamside vegetation could result in higher stream temperatures and may degrade fish and other aquatic species habitat. ESR actions would reduce impacts by stabilizing soil and vegetative conditions.

Fewer acres are identified as appropriate for prescribed fire and non-fire fuel treatments under the No Action Alternative. As in the Proposed Action alternative, vegetation disturbance associated with prescribed fire and non-fire fuel treatments would be evaluated through an environmental planning and review process that would minimize impacts related to vegetation loss and increased erosion. Often these impacts are short term and conditions return to pre-fire levels once vegetation is re-established. Efforts would be made to protect vegetation and restore native species after a disturbance.

Long-term Impacts

Under the No Action Alternative, wildland fire suppression would remain the principal response to wildland fires. The effort to suppress wildland fire could lead to an increase in hazardous fuels resulting in increased potential for large or severe wildland fires. This could increase the loss of vegetation cover and organic matter, degrade stream banks, and increase erosion rates in wetlands and riparian zones.

4.3.10 WILD AND SCENIC RIVERS

Short-term Impacts

Short-term impacts from the No Action Alternative would be similar to those described under the Proposed Action. The increased emphasis on suppression, however, could lead to more severe short-term impacts than those anticipated under the Proposed Action. More aggressive suppression efforts could potentially decrease the amount of river segment acres that burn. Fewer burned acres may give the impression of a more natural environment, though the lack of fire would actually increase fuel loads. Fewer acres would have prescribed fire and non-fire fuel treatments under the No Action Alternative. Less treatment results in greater accumulation of fuels and trends away from DWFC.

Long-term Impacts

This alternative would likely continue to trend in fuel buildups in or around eligible river segments. If heavy fuel loads were ignited, then a fire of high severity and temperature could damage historic, cultural, scenic, or other relevant and important values. Suppression efforts to protect river segments may increase impacts on the values present. The exclusion of fire from ecosystems, as would be directed under the No Action Alternative, runs counter to managing areas for naturalness. Effects from planned actions would be less than in the Proposed Action, due to the lower acres targeted for those treatments.

4.3.11 WILDERNESS STUDY AREAS

As shown in **Figure 4.12**, approximately eight percent of WSA lands would be within the Suppression Emphasis Category, approximately 26 percent in the Resource Objectives Emphasis Category, and approximately 66 percent in the Natural Fire Emphasis Category.

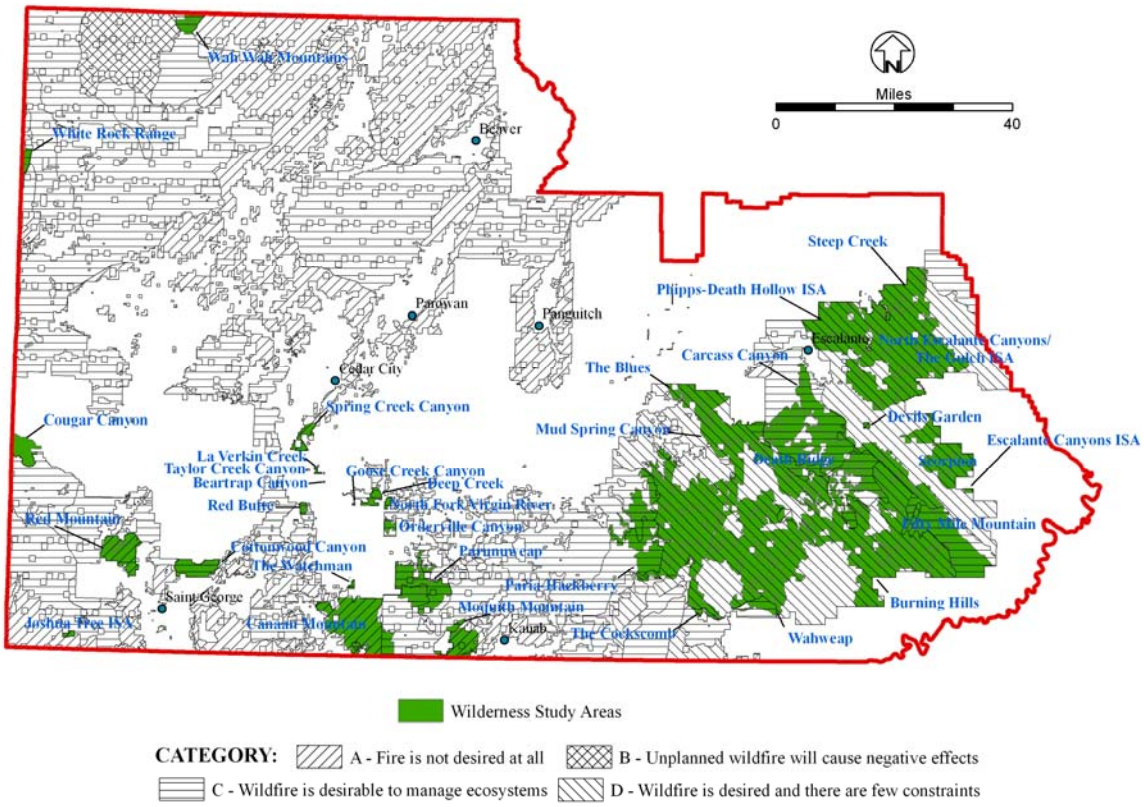
Short-term Impacts

Short-term impacts from the No Action Alternative would be similar to those described under the Proposed Action. The increased emphasis on suppression could lead to more severe short-term impacts than those anticipated from the Proposed Action. Additionally, the greater focus on suppression efforts could potentially decrease the amount of WSAs acres that burn. Fewer burned acres may give the impression of a more natural environment, but the lack of fire events may actually lead to fuel build-ups. However, in some WSAs where private lands or critical values are not threatened fires may be allowed to burn. The effects of these fires would be similar to those seen under the Proposed Action. Fewer WSA acres would be in FMZs where prescribed fire and non-fire fuel treatments would be appropriate under the No Action Alternative, which would continue the trend of hazardous fuels accumulation.

Long-term Impacts

Implementation of this alternative would likely continue the current trend toward fuel buildups in or around WSAs. A fire of high severity and temperature could damage historic, cultural, scenic, or other values. Suppression efforts to protect these areas may increase impacts on the values present. The exclusion of fire from ecosystems, as would be directed under the No Action Alternative, runs counter to managing areas for naturalness.

FIGURE 4.12: WILDERNESS STUDY AREAS AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



4.3.12 LIVESTOCK GRAZING

Short-term Impacts

Under the No Action Alternative, approximately 24 percent of grazing allotments fall into Category A, two percent in Category B, 49 percent are located Category C and 25 percent are in Category D. The majority of grazing allotments are located in areas where wildland fire is desired. **Figure 4.13** presents locations of the grazing allotments relative to fire management categories. Potential short-term impacts of fire management activities under the No Action Alternative would be less than those under the Proposed Action because the No Action alternative could result in fewer acres burned in the short-term. Forage and allotment use decreases would occur after wildland fires, but would encompass fewer acres than in the Proposed Action. Range improvements may be destroyed by wildland fire. ESR actions would be implemented to a lesser degree and corresponding ground disturbances would be lowered. There would also be less forage loss due to planned actions since there would be fewer acres treated in the No Action Alternative. Therefore, the permittees could be impacted less in the short-term.

Long-term Impacts

Under the No Action Alternative, a trend away from DWFC lead to higher severity wildland fire. This may lead to the loss of allotment use for longer periods than under the Proposed Action, due to the loss of seed banks and physical and chemical degradation of soil that negatively impacts its ability to recover after wildland fire. An increased loss of allotment improvements may occur due to wildland fire. ESR actions would help offset some of the increase in impacts, but may also increase the need to use non-native vegetation to stabilize erosive soil and to lower the ability for invasive non-native species to inhabit disturbed areas.

4.3.13 WOODLANDS AND FORESTRY

Short-term Impacts

The No Action Alternative would allow fuel accumulation and juniper encroachment to continue at a higher rate than the Proposed Action due to more aggressive suppresion, and lower levels of fuel treatments. Wildland fire that does occur would decrease the amount of biomass, timber, firewood, and pinyon nut harvesting opportunities in the areas affected by these events.

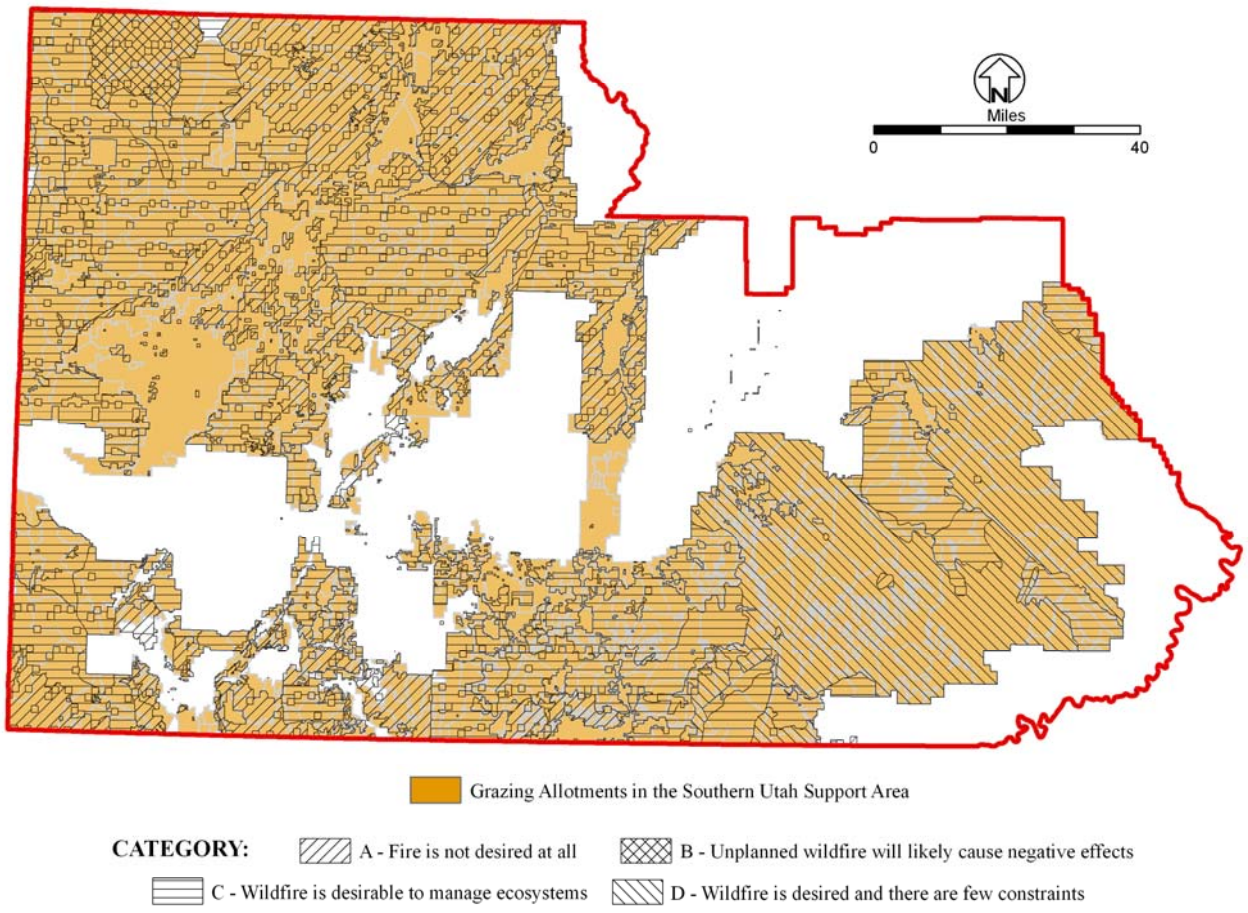
Non-fire treatment methods to reduce the occurrence of younger age classes in areas of old growth (in particular for ponderosa, aspen and mixed conifer) could increase the survivability of old growth forests during fire events (Howard 2003). Since treatments in the No Action Alternative would be less than the Proposed Action, this benefit would be reduced in the No Action.

Long-term Impacts

In the long term, the current conditions trends away from DWFC would continue. However, a continuing buildup of fuels would occur. Movement away from DWFCs could result in more frequent severe wildland fire events that damage encroaching as well as old growth pinyon and juniper woodland and other resources that are integral to these woodlands. The large expanse of pinyon-juniper would help offset effects on the availability of forest products during this period.

Prescribed fire and non-fire treatments at levels identified in the No Action Alternative would not change the opportunity for harvest. The use of non-fire treatment methods to reduce the occurrence of ladder fuels in areas of desirable old growth forests would also decrease the fire severity and increase the survivability of old growth forests during fire events (Howard 2003) in the long term.

FIGURE 4.13: GRAZING ALLOTMENTS AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



4.3.14 VEGETATION

Short-term Impacts

In addition to impacts from the fire itself, wildland fire suppression actions (i.e., fireline construction, snag removal) have the potential to disturb all vegetation types. Figure 4.14 illustrates vegetation types and fire management categories for the No Action Alternative. Table 4.3 shows the percent of each of the GAP vegetation type groups in each fire management category. Since this alternative has more aggressive suppression, there may be more effects due to suppression than due to wildfire compared with the Proposed Action Alternative. Fewer of acres of fuel treatment in the No Action Alternative will result in continued trends away from DWFC. Trends away from DWFC would be especially apparent in pinyon and juniper woodlands, sagebrush, ponderosa pine and aspen since these ecosystems would greatly benefit from wildland fire and fuels treatments. Effects from the No Action and Proposed Action would be similar for salt desert shrub, grassland, blackbrush, mountain shrub and oak, and mixed conifer since these vegetation types would not be specifically targeted for reintroduction of fire or large acres of fuel treatments in either alternative.

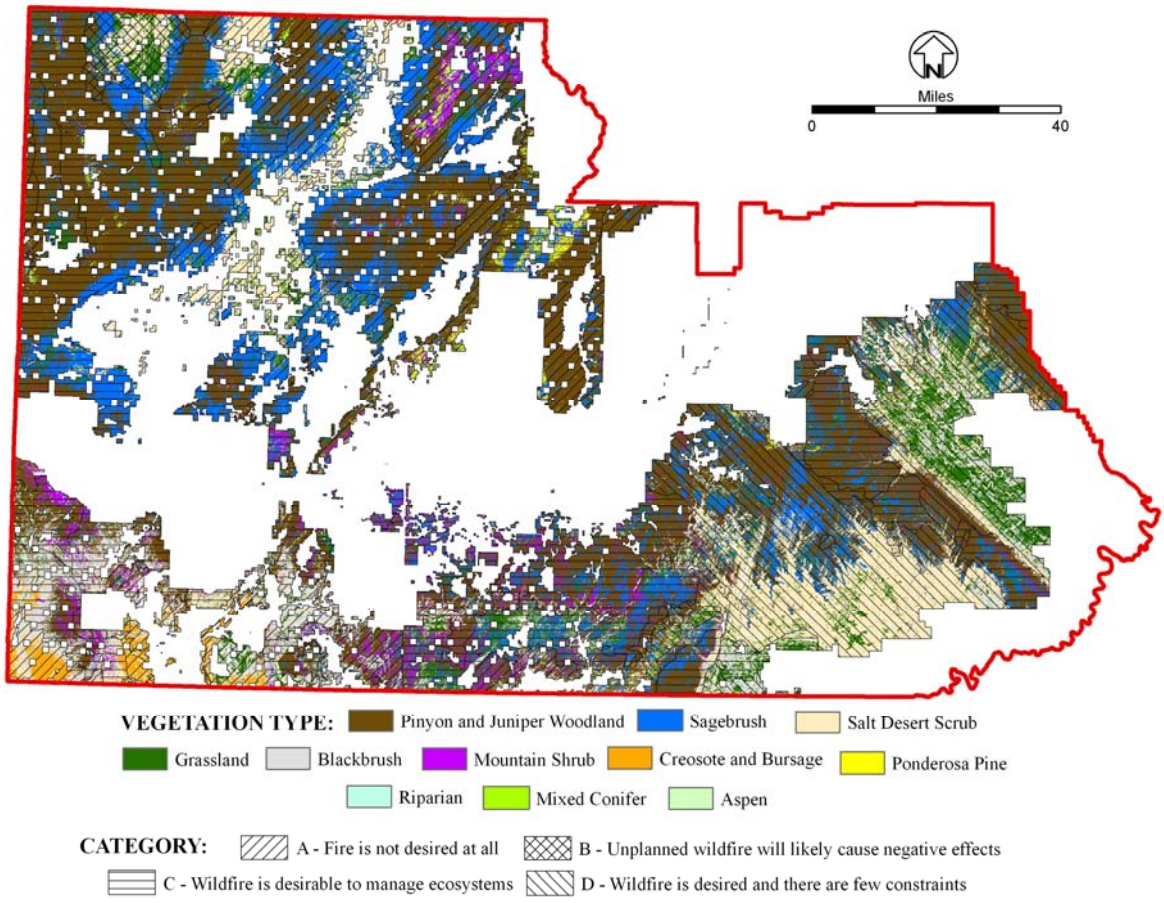
Long-term Impacts

In the No Action Alternative, fewer acres of wildfire and fuels treatment would continue resulting in the potential for larger, more severe wildland fires. With fewer acres of fuel treatments implemented, the trends away from DWFC and the risk of losing key ecosystem components following wildfire would continue.

TABLE 4.3: PERCENTAGE OF VEGETATION TYPE GROUPS AND FIRE MANAGEMENT ZONE CATEGORY UNDER THE NO ACTION ALTERNATIVE

Vegetation Type Group	Percent of Type by Fire Management Zone Category			
	A	B	C	D
Pinyon and Juniper Woodland	19%	1%	64%	16%
Sagebrush	30%	3%	51%	16%
Salt Desert Shrub	24%	4%	15%	57%
Grassland	22%	6%	32%	40%
Blackbrush	29%	0%	42%	29%
Mountain Shrub	27%	0%	64%	9%
Oak	38%	0%	60%	2%
Creosote and Bursage	89%	0%	11%	0%
Ponderosa pine	34%	0%	60%	6%
Mixed Conifer	40%	0%	59%	1%
Aspen	69%	0%	31%	0%
Wetlands and Riparian Zones	20%	0%	77%	2%

FIGURE 4.14: VEGETATION TYPES AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



4.3.15 FISH AND WILDLIFE

Short-term Impacts

Because wildland fire suppression under the No Action Alternative would be more aggressive than the Proposed Action, short-term impacts from wildfire suppression actions could be greater than under the Proposed Action. However, short-term impacts from the fire itself could be less in the No Action Alternative.

Less acres of fuel treatments would be applied in the No Action Alternative. Short-term impacts associated with habitat alteration (due to ground disturbance and potential for noxious weed infestation) due to fuel treatments would be less than under the Proposed Action.

Fish

Direct effects from wildland fire suppression could include the introduction of fire retardant, aviation fuel, or lubricants into streams and wetlands; erosion of exposed soils from fireline construction on steep slopes adjacent to streams; damaged riparian vegetation and soils (resulting in erosion) from the use of heavy equipment and establishment of fire camps; and reduced natural stream flow during drafting and pumping. These impacts would adversely impact water quality of the various fisheries throughout SUSA. The collective short-term impacts of increased sedimentation (from erosion) could have watershed-wide effects including changes in temperature, turbidity, and water chemistry.

Non-game and Big Game Species

Direct effects from wildland fire suppression could include damaged vegetation (including forage resources) from the use of heavy equipment and establishment of fire camps, as well as weed invasion, an increase in the size of an undesirable habitat type, preferential grazing, inhibited leaf production, leaf death, a decrease in understory diversity and overall species richness, shoot damage, an increase in insect herbivory, and suppressed flowering from the introduction of fire retardant or foam (Adams and Simmons 1999). Direct effects from prescribed fire and non-fire fuel treatments could include mortality to individual animals, modification, or destruction of forage or prey resources, habitat alteration or damage, and species displacement.

Indirect impacts could include changes in the survival or reproduction of aquatic prey species (i.e., prey of birds and carnivores) due to increased sedimentation (as a result of upstream erosion) and subsequent habitat modification.

Long-term Impacts

Fish

Long-term adverse impacts to fisheries and aquatic resources could include alteration of habitat quality from repeated short-term impacts, and impacts on water quality associated with an increasing risk of severe wildland fire (see the Water Quality section for additional discussion regarding watershed impacts).

Non-game and Big Game Species

Increases in suppression-related impacts to control severe wildland fires would be likely. Severe wildland fire events would remove forage and potentially contribute to undesirable vegetation conversions in critical habitats including winter range. Because prescribed fire and non-fire treatments would not likely consist of

large treatment areas, the overall condition of the landscape would continue to trend away from historical conditions.

4.3.16 SOILS

Short-term Impacts

Due to more aggressive suppression under the No Action Alternative, there could be more soil impacts (disturbance and compaction) from fireline construction, road construction, and uses of heavy equipment. There would be less impacts from fuels treatment under the No Action Alternative due to fewer acres treated.

Long-term Impacts

Wildland fires under the No Action Alternative would become larger and more severe resulting in a greater occurrence of negative impacts to soil resources. High-severity fires would remove more of the vegetation cover and organic matter, thereby reducing nutrient cycling. High-severity wildland fires are also more likely to adversely affect soil microorganisms and biological crusts that prevent erosion and fix nitrogen from the atmosphere. High-severity fires may also result in the formation of water-repellent soil layers (Robichaud et al. 2000), which can decrease infiltration and increase the rate and quantity of runoff causing accelerated erosion and potentially dangerous debris flows. These impacts would decrease the ability for soil to support vegetative growth and wildlife habitat.

4.3.17 RECREATION

Short-term Impacts

The impact to recreational sites and facilities from wildland fire suppression management under the No Action Alternative would be similar to the Proposed Action. More aggressive suppression in the No Action Alterantive would potentially decrease impacts to recreation sites and facilities from wildfire. However, fewer acres are identified for fuels treatments under the No Action Alternative. Fuel treatments, particularly surrounding sites and facilities, would help control hazardous fuel loads and minimize fire risks to developed sites and facilities.

Long-term Impacts

Under the No Action Alternative, the greater emphasis on suppression and lack of fuel treatments would continue current trends of increasing hazardous fuels resulting in a greater long-term risk of large or severe wildland fires threatening developed sites and facilities.

4.3.18 SOCIAL AND ECONOMIC CONSIDERATIONS

Short-term impacts to public land users from wildfires could be less under the No Action Alternative due to more aggressive suppression. More aggressive suppression could result in fewer impacts to forest product values and grazing permittees. Air quality impacts, altered transportation routes, and disruption of subsistence activities could be less than the Proposed Action. Slightly decreased revenue for communities from utilization of local services for planned fuel treatments is anticipated compared to the Proposed Action.

Long-term Impacts

Long-term effects could include an increase in the cost of suppression, increasing income to fire suppression and ESR-related personnel and support businesses. Increases in economic losses due to direct and indirect

effects of larger, more severe wildland fires could be incurred. Impacts could include greater chances for wildland fire to damage or destroy structures and infrastructure on agency-administered lands and in adjacent WUI areas, increasing loss of forage on and use of grazing allotments, and overall decreases in human health and safety.

4.3.19 WILD HORSES AND BURROS

Short-term Impacts

Under the No Action Alternative, approximately nine percent of HMAs fall into Category A, four percent in Category B, 87 percent are located Category C and none in Category D. **Figure 4.15** presents the locations of the HMAs relative to fire management category areas.

The No Action Alternative short-term impacts of wildland fire suppression would be more than in the Proposed Action. The decrease in wildland fire use and increase in suppression would account for these impacts. ESR would offset some of the impacts to HMAs and HAs by restoring forage in shorter time frames. The lower level of planned fuel treatments would lessen impacts to these areas.

Long-term Impacts

Long-term effects from continued fire suppression and lower levels of wildland fire use and planned fuel reduction treatments would include an increase in severe wildland fires that could decrease available forage and shelter for wild horses and burros. Herds may be displaced impacting adjacent lands, land uses, and herd health.

4.3.20 WILDERNESS CHARACTERISTICS

As shown in **Figure 4.16**, approximately nine percent of lands with wilderness characteristics are found Category A FMUs, less than one percent are found within Category B FMUs, approximately 41 percent are found within Category C FMUs, and approximately 50 percent are found within Category D FMUs.

Short-term Impacts

Due to more aggressive suppression in the No Action Alternative, short-term impacts to wilderness characteristics from suppression-related actions could be greater than in the Proposed Action. However, more aggressive suppression actions could decrease fire-related impacts to wilderness characteristics. Fewer burned acres may give the impression of a more natural environment, though the smaller extent of wildland fires would actually lead to the build up of fuel loads. However, in some areas where private lands or critical values are not threatened fires may be allowed to burn. The effects of these fires would be similar to those seen under the Proposed Action. Fewer acres are identified as appropriate for fuel treatments under the No Action Alternative resulting in less short-term impacts to wilderness characteristics.

Long-term Impacts

The No Action Alternative would continue trends away from DWFC and toward large, severe fire. High severity fires could damage resource values (e.g., naturalness, opportunities for solitude and primitive recreation). Suppression efforts to protect these areas may increase impacts on the values present. Aggressive fire suppression actions, as would be directed under the No Action Alternative, runs counter to managing areas for naturalness.

FIGURE 4.15: HERD MANAGEMENT AREAS, HERD AREAS, AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE

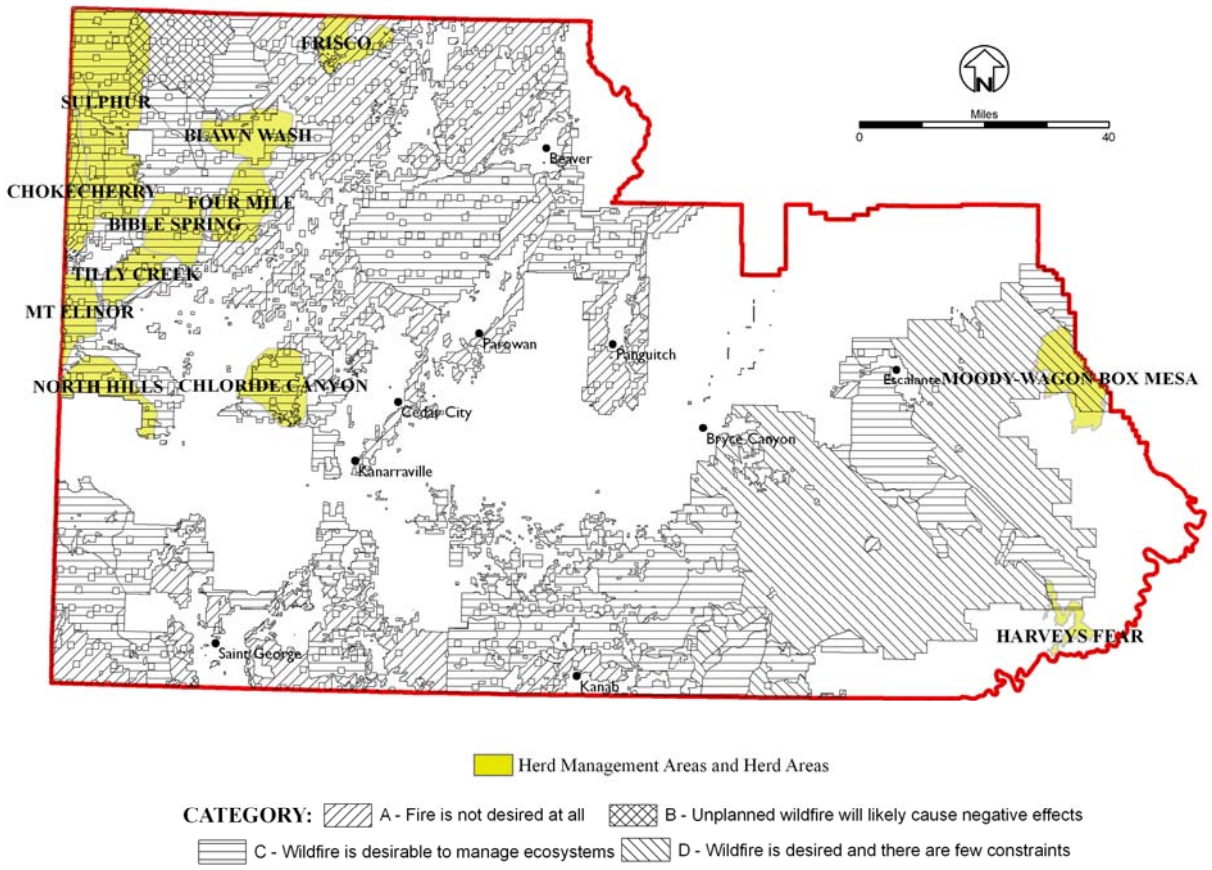
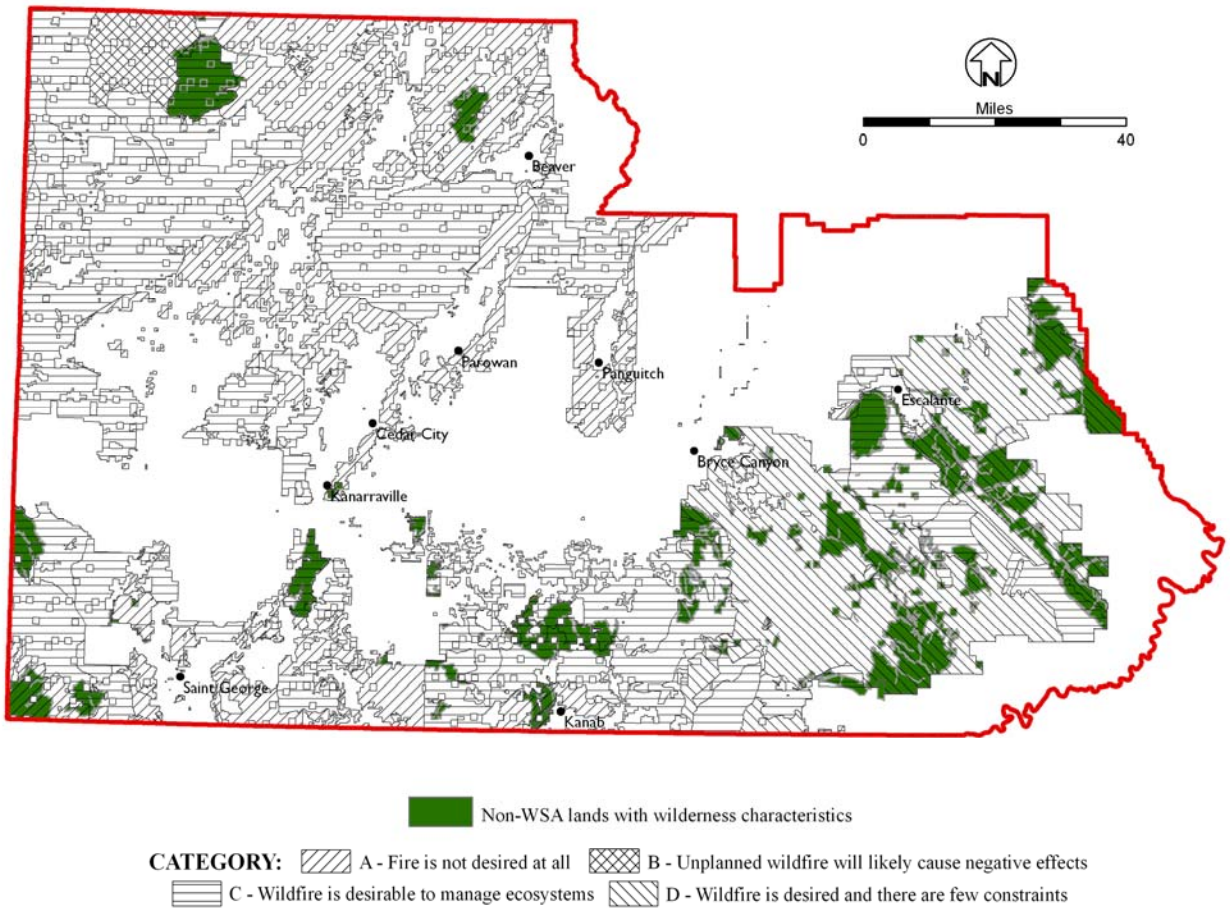


FIGURE 4.16: NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS AND FIRE MANAGEMENT CATEGORIES FOR THE NO ACTION ALTERNATIVE



4.4 CUMULATIVE EFFECTS

4.4.1 REASONABLY FORESEEABLE ACTION SCENARIO

The following reasonably foreseeable action scenario (RFAS) identifies actions in or near the planning area that could cumulatively with the Proposed Action or No Action Alternative have an additive effect on the resources discussed in Chapter 4. The potential cumulative impacts from those actions are summarized in this section.

- National Fire Plan activities for all surrounding federal and many state land management agencies
- Land management and resource management plan revisions in Kanab, Moab, Monticello, Richfield, Cedar City and Salt Lake.
- Land management and resource management planning throughout Utah
- Continuing implementation of the Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah
- Continuing implementation of vegetation treatment on BLM lands in 13 Western states (BLM 1991) and upcoming Vegetation EIS (ongoing planning)
- Regulatory actions, guidance and associated revisions for sagebrush restoration and grazing on public lands
- Vegetation treatment resulting from wildlife mitigation projects (big game winter range, sage grouse habitat restoration)
- TMDL planning
- Air quality degradation or improvement
- Continued increase in WUI
- Increase in recreational use of BLM lands
- Continued expansion of mineral extraction activities including oil and gas
- Ongoing growth and development throughout the planning area
- New coal-fired power plants
- Utility corridor development
- Continued and increased noxious weeds infestation on lands adjoining BLM's
- Continued human-caused and natural ignitions.

4.4.2 AIR QUALITY

Proposed Action

Implementing the National Fire Plan on adjacent areas state-wide would cause additional short-term localized increases in particulate emissions from planned ignitions. However, a long-term reduction in the risk of violations of air quality standards from large, uncontrolled smoke emissions on adjacent lands would occur. Increased recreational use and continued human population growth (and associated development) would contribute particulate matter emissions and fugitive dust emissions.

Long-term reduction in the risk of large, uncontrolled smoke emissions (particularly from the effects of implementing the National Fire Plan on other agency lands and on BLM lands) would help to offset the increased emissions from development and recreational use. Increased recreational use may increase human-caused ignitions, which, may add to emissions in the short term.

No Action Alternative

Cumulative effects of No Action Proposed Action are similar to cumulative effects of the Proposed Action in the short term. In the long term, the greater risk of increased emissions from large, unplanned wildland fires and their negative effects would combine with additional emissions from increased recreational use of OHVs, use of automobiles to access recreational areas, and development and construction. Air quality and visibility would be degraded more frequently than is currently experienced. Large-scale implementation of the National Fire Plan would help to offset the increased emissions from development and recreational use.

4.4.3 AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Proposed Action

Past management and environmental actions, including changes to vegetation conditions and the resulting modification of fire role and regime, have resulted in an existing environment much different than the historical condition. Likewise, a variety of political and regulatory management constraints, associated with safety considerations and other resource needs, affect how the role of fire or non-fire fuels management can be applied within these areas.

Reasonably foreseeable actions would lead to an increase in human pressure on ACECs, noxious weed spread, and the potential for human-caused fires to affect the areas as use increases.

The overall effect of the Proposed Action and reasonably foreseeable actions would be to reduce potential impacts from wildland fire, which would help maintain the naturalness of ACECs by allowing the use of fire to achieve management goals, help protect the special qualities of ACECs, and help to protect the area from invasion of noxious weeds. The Proposed Action would allow flexibility in management of fire and fuels to accommodate the increased use and impacts that it causes.

No Action Alternative

Cumulative effects of the No Action Alternative could lead to more intense suppression actions adversely impairing the unique values associated with ACECs, continue the trend toward larger fuel buildups in and around ACECs (leading to large, severe wildland fires which could possibly damage biologic, cultural, or scenic values associated with ACECs), and have an adverse impact on management of these areas. These effects would all be exacerbated by the reasonably foreseeable actions and would contribute to the adverse effects the No Action Alternative has on ACECs.

4.4.4 CULTURAL RESOURCES

Proposed Action

Full-suppression fire management techniques used prior to the current fire management actions have altered the natural fire occurrence frequency and allowed preservation of historic-aged resources where they otherwise would have been destroyed.

Reasonably foreseeable actions include increased mineral development activities, utility corridor development, vegetation treatments, and recreational use on and WUI expansion adjacent to BLM-administered lands. Impacts to cultural resources from these would include an associated increase in vandalism, artifact collection, and destruction.

The Proposed Action would reduce impacts that wildland fire and wildland fire suppression have on cultural resources in the long term. Cumulative effects activities would add to the disturbance, possible destruction,

or removal of cultural artifacts. Existing regulations and protocols should help reduce the impacts on cultural resources.

No Action Alternative

No Action Alternative would, in the long term, increase impacts that wildland fire and wildland fire suppression may have on cultural resources. Cumulative effects activities would add to the disturbance or removal of artifacts and would increase the amount of ground-disturbing suppression activities that would alter areas already being impacted by OHV use, such as sections of historic trails. Fire-suppression actions would exacerbate the loss of these resources through mineral development, vegetation treatments, utility corridor development, and WUI expansion.

4.4.5 ENVIRONMENTAL JUSTICE

Proposed Action

Reasonably foreseeable actions include increased recreational use, sagebrush restoration on BLM-administered and other lands, utility corridor development, and mineral resource development in areas containing juniper and pinyon woodlands. This would include an associated decrease in the access to and acreage of those woodlands used by commercial, minority, and low-income pinyon nut harvesters.

The Proposed Action would reduce impacts that wildland fire and wildland fire suppression have on pinyon nut harvesting opportunities in the long term. Cumulative effects activities would add to the wildland fire and suppression disturbances. Ongoing human population growth and an increase in the WUI may alter fire management activities, which, under the Proposed Action, would consider the impacts and protect minority or low income populations from disproportionate impacts.

No Action Alternative

The No Action Alternative would, in the long term, increase impacts that wildland fire and wildland fire suppression may have on juniper and pinyon woodlands. However, no reduction in these woodlands would be planned in a large aerial extent. Cumulative effects activities would offset increases in woodland encroachment to a degree. Pinyon nut harvesting opportunities would remain the same. Large area of woodlands in the planning area would allow the movement of harvesters to areas not impacted as greatly by a loss of harvesting opportunities due to a severe wildfire events and cumulative action induced woodland losses.

4.4.6 INVASIVE, NON-NATIVE SPECIES

Proposed Action

Noxious weed spread and introduction as a result of increased recreational use and future development for mineral extraction would have a negative impact on vegetation throughout the planning area. However, the Proposed Action would contribute to the overall improvement of health within vegetation communities and make them more resistant to invasion from noxious weeds.

No Action Alternative

Increased recreational use and future development for mineral extraction may contribute to the continued spread and introduction of noxious weeds, which would exacerbate the problems caused by No Action Alternative regarding cheatgrass invasion.

4.4.7 NATIVE AMERICAN RELIGIOUS CONCERNS

Proposed Action

Reasonably foreseeable actions include increased recreational use, utility corridor development, and mineral resource development in areas containing Native American religious concerns. These actions would result in an increase in alterations to the facets of a landscape valued in Native American religious beliefs and practices.

The Proposed Action would reduce impacts that wildland fire and wildland fire suppression have on Native American religious concerns in the long term. However, in the short term, more of the associated values and sites may be impacted due directly to wildland fire or suppression activities. Cumulative effects activities would add to the wildland fire and suppression disturbances. Consultation with tribes prior to planned fuel management activities would help offset increasing impacts from other uses. Ongoing growth and an increase in the WUI may alter fire management activities, which, under the Proposed Action, would consider the impacts and protect Native American religious concerns identified by tribal representatives.

No Action Alternative

The No Action Alternative would, in the long term, increase impacts that wildland fire and wildland fire suppression may have on Native American religious values. Cumulative effects activities would add to the alteration of attributes Native American's consider important in the practice of religious beliefs. Ongoing growth and an increase in the WUI may alter fire management activities, including added pressure to suppress more wildland fires, which, under the No Action Alternative could lead to further loss or damage of the religious values Native American's recognize in those areas.

4.4.8 SPECIAL STATUS SPECIES

Proposed Action

Overall fuel reductions associated with the large scale implementation of the National Fire Plan on adjacent lands would gradually reduce the risk of a severe wildland fire event and would restore ecosystems that would more closely reflect vegetation composition more consistent with a natural fire regime.

Because management actions would be planned to avoid and minimize impacts on SSS and their habitat, the Proposed Action would contribute minimal short-term adverse impacts to reasonably foreseeable actions. These short-term impacts would be offset by long-term beneficial effects of rehabilitation activities (e.g., large scale implementation of the National Fire Plan, the Vegetation EIS, and Utah Rangeland Health Standards and Guidelines), protection of ecological resources through fire suppression, and reduction of the fuel load (following a prescribed fire, or implementation of non-fire fuel treatments or wildland fire use). The subsequent gradual return to a more natural attainment of a managed fire regime would result in long-term beneficial effects.

No Action Alternative

Overall hazardous fuel reductions associated with the large scale implementation of the National Fire Plan on adjacent lands would gradually reduce the risk of a severe wildland fire event, and restore ecosystems that would reflect vegetation composition more characteristic of natural fire regimes.

Although short-term adverse impacts would be minimized under the No Action Alternative, the long-term risk of severe wildfire (and associated risk to special status plants and animals and their important habitat) on BLM-administered lands would continue to increase. This increase could contribute to long-term adverse

impacts on SSS and their habitat (from changes in vegetation composition and structure caused by aggressive fire suppression and potentially severe wildland fires).

4.4.9 WATER QUALITY

Proposed Action

The cumulative effects of the Proposed Action on water quality would include improvements in watershed health, such as an increased supply of woody debris or stream bank vegetation, and increased stream bank and channel stability. Cumulative effects from recreational use and noxious weed infestations would continue to have negative effects on sediment loads. The implementation of water quality (TMDLs) regulations, Utah Rangeland Health Standards and Guidelines, restrictions on OHV use, and large scale implementation of the National Fire Plan by other agencies would improve the water quality and supply when combined with the long-term effects of the Proposed Action.

No Action Alternative

Cumulative effects of the No Action Alternative would generally have negative effects on water quality, largely attributable to a trend toward increasingly severe wildland fires. Soil infiltration capacity may be increased or reduced, affecting runoff and groundwater. Similar to the Proposed Action, implementation of the National Fire Plan, TMDLs, and Utah Rangeland Health Standards and Guidelines would benefit water quality. However, the overall long-term trend resulting from increasingly severe wildland fire would be toward a degradation of water quality and increased alteration of natural hydrologic systems.

4.4.10 WETLANDS AND RIPARIAN ZONES

Past management and environmental actions, including changes in vegetation conditions and the resulting modification of fire role and regime, have resulted in an existing environment much different than the historical condition. Alterations including diversion, impoundment, channelization, dewatering, timber and grazing practices, and the invasion of nonnative and noxious vegetation species have considerably altered riparian conditions and created non-functioning or limitedly functioning riparian areas.

Proposed Action

Cumulative effects on riparian resources would include an increase in soil stability, a more sustainable supply of woody debris or stream bank vegetation, overall improvement in native vegetation composition, overall improvement in bank and channel stability, and increased functionality of riparian areas. Cumulative effects from recreational use could continue to adversely impact riparian areas by causing higher sediment loads and noxious weeds could continue to proliferate. However, the implementation of management guidance on grazing, recreation and OHV use, and vegetation treatments would improve the overall health and quality of riparian areas when combined with the long-term effects of the Proposed Action.

No Action Alternative

Cumulative effects of the No Action Alternative would generally be similar to the Proposed Action, but with a greater potential for adverse impacts based on the lack of stated RPMs and the possibility of increasingly severe wildland fires. Recreation and grazing practices could potentially cause increased erosion and damage to vegetation. Noxious weeds could continue to proliferate. However, management policies and practices would attempt to minimize these impacts.

4.4.11 WILD AND SCENIC RIVERS

Proposed Action

Past management and environmental actions, including changes to vegetation conditions and the resulting modification of fire role and regime, have resulted in an existing environment much different than the historical condition. Likewise, a variety of political and regulatory management constraints associated with safety considerations and other resource needs affect how the role of fire or non-fire fuels management can be applied within these areas.

Reasonably foreseeable actions would lead to additional human pressure on rivers, more use of these areas, an increase in noxious weed spread and the potential for human-caused fires to affect the areas as use increases.

The overall effect of the Proposed Action together with reasonably foreseeable actions would be to reduce potential impacts from wildland fire, which would help maintain the naturalness of eligible river segments, help protect the special qualities of river segments, and help to protect the area from invasion of noxious weeds. The Proposed Action would allow flexibility in management of fire and fuels to accommodate the increased use and impacts that it would generate.

No Action Alternative

Cumulative effects of the No Action Alternative could lead to more intense suppression actions that would (1) adversely affect the unique values associated with river segments, (2) continue the trend toward larger fuel buildups in and around river segments (which could lead to large, severe wildland fires that could possibly damage biologic, cultural, recreational, or scenic values associated with river segments), and (3) have an adverse impact on management of these areas. These would all be exacerbated by the reasonably foreseeable actions and would contribute to the adverse effects the No Action Alternative would have on eligible river segments.

4.4.12 WILDERNESS STUDY AREAS

Proposed Action

Past management and environmental actions, including changes to vegetation conditions and the resulting modification of fire role and regime, have resulted in an existing environment much different than historical conditions. Likewise, a variety of political and regulatory management constraints associated with safety considerations and other resource needs affect how the role of fire or non-fire fuels management can be applied within these areas.

Reasonably foreseeable actions would lead to additional human pressure on WSAs, more use of these areas, an increase in noxious weed spread, and the potential for human-caused fires to affect the areas as use increases.

The overall effect of the Proposed Action together with reasonably foreseeable actions would be to reduce potential impacts from wildland fire. This reduction in wildland fire impacts would help maintain the naturalness of WSAs, help protect the special qualities of WSAs, and help to protect the area from invasion of noxious weeds. The Proposed Action would allow flexibility in management of fire and fuels to accommodate the increased use and impacts that it causes.

No Action Alternative

Cumulative effects of the No Action Alternative could lead to more intense suppression actions that may (1) adversely affect the unique values associated with WSAs, (2) continue the trend toward larger fuel buildups in and around WSAs leading to large, severe wildland fires (which could possibly damage values associated with WSAs), and (3) have an adverse impact on management of these areas. These would all be exacerbated by the reasonably foreseeable actions and would contribute to the adverse effects the No Action Alternative has on WSAs.

4.4.13 LIVESTOCK GRAZING

Proposed Action

Cumulatively, additional regulatory direction related to the Proposed Revision to the Grazing Regulations on Public Lands would eventually lead to increased rangeland health and improved range management. Increased recreational use and continued spread of noxious weeds may have a negative impact on grazing resources. Changes in grazing regulations, combined with the effects of the Proposed Action would contribute to the long-term increased productivity and stability of grazing resources. The negative effects of noxious weed spread may be somewhat offset by the Proposed Action, as it would contribute to the overall improvement of health of grazing resources and make them more resistant to invasion from noxious weeds.

No Action Alternative

The effects of the No Action Alternative on livestock grazing include an increase in the vegetative fuel load and in the likelihood of severe wildland fires. Grazing regulations would eventually lead to increased rangeland health and better management. However, the increase in fuel loadings from the No Action Alternative would reduce stability of grazing resources. Negative impacts from the spread of noxious weeds on lands adjoining the SUSA planning area combined with the added risk of severe wildland fires from the No Action Alternative would reduce the health and productivity of livestock grazing resources. This would be most pronounced in the west desert portion of the planning area, where cheatgrass infestation is of greatest concern.

4.4.14 WOODLANDS AND FORESTRY

Proposed Action

National Fire Plan activities, LRMP revision, implementation of Utah Rangeland Health Standards and Guidelines, and continuing implementation of vegetation treatment on BLM lands in 13 Western states (BLM 1991) would all contribute reduced FRCC. Reduced FRCC would indicate decreased risk to old growth. These activities would not have any cumulative effects on commercial uses of BLM-managed forest lands. Increases in WUI, development, and recreational activities may eventually result in greater demands on local sources of biomass, timber, firewood, and pinyon nuts.

No Action Alternative

The effects of implementation of the National Fire Plan would occur on lands adjacent to BLM-administered lands and would be similar to the effects described under the Proposed Action. Cumulatively, this would offset the effects of the No Action Alternative that would occur on BLM-administered lands. However, the likely decrease in availability of forest produces in the long term caused by continued high-severity fire may cause forest precuts gathers to move off some of the 2.6 million acres of forested BLM-administered lands and on to other ownerships.

4.4.15 VEGETATION

Proposed Action

National Fire Plan activities, LRMP revision, implementation of rangeland health standards and guidelines for Utah, and continuing implementation of the recommendations in *Vegetation Treatment on BLM lands in Thirteen Western States* (BLM 1991) would all contribute to a reduction in invasive species and fuel loads where treatments are applied. Increases in WUI, development, and recreational activities may eventually cause more acres to have wildland fire suppression actions due to the AMR.

No Action Alternative

The National Fire Plan would still be implemented on adjacent federal lands, and to a large extent, state lands. Many private industrial land owners would likely follow suit. Wildland fires would continue to surpass the ability for safe suppression on BLM-administered lands, and would likely increase, as would impacts from high-severity fire on BLM-administered lands. Cumulatively, impacts on vegetation would likely be offset somewhat by implementation of the National Fire Plan on adjacent lands. While the Proposed Action would set the entire planning area on an overall trend toward lower severity fire with fewer impacts on vegetation, the No Action Alternative would maintain the current situation and resulting negative effects on vegetation.

4.4.16 FISH AND WILDLIFE

Proposed Action

Reasonably foreseeable actions would subject wildlife to temporary displacement and habitat alterations. Overall hazardous fuel reductions associated with the large scale implementation of the National Fire Plan on adjacent lands would gradually reduce the risk of a severe wildland fire event, and restore ecosystems that would reflect vegetation composition more consistent with historic fire regimes.

Because planned actions described within the Proposed Action would be timed to avoid and minimize impacts on critical habitat and breeding seasons, the Proposed Action would contribute minimal short-term impacts and long-term beneficial effects to reasonably foreseeable actions.

No Action Alternative

Overall hazardous fuel reductions associated with the large-scale implementation of the National Fire Plan would gradually reduce the risk of severe wildland fire events, and restore ecosystems that would reflect vegetation composition more consistent with natural fire regimes.

The No Action Alternative could contribute to long-term adverse impacts (from changes in vegetation composition and structure caused by aggressive fire suppression and potentially severe wildland fires) on individuals, populations, and habitats.

4.4.17 SOILS

Proposed Action

Effects of the Proposed Action (long-term reduction in soil loss, erosion, compaction and damage to the soil crust, and less risk of altered porosity and infiltration rates) would be added to the effects from reasonably foreseeable actions (such as increased recreational land use and noxious weeds), but the Proposed Action would help to minimize the total negative effects. When combined with the long-term effects of the

Proposed Action, implementation of potentially forthcoming guidance on grazing, water quality (TMDLs), OHV use, and the National Fire Plan on a large scale would improve soil conditions.

No Action Alternative

Under the No Action Alternative, there would be greater risk of loss of vegetation cover and organic matter from high severity wildland fire, along with an increase in erosion, and a reduction in microorganisms and infiltration on BLM-administered lands. All would be minimally offset by implementation of the National Fire Plan by other agencies. Cumulative effects from reasonably foreseeable actions (described above) would exacerbate these problems with the exception of the improvements made when regulations decrease impacts. Overall, the long-term trend would be toward more degraded soil conditions on BLM-administered lands.

4.4.18 RECREATION

Proposed Action

Recreation may be affected by reasonably foreseeable actions. Increased recreational use and facility development, human population growth (and associated development), wildland fire, WUI, and noxious weeds would all change visitors' experiences.

Cumulatively, these effects, along with the Proposed Action, may increase the susceptibility of recreational facilities, dispersed camping areas, trails, OHV routes, and sanitation facilities to fire or fire suppression impacts. Increases in or reprioritization of fuel treatment projects may be required to protect recreational resources. Long-term benefits include reduced fuel loadings leading to more effective protection against wildland fire and improved safety of recreationists.

The expected increase in recreation facilities would put a demand on fuel treatment funds. The opportunity to use these limited funds to do fuel treatments surrounding the recreation sites and facilities may be even more limited due to competition for funding with WUI areas.

No Action Alternative

An expected increase in WUI areas would place an additional demand on fuel treatment funds. Competition for funds may limit opportunities to implement fuel treatment actions in or near recreation sites and facilities. The anticipated continued spread of noxious weeds could lead to reduced recreational enjoyment.

4.4.19 SOCIAL AND ECONOMIC CONSIDERATIONS

Proposed Action

A continued increase in WUI areas, recreational use of BLM-administered lands, and human population growth (and associated development) throughout the planning area would put more pressure on the BLM to protect resources (both inside and outside of WUI areas) from wildland fire. An increase in public use would expose a greater number of people to impacts from fire management actions on and adjacent to BLM-administered lands. The cumulative effects of the Proposed Action and reasonably foreseeable development scenario could result in additional payroll for planned management actions, and its corresponding increase in agency expenses. Additional public response to the Proposed Action could cause alterations in proposed treatments and expansion of WUI areas.

Reasonably foreseeable actions together with the Proposed Action could cause a short-term displacement of affected human populations from smoke and dust. People could be forced to leave their residences during

wildland fire events and suppression activities. Some businesses could be forced to close during fire management activities, thereby resulting in a loss of income for the duration of the activity.

No Action Alternative

A continued increase in WUI areas, recreational use of BLM-administered lands, and human population growth (and associated development) throughout the planning area would potentially expose more of the public to severe wildland fire, and could increase the value of resources damaged by them. Aggressive wildland fire suppression (without sufficient planned fuel treatments to lessen fuel loads in and adjacent to developed areas) would increase the risk for severe wildland fire in WUIs.

4.4.20 WILD HORSES AND BURROS

Proposed Action

The Proposed Action, in conjunction with ongoing management (grazing, noxious weed control, OHV use) would continue to improve rangeland health and would likely have a positive effect on wild horses and burros by increasing the quantity and quality of forage and shelter. A decrease in high-severity fires from actions undertaken in Proposed Action would create more sustainable HMAs.

No Action Alternative

The Proposed Action, in conjunction with ongoing management, such as grazing and noxious weeds control would continue to generally maintain HMA habitat. However, aggressive suppression of all wildland fires and limited fuel treatments to lessen fuel loads would result in a trend toward greater likelihood of high severity wildland fires would decrease wild horse and burro forage and shelter and may destroy corrals, fences, and water facilities.

4.4.21 WILDERNESS CHARACTERISTICS

Proposed Action

Past management and environmental actions, including changes to vegetation conditions and the resulting modification of fire role and regime, have resulted in an existing environment much different than the historical condition. Likewise, a variety of political and regulatory management constraints associated with safety considerations and other resource needs affect how the role of fire or non-fire fuels management can be applied within these areas. Reasonably foreseeable actions would lead to additional human pressure on lands with wilderness characteristics, more use of these areas, an increase in noxious weed spread, and the potential for human-caused fires to affect such areas.

The overall effect of the Proposed Action, together with reasonably foreseeable actions, would be to reduce potential impacts from wildland fire, which would help to maintain the naturalness of these areas, protect wilderness characteristics, and protect the area from invasion of noxious weeds. The Proposed Action would allow flexibility in management to accommodate the increased use and impacts that it causes.

No Action Alternative

Cumulative effects of the No Action Alternative could lead to more intense suppression actions that would (1) adversely affect the unique values associated with river segments, (2) continue the trend toward larger fuel buildups in and around river segments (which could lead to large, severe wildland fires that could possibly damage biologic, cultural, recreational, or scenic values associated with river segments), and (3) have an adverse impact on management of these areas. These would all be exacerbated by the reasonably

foreseeable actions and would contribute to the adverse effects the No Action Alternative would have on lands with wilderness characteristics.

CHAPTER 5. CONSULTATION AND COORDINATION

5.1 INTRODUCTION

Issues identified for analysis within this EA are included in **Appendix A**, which contains the resource concerns identified, including those resources considered as critical elements of the human environment and related issues derived from the BLM, affiliated agency reviews, and comments received.

A thorough consultation and coordination effort among agencies and public parties with interests in the process was planned and conducted to ensure the opportunity for involvement throughout the EA process. Among the interested parties were federal, state and local government agencies, and tribes that create, administer, and monitor policy for these lands and adjacent lands. BLM established a coordinated collaborative effort in developing the EA by seeking the active participation from all of these parties.

5.2 PERSONS, GROUPS, AND AGENCIES CONSULTED

The BLM coordinated and collaborated with numerous federal, state, tribal, and local government agency representatives as well as private organizations and individuals wishing to participate in the LUP amendment and FMP revision processes. The BLM contacted more than 60 federal representatives; 40 Utah state agency representatives (several in the neighboring states of Arizona, Nevada, and Colorado); 100 county and city governments across Utah; and more than 70 tribes and tribal representatives. Each contact received public scoping meeting notices and planning bulletins informing them of the purpose, schedule, and progress of the project. The mailing list, containing all agency points of contact, is contained in the Administrative Record within the project documentation. **Table 5.1** lists persons, agencies, and organizations consulted for purposes of the FMP EA.

5.3 SUMMARY OF PUBLIC PARTICIPATION

During preparation of the FMP EA, the public was notified of the Proposed Action. A Notice of Intent (NOI) invited participation of interested agencies, organizations, and members of the general public to assist the BLM in determining the scope of issues to be addressed. It was published in the Federal Register on April 2, 2004. The publication of this NOI initiated a public scoping comment period that ended on July 21, 2004.

A Public Involvement Plan was prepared in June 2004 to ensure an effective, consistent, and open communication process among BLM and other federal, state, and local government agencies; Native American tribes; the public; and other stakeholders. This plan not only outlined the series of open house public meetings throughout the state that would allow for comment and discussion on current and proposed fire management, but also planned for continued public involvement opportunities throughout the project.

A Planning Bulletin was also developed to advise the public of fire management project. It also described the project, encouraged public participation at the public scoping meetings, and identified opportunities and methods for submitting comments throughout the NEPA process. In addition to providing background information, the bulletin outlined the public involvement process for the project; the schedule; a listing of public meetings; instructions on making comments and joining the mailing list, information about the project's public website; and contact information. On June 24, 2004, the Bulletin was sent to 1,149 individuals, organizations, state, county and city government agencies, and tribal governments and groups on the BLM's mailing list. The BLM sent each tribal government an individualized letter (dated June 29, 2004) inviting them to consult on the project. Native American consultation is ongoing. All entities on the mailing list were contacted about the project and invited to submit comments. In addition, a website has been established that displays information about this project. It is located at http://www.ut.blm.gov/fireplanning/index.htm.

TABLE 5.1: LIST OF PERSONS, AGENCIES, AND ORGANIZATIONS CONSULTED

Name	Purpose and Authorities for Consultation or Coordination	Findings and Conclusions
U.S. Environmental Protection Agency (EPA), Region 8	Consultation for responsibilities under National Environmental Policy Act (NEPA) and Section 309 of the Clean Water Act	The EPA provided formal comments to the BLM during public scoping on May 17, 2004 and identified concerns that included the need to develop broad fire planning to protect local ecology, recreation, and commodity production. The EPA requested that BLM consider management needs for local fuel hazards; that fire management planning would conform to interim air quality policy and local smoke management plans; and that management be developed to protect aquatic resources from adverse impacts on soil and water. The EPA also identified analysis considerations associated with livestock grazing and noxious weed control. The BLM considered EPA's comments and incorporated them into the Proposed Action and the analysis of the alternatives.
U.S. Fish and Wildlife Service (USFWS)	Consultation under Section 7 of the Endangered Species Act (ESA) (16 USC 1531) and Biological Assessment (BA) Review	USFWS is a participating party who is consulting under an agreement that tiers off the BLM and USFWS November 1, 2001 consultation agreement and March 3, 2004 alternative consultation agreement for land use planning. The service has provided comment and analysis recommendations for the species list prepared by the BLM. The service has also reviewed, provided additional RPMs, and concurred with the species findings within the BA, completed on March 4, 2005.
Tribes and Tribal Representatives within Utah and Surrounding States	Consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531) and National Historic Preservation Act (NHPA) (16 USC 1531)	Planning bulletins were provided to approximately 50 tribes by BLM on June 21, 2004. In addition, individual letters were sent to each tribal government on June 29, 2004 regarding BLM's intent to conduct this EA and requesting their participation and cooperation. Tribes were also invited to public scoping meetings that took place from July 6-14, 2004. To date, no tribal government has agreed to participate or formally consult on this project.
Utah Governor's Office of Planning and Budget—Resource Development Coordinating Committee (RDCC)	Consultation regarding on-going multi-agency planning actions and associated federal planning actions	BLM and Maxim Technologies (Maxim) met with the RDCC on June 23, 2004 to discuss the scope of proposed fire management planning and to seek input from associated state agencies that may be affected by the proposed federal actions. Utah Division of Wildlife Resources (UDWR) and Utah Division of Forestry, Fire, and State Lands (FFSL) indicated their desire to be involved in federal fire planning discussions (see proceeding comments). RDCC also responded to the BLM with a formal letter on July 15, 2004, which outlined the UDWR's considerations.
Utah Department of Community and Economic Development—Utah State Historic Preservation Office (SHPO)	Consultation on proposed fire management as required by the NHPA (16 USC 470)	BLM and Maxim staff met with SHPO (in June 2004 and July 2004) to discuss scope of planning and the possibility of SHPO acting as a participating party in the FMP process. SHPO had determined at these meetings not to act as a participating party, but they did provide feedback on the scope and analysis of the Proposed Action. In a meeting on January 25, 2005, BLM and SHPO agreed to develop a programmatic agreement specifically addressing wildland fire use on public lands within Utah.

Name	Purpose and Authorities for Consultation or Coordination	Findings and Conclusions
Utah Division of Natural Resources—Division of Forestry, Fire and State Lands (FFSL)	Consultation on fire management planning on adjacent state lands	FFSL attended the BLM statewide interdisciplinary team (IDT) meeting on June 22, 2004 and June 23, 2004, and contributed to scope and analysis discussions. BLM met with FFSL on August 24, 2004 to discuss the proposed direction of statewide fire management on public lands, as well as the need to coordinate with local BLM field offices in the development of fire management planning at a local level as identified in the FMPs that tier off the statewide land use plan (LUP) amendment. Maxim staff coordinated with FFSL staff in September and October 2004 to obtain resource data and historic wildland fire information to support BLM data and the development of the environmental assessments (EAs).
Utah Division of Natural Resources—Division of Wildlife Resources (UDWR)	Consultation on impacts of fire management on fish and wildlife species	UDWR, in association with the Governor's Office of Planning and Budget, and RDCC, provided formal comments to the BLM on July 15, 2004, and a request to be included as a participating party. The BLM coordinated proposed fire management actions and considerations of wildland fire use to benefit wildlife habitat with UDWR. Maxim staff coordinated with a variety of UDWR personnel, from July through October 2004, in developing fish and wildlife resource data, GIS data, and scope of analysis within the EA. These meetings also included coordination with the UDWR Utah Natural Heritage Program.

5.3.1 PUBLIC MEETINGS

On June 25, 2004, a public notice was delivered as a media advisory and press release to one Utah cable television station and newspapers and radio stations in Utah, Arizona, Colorado, and Nevada. The notice announced public scoping meeting dates, times, and locations, and invited the public to participate. Prior to the formal scoping process, BLM provided a number of opportunities for federal, state, and local agencies, interested organizations, and the general public to provide input for the planning process. These opportunities included early notification of the scoping process, a lengthy comment period, a variety of venues for meetings, and newspaper reminders of meeting times and locations. Comments were received from April 2 through July 21, 2004.

From July 6 through July 14, 2004, BLM conducted five open house meetings in Moab, Cedar City, Richfield, Vernal, and Salt Lake City, Utah. These meetings were announced in a Planning Bulletin that was mailed on June 24, 2004, to more than 1,100 individuals and organizations throughout the state. News releases were issued to state and local media that communicated the purpose of the meetings, as well as the time and place of each meeting. Further, the Utah BLM webpage advertised the meetings and scoping period. Approximately 700 subscribers of the Utah BLM electronic newsletter ("E-Briefs") received related information. News releases were issued to state and local media that communicated the purpose of the meetings, as well as the time and place of each meeting. A series of public scoping meetings were held across the state according to the schedule in **Table 5.2**.

TABLE 5.2: PUBLIC SCOPING MEETINGS

Date	City	Facility	Address
July 6, 2004	Moab	BLM Field Office	82 East Dogwood
July 7, 2004	Cedar City	Heritage Center, Festival Hall 1	90 North Main
July 8, 2004	Richfield	BLM Field Office	150 East 900 North
July13, 2004	Vernal	Western Park	302 West 200 South
July 14, 2004	Salt Lake City	BLM Field Office	2370 South 2300 West

An open house format was used for the scoping meetings, in which attendees could interact informally and individually with BLM representatives at stations providing information on fire management planning, land use planning, and local fire operations. Attendees signed a registration sheet and received an information packet with handouts including a comment form, state map depicting the five FMP planning areas, the NOI, and a list of project-related web resources. Additional handouts and personnel were available at four other stations in the meeting room. One station provided a description of BLM land use planning and the amendment process and schedule; another provided details of statewide fire management planning actions, FMP boundaries, and a list of potential actions. A third station provided a description of local BLM field office fire management practices and operations; and the fourth provided an introductory video on fire management and fire tips related to WUI.

An area was also provided for participants to write or ask questions. Visual aids included maps of FMP planning areas, LUP areas, fire occurrences in each FMP planning area, project schedule, and two flow charts showing the relationship of an LUP to an FMP and the fire management implementation process. Attendees were free to fill out a comment form at the comment table before leaving the meeting. Both written and verbal comments were recorded, analyzed, and reported on in the Scoping Report and considered in preparation of this EA. There were 91 comments identified from 20 letters received during the scoping process. A comment summary table is found in the Scoping Report. The letters received can be found in the Administrative Record.

5.3.2 PUBLIC COMMENTS

During the public scoping period, comment letters were received from the Resource Development Coordinating Committee (RDCC) and from UDWR in conjunction with RDCC. In addition, work was performed among the BLM, The Wilderness Society, and other environmental groups to address concerns raised following their review of a preliminary draft of the Proposed Action.

Other responses to solicitations for public input resulted in letters that were received via fax, mail, email, and hand. A total of 20 letters were received. Each letter was source-coded based on its origin (type) and numerical sequencing. Written letters were source coded based on the commenter as either "A" for agency/government, "I" for individual, or "O" for organization. The second digit of the source code assigned relates to the number of letters in each group (e.g., O6 refers to the sixth letter received from an organization). A comment summary table was developed that grouped comments by topic. Each comment was assigned a two-digit topic code.

5.4 LIST OF PREPARERS

BLM selected Maxim Technologies from a list of qualified environmental services contractors through a competitive procurement process to support Utah BLM on this important FMP EA. The preparers of this EA included a combination of BLM and contract personnel.

5.4.1 BLM PREPARERS

BLM's IDT assisted in the preparation of this EA and with the development and evaluation of the proposed fire management direction. BLM participants and their responsibilities are listed in **Table 5.3**. BLM also assigned a contracting officer's representative and technical project lead with primary responsibilities for oversight of contractors, agency collaboration, and NEPA process.

TABLE 5.3: BLM INTERDISCIPLINARY TEAM

Name	Title	Document Section Responsibility
Jolie Pollet	Project Manager	Technical coordination, quality control, vegetation, fire ecology, Proposed Action, resource protection measures
Matthew Higdon	National Environmental Policy Act Planner	Technical coordination, quality control, planning
Tim Faircloth	Threatened and Endangered Species (TES) Specialist	Section 7 consultation, review of wildlife, TES
Michael Dussinger	Cultural Resource Specialist	Cultural resources, Native American consultation
Steven Strong	Natural Resource Specialist	Soils, forestry, fuels/fire management
Tim Faircloth	Wildlife Biologist	Wildlife, fisheries
Marc Stavropoulos	Range Specialist	Livestock grazing
Kim Bartel	Recreation Specialist	Recreation, special designation, wilderness, visual
Robert Specht	Botanist	Vegetation, special status plants/invasive weeds
Del Clark	Range Technician	Wildhorses
Keith Rigtrup	Planner	Socioeconomics, environmental justice
Karl Wright	Natural Resource Specialist	Watersheds, floodplains/riparian

5.4.2 5.4.2 MAXIM TECHNOLOGIES PREPARERS

Maxim assembled a team of managers and senior resource specialists who formed the Maxim Technologies IDT (**Table 5.4**). They worked with BLM's IDT to provide independent and objective NEPA compliance support and documentation; EAs of potentially affected resources, analysis of GIS data, and detailed maps.

TABLE 5.4: MAXIM TECHNOLOGIES INTERDISCIPLINARY TEAM

Name	Title	Document Section Responsibility
Jim Melton	Project Manager	Planning, National Environmental Policy Act (NEPA)
David Steed	Asst. Project Manager	U.S. Fish and Wildlife Service consultation, planning, NEPA
Mike Egan	Asst. Project Manager	Planning, cultural resources, grazing
Susan Hatch	Biologist	Special status species, fish and wildlife, areas of critical environmental concern (ACECs), wilderness characteristics, socioeconomics, wilderness study areas, wetlands and riparian zone
Terry Grotbo	Senior NEPA and Planning Advisor	NEPA review

Name	Title	Document Section Responsibility
Fred Gifford	GIS Coordinator	GIS, database
Cameo Flood	Forester	Vegetation, woodlands and forests, Chapters 3 and 4
Valerie Waldorf	Lead GIS Specialist	GIS, maps, figures, socioeconomics, wildhorses and burros
Wynn John	Environmental Engineer	Soil, water, floodplains
Tennille Flint	Biologist	ACECs, wilderness characteristics, socioeconomics, wilderness study areas, wetlands and riparian zone, Chapter 1
Nancy Linscott	Socioeconomics Specialist	Socioeconomics, environmental justice
Mike Polk	Cultural Resource Specialist	Cultural Resources
Dale-Marie Herring	Technical Writer/Coordinator	Writing, editing, Chapters 1-5, coordination

CHAPTER 6. ACRONYMS, GLOSSARY, AND REFERENCES

6.1 ACRONYMS

ACEC	Area of Critical Environmental Concern
AMR	Appropriate Management Response
AUM	Animal Unit Month
BLM	Bureau of Land Management
CAA	Clean Air Act
CEQ	Council on Environmental Quality
DWFC	Desired Wildland Fire Condition
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EO	Executive Order
ESA	Endangered Species Act
ESR	Emergency Stabilization and Rehabilitation
FLPMA	Federal Land Policy and Management Act
FMP	Fire Management Plan
FMU	Fire Management Unit
FMZ	Fire Management Zone
FRCC	Fire Regime Condition Class
GAP	Gap Analysis Program
GSENM	Grand Staircase-Escalante National Monument
HMA	Herd Management Area
IDT	Interdisciplinary Team
LUP	Land Use Plan
NAA	Non-attainment Area
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
OHV	Off-highway Vehicle
PM_{10}	Fine Particulates with an Aerodymanic Diamater of 10 Micrometers or Less
$PM_{2.5}$	Fine Particulates with an Aerodymanic Diamater of 2.5 Micrometers or Less
RMP	Resource Management Plan
RPM	Resource Protection Measure
SMP	Smoke Management Plan
SSS	Special Status Species
SUSA	Southern Utah Support Area
TMDL	Total Maximum Daily Load

UDEQ	Utah Department of Environmental Quality
UDWR	Utah Division of Wildlife Resources
USFWS	U.S. Fish and Wildlife Service
WSA	Wilderness Study Area
WSRA	Wild and Scenic Rivers Act
WUI	Wildland Urban Influence

6.2 GLOSSARY

Agency	Any federal, state, or county government organization participating with jurisdictional responsibilities.
Air Quality	The characteristics of the ambient air (all locations accessible to the general public) as indicated by concentrations of the six air pollutants for which national standards have been established (e.g., particulate matter, sulfur dioxide, nitrogen dioxide, ozone, carbon monoxide, and lead), and by visibility in mandatory federal Class I areas. For the purposes of the Utah Smoke Management Plan, concentrations of particulate matter are taken as the primary indicators of ambient air quality.
Alternative	One of at least two proposed means of accomplishing planning objectives.
Ambient Air	Literally, the air moving around us; the air of the surrounding outside environment.
Analysis	The examination of existing and/or recommended management needs and their relationships to discover and display the outputs, benefits, effects, and consequences of initiating a proposed action.
Appropriate Management Response (AMR)	Specific actions taken in response to a wildland fire to implement protection and fire use objectives. Responses range from full suppression to managing fire for resource benefits (fire use).
Area of Critical Environmental Concern (ACEC)	An area of public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and provide safety from natural hazards.
Aspect	Direction toward which a slope faces.
Assessment	The act of evaluating and interpreting data and information for a defined purpose.

Biological Treatment Biological treatment of vegetation could typically employ grazing by cattle, sheep, or goats, but as technology progresses, it may also include insects, but would not include the use of invertebrates or microorganisms.

Biomass The dry weight of plants in a unit area.

Brush A collective term that refers to stands of vegetation dominated by shrublands, shrubby woody plants, or low-growing trees.

Buffer Zones An area of reduced vegetation that separates wildland from vulnerable residential or business developments or other high-value areas. This barrier is similar to a greenbelt in that it is usually used for another purpose such as agriculture, recreation areas, parks, or golf courses.

Cabling Same as chaining, except a cable is used instead of an anchor chain (see chaining).

Chaining The process of modifying vegetation by pulling an anchor chain between two crawler tractors, thus reducing tall-growing, brittle vegetation and enhancing grasses, forbs, and sprouting shrubs.

Chemical Treatment The use of herbicide to control herbaceous and woody species. BLM would use EPA-approved herbicides in accordance with EPA's Endangered Species Pesticide Program covered in BLM's *Vegetation Treatment on BLM Lands in Thirteen Western States FEIS* (May 1991).

Climax A terminal stage of ecological succession in which the vegetation association remains stable over a relatively long period.

Closure Legal restriction – but not necessarily elimination – of specified activities such as smoking, camping, or entry that might cause fires in a given area.

Collaboration A cooperative process in which interested parties, often with widely varied interests, work together to seek solutions with broad support, for managing public and other lands.

Composition The numbers and kinds of plants and animals in an area.

Condition Class (CC) Condition class (CC) is a classification of the amount of departure from the natural condition. The three classes are based on low (CC 1), moderate (CC 2), and high (CC 3) departure from the central tendency of the natural (historical) regime. See: www.frcc.gov.

Critical Habitat Federally-mandated (under the ESA of 1973, as amended) designation for threatened or endangered species that is proposed, designated, and managed by the U.S. Fish and Wildlife Service.

Critical Seasonal Use Area	Designation provided by Utah Division of Wildlife Resources for the most important/valuable big game seasonal use areas in the state that they manage.
Crown Fire (Crowning)	The movement of fire through the crowns (top) of trees or shrubs more or less independently of the surface fire.
Cultural Resources	Those resources of historical, archaeological, or paleontological significance. Non-renewable elements of the physical and human environment including archaeological remains (evidence of prehistoric or historic human activities) and sociocultural values traditionally held by ethnic groups (sacred places, traditionally used raw materials, etc.).
Cumulative Effects	Cumulative effects result from the impacts of past, present, and reasonably foreseeable future activities combined with the projected direct and indirect effects of each alternative considered.
Direct Effects	Direct effects are those consequences that are expected to occur following implementation of an alternative. Direct effects are caused by the action and occur at the same time and place as the action.
Disturbance	Any relatively discrete event, either natural or human-induced that causes a change in the existing condition of an ecological system.
Ecosystem	An arrangement of organisms defined by the interactions and processes that occur between them. Ecosystems are often defined by their composition, function, and structure.
Ecosystem Sustainability	The ability to sustain diversity, productivity, resilience to stress, health, renewability, and/or yields of desired values, resource uses, products, or services from an ecosystem while maintaining the integrity of the ecosystem over time.
Emergency Stabilization and Rehabilitation	Planned actions to stabilize and prevent unacceptable degradation to natural and cultural resources after unplanned wildfires.
Endangered Species	Any animal or plant species in danger of extinction in a portion of its range. This is a federal designation (under the ESA of 1973 as amended). Most of these species fall under the jurisdiction of the U.S. Fish and Wildlife Service.
Endemic	A species restricted to a given geographical location and which is native to that locale.
Environment	All that surrounds an organism and interacts with it.
Environmental Assessment (EA)	EAs were authorized by NEPA of 1969. They are concise, analytical documents prepared with public participation that determine whether an EIS is needed for a particular project or action. If an EA determines an EIS is not needed, the EA becomes the document allowing agency compliance with NEPA requirements.

Environmental Impact Statement (EIS)

Authorized by NEPA of 1969 and prepared with public participation, EISs assist decision makers by providing information, analysis, and an array of action alternatives, allowing managers to see the probable effects of decisions on the environment. Generally, EISs are written for large-scale actions or geographical areas.

Environmental Justice

The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

Ephemeral

A stream that flows only in direct response to precipitation, and whose channel is above the water table at all times.

Fine (Light) Fuels

Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which is less than ¼-inch in diameter and has a time lag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Fire Intensity

A general term relating to the heat energy released by a fire.

Fire Management Plan (FMP)

A FMP is a functional activity plan for the fire management program. The FMP is the primary tool for translating programmatic direction developed in the land management plan into on-the-ground action. The FMP synthesizes broad fire management goals and places them into a strategic context. Criteria for making initial action decisions must be a component of the FMP.

Fire Management Unit (FMU)

Any land management area definable by objectives, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regimes, etc., that set it apart from management characteristics of an adjacent unit. FMUs are delineated in FMPs. These units have dominant management objectives and pre-selected strategies assigned to accomplish these objectives.

Fire Regime (FR)

The fire pattern across the landscape, characterized by occurrence interval and relative intensity. Fire regimes result from a unique combination of climate and vegetation and exist on a continuum from short-interval, low-intensity fires to long-interval, high-intensity fires. The five natural (historical) fire regimes below are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation:

I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75 percent of the dominant overstory vegetation replaced).

II – 0-35 year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced).

III – 35-100+ year frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced).
IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced).
V – 200+ year frequency and high (stand replacement) severity. (See www.frcc.gov).

Fire Return Interval The number of years between two successive fires in a designated area.

Fire Season 1) Period(s) of the year during which wildland fires are likely to occur, spread, and affect resource values sufficient to warrant organized fire management activities. 2) A legally enacted time during which burning activities are regulated by state or local authority.

Fire Severity Fire severity is a product of fire intensity and residence time at a site. Severity denotes the effects, from low to high, of fire on the soil and vegetation components of a site.

Fire Use The combination of wildland fire use and prescribed fire application to meet resource objectives.

Fireline A linear fire barrier that is cleared of fuels and scraped or dug to mineral soil. Also called control line, containment line or line.

Forage Vegetation of all forms available and of a type used for animal consumption.

Forbs Plants with soft, rather than permanent, woody stems that are not grass or grass-like plants.

Forest Products Woodland and timber products, such as posts, poles, firewood, Christmas trees, and sawlogs.

Fuel A combustible material, including vegetation such as grass, leaves, ground litter, plants, shrubs, and trees that feed a fire. (See Surface Fuels.)

Fuel Reduction Manipulation, including combustion and/or or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

Fuels Management The practice of evaluating, planning, and executing the treatment of wildland fuel to control flammability and reduce the resistance to control through mechanical, chemical, biological, or manual means, or by prescribed and wildland fire, in support of land management objectives.

Fuel Type An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

Geographic Area	A political boundary designated by the wildland fire protection agencies, where these agencies work together in the coordination and effective utilization of resources. See www.fs.fed.us/fire/reports.shtml for a listing of and links to Geographic Area Coordination Centers.
Goal	A concise statement that describes a desired condition to be achieved sometime in the future. It is normally expressed in broad, general terms (usually not quantifiable) and is timeless in that it has no specific date by which it is to be completed. Goal statements form the principle basis from which objectives are developed.
Grazing Permit	An authorization that allows grazing on public lands. Permits specify class of livestock on a designated area during specified seasons each year. Permits are of two types: preference (10 year) and temporary non-renewable (1 year).
Guideline	Actions or management practices that may be used to achieve desired outcomes, sometimes expressed in best management practices. Guidelines may be identified during the land use planning process, but they are not considered a land use decision unless the plan specifies that they are mandatory. Guidelines for grazing administration must conform to 43 CFR 4180.2
Habitat	A specific set of physical conditions in geographical area(s) that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are: food, water, cover and living space.
Implementation Plan	A sub-geographic or site-specific plan written to implement decisions made in a LUP. Implementation plans include both activity plans and project plans.
Incident	A human-caused or natural occurrence, such as wildland fire, that requires emergency service action to prevent or reduce the loss of life or damage to property or natural resources. Incident management teams also handle other non-fire emergency response, including tornadoes, floods, hurricanes, earthquakes, and other disasters or large events.
Indirect Effects	Indirect effects are those consequences, which are expected to occur following implementation of an alternative. Indirect effects are caused by the action and occur later in time or farther from the activity.
Interdisciplinary Team (IDT)	A team representing several disciplines to ensure coordinated planning of the various resources.
Intermittent or Seasonal Stream	A stream that flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas.

Ladder Fuels — Fuels that provide vertical continuity between strata and allow fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

Land Use Plan (LUP) — A set of decisions that establish management direction for land within an administrative area. An assimilation of land-use-plan-level decisions developed through the planning process outlined in 43 CFR 1600, regardless of the scale at which the decisions were developed. The term includes both RMPs and MFPs.

Landscape — An area of interacting and interconnected patterns of habitats (ecosystems) that are repeated because of the geology, land form, soil, climate, biota, and human influences throughout the area. Landscape structure is formed by disturbance events, successional development of landscape structure, and flows of energy and nutrients through the structure of the landscape. A landscape is composed of watersheds and smaller ecosystems. It is the building block of biotic provinces and regions.

Large Fire — 1) For statistical purposes, a fire burning more than 100 acres. 2) A fire burning with a size and intensity such that its behavior is determined by interaction between its own convection column and weather conditions above the surface.

Light (Fine) Fuels — Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which is less than ¼-inch in diameter and has a time lag of one hour or less. These fuels ignite readily and are rapidly consumed by fire when dry.

Litter — Top layer of the forest, scrubland, or grassland floor, directly above the fermentation layer, composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

Long Term — Defined in this document as 10 years or more. This applies to any long-term use.

Management Concern — An issue, problem, or condition that constrains the range of management practices identified by the Forest Service in the planning process.

Management Direction — A statement of multiple-use and other goals and objectives, associated management prescriptions, and standards and guidelines for attaining them.

Management Framework Plan — A LUP for public lands administered by BLM that provides a set of goals, objectives, and constraints for a specific planning unit or area; a guide to the development of detailed plans for the management of each resource. This form of plan is now being replaced with RMPs.

Management Practice	A specific activity, measure, course of action, or treatment.
Mechanical Treatment	Mechanical treatments of vegetation employ several different types of equipment to suppress, inhibit, or control herbaceous and woody vegetation. For the purposes of this plan, mechanical treatments may include employing the following: cabling, chaining, disking (or disk plowing), bulldozing, mowing, beating, crushing, chopping or shredding vegetation using a variety of mechanized equipment.
Monitoring (Plan Monitoring)	The process of tracking the implementation of LUP decisions and collecting and assessing data and/or information necessary to evaluate the effectiveness of land use planning decisions.
National Ambient Air Quality Standards	Standards for maximum acceptable concentrations of pollutants in the ambient air to protect public health with an adequate margin of safety, and to protect public welfare from any known or anticipated adverse effects of such pollutants (e.g., visibility impairment, soiling, materials damage, etc.) in the ambient air.
National Environmental Policy Act (NEPA)	NEPA is the basic national law for protection of the environment, passed by Congress in 1969. It sets policy and procedures for environmental protection, and authorizes EISs and EAs to be used as analytical tools to help federal managers make decisions on management of federal lands.
Naturalness	An area that "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable". (Section 2[c], *Wilderness Act*).
Non-fire fuel treatments	Includes manual, mechanical, biological, chemical, and seeding actions.
Objective	A concise, time-specific statement of measurable planned results that respond to pre-established goals. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals.
Off-road Vehicle	Any motorized vehicle designated for or capable of cross-country travel over lands, water, sand, snow, ice, marsh, swampland, or other terrain excluding: (1) any non-amphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle used in national defense.

Old Growth — A wooded area, usually greater than 200 years of age, which has never been altered or harvested by humans. An old-growth forest often has large individual trees, a multi-layered crown canopy, and a significant accumulation of coarse woody debris including snags and fallen logs. Utah BLM would adopt the U.S. Forest Service (USFS) old-growth definitions and identification standards per the USFS document *Characteristics of old-growth forests in the intermountain region*" (April 1993). In instances where the area of application in the previous document doesn't apply to specific species (e.g., *Pinus edulis*), use the document *Recommended old-growth definitions and descriptions, UDSA Forest Service southwestern region* (Sept.1992).

Perennial — A stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.

Planning Area — One or more planning units for which management framework plans were prepared under previous BLM planning procedures.

Planning Unit — As used in previous BLM planning, a geographical unit within a BLM district. It included related lands, resources, and use pressure problems that were considered together for resource inventory and planning.

Prescribed Fire — Any fire ignited by management actions under certain predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written prescribed fire plan must exist, and NEPA requirements must be met prior to ignition.

Prescription — Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of AMRs, and indicate other required actions. Prescription criteria may include a combination of safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Prevention — Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards.

Public Lands — Any lands or interest in lands outside of Alaska owned by the United States and administered by the Secretary of the Interior through the BLM, except located on the Outer Continental Shelf and lands held for the benefit of Indians.

Public Participation — The process of attaining citizen input into each planning document development stage. It is required as a major input into the BLM's planning system.

Range Improvements (Structural/Nonstructural)	Any activity or program on or relating to rangelands designed to improve forage production, change vegetation composition, control patterns of use, provide water, stabilize soil and water conditions, and enhance habitat for livestock, wildlife, and wild horses and burros. Rangeland improvements include non-structural land treatments (such as chaining, seeding, and burning), and structural (such as stockwater developments, fences, and trails).
Rangeland	Land dominated by vegetation that is useful for grazing and browsing by animals. "Range" and "rangeland" are used interchangeably.
Raptors	Birds of prey, such as the eagle, falcon, hawk, owl, or vulture.
Recreation Opportunities	Favorable circumstances enabling visitors' engagement in a leisure activity to realize immediate psychological experiences and attain more lasting, value-added beneficial outcomes.
Region	May be any geographical area larger than a planning area (socioeconomic profile area, sub-state, state, multi-state, or national), appropriate for comparative area analysis and for which information is available. Regions may be different for different resources or subject matter analysis.
Rehabilitation	The activities necessary to repair damage or disturbance caused by wildland fires or the fire suppression activity.
Resource Area	A geographic portion of a BLM district: An administrative subdivision whose manager has primary responsibility for day-to-day resource management activities and resource use allocations. In most instances it is the area for which RMPs are prepared and maintained.
Resource Management Plan (RMP)	A document prepared by field office staff with public participation and approved by field office managers that provides general guidance and direction for land management activities at a field office. The RMP identifies the need for fire in a particular area and for a specific benefit.
Resources	1) Personnel, equipment, services, and supplies available or potentially available for assignment to incidents. 2) The natural resources of an area, such as timber, grass, watershed values, recreation values, and wildlife habitat.
Retardant	A substance or chemical agent that reduces the flammability of combustibles.
Riparian Habitat	A native environment growing near streams, reservoirs, ponds, etc. that provides food, cover, water, and living space (permanent or intermittent). It is usually unique or limited in arid regions and is, therefore, of great importance to a wide variety of wildlife.
Seeding (and Planting)	Involves the introduction of seeds and plants to a site that alters existing plant communities and influences successional processes.

Sensitive Species	Species not yet officially listed but that are undergoing status review for listing on the Fish and Wildlife Service official threatened and endangered list; species whose populations are small and widely dispersed or restricted to a few localities; and species whose numbers are declining so rapidly that official listing may be necessary.
Severity	Degree to which a site has been altered or disrupted by fire; loosely, a product of fire intensity and residence time (duration) of the fire. Severity denotes the effects, from low to high, of fire on the soil and vegetation components of a site.
Short Term	Defined in this document as one to five years. This applies to any "short-term" use.
Slash	Debris left after logging, pruning, thinning, or brush cutting; includes logs, chips, bark, branches, stumps, and broken understory trees or brush.
Smoke Management	Conducting a prescribed fire under fuel moisture and meteorological conditions, and with firing techniques that keep the smoke's impact on the environment within acceptable limits.
Soil Compaction	Increasing the soil bulk density, and concomitantly decreasing the soil porosity, by the application of mechanical forces to the soil.
Soil Disturbance	Physical disturbance of the vegetation or soil surface by any action, usually via mechanical or manual tools. Includes all activities except casual use, wildland fire, and prescribed fire treatments. See Surface Disturbance.
Special Recreation Management Areas	Recreation management areas that receive emphasis and priority in BLM's recreation planning and management efforts. The recreation resources in these areas require explicit management to provide specified recreation setting, activity, and experience opportunities. Recreation management objectives would provide explicit guidelines with respect to the existing opportunities and problems in these areas. RMPs would subsequently be prepared for special recreation management areas using RMP objectives for guidance.
Special Status Species (SSS)	Includes proposed species, listed species, and candidate species under the ESA; state-listed species; and BLM state director-designated sensitive species (see BLM Manual 6840, Special Status Species Policy).
Standard	Forest plan standards describe a condition of land, normally a maximum or minimum condition, which is measurable. A standard can also be expressed as a constraint on management activities or practices. Deviation from compliance with a standard requires a forest plan amendment.
State Lands	Lands controlled or administered by the State of Utah.

Strategy	The science and art of command as applied to the overall planning and conduct of an incident.
Structure	The sizes, shapes, and/or ages of the plants and animals in an area.
Succession	Observed process of change in the species structure (and composition) of an ecological community over time.
Suppression	A management action intended to extinguish a fire or alter its direction of spread.
Surface Disturbance	Any surface disturbing activity (does not include fire).Disturbance of the vegetative or soil surface by any action. Includes all activities but casual use and wildland fire or fire treatments. See Soil Disturbance.
Surface Fuels	Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, forbs, low and medium shrubs, tree seedlings, heavier branchwood, downed logs, and stumps interspersed with or partially replacing the litter.
Sustainability	The ability to maintain a desired condition or flow of benefits over time.
Tactics	Deploying and directing resources on an incident to accomplish the objectives designated by strategy.
Total Maximum Daily Load (TMDL)	An estimate of the total quantity of pollutants (from all sources: point, non-point, and natural) that may be allowed into waters without exceeding applicable water quality criteria.
Values at Risk	To rate according to a relative estimate of worth when exposed to a chance of loss or damage.
Vegetation Treatment	Changing the characteristics of an established vegetation type to improve rangeland forage or wildlife habitat resources. Treatments are designed for specific areas and differ according to the area's suitability and potential. The most common land treatment methods alter the vegetation by chaining, spraying with herbicides, burning, and plowing, followed by seeding with well adapted desirable plant species.
Vegetation	Plants in general or the sum total of the plant life above and below ground in an area.
Visibility	The greatest distance in a given direction where it is possible to see and identify with the unaided eye a prominent dark object against the sky at the horizon.
Wetlands	Lands including swamps, marshes, bogs, and similar areas, such as wet meadows. They also include River overflows, mud flats, and natural ponds.

Wilderness Area	An area officially designated as wilderness by Congress. Wilderness areas will be managed to preserve wilderness characteristics and shall be devoted to the public purposes of recreation, scenic, scientific, educational, conservation, and historical use.
Wilderness Study Area (WSA)	Areas under study for possible inclusion as a Wilderness Area in the National Wilderness Preservation System.
Wilderness	An area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of undeveloped federal land retaining its primeval character and influence without permanent improvements or human habitations.
Wildfire	A free-burning fire requiring a suppression response.
Wildland	Any area under fire management jurisdiction of a land management agency.
Wildland Fire Management Program	The full range of activities and functions necessary for planning, preparedness, emergency suppression operations, and emergency rehabilitation of wildland fires, and prescribed fire operations, including natural fuels management to reduce risks to public safety and to restore and sustain ecosystem health.
Wildland Fire Situation Analysis	A decision making process that evaluates alternative management strategies against selected criteria (e.g., safety, environmental, social, political, economic), and resource management objectives.
Wildland Fire Suppression	An AMR to wildland fire that results in curtailment of fire spread and eliminates all identified threats from the particular fire. All wildland fire suppression activities provide for firefighter and public safety as the highest consideration, but minimize loss of resource values, economic expenditures, and/or the use of critical firefighting resources.
Wildland Fire	Any non-structure fire, other than prescribed fire, that occurs in the wildland.
Wildland Fire Use	The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in an FMP. Operational management is described in the WFIP. Wildland fire use is not to be confused with "fire use", a broader term encompassing more than just wildland fires.
Wildland Urban Interface (WUI)	The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Because of their location these structures are extremely vulnerable to fire should an ignition occur in the surrounding area.

Woodland	Forest lands stocked with other than timber species (i.e., pinyon, juniper, mountain mahogany, etc.). A plant community in which, in contrast to a typical forest, the trees are often small, and relatively short compared to their crown (i.e., pinyon, juniper). Uses of the woodland products are generally limited to firewood, posts, and harvest of fruit (pinyon nuts).

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APPENDIX A
Interdisciplinary Team Analysis Record Checklist

INTERDISCIPLINARY TEAM ANALYSIS RECORD CHECKLIST

Project Title: Southern Utah Support Area Planning Area Fire Management Plan Environmental Assessment
NEPA Log Number: UT-040-04-054
File/Serial Number:
Project Leaders: Dawna Ferris-Rowley, SGFO ; Tooter Burdick, condition class FO

FOR EAs/CXs: NP: not present; NI: resource/use present but not impacted; PI: potentially impacted

STAFF REVIEW OF PROPOSAL:

NP/NI/ PI	Resource	Date Reviewed	Signature	**Review Comments** (required for all NIs and PIs. PIs require further analysis.)
CRITICAL ELEMENTS				
PI	Air Quality	11/2004	Paul Briggs, Clair Jolley	**Issue: Potential short-term air quality impacts related to wildland fire and use of prescribe fire for hazard fuel reductions.** These could affect Class I airsheds of regional national parks and monuments (southwest Utah/Arizona/ Nevada) and the Las Vegas non-attainment area. Indicator: Smoke and particulates generated from fires
PI	Areas of Critical Environmental Concern (ACEC)	11/2004	Dawna Ferris-Rowley (SGFO), Lorraine Christian (KFO)	**Issue: Impacts on the values the ACECs were designated as important and relevant.** Indicator: Relevance and importance criteria, as stated in LUPs or evaluations. The St. George field office has 10 ACECs, a majority of which contain multiple resources values, including listed species and their designated critical habitats, riparian zones, community watershed protection zones, and National Register of Historic Places (NRHP) eligible or listed properties, that required special management attention. Kanab field office has one ACEC for watershed protection, similar potential for effects. There are no ACECs in the Cedar City field office area or the Grand Staircase-Escalante National Monument (GSENM).Fire management actions, both suppression tactics and hazard fuel reduction projects, have the potential to impact the relevance and importance criteria for which the ACECs were designated. The potential adverse effects would be lessened or avoided if appropriate resource protection measures (RPMs) are implemented during wildland fire suppression and in project planning for fire and non-fire hazard fuel reductions.
PI	Cultural Resources	11/2004	Dawna Ferris-Rowley Noel Logan	**Issue: Impacts resulting from fire management strategies, including wildland fire suppression, prescribed fire, mechanical treatments, and rehabilitation activities could adversely affect the eligibility characteristics of properties that are listed or eligible for listing to the NRHP ("historic properties").** Some types of historic properties, such as historic mining-related features could benefit from implementation of hazard fuel reduction projects that would lessen the potential for severe, high intensity wildland fires that can damage or destroy fire-susceptible sites and increase on-site erosion. Traditional cultural properties that provide localities for subsistence

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				plant gathering (e.g., for seeds, fiber, ceremonial purposes) could be enhanced by allowing fire to play a role in maintenance of important plant communities. Adverse effects to historic properties could be avoided or minimized by the implementation of resource protection measures during wildland fire suppression and in project planning for fire and non-fire hazard fuel reductions.
PI – St George NI-condition class FO, GSENM and KFO	Environmental Justice	11/2004	Gina Ginouves-CCFO Dawna Ferris-Rowley-SGFO	**Issue: Wildland fires, as well as fire and non-fire hazard fuel reduction proposals, when considered cumulatively with similar actions proposed on the Dixie National Forest and on adjacent public lands outside this planning unit, have the potential to substantially reduce regional pinyon-juniper woodlands and opportunities for pinyon nut harvesting in the St. George field office.** This could represent a disproportionate adverse environmental (socioeconomic) effect on minority and low income populations that continue traditional hunting and collecting subsistence practices. Many American Indians and some members of local Hispanic communities harvest pinyon nuts from public lands for personal consumption and to sell or trade; others derive income working as seasonal nut pickers for commercial harvesters. For these individuals and households, loss of pinyon nut harvesting opportunities on public lands and related employment opportunities could negatively impact the continuity of a traditional subsistence practices and further reduce income levels for those already at low income or even poverty levels. According to EPA Region VIII Environmental Justice Map, the four SUSA planning area counties have been categorized as a minority population area of 0 to 20 percent (http://www.epa.gov/environ./ej). Effects would, in some instances, cross-walk with Native American religious concerns and socioeconomic analysis, both screened below. Found not to be of issue in the Kanab, Cedar City, or GSENM areas. *Further analysis of the potential for impact to minority or low income populations can be found in Chapter 4.* NI- Any potential issues are addressed elsewhere, specifically under Native American religious concerns
NI	Farmlands (Prime or Unique)	11/2004	Dave Corry (SGFO)	Rationale for NI: BLM generally does not manage land in the SUSA planning area that would qualify as prime or unique farmland. Nothing in the action that would irreversibly convert any BLM lands to non-agricultural use or result in the potential loss of prime farmlands, as defined by the Farmland Protection Policy Act.
NI	Floodplains	11/2004	Dave Corry (SGFO), Randy Beckstrand (KFO/GSENM), Craig Eggerton (CCFO)	Rationale for NI: Floodplains exist throughout the planning area but because actions in this proposal and alternative would not impact the functionality of floodplains, consistent with EO #11988, this critical element would not be impacted. The Proposed Action and No Action Alternative include provisions to avoid adverse effects and incompatible development in floodplains, consistent with the EO that mandates that agency actions minimize potential harm to or within the floodplain; reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and restore/preserve the natural and beneficial values served by floodplains.
PI	Invasive, Non-native Species	11/2004	Ambur Hughes (GSENM), Randy Beckstrand (KFO), Jessica Bullock (CCFO), Kim	**Issue: Potential for increased infestation/introduction of invasive and non-native species following wildland fires and fire and non-fire hazard fuel reduction projects.** **Indicator: acreage of land infested**

NP/NI/ PI	Resource	Date Reviewed	Signature	**Review Comments** (required for all NIs and PIs. PIs require further analysis.)
			Leany (SGFO)	In the SUSA planning unit, invasive species, especially cheatgrass/red brome and noxious weeds, are quick to invade new disturbances, such as burn areas and fire fuel breaks. Cheatgrass/red brome dominated sites are increasingly susceptible to burn/reburn regimes, since the natural fire regime has been disrupted. Repeated fires generally prevent the return of native species (the potential natural community). In many cases, particularly in the arid Mojave Desert, desirable species (noxious weed free) must be seeded and sustained, if they are to compete with the invasive species. **Issue: Potential human health/safety issues, property, and resource destruction due to flammability of invasive/non-native species. Tamarisk along river and stream channels in WUI zones of St George field office represent a serious fire hazard that put the above resources at risk of high heat, rapid spread fires. (Acreage of hazardous fuels infested).** The Proposed Action includes the following RPMs: ▪ Use of resource advisors during wild land fire suppression and project planning for hazard fuel reduction projects. ▪ Pressure washing of fire suppression vehicles and/or heavy equipment may be required by resource advisor. ▪ Stabilization and rehabilitation planning that includes reseeding, green stripping, and other measures to control introduction and spread of invasive, non-native species.
PI	Native American Religious Concerns	11/2004	Dawna Ferris-Rowley (SGFO)	**Issue: Potential impacts on sacred/ceremonial use sites based on fire suppression actions and/or hazard fuel reduction projects.** Ongoing consultations with Native Americans indicate concerns over the loss of resources and/or damage to public lands where traditional subsistence resources, like game and plant products, are hunted or collected. In some instances, concerns have been expressed about the effects of fire suppression actions on sacred sites and those used for ceremonial purposes. Since sacred or ceremonial activities are often intertwined with traditional subsistence practices, areas where traditional resource collection occurs are often considered to be sacred sites by Native Americans. Fire management actions that have an effect, e.g., reduction of the acreage of pinyon-juniper woodlands or damage to mule deer habitat, could be considered not only an adverse impact to traditional hunting and collecting zones, but also an impact on sacred/ceremonial use area. St George field office conducts government-to-government consultations with the Paiute Indian Tribe of Utah and its respective bands under protocols contained in a memorandum of agreement, signed in 1999. These consultations identify and attempt to mitigate effects to resources and concerns of the Paiute Indian Tribe of Utah. Consultations with other American Indian tribes, including the Ute Tribe, Hopi Tribe, and Navajo Nation, that claim affiliation to the southwestern Utah geographic area, are conducted on an undertaking-specific basis.
PI (NP in Cedar City FO)	Threatened, Endangered or Candidate Species - Plants	11/2004	Amber Hughes (GSENM), Bob Douglas (SGFO), Shawn Peterson (KFO), Steve Hedges (CCFO)	**Issue: Impacts to listed/candidate plant species from fire actions.** Potential for loss of habitat; displacement of individuals (in some cases); some mortality of individuals from fire; positive effects as well. Fire suppression in Mojave FMU and limited suppression in Colorado

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				Plateau FMU (plants found near Springdale in Zion NP only) could result in protection of four threatened and endangered (T&E) plants and their habitat. Community assistance and protection in Mojave FMU could result in surface disturbances within these same threatened and endangered plant habitats. No T&E plants or their habitat occur in Great Basin FMU or Kolob FMU. Most populations of T&E plants in Washington County have been identified and mapped. Any prescribed fire/non-fuel treatment or emergency stabilization and rehabilitation proposed under this plan would avoid T&E plants and their habitats. Fire suppression in Mojave FMU and limited suppression in Colorado Plateau FMU could result in protection of several BLM sensitive plants and their habitat. Community assistance and protection in Mojave FMU could result in surface disturbances within these same BLM sensitive plant habitats. BLM sensitive plant populations may occur in all FMUs within Washington County. Some of these populations have been identified and mapped. Any Prescribed Fire/Non-fuel treatment or emergency stabilization and rehabilitation proposed under this plan would avoid those BLM sensitive plants that have been identified and mapped. Several BLM sensitive plant populations may occur in the FMUs in Washington County that have not been inventoried or mapped. The affects of any prescribed fire/non-fuel treatment or emergency stabilization and rehabilitation proposed under this plan should look at affects. (NP for Cedar City field office)
PI	Threatened, Endangered or Candidate Species - Animals	11/2004	Steve Small	**Issue: Impacts to listed/candidate animal species and potential/occupied habitat.** Potential for habitat degradation /loss/alteration. Among species - Mexican spotted owl, California condor, yellow-billed cuckoo (Western pop.), bald eagle, southwestern willow flycatcher, Mojave Desert tortoise, Utah prairie dog, Virgin River chub, woundfin are present in the SUSA planning area, but not in each field office. Biological assessment would address potential effects on the pygmy rabbit (petitioned for listing) and greater sage grouse. Designated critical habitat, species recovery plans provide protocols for actions within habitat, including fire suppression tactics. Overall impacts would likely include short-term negative effects, based on vegetative loss or changes, soil impacts, etc., followed by long-term benefits. The Proposed Action includes the following RPMS: ▪ Resource advisor involvement in the planning for fire suppression in areas that contain T&E species and/or designated critical habitat is necessary. ▪ Avoidance areas, such as fish bearing streams, riparian areas, where fire retardant would not be used during fire suppression.
NI	Wastes (hazardous or solid)	10.27.2004	Randy Peterson	Rationale for NI: This proposal would not impact hazardous or solid wastes. The following RPMs are part of the Proposed Action: ▪ Recognize hazardous wastes and move fire personnel to a safe distance from dumped chemicals, unexploded ordnances, drug labs, wire burn sites, or any other hazardous wastes. ▪ Immediately notify BLM field office haz-mat coordinator or state haz-mat coordinator upon discovery, following the BLM hazardous materials contingency plan. ▪ Use of hazardous materials for fire or fuels activities would

NP/NI/ PI	Resource	Date Reviewed	Signature	**Review Comments** (required for all NIs and PIs. PIs require further analysis.)
				comply with state and federal laws and regulations.
PI	Water Quality (drinking/ground)	11/2004	Craig Eggerton (CCFO), Randy Beckstrand (KFO/GSENM), Dave Corry (SG)	**Issue: Impacts on ground water quality not anticipated under the Proposed Action or No Action Alternatives, since natural filtering processes of the aquifer would adequately protect water quality. (TMDL on 303d streams).** **Issue: Short-term impacts to drinking water could result from non-fire fuel treatments, prescribed fires, and unplanned ignitions that remove protective vegetation cover.** Potential exists that TMDL could be increased on streams, rivers, and reservoirs on the State of Utah 303 (d) list (e.g., Beaver River, Minersville Reservoir, Santa Clara River, Gunlock Reservoir). Watershed plans, including cooperative plans with local water conservancy districts, could be disrupted. Municipal watersheds could be impacted by the proposed action, leading to increased sedimentation, ash, or other materials being introduced into municipal water sources. No long-term adverse effects are anticipated to drinking water, due to fire rehabilitation efforts and natural re-vegetation that would return vegetation and soil conditions to pre-fire or pre-treatment conditions.
PI	Wetlands and Riparian Zones	11/2004	Steve Hedges (CCFO), Dave Corry (SG), Lisa Church (KFO), Paul Chapman (GSENM)	**Issue: Impacts to riparian zone resources, including vegetation, soils, bank morphology, that could result from fire suppression actions or fire and non-fire hazard fuel reduction projects. (Proper Functioning Condition)** Impacts could include soil compaction, increased erosion and sedimentation, and vegetative changes, either increase or decrease in desired species.
PI	Wild and Scenic Rivers (WSR)	11/2004	Pete Wilkins (CC), Craig Sorenson (GSENM), RJ Hughes (St George)	**Issue: Impacts to outstanding remarkable values.** The Proposed Action would not alter the free-flowing nature of any river segment. There are three different classifications under which river segments can qualify: wild, scenic or recreational. Proposed Wild and Scenic River segments do not require special consideration with regard to suppression activities, with the exception of segments with wild classification, where "...values must remain natural appearing and... practices do not have an adverse effect on the natural character of the river area..." In these segments, fires do not require suppression activities unless contiguous to private lands and in accordance with other management guidance. In the St George field office and GSENM, portions of numerous creeks, rivers, and tributaries have been determined suitable for Wild and Scenic River inclusion. Kanab and Cedar City field offices have not completed Wild and Scenic River studies; therefore, none are present. During extreme conditions where the entire riparian habitat is in jeopardy, the resource advisor could allow all necessary suppression tactics to avoid the total loss of habitat, especially where native communities exist.
NI	Wilderness	11/2004	Tom Christensen (KFO), RJ Hughes (SGFO)	Kanab field office includes Paria Canyon-Vermilion Cliffs Wilderness. St George field office includes the Beaver Dam Wilderness. Rationale for NI: Wilderness characteristics may be degraded in the short term, however, the long-term effect would most likely constitute improvement. Improvement may be identified in terms of a more diverse and desirable vegetation cover. Fire activities would take into account existing wilderness characteristics of the area, the need

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				to prevent impairing actions, historic fire occurrence, natural role of fire, proposed degree of suppression, smoke management, the use of natural firebreaks, adequate buffer zones, etc. The Proposed Action includes the following RPM: The management prescription for any designated wilderness area would be adhered to in all fire management decisions for those portions of the FMU.
PI	WSAs	10.27.2004	Craig Sorenson (GSENM), Tom Christensen (KFO), Wade Judy (CC),	**Issue: Impacts to naturalness, opportunities for solitude, and opportunities for primitive recreation of the WSA.** Each office in the SUSA planning area has WSAs. As noted in the Interim Management Plan (IMP) H-8550-1, BLM would conduct all prescribed fire and suppression techniques under IMP guidance. For example, "light-hand-on-the-land" fire suppression techniques would be used. All uses of earth-moving equipment within a WSA require authorization. Use of motorized vehicles and mechanical equipment during mop-up should be minimized. Most if not all impacts would be temporary, short-term in nature, and show improvement in the long term. Surface reclamation prescriptions are necessary for all WSAs. Suppression actions should be employed within 1/4-mile for protection of private land and established subdivisions due to heavy fuel loading. Suppression should be required during "red flag" conditions due to the proximity of private lands, existing heavy fuel loads, and presence of scattered ponderosa pine stands. Use of "minimum tools" described in the Interim Guidance should be followed, unless fires are located within 1/4-mile of private lands, where full suppression is allowed. Fire suppression on Canaan Mountain, Red Butte and Watchman and Taylor Creek WSAs should apply MIST techniques, under the direct supervision of the resource advisor. Retardant use in the Canaan Mountain, Red Butte, and Watchman and Taylor Creek WSAs should be approved only after consultation with resource advisor. The resource advisor would consult the agency administrator, as appropriate, on all retardant use within these WSAs. The Joshua Tree Instant Study Area should require full suppression activities the same as for the adjacent Critical Desert Tortoise Habitat due to important desert vegetative communities (Joshua Tree/creosote) that do not recover after fire. Desert tortoise habitats located within the Cottonwood Canyon Wilderness Study should follow the same protocols for Critical Desert Tortoise Habitat and should also follow the Wilderness Study Area Interim Management Guidance. In the Cougar Canyon, Red Mountain, and Cottonwood Canyon WSAs, fires should be allowed to play a natural role as described in the IMP. Suppression actions should be employed within 1/4-mile of private land and established subdivisions due to heavy fuel loading. Suppression should be required during "red flag" conditions due to the proximity of private lands or existing heavy fuel loads. Use of "minimum tool" as described in the Interim Guidance should be followed. Riparian areas within WSAs do not require suppression action and should be managed in accordance with the IMP guidance.

NP/NI/ PI	Resource	Date Reviewed	Signature	**Review Comments** (required for all NIs and PIs. PIs require further analysis.)
OTHER RESOURCES/CONCERNS				
NI	Rangeland Health Standards and Guidelines	10.27.2004	Melanie Mendenhall	Rationale for NI: Rangeland Health Standards and Guidelines would be followed and are incorporated into the proposed action (see resource protection measures for livestock and vegetation). Fire management decisions in the proposed action would not be contributing to any failure to meet Rangeland Health Standards.
PI	Livestock Grazing	10.27.2004	Melanie Mendenhall	**Issue: Impacts to grazing allotment resources, livestock, and licensed operators as a result of wildland fires, fire suppression tactics, and fire and non-fire hazard fuel reduction projects.** In the short term, loss of forage, disruption of management plans, temporary closures and/or changes in season of use could occur, post burn and during rehabilitation period. In the long term, successful re-vegetation efforts or vegetative conversions could improve the quality and quantity of livestock forage within an allotment. The Proposed Action includes the following RPMs: ▪ Use of resource advisors to recommend protection measures for allotment resources and improvements and provide notification to livestock operators. ▪ Rehabilitation actions to restore productivity to allotment resources and repair/replace damaged rangeland improvements.
PI	Woodland/Forestry	10.27.2004	Doug Page Craig Egerton	**Issue: Wild land fires, as well as fire and non-fire hazard fuel reduction projects, have the potential to destroy or reduce the availability of forest-related products (including fuel wood, juniper posts, pine nuts, and Christmas trees, etc.).** **Issue: Effects of fire suppression and prescriptive fire actions on aspen regeneration.** The Proposed Action includes the following RPMs: ▪ Project planning for hazard fuel reductions should include prescriptions that address any manipulation of woody tree species and provide for the protection of old growth ponderosa pine, as appropriate. ▪ Fire and non-fire hazard fuel reduction projects have the potential to adversely impact forest resources (woody tree species) that may have wildlife, including T&E, watershed, recreation, and scenic values. Further, there is potential for fires to create hydrophobic soil conditions in post-burn situations. These considerations are discussed in other resource discussion sections of this EA.
PI	Vegetation including Special Status plant species	11/2004	Shawn Peterson (KFO), Steve Hedges (CC), Amber Hughes (GSENM), Bob Douglas (SG)	**Issue: Potential for impacts to plant communities (including special status species) as result of fire, fire suppression tactics, and hazard fuel reduction projects. (modification of plant communities – density and composition)** Vegetative density and species compositions may be modified, mortalities may occur to individual plants or larger portions of the community. Effects could be negative or beneficial, depending on the species, as improvement or degradation of habitat occurs.
PI	Fish and Wildlife including Special	11/2004	Steve Small	**Issue: Impacts to fish and wildlife (including special status) species and potential/occupied habitat. (habitat**

NP/NI/ PI	Resource	Date Reviewed	Signature	**Review Comments** (required for all NIs and PIs. PIs require further analysis.)
	Status Species			**degradation/displacement/loss/alternation)** Potential negative impacts on crucial seasonal habitats for elk, mule deer, pronghorn, pygmy rabbit, greater sage grouse, raptors, songbirds, and others, that varies by geographic area within SUSA planning area. Overall, generally short-term negative effects, based on vegetative loss or changes, soil impacts, etc., followed by long-term benefits to many species or habitats. The Proposed Action includes the following RPM: Resource advisor involvement in planning for fire suppression in areas that contain T&E species and/or designated critical habitat.
PI	Soils	11/2004	Shawn Peterson (GSENM/KFO), Craig Eggerton (CC), Dave Corry (SG)	**Issue: Impact to soils related to wildland fire, fire suppression tactics, fire and non-fire hazard fuels reduction projects. (Erosion/sedimentation; infiltration/runoff; and compaction and sterilization of the soil.)** Soil horizons could be affected in the short term by compactions, as well as wind and water erosion, accelerated by the loss of vegetative cover to fire and/or mechanical treatment. High heat, high intensity fires may create hydrophobic, sterile soil surfaces. In the long term, soil conditions would be expected to stabilize, as a result of natural processes or rehabilitation actions. The Proposed Action includes the following RPMs: ▪ Use of resource advisors in fire suppression and fuels reduction planning. ▪ Minimization of use of heavy equipment and mechanical treatments during fire activities. ▪ Rehabilitation of burned areas, using water bars, appropriate seed mixes, mulches, and other treatments indicated to ensure successful re-vegetation.
PI	Recreation	10.27.2004	Wade Judy (CC), Tom Christensen (KFO), Craig Sorenson (GSENM), RJ Hughes (SG)	**Issue: Impacts to developed recreation sites and facilities.** Consideration should be made of the temptation by off-highway vehicle (OHV) users to employ firelines in order to access new areas. Management should have option to close areas post-fire to protect resource values from this illegal OHV use. Further, scarification of tracks caused by repeated cross country driving during suppression; mechanical and material reclamation to prevent travel on constructed firelines; rest period (OHV closure) following fires as per management discretion. Fire events often have an impact on recreation. Local and visiting populations are affected by the impacts, which include biophysical effects, indirect effects of fire operations, fuel treatments, area closures, and other disruptions to human systems. Most recreational activities, including fishing, hunting, hiking, sightseeing, and mountain biking, may experience some impact in the short term but the long-term impact of these activities which do not require developed, structural recreation amenities, would most likely improve, as the natural effect of fire takes hold. However, developed recreation areas, which support wood, metal, and stone structures, picnic tables, shade trees, and other amenities, are susceptible to fire impact. There could be a prioritization of suppression measures to protect/preserve recreation sites/facilities that would address the concern of such impacts. A list of developed recreation areas within each management area would be generated, and the proper prescription instituted that would protect developed recreation areas from potential impacts

NP/NI/ PI	Resource	Date Reviewed	Signature	**Review Comments** (required for all NIs and PIs. PIs require further analysis.)
				from fire activities.
NI	Visual Resources	10.27.2004	Wade Judy (CC), Tom Christensen (KFO), Craig Sorenson (GSENM), Cimarron Chacon (SG)	Rationale for NI: Visual resources would be degraded in the short term, but would improve to surpass existing conditions as more diverse and more desirable vegetation becomes established. The same would be true for wilderness values. As a greater variety of vegetation presents itself, positive changes to texture, color, and line may be apparent. As conifers are thinned, and more shrubs appear, more visual variety exists, in the long term. Identification of VRM classes for individual field offices may be helpful.
NI	Geology/Mineral Resources	10.27.2004	Ed Ginouves (CC), Doug Powell (KFO/GSENM),	Rationale for NI: The Proposed Action includes resource protection measures to address concern of suppression of wildland fire in presence of oil and gas facilities. Mitigation measures may be added to future, site-specific proposed actions as a result of site-specific analysis during project-level planning for treatment.
NI	Paleontology	11/2004	Alan Titus	Rationale for NI: Resource protection measures resolve concerns regarding fire management impacts on paleontological resources. In the event that paleontological resources are discovered in the course of ground disturbing activities, effort should be made to protect these resources. Further, BLM Manual and Handbook H-8270-1, Chapter III (A) and III (B) would be used in planning and implementing projects.
NI	Lands/Access	10.27.2004	Elaine Robinson	Rationale for NI: While lands and access concerns are present in the large planning area, fire management practices would be designed to avoid conflicts with authorized rights-of-way and other facilities. Concerns relating to lands and access during planned activities have been considered with inclusion of the following RPM in the Proposed Action: "Fire management practices would be designed to avoid or otherwise ensure the protection of authorized rights-of-way and other facilities located on the public lands, including coordination with holders of major rights-of-way systems within right-of-way corridors and communication sites." Prior to planned activities, appropriate coordination would take place with holders of rights-of-way as well as with private and cooperating agency land owners, and specific RPM would be incorporated into proposed actions as needed.
PI	Fuels/Fire Management	10.27.2004	Tooter Burdick	Fire and fuel management considerations form the basis for the proposed action. Therefore, fire and fuels management is considered and addressed in full in this EA. The objective of the FMP is to provide management direction for this resource, in consideration of other resources.
PI	Socioeconomics	10.27.2004	Dawna Ferris-Rowley	**Issue: Impacts to socioeconomics.** Fire management actions have the potential to impact the socioeconomic status of a wide array of public land users, including rights-of way holders, special use permit holders, licensed livestock operators, American Indian tribes, local communities, and other governmental entities, including federal, state, county, and municipal units. Impacts to individuals, local communities, American Indian tribes, and others can be short-term and long-term in duration, positive and negative in nature.
PI	Wild Horses and Burros	10.27.2004	Chad Hunter	**Issue: Impacts on wild horse and burro herds and herd management areas.** Wild horse and burro herds and their herd management areas (none of which occur within the Kanab field office) could be negatively

NP/NI/ PI	Resource	Date Reviewed	Signature	**Review Comments** (required for all NIs and PIs. PIs require further analysis.)
				impacted by wildland fire and related suppression activities. Suppression activities can result in the short term loss of forage and vegetative cover when they involve the construction of extensive fireline, esp. with heavy equipment, or when extensive backfiring occurs. Other human activities during suppression (vehicle travel, fire camps, aircraft noise) could also disrupt herd movements and possibly deny wild horses and burro herds access to springs or water sources, if they are being used as dipping locations for aerial attack. Short-term impacts could include loss of forage, cover, and availability/access to water sources. Fire and non-fire hazard fuel reduction projects could also impact the availability of forage, cover, and disrupt herd traditional use patterns. Cedar City field office manages 10 herd management areas, GSENM manages one; no other herds or herd management areas occur within the SUSA planning area. The Proposed Action includes the following RPMs: ▪ Resource advisor would make recommendations during fire suppression and hazard fuel reduction actions to minimize impacts on herds and herd management areas. ▪ Rehabilitation plans would not propose the construction of range fencing that restrict wild horses and burros access to water sources.
PI	Wilderness characteristics	10.27.2004	Wade Judy, Craig Sorenson, Tom Christensen, RJ Hughes	**Issue: Impacts to the naturalness, opportunity for solitude, opportunity for primitive recreation, and any supplemental values.** Wilderness characteristics could be impacted in the short term by wild land fire and fire suppression measures. In the long term, some beneficial effects, in the form of vegetative diversity, could result. There have been no "non-WSA lands likely to have wilderness characteristics" identified in the planning area. No new information has, to date, been provided to substantiate the reasonable probability of such wilderness characteristics. The Proposed Action includes the following RPM: Fire suppression tactics would be conducted according to "MIST" principles that avoid impairment of wilderness characteristics.

FINAL REVIEW

Reviewer Title	Date	Signature	Comments
NEPA/Environmental Coordinator	2/24/2005	/s/ Pete Wilkins, Cedar City FO	
Manager	2/24/2005	/s/ Todd Christensen, Cedar City Field Office Manager	

APPENDIX B
Wildland Fire Management Policy

Appendix B: Wildland Fire Management Policy

Authority: The statutes cited herein authorize and provide the means for managing wildland fires.	
Protection Act of September 20, 1922 (42 Stat. 857; 16 USC 594)	Authorizes the Secretary of Interior to protect and preserve, from fire, disease, or the ravages of beetles, or other insects, timber owned by the United States upon the public lands, national parks, national monuments, Indian reservations, or other lands under the jurisdiction of the Department of Interior (DOI) owned by the United States.
Clark-McNary Act of 1928 (45 Stat. 221; 16 USC 487)	Authorized technical and financial assistance to the states for forest fire control and for production and distribution of forest tree seedlings. (Sections 1 through 4 were repealed by the Cooperative Forestry Assistance Act of 1978.)
Federal Property and Administrative Service Act of 1949 (40 USC 471 et seq.)	Provides the government an economical and efficient system for procurement and supply of personal property and non-personal services.
Reciprocal Fire Protection Act, Act of May 27, 1955 (69 Stat. 66; 42 USC 1856a, 42 USC 1856)	Authorizes agencies that provide fire protection for any property of the United States to enter into reciprocal agreements with other fire organizations to provide mutual aid for fire protection.
Clean Air Act, Act of July 14, 1955, as amended (42 USC 7401 et seq.)	This act provides for the protection and enhancement of the nation's air resources and applies to the application and management of prescribed fire.
Wilderness Act, Act of September 3, 1964 (16 USC 1131, 1132)	Provides for the designation and preservation of wilderness.
National Wildlife Refuge System Administration Act of 1966, as amended (80 Stat. 927; 16 USC 668dd through 668ee)	Provides guidelines and directives for administration and management of all areas in the National Wildlife Refuge System, including "wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas."
National Environmental Policy Act of 1969 (42 USC 4321)	Requires preparation of environmental impact statements for federal projects, which may have a significant effect on the environment. It requires systematic, interdisciplinary planning to ensure the integrated use of the natural and social sciences and the environmental design arts in making decisions about major federal actions that may have a significant effect on the environment.
Endangered Species Act of 1973 (16 USC 1531)	Provides for the protection and conservation of threatened and endangered fish, wildlife, and plant species. Directs all federal agencies to utilize their authorities and programs to further the purpose of the Act.
Disaster Relief Act, Act of May 22, 1974 (88 Stat. 143; 42 USC 5121)	Provides the authority for the federal government to respond to disasters and emergencies. Established the presidential declaration process and authorized disaster assistance programs.
Federal Fire Prevention and Control Act, Act of October 29, 1974 (88 Stat. 1535; 15 USC 2201)	Authorizes reimbursement to state and local fire services for costs incurred in firefighting on federal property.
Federal Land Policy and Management Act of 1976 (90 Stat. 2743)	Outlines functions of the BLM Directorate, provides for administration of public land through the BLM, provides for management of the public lands on a multiple use basis, and requires land-use planning including public involvement and continuing inventory of resources. The Act establishes as public policy that, in general, the public lands will remain in federal ownership, and also authorizes:

	▪ Acquisition of land or interests in lands consistent with the mission of the Department and land use plans. ▪ Permanent appropriation of road use fees collected from commercial road users to be used for road maintenance. Collection of service charges, damages, and contributions and use of funds for specified purposes. ▪ Protection of resource values. ▪ Preservation of certain lands in their natural condition. ▪ Compliance with pollution control laws. ▪ Delineation of boundaries in which the federal government has right, title, or interest. ▪ Review of land classifications in land use planning and modification or termination of land classifications when consistent with land use plans. ▪ Sale of lands if the sale meets certain disposal criteria. ▪ Make, modify, extend, or revoke withdrawals. ▪ Exchange or conveyance of public lands if in the public interest. ▪ Outdoor recreation and human occupancy use. ▪ Management of the use, occupancy, and development of the public lands through leases and permits. ▪ Designation of federal personnel to carry out law enforcement responsibilities. ▪ Determination of the suitability of public lands for rights-of-way purposes (other than oil and gas pipelines) and specification of the boundaries of each right-of-way. ▪ Recordation of mining claims and reception of evidence of annual assessment work.
Federal Grant and Cooperative Agreement Act of 1977 (PL 950224, as amended by PL 97-258, September 13, 1982, 96 Stat. 1003; 31 USC 6301 thru 6308)	Established criteria for a federal agency to use to determine whether a transaction is procurement or financial assistance. Established guidelines to bring about uniformity in the selection and use of procurement contracts, grants, and cooperative agreements.
Supplemental Appropriation Act, Act of September 10, 1982 (96 Stat. 837)	Authorized the Secretary of Agriculture and Secretary of Interior to enter into contracts with state and local governmental entities, including local fire districts, for procurement of services in the preparedness, detection, and suppression of fires on any units within their jurisdiction.
Wildfire Suppression Assistance Act, Act of April 7, 1989 (PL 100-428, as amended by PL 101-11, April 7, 1989; 42 USC 1856).	This act authorizes the Secretary of Agriculture to enter into agreements with fire organizations of foreign countries for assistance in wildfire protection.
Indian Self-Determination and Education Assistance Act (PL 93-638), as amended	Provide for the full participation of Indian tribes in programs and services conducted by the federal government for Indians and encouraged the development of human resources of the Indian people; established a program of assistance to upgrade Indian education.
National Indian Forest Resources Management Act (PL 101-630, November 28, 1990)	Required the Secretary of Interior to undertake management activities on Indian forestlands, in furtherance of the United States trust responsibility for these lands. Activities must incorporate the principles of sustained yield and multiple use, and include tribal participation.
Tribal Self-Governance Act of 1994 (PL 103-413)	Provided for native tribes to enter into annual funding agreements with Department of Interior "to plan, conduct, consolidate, and administer programs, services, functions, and activities" administered by the DOI that are of special geographic, historical, or cultural significance.
Clean Water Act of 1987,	Establishes objectives to restore and maintain the chemical, physical, and biological

as amended (33 USC 1251)	integrity of the nation's water.
Executive Order 12898, Environmental Justice, February 11, 1994 (59 FR 7629)	Requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.
Executive Order 13112, Invasive Species, February 3, 1999 (64 FR 6183)	Directs federal agencies to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause.
Migratory Bird Conservation Act of 1929, as amended (16 USC 715) and treaties pertaining thereto	Provides for habitat protection and enhancement of protected migratory birds.
Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, January 10, 2001 (66 FR 3853)	Directs agencies within the executive branch to take certain actions to further implement the Migratory Bird Treaty Act, with the goal of promoting the conservation of migratory bird populations.
Archaeological Resource Protection Act	Expands the protections provided by the Antiquities Act of 1906 in protecting archaeological resources and sites located on public and Indian lands.
Executive Order 11514, Protection and Enhancement of Environmental Quality	Directs federal agencies to provide leadership in protecting and enhancing the quality of the nation's environment to sustain and enrich human life and to initiate measures to meet national environmental goals.
Executive Order 11593, Protection and Enhancement of the Cultural Environment	Requires federal agencies to provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the nation by administering and initiating measures necessary to preserve, restore, and maintain federally owned sites, structures, and objects of historical, architectural, or archaeological significance.
Executive Order 11988, Floodplain Management	Requires federal agencies to take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains.
Executive Order 11990, Protection of Wetlands	Directs federal agencies to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.
Executive Order 12866, Regulatory Planning and Review	The objectives of this executive order are to enhance planning and coordination with respect to both new and existing regulations; to reaffirm the primacy of federal agencies in the regulatory decision-making process; to restore the integrity and legitimacy of regulatory review and oversight; and to make the process more accessible and open to the public.
Colorado River Basin Salinity Control Act	Authorized the construction, operation, and maintenance of works in the Colorado River Basin to control the salinity levels of the Colorado River.
National Historic Preservation Act of 1966, as amended (16 USC 470)	Expands protection of historic and archaeological properties to include those of national, state, and local significance. It also directs federal agencies to consider the effects of proposed actions on properties eligible for, or included in, the National Register of Historic Places.
Healthy Forest Restoration Act of 2003	Crafted to reduce the threat of destructive wildfires while upholding environmental standards and encouraging early public input during review and planning processes.
Wild and Scenic Rivers Act of 1968 (PL 90-542, as amended) (16 USC 1271-	Provides a national policy and program to preserve and protect selected rivers because of their outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. Provides for a National Wild and Scenic Rivers

1287)	System, and for other purposes.
These acts are codified (as referenced) in the United States Code which can be accessed at http://www4.law.cornell.edu/uscode	
Policy Documents	
Federal Wildland Fire Management Policy and Program Review, December 18, 1995, USDI and USDA Final Report. Federal Wildland Fire Management Policy and Program Review, March 23, 1996, USDI and USDA Implementation Action Plan Review and Update of the 1995 Federal Wildland Fire Management Policy, January, 2001, USDI, USDA, DoE, DoD, DoC, EPA, FEMA, and NASF.	The principles and policies in this plan, and subsequent reviews and amendments, provide a common approach to wildland fire by the DOI and the Department of Agriculture. The plan encourages agencies to move the emphasis from fire suppression to integrating fire into the management of lands and resources consistent with public health and environmental quality considerations. Managers are encouraged to use fire as one of the basic tools for accomplishing resource management objectives
Utah BLM Rangeland Health Standards and Guidelines, 1997.	BLM generated standards that spell out conditions to be achieved on BLM lands in Utah and guidelines that would be applied to achieve the standards.
Western Governor's Association (http://www.westgov.org/)	
A Collaborative Approach for Reducing Wildland Fire risks to Communities and the Environment: 10-Year Comprehensive Strategy, August 2001.	This plan outlined a comprehensive approach to the management of wildland fire, hazardous fuels, and ecosystem restoration and rehabilitation on federal and adjacent state, tribal, and private forest and rangelands in the United States, emphasizing measures to reduce the risk to communities and the environment
A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan, May 2002, 27p.	A set of core principles was developed to guide the identification of goals for this strategy. These principles include such concepts as priority setting, accountability, and an open, collaborative process among multiple levels of government and a range of interests. The end results sought by all stakeholders are healthier watersheds, enhanced community protection, and diminished risk and consequences of severe wildland fires. This community-based approach to wildland fire issues combines cost-effective fire preparedness and suppression to protect communities and the environment with a proactive approach that recognizes fire as part of a healthy, sustainable ecosystem.
National Academy of Public Administration (http://www.napawash.org/)	
Federal Fire Management: Limited Progress in Restarting the Prescribed Fire Program (GAO/RCED-91-42), December 5, 1990.	The report reiterated that fire is beneficial and even necessary to wildlands. Where fire has been a historic component of the environment it is essential to continue that influence, and that attempts to exclude fire from such lands could result in unnatural ecological changes and increased risks created by accumulation of fuels on the forest floor. Supported the use of prescribed burn to achieve management objectives, when the risks of such a burn have been analyzed.
State of Utah Regulations and Local Government Plans	
Utah Administrative Code R317	Utah's regulations concerning water quality
Utah Administrative	Utah's regulations concerning air quality

Code R307	
Five County Association of Government 2004	Natural Hazard Mitigation Plan for southwestern Utah's Beaver, Garfield, Iron, Kane, and Washington Counties

APPENDIX C
Wildland Fire Management Categories for the No Action Alternative

Wildland Fire Management Categories for the No Action Alternative

For the purposes of comparing the No Action Alternative with the Proposed Action in this environmental assessment (EA), the planning areas for both alternatives were divided into three fire management categories (A, B/C, D) that define the role and response that wildland fire has in a particular ecosystem. While not specifically identified in the Proposed Action, management direction common to both alternatives allows for division of the planning area into categories for comparative analysis purposes in Chapter 4. These categories define where and to what degree fire, both planned (prescribed fire) and unplanned (wildland fire) are appropriate. Due to the similarity in goals and objectives in categories B and C, they are combined. Categories are described below.

Category A: Where wildland fire is not desired.

Category A is designated for two primary reasons. First, wildland fires in these areas have adverse environmental impacts on the ecosystem. These impacts include such factors as the destruction of crucial wildlife habitat, conversion of native vegetation to exotic plant species, establishment of weed species, increased soil loss, reduced water quality, and damage to cultural and historical resources. The second reason for designating an area as a category A is primarily related to social, economic, and/or political concerns and impacts. These impacts include public and fire fighter safety; threats to adjacent communities and property owners; threats to improvements such as residences, communication sites, industrial sites, and range improvements; smoke impacts to communities and airport operations; and disturbance to high use recreation areas.

Category A areas are where fire is not a regular, natural part of the ecosystem, or where fire has more harmful impacts than benefits to the ecosystem. Fire has generally played a negative role in these areas by altering the native vegetation and allowing introduction of exotic species such as cheatgrass. Introduction of these exotic species has changed the size and interval of fires and has altered the natural species composition of the sites disrupting the natural secession of the native plant communities. As a result, increased size and frequency of fires allows continued and increased disturbance to native plant communities, destroys wildlife habitat, and produces other adverse impacts to the ecosystem. Because the native species generally lack an ability to out-compete introduced and exotic species following a fire, rehabilitation projects are required to establish desirable vegetation and prevent soil loss and other undesirable natural consequences. Key examples include the salt desert shrub, black sagebrush, and big sagebrush shrub communities.

Prescribed fire for resource management is not recommended nor desired in these units due to fire's adverse environmental impacts. However, prescribed fire may be used to establish fuel breaks and perform hazardous fuel reduction when the benefits of mitigating the potential for a large spreading fire outweigh the impacts of the fuels management project. In addition, other forms of fuels management designed to protect these fire-sensitive areas are recommended and may include mechanical manipulation, grazing management, seeding to less flammable and more desirable species, vegetative fuel breaks, and other management actions.

Category B/C: Fire is allowed but the amount of wildland fire suppression is dependent on site-specific values at risk. Constraints are applied on a case-by-case basis to wildland fire suppression and many areas may require mitigation measures be implemented for planned actions.

Category C: Where wildland fire is desired to manage ecosystems, but there are constraints because of the existing vegetation due to past fire exclusion.

These are areas where wildland fire is a natural part of the ecosystem. The health and diversity of the vegetation, soils, and wildlife have evolved and are enhanced or dependent upon the natural consequences of fire. In normal circumstances, the existing native vegetation would naturally re-vegetate after fire. Key ecosystem examples include juniper with perennial grasslands, aspen groves and big sagebrush with perennial

grasses, and other upper elevation plant communities. Although these ecosystems benefit from both unplanned wildland fires and planned prescribed fires, use of either as a management tool may be limited by constraints. These constraints include threats to adjacent developments and residential communities, smoke impacts, lack of manageable fire boundaries, political concerns, and economics of management. Because unplanned wildland fires or wildland fires can be beneficial in these areas, the appropriate fire management response may utilize less aggressive suppression strategies and tactics that result in more acreage burned than under a more aggressive fire suppression response.

Prescribed fire use in these areas is recommended both to meet resource management objectives and as fuels management to mitigate the constraints that may limit using less aggressive suppression in wildland fire situations. Fuels management may be necessary to define more manageable wildland fire boundaries, to protect and minimize the severity and impact of wildland fires on existing plant communities, and to protect values in adjacent units (i.e.: resource values, developments, etc.). Fuels management activities may involve prescribe fire, mechanical manipulation, fuel break development, and other management strategies.

With this said, constraints, including suppression, are seriously evaluated due to fire sensitivity and abnormal wildland fuels accumulations that produce larger, more severe fires than would normally occur in a healthy ecosystem. The key examples are those areas where the absence of fires has resulted in replacement of diverse vegetation communities with monotypic stands of less desirable species. These areas include dense stands of juniper or decadent stands of big sagebrush. These plant communities may have little vegetation and age class diversity, resulting in accumulations of hazardous and volatile fuels. Fuels management is a key to mitigating the negative impacts of unplanned wildland fire in these areas.

Category D: Areas where wildland fires may burn without constraints associated with resource conditions, social, economic, or political considerations.

The ecosystem response of these areas is similar to category C, except there are no constraints to the use of fire. Most often the appropriate fire management response in these areas is to monitor the fire and let the fire play out its natural role in the ecosystem. The key ecosystem example for this category is the vegetation communities located in the mudflat areas. Vegetation in these areas is sparse and there is little to no threat to resource values, improvements, or adjacent ownerships. In addition, because of their isolation, social, economic, or political considerations are unlikely to occur.

APPENDIX D
Fire Management Actions for the Proposed Action and No Action Alternative

Fire Management Actions for the Proposed Action and No Action Alternative

Four fire management actions are proposed in the Proposed Action. The first two as described below, wildland fire suppression and wildland fire use, are considered unplanned and do not undergo site-specific National Environmental Policy Act (NEPA) analysis due to unknown location, size, and timing of the events. The last two, prescribed fire and non-fire fuel treatments are considered planned actions and undergo site-specific NEPA review and analysis prior to implementation. The following summarizes the proposed fire management actions that would be available for use:

Wildland Fire Suppression: Fire suppression goals stated in the Proposed Action are designed to allow wildland fire to function in its ecological role when appropriate for the site and situation, while still protecting resource values at risk. Priorities for a quick suppression response include providing for public and firefighter safety, preventing wildland fires from spreading to private land, and protecting cultural resources, riparian areas, or other sensitive resources, or improvements on Bureau of Land Management (BLM) lands. For any type of response, minimizing cost must be considered. The suppression objectives outline the amount of acres wildfires must be contained to per fire event in the fire management units (FMUs). Once the burn target for the decade has been reached for each vegetative type from unplanned ignitions, a review of objectives and strategies would be initiated to develop new suppression criteria on all wildland fires within that FMU. Considerations for suppression objectives with target acres for FMUs are as follows:

- Fire intensity level
- Size of the public land
- Level of use by the public
- Proximity to private residences, communities, and private in-holdings
- Wilderness values
- Historic fire regimes
- Unique biological, cultural, historical, or archeological resources

To meet suppression objectives appropriate management response (AMR) procedures are required (BLM 2003a). AMR is any specific action suitable to meet FMU objectives (BLM 2003a). AMR, included as part of the Proposed Action, may include the following actions:

- *Monitor from a Distance*: Fire situations where inactive fire behavior and low threats require only periodic monitoring.
- *Monitor On-site*: Fire situations that require the physical placement of monitors on the fire site to track the fire's spread, intensity, and/or characteristics.
- *Confinement*: Actions taken when fires are not likely to have resource benefits, but threats from the fire do not require costly deployment of large numbers of suppression resources.
- *Monitor plus Contingency*: Fires are managed for resource benefits but contingency actions are prepared to ensure adequate preparation for possible undesirable developments.
- *Monitor plus Mitigation*: Fires are managed for resource benefit, yet pose real, but not necessarily immediate, threats. These fires are monitored, but plans are developed and implemented to delay, direct, check fire spread, or contain fire, and to ensure public safety.
- *Initial Attack*. Initially, suppress wildland fires if it is consistent with protecting people or resource values at risk.
- *Suppress Large Fires*: A combination of tactics such as direct attack, indirect attack, and confinement by natural barriers are utilized to accomplish protection objectives as directed in a wildland fire situation analysis (WFSA).
- *Control and Extinguish*: Actions are taken when the selected WFSA indicates a control strategy using direct attack. Sufficient resources are assigned to achieve control of the fire minimizing acres burned.

Following wildland fire suppression, areas may undergo emergency stabilization and rehabilitation (ESR) as appropriate. This activity may include obliteration of firelines, erosion control, and seeding implemented as a resource protection measure. ESR is only implemented after a wildland fire suppression event. ESR would be designed and implemented using an interdisciplinary team approach, utilizing resource and fire staff to develop site-specific ESR plans.

Wildland Fire Use: The management of naturally ignited wildfires to accomplish specific pre-determined resource management goals would be determined on an occurrence-by-occurrence basis for each FMU where wildland fire use has been identified for potential use. An examination of the current fire situation, determination of probable fire cause, and estimation of the potential for fire spread would be conducted to determine the potential to accomplish resource management objectives. If a fire were determined to be suitable for management as a wildland fire use incident, the ignition would be managed in accordance with the procedures and requirements outlined in the *Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide* (USDA 1998).

Prescribed Fire: Prescribed fire would be implemented according to sound scientific information to achieve desired wildland fire conditions (DWFCs). Prescribed fire would be considered for an FMU if it could benefit ecosystems and minimize undesirable wildland fire effects through fuels reduction. Suitability of specific areas for introduction of prescribed fires would be determined through a NEPA review prior to implementation.

The prescribed burn season would typically occur in the fall. Hand pile burning would usually occur in the winter months. However, these types of actions could occur whenever the need is present and conditions are favorable. The fire management staff would initiate prescribed fire projects with input from resource specialists. Prescribed burn bosses would be required to evaluate and assess results and effectiveness of the burn. Prescribed fire may be used for any of the following purposes:

- Fuels reduction around federally listed communities at risk from wildfire
- Conversion of Fire Regime Condition Class (FRCC) 3 lands to FRCC 2 or FRCC 1 lands
- Conversion of FRCC 2 to FRCC 1 lands
- Maintenance of FRCC 1 lands

Non-fire Fuel Treatments: Non-fire fuel treatments (mechanical and biological) may be considered as needed by a site-specific plan. Mechanical treatments include hand thinning, hand piling, brush crunching, mowing, disking, and bullhog thinning. Seeding is often used for fuels treatments. Many FMUs have acreage targets for non-fire fuel treatments. While the remaining FMUs may not have target acres, future treatment plans would be prepared to implement those actions. Similar to prescribed fire, non-fire fuel treatments are considered planned actions and the suitability of specific areas for its introduction would be determined through a NEPA review prior to implementation.

Non-fire fuel treatments can be used for the same purposes as prescribed fire (see above) and may or may not be used in conjunction with prescribed fire. Projects would be developed to achieve DWFCs and the associated vegetation management goals stated in Southern Utah Support Area land use plans.

Restoration and rehabilitation measures may follow prescribed and non-fire management actions. They would emphasize the re-establishment and perpetuation of habitat diversity and prevention or reduction of invasive weed species. The short-term objective would be to stabilize soils, reduce potential impacts to values at risk (cultural, watershed, fish and wildlife, and any adjacent private holdings), and prevent the establishment of non-native invasive species. Long-term objectives include further stabilization of sites. Restoration and rehabilitation efforts are selectively applied to planned management actions. ESR is a part of wildland fire suppression management action and is considered separately from standard restoration and rehabilitation.

APPENDIX E
Goals and Objectives by Fire Management Unit for the Proposed Action

Fire Management Unit (FMU)	Total FMU Acres	Total BLM Acres in FMU	Wild Fire Suppression (contain fire per ignition at this acreage or less)	Decadal Suppression Fire Goal	Wildland Fire Use (10-year acreage estimates)	Prescribed Fire (10-year acreage estimates)	Non-Fire Fuel Treatments (10-year acreage estimates)	Other Goals and Objectives
#1 Big Deer	623,255	569,520	1,000	95,000	0	95,000	95,000	Individual wildfires up to 1,000 acres would contribute to creating desired mosaic except when sage grouse, special status plants, and riparian habitat are threatened. Wildfires exceeding 5,000 acres that continue to meet management objectives should be managed under appropriate suppression strategies. Convert 50,000 acres of pinyon and juniper woodland, 25,000 acres of juniper, and 20,000 acres of sagebrush to sagebrush/perennial grass using wildfire, prescribed, and non-fire fuels treatments.
#2 The Blues	31,453	30,714	0	0	0	0	0	No fire use, prescribed, or non-fire fuels projects in this FMU.
#3 Collett/Fifty-Mile Mountain	167,702	167,702	500	1,000	0	100	100	Allow fire to play a natural role, promote the regeneration of aspen patches by burning at low temperatures or using low-impact mechanical means, and create a mosaic through conversion of areas of pinyon and juniper woodland to sagebrush/perennial grassland. Wildfires exceeding 500 acres that continue to meet management objectives should be managed under appropriate suppression strategies.
#4 Escalante-Circle Cliffs	602,842	572,889	1,000	40,000	0	40,000	40,000	Allow fire to play a natural role and create a mosaic through conversion of pinyon and juniper woodland to sagebrush/perennial grassland. Individual wildfires up to 1,000 acres would contribute to creating desired mosaic. Wildfires exceeding 1,000 acres that continue to meet management objectives should be managed under appropriate suppression strategies.

#5 Kaiparowits	568,949	568,413	5,000	35,000	0	35,000	35,000	Individual wildfires up to 5,000 acres would contribute to creating desired mosaic. Wildfires exceeding 5,000 acres that continue to meet management objectives should be managed under appropriate suppression strategies.
#6 Beaver	74,130	43,953	100	11,000	0	12,000	12,000	Allow fires in pinyon and juniper woodland to burn to 100 acres. Open pinyon and juniper woodland to increase the sagebrush and grass composition. In sagebrush, create a mosaic of different age classes using prescribed or mechanical treatment. In pinyon and juniper woodland, convert 9,000 acres to sagebrush/ perennial grass. In juniper, convert 2,000 acres to sagebrush/perennial grass. For pinyon and juniper woodland, use wildfire, prescribed, and mechanical treatments. Use prescribed and mechanical treatment on about 1,000 acres of sagebrush to improve age class diversity.
#7 Escalante Desert	965,587	340,807	0	2,000	0	1,000	1,000	Use fuels treatments to reduce fuel loads and the possibility of large, severe fires. Improve sagebrush with small prescribed and mechanical treatments. Improve about 500 acres of juniper and convert to sagebrush/ grassland over next 10 years. Improve about 1,500 acres of sagebrush community to grassland/forb over the next 10 years.
#8 Hamblin Valley	240,771	184,290	1,000	27,300	0	10,000	5,000	Apply full suppression in native sagebrush dominated areas. Apply appropriate suppression actions to contain fires to 1,000 acres in pinyon and juniper woodland-dominated areas. Use small sagebrush fires to create a diversity of age classes.Convert 5,000 acres pinyon, 12,300 acres of pinyon and juniper woodland, and 5,000 acres of sagebrush to improve age-class diversity using prescribed and mechanical treatments.

#9 Mineral-Black Mountain	646,152	500,231	1,000	63,000	0	10,000	30,000	Apply full fire suppression in native sagebrush dominated areas. In areas not identified for treatment, apply full fire suppression action in pinyon and juniper woodland areas if 5,000 acres have burned as a result of wildfire over a five year period. Use fire to maintain or expand Utah prairie dog habitat. Convert 54,000 acres of pinyon and juniper woodland to sagebrush/perennial grass using wildfire, prescribed (10,000 acres), and non-fire fuels projects (30,000 acres). Use wildfire, prescribed, and mechanical treatment to convert 5,000 acres of pinyon to mountain shrub or sagebrush and perennial grass. Treat 20,000 acres of sagebrush to improve age class diversity using small prescribed fires and non-fire fuels treatments (10,000 acres). (All of these acreages over the next 10 years.)
#10 Mountain Home	97,185	86,733	5,000	12,250	5,000	12,250	1,000	Open existing closed pinyon and juniper woodland and sagebrush plant communities. Before applying appropriate management response, allow fires to burn up to 5,000 acres to create a mosaic of age classes. Over the next 10 years, convert 12,250 acres of juniper and pinyon and juniper woodland to a sagebrush/grassland plant community. Improve the pinyon plant community to create a more open diverse plant community on 1,000 acres. Use wildfire, prescribed, and non-fire treatments to improve habitat for large grazing ungulates by improving the existing vegetation.
#11 Parowan Front/Antelope Range	412,178	151,553	0	2,000	0	5,000	10,000	Use fire to create a mosaic pattern in the sagebrush vegetation using small burns of 10 to 15 acres in canyon and valley bottoms. Use fire to create a desired future condition of 10 percent grass- and forb-dominated communities and 90 percent sagebrush-dominated communities. Use prescribed and non-fire fuels methods to convert 6,200 acres of pinyon and juniper woodland and 4,600 acres of juniper to sagebrush/perennial grass over 10 years. Treat 5,400 acres of sagebrush to improve age class diversity and create a mosaic of differing age classes. Fully suppress riparian wildfires, especially in the Spring Creek Wilderness Study Area, to prevent damage to Mexican spotted owl habitat.

Fire Management Unit (FMU)	Total FMU Acres	Total BLM Acres in FMU	Wild Fire Suppression (contain fire per ignition at this acreage or less)	Decadal Suppression Fire Goal	Wildland Fire Use (10-year acreage estimates)	Prescribed Fire (10-year acreage estimates)	Non-Fire Fuel Treatments (10-year acreage estimates)	Other Goals and Objectives
#12 Pine Valley	124,295	110,993	0	1,100	0	1,000	1,000	Fully suppress all fires in salt desert scrub and grasslands. Use mechanical and prescribed treatments in sagebrush to improve compositions and age class diversity.
#13 Wah Wah-Needles	664,770	550,689	5,000	40,400	1,000	25,000	25,000	Convert pinyon and juniper woodland and juniper to sagebrush/perennial grass using wildfire, prescribed, and fuels treatments. Convert pinyon to pinyon/mountain brush/perennial grass using all the strategies above. Also treat sagebrush to improve grass component and improve age class diversity using mechanical and prescribed treatments.
#14 Wah Wah Valley	79,132	62,268	0	1,000	0	1,000	1,000	Use wildfire and prescribed fire to maintain existing vegetation in the plant communities and improve sagebrush age class diversity. Over 10 years, do not allow more than 500 acres to burn in the sagebrush plant community. Create a mosaic of age classes in the sagebrush areas by allowing small natural fires and prescribing 10- to 15-acre fires.
#15 Colorado Plateau	216,682	174,701	1,500	30,000	0	10,000	2,000	Maximize habitat diversity in the mountain shrub and sagebrush vegetation types by reducing the amount of shrubs and sagebrush and increasing grass and forbs in selected areas. Maximize habitat diversity in the pinyon and juniper woodland type by reducing the number of trees and increasing desirable shrubs, grasses, and forbs. Maximize habitat diversity in riparian areas within the mountain shrub type by maintaining woody species composition while providing for streambank protection thorough adequate forb and grass cover. Improve mule deer winter habitat and livestock forage by increasing the amount and diversity of forbs and herbaceous material. Protect diverse woody age structure in cottonwood-willow riparian habitat. Suppress fires outside of blackbrush, salt desert scrub, desert grassland, and creosote (which receive full suppression) at 1,500 acres/fire. Convert pinyon and juniper woodland, sagebrush, and sagebrush/perennial grass to plant communities with more grass and forbs.

#16 Great Basin	201,791	174,210	3,000	20,000	0	20,000	5,000	Maximize habitat diversity in the mountain shrub and sagebrush vegetation types by reducing the amount of shrubs and sagebrush and increasing grass and forbs in selected areas. Maximize habitat diversity in the pinyon and juniper woodland type by reducing the number of trees and increasing desirable shrubs, grasses, and forbs. Maximize habitat diversity in riparian areas within the mountain shrub type by maintaining woody species composition while providing for stream bank protection thorough adequate forb and grass cover. Improve mule deer winter habitat and livestock forage by increasing the amount and diversity of forbs and herbaceous material. Protect diverse woody age structure in cottonwood-willow riparian habitat. Increase herbaceous vegetation for rangeland health and habitat improvement and reduce the hazards of wildland fire. Convert 20 percent of pinyon and juniper woodland, mountain shrub, and oak to forbs and grass improving to Condition Class 1 or 2 over the next 10 years via wildfire and prescribed fire in aggregate.
#17 Kolob	58,033	12,178	500	500	500	0	1,000	Use modified suppression to improve herbaceous vegetation for elk and mule deer, livestock forage, and other upland species such as wild turkey and grouse. Protect existing stands from crown fires and loss of ponderosa communities in areas with dominant or considerable ponderosa pine habitat. Protect diverse woody age structure in cottonwood-willow riparian habitat.
#18 Mohave Desert	489,191	267,301	0	1,000	0	1,000	1,000	Suppress all fires within the FMU to protect life, private property, and special status species and their habitat. Use prescribed and non-fire fuels treatments to control tamarisk on 1,000 acres over the next 10 years.

#19 Buckskin/ Dog Valley	163,303	121,403	0	30,000	0	32,400	32,400	Except for pinyon and juniper woodland and seedings, use full fire suppression. Use wildfire, prescribed, and non-fire fuels to convert 30,000 acres of pinyon and juniper woodland to sagebrush and grass. Restore 2,000 acres of old seedings in pinyon and sagebrush vegetation types using prescribed burns and non-fire fuels projects. In the mountain fir community, treat 400 acres using prescribed burning and mechanical treatment to allow aspen to regenerate. Maintain and enhance habitat for sage grouse, mule deer, Utah prairie dog, and elk through use of small, mosaic type fires in the sagebrush type. These small desirable fires generally result under a full suppression response. Convert 30,000 acres of pinyon and juniper woodland to sagebrush/grass using all methods including wildfire. Reduce the effects of the invasion of fir into aspen by treating 400 acres of mountain fir to allow more aspen to grow. Improve about 1,000 acres of old seedings using mechanical treatments and prescribed burning. In the sagebrush community, treat about 1,000 acres to create a mosaic of different age classes.
#20 East Sands	58,584	52,070	0	500	0	9,220	9,220	Protect Kanab municipal watershed values. Use prescribed and non-fire fuels projects to convert 6,600 acres of juniper and 560 acres of pinyon and juniper woodland to sagebrush/grass, 1,380 acres of sagebrush, and 681 acres of sagebrush/perennial grass for age class diversity objectives.

#21 East Zion North Fork	162,836	41,049	0	1,000	0	3,000	3,000	Improve the vigor of the ponderosa pine trees by reducing competition by pinyon and juniper woodland in the understory. Treat 1,000 acres to reduce pinyon and juniper woodland competition (hand cutting and bull hog). Improve critical deer winter range by treating 2,000 acres in pinyon and juniper woodland and sagebrush to create more sagebrush and a mosaic of age class diversity. Improve ponderosa vigor and reproduction by reducing competition by pinyon juniper trees using prescribed and/or non-fire fuels treatments.Protect upper Virgin River watershed. Protect cultural and historic sites.
#22 Glendale Bench	118,618	67,423	0	20,000	0	20,000	22,000	Improve ponderosa pine vigor and reproduction by reducing competition from pinyon and juniper woodland using prescribed fire and/or non-fire fuels treatments. Convert pinyon and juniper woodland to sagebrush/grassland using natural fire, prescribed fire, and mechanical treatment. Convert juniper to sagebrush/grassland using natural fire, prescribed fire, and mechanical treatment. Convert sagebrush using mechanical methods; create a mosaic of age classes in the sagebrush and sagebrush perennial grassland vegetation types.
#23 Kanab-Johnson Canyon	62,260	21,948	0	100	0	0	3,000	Use mechanical treatment for improvement of critical deer habitat in the east portion of the FMU. Protect Siler's pincushion cactus and sensitive plants. Maintain and or enhance existing vegetation communities while keeping fire at a minimum.
#24 Panguitch	175,036	83,235	1,000	15,000	0	15,000	15,800	Full suppression to protect communities, private property and riparian habitat. In pinyon and juniper woodland, contain fires to 1,000 acres or greater using appropriate management response. In sagebrush, contain fires to 50 acres if possible. Improve sage grouse and Utah prairie dog habitat on 15,000 acres using wildfire, prescribed, and non-fire fuels treatments. Use non-fire fuels treatments to improve 800 acres of sagebrush.

APPENDIX F
Resource Protection Measures for Fire Management Units

Resource Protection Measures for Fire Management Units in the Southern Utah Support Area (Note: All Resource Protection Measures are applicable to the Proposed Action. Those applying to the No Action Alternative are identified.)

Code	Protection Measures (and applicable fire management practices) **Abbreviations for fire management actions: SUP: Wildfire suppression; NF: Non-fire fuels treatment; WFU: Wildland fire use for resource benefit; ESR: Emergency stabilization and rehabilitation; RX: Prescribed Fire.**	No Action Alternative	Biz Deer	Blues	Collett/50 mi	Escalante/CC	Kaiparowits	Beaver	Escalante D	Hamblin V	Mineral-Black	Mtn Home	Parowan/Antelope	Pine Valley	Wah-Wah Needles	Wah Wah V	Colo Plateau	Great Basin	Kolob	Mohave D	Buckskin/Dog	East Sands	E Zion/No Fk	Glendale Bench	Kanab-Johnson	Panguitch	Paria	West Sands
	General Resource Protection																											
G-1	Fire rehabilitation and stabilization must begin immediately during suppression. (ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Air Quality																											
AQ-1	Evaluate weather conditions, including wind speed and atmospheric stability, to predict impacts from smoke from prescribed fires and wildland fire use. Coordinate with Utah Department of Environmental Quality for prescribed fires and wildland fire use. (RX, WFU)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
AQ-2	When using chemical fuels reduction methods, follow all label requirements for herbicide application. (NF)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
AQ-3	Monitor wind direction and smoke drift, take actions needed to minimize effects on Zion National Park. (NF)	Y																					X					
	Cultural Resources																											
CR-1	Cultural resource advisors must be contacted when fires occur in fire management units (FMUs) containing sensitive cultural resources. (SUP)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CR-2	Wildland fire use is discouraged in areas containing sensitive cultural resources. A programmatic agreement is being prepared by Utah State Historic Preservation Office, BLM, and the Advisory Council to cover the finding of adverse effect to cultural resources associated with wildland fire use. (WFU) (LUP CR-2)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CR-3	Potential impacts of proposed treatment must be evaluated for compliance with National Historic Preservation Act and Utah statewide protocol. This must be conducted prior to the proposed treatment. (RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CR-4	No heavy equipment use until resource advisor or monument manager arrives. (SUP, WFU)	Y	X	X	X	X																X	X		X		X	X

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	Invasive, Non-Native Species																											
INV-1	Post-fire weed management would include all invasive plant species, not just noxious weeds, and must take a high priority. (ESR)		X	X	X	X	X																				X	
INV-2	In areas known to have weed infestations, aggressive action must be taken to rehabilitate firelines, seed, and provide follow-up monitoring and treatment to reduce the spread of noxious weeds. Monitor burned areas and treat as necessary. All seed used would be tested for purity and for noxious weeds. Seed with noxious weeds would be rejected (BLM 1991). (SUP, WFU, RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INV-3	All machinery and equipment must be high-pressure washed to remove loose soil before entering project/incident areas, where appropriate. (SUP, WFU, RX, NF, ESR)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Native American Religious Concerns																											
NAT-1	Consultations with tribes that claim affiliation to the Southern Utah Service Area (SUSA) planning area would be conducted prior to agency actions, including rehabilitation and hazard fuels reduction projects where traditional cultural properties, sacred sites, or traditional subsistence resources could be affected. (SUP, WFU, RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Threatened, Endangered, or Candidate Species (plants and animals)																											
END-1	Initiate Emergency Section 7 consultation with U.S. Fish and Wildlife Service (USFWS) upon the determination that wildfire suppression may pose a potential threat to any listed threatened and endangered species (TES) or adverse modification of designated critical habitat. (SUP, WFU)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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END-2	Prior to planned fire management actions, survey for listed TES and non-listed sensitive species. Initiate Section 7 consultation with USFWS as necessary if proposed project may affect any listed species. Review appropriate management, conservation and recovery plans and include recovery plan direction into project proposals. For non-listed special status plant and animal species, follow the direction contained in the BLM Manual 6840. Ensure that any proposed project conserves non-listed sensitive species and their habitats and ensure that any action authorized, funded or carried out by BLM does not contribute to the need for any species to become listed. (RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
END-3	See site-specific conservation measures identified in the biological assessment.		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
END-4	All fires within and adjacent to the sage grouse areas (and the lands between the mapped sage grouse habitat) must be immediately suppressed at less than five acres. Limit fires to a maximum of five acres per fire to preserve the sagebrush habitat component on the Skutumpah Terrace above the White Cliffs. (SUP)		X																									
END-5	To protect all special status species (BLM Sensitive), no mechanized equipment or hand tools are recommended for these populations and fire size must be limited to five acres. (SUP)		X	X	X	X	X	X	X	X	X		X	X	X						X					X	X	
END-6	All fires within Jones' Cycladenia and Plateau Ladies Tresses habitats must be immediately suppressed using low-impact/non-surface disturbing methods. (SUP)	Y				X																						
END-7	Suppression action within sensitive plant or TE/sensitive animal areas would be as outlined in the multiple use restrictions for the species. (SUP)											X																
END-8	Fully suppress riparian wildfires, especially in the Spring Creek Wilderness Study Area (WSA), to prevent damage to Mexican spotted owl habitat. (SUP)	Y											X															
END-9	The Woodbury Desert Study Area requires full suppression and must follow Desert Tortoise critical habitat protocol. (SUP)	Y																		X								

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END-10	Fires suppression in Desert Tortoise critical habitat must follow protocol according to Fighting wildfire in desert tortoise habitat: consideration for land manage. (SUP)	Y																X		X								
END-11	To manage for sage grouse, a sensitive species, sage grouse guidelines would be followed in all fire suppression and habitat work. (SUP)	Y																								X		
END-12	To manage for Utah prairie dog, a sensitive species, BLM or Utah prairie dog guidelines must be followed in fire suppression. (SUP)	Y								X	X		X								X					X		
	Wastes (hazardous or solid)																											
HW-1	Recognize hazardous wastes and move fire personnel to a safe distance from dumped chemicals, unexploded ordnance, drug labs, wire burn sites or any other hazardous wastes. Immediately notify BLM field office hazmat coordinator or state hazmat coordinator upon discovery of any hazardous materials, following the BLM hazardous materials contingency plan. (SUP, WFU, RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Water Quality (drinking/ground)																											
WQ-1	Suppress wildfires consistent with compliance strategies for restoring or maintaining the restoration of water quality-impaired (303d listed) waterbodies. Do not use retardant within 300 feet of water bodies. (SUP, WFU)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WQ-2	Plan and implement projects consistent with compliance strategies for restoring or maintaining the restoration of water quality impaired [303(d) listed] waterbodies. Planned activities must take into account the potential impacts on water quality, including increased water yields that can threaten fisheries and aquatic habitat, improvements at channel crossings, channel stability, and downstream values. Of special concern are small headwaters of moderate to steep watersheds, erosive or saline soils, multiple channel crossings, at-risk fisheries, and downstream residents. (RX, NF, ESR)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WQ-3	Prevent degradation of groundwater quality whenever practicable. (SUP, WFU, RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			

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WQ-4	When using chemical fuel reduction treatments, follow all label directions, additional mitigations identified in project NEPA evaluation, and the approved pesticide-use proposal for the chemical(s) being used. Provide a minimum 100-foot-wide riparian buffer strip for aerial application, 25 feet for vehicle application and 10 feet for hand application. Any deviations must be in accordance with the label. Herbicides would be applied to individual plants within 10 feet of water where application is critical (BLM 1991). (NF)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Wetlands/Riparian Zones																											
WET-1	Avoid heavy equipment in riparian or wetland areas. During fire suppression or wildland fire use, consult a resource advisor before using heavy equipment in riparian or wetland areas. (SUP, WFU, RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WET-2	Limit ignition within native riparian or wetland zones. Allow low-intensity fire to burn into riparian areas. (RX)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WET-3	No blading within 1/4-mile buffer of riparian zone. (SUP)																			X						X		
WET-4	Limit wildfires within riparian areas to 100 acres. (SUP, WFU)				X	X																					X	
WET-5	Limit wildfires within riparian areas to five acres. (SUP, WFU)						X																					
WET-6	Restrictions on use of foam and aerial retardant (requires non-toxic certification). If entire riparian habitat is in jeopardy, the resource advisor could allow all necessary suppression tactics to avoid the total loss of habitat, especially where native communities exist. (SUP)	Y															X	X	X	X								
WET-7	Fire suppression within 1/8 mile of riparian zone to prevent destruction of endangered species habitat, or fisheries habitat. (SUP)															X	X		X									

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WET-8	No blading within 1/8-mile buffer of riparian zone. (SUP)																X	X										
	Wilderness and Wilderness Study Areas (H-8550-1, H-1742-1, Manual Section 1742)																											
WILD-1	Use of earth-moving equipment must be authorized by the field office manager for wilderness-related designations and all other land areas. (SUP, WFU, RX, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WILD-2	Fire management actions would rely on the most effective methods of suppression that are least damaging to wilderness values, other resources and the environment, while requiring the least expenditure of public funds. (SUP, WFU)	Y	X	X	X	X	X					X				X	X	X	X			X				X	X	
WILD-3	A resource advisor must be consulted when fire occurs in wilderness and WSAs. (SUP, WFU)	Y	X	X	X	X	X					X				X	X	X	X			X				X	X	
WILD-4	Use of fire retardant must be authorized by the field office manager for wilderness related designations and all other land areas. (SUP, WFU)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WILD-5	All surface disturbances caused by suppression actions would be rehabilitated to the fullest extent. (SUP, WFU)	Y	X	X	X	X	X					X				X	X	X	X			X				X	X	
WILD-6	Suppression actions would be employed within 1/4 mile for protection of private land and established subdivisions due to heavy fuel loading for all land areas, regardless of designation. (SUP)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Rangeland Health Standards and Guidelines																											
R-1	Rangelands that have been burned by wildfire, prescribed fire, or wildland fire use would be ungrazed for a minimum of one complete growing season following the burn.(SUP, WFU, RX)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
R-2	Rangelands that have been re-seeded or otherwise treated to alter vegetative composition, chemically or mechanically, would be ungrazed for a minimum of two complete growing seasons. (RX, NF, ESR)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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	Livestock Grazing																											
LG-1	Coordinate with permittees regarding the requirements for non-use or rest of treated areas. (SUP, WFU, RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Woodland/Forestry																											
WF-1	Planned projects must be consistent with HFRA Section 102(e)(2) to maintain or contribute to the restoration of old-growth stands to a pre-fire suppression condition and to retain large trees contributing to old-growth structure. (SUP, WFU, RX, NF)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WF-2	During planning, consider opportunities to utilize forest and woodland products prior to implementing prescribed fire activities. Include opportunities to use forest and woodland product sales to accomplish non-fire fuels treatments. In forest and woodland stands, consider developing silvicultural prescriptions concurrently with fuels treatment prescriptions. (RX, NF)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Vegetation																											
V-1	When restoring or rehabilitating disturbed rangelands, non-intrusive, non-native plant species are appropriate for use when native species: (1) are not available; (2) are not economically feasible; (3) cannot achieve ecological objectives as well as nonnative species; and/or (4) cannot compete with already established native species (Noxious Weeds Executive Order 13112 2/3/1999; BLM Manual 9015; BLM 1991). (RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
V-2	Fires in blackbrush dominated areas would be suppressed based on the advice of the resource advisor. (SUP)					X																						
	Fish and Wildlife																											
FW-1	Avoid treatments during nesting, fawning, spawning, or other critical periods for wildlife or fish. (RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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FW-2	Avoid or limit the size of, wildland fires in important wildlife habitats such as mule deer winter range, riparian, and occupied sage grouse habitat. Use resource advisors to help prioritize resources and develop wildland fire situation analyses and wildland fire implementation plans when important habitats may be impacted. (SUP, WFU)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FW-3	Minimize wildfire size and frequency in sagebrush communities where sage grouse habitat objectives would not be met if a fire occurs. Prioritize wildfire suppression in sagebrush habitat with an understory of invasive, annual species. Retain unburned islands and patches of sagebrush unless there are compelling safety, private property and resource protection or control objectives at risk. Minimize burn-out operations (to minimize burned acres) in occupied sage-grouse habitats when there are no threats to human life and/or important resources. (SUP)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FW-4	Establish fuels treatment projects at strategic locations to minimize size of wildfires and limit further loss of sagebrush. Fuels treatments may include green-stripping to help reduce the spread of wildfires into sagebrush communities. (RX, NF)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FW-5	Use wildland fire to meet wildlife objectives. Evaluate impacts to sage grouse habitat in areas where WFU for resource benefit may be implemented. (WFU, RX)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FW-6	Create small openings in continuous or dense sagebrush (>30% canopy cover) to create a mosaic of multiple-age classes and associated understory diversity across the landscape to benefit sagebrush-dependent species. (WFU, RX, NF)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FW-7	Implement treatments (fire, cutting, chaining, seeding, etc.) on sites that are currently occupied by forests or woodlands but historically supported sagebrush communities to reestablish sagebrush communities. (RX, NF)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FW-8	Evaluate and monitor burned areas and continue management restrictions until the recovering and/or seeded plant community reflect the desired condition. (SUP, WFU, RX, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Code	Protection Measures (and applicable fire management practices) Abbreviations for fire management actions: SUP: Wildfire suppression; NF: Non-fire fuels treatment; WFU: Wildland fire use for resource benefit; ESR: Emergency stabilization and rehabilitation; RX: Prescribed Fire.	No Action Alternative	Big Deer	Blues	Collett/50 mi	Escalante/CC	Kaibarowits	Beaver	Escalante D	Hamblin V	Mineral-Black	Mtn Home	Parowan/Antelope	Pine Valley	Wah-Wah Needles	Wah Wah V	Colo Plateau	Great Basin	Kolob	Mohave D	Buckskin/Dog	East Sands	E Zion/No Fk	Glendale Bench	Kanab-Johnson	Paneuitch	Paria	West Sands
FW-9	Utilize the ESR program to apply appropriate post-fire treatments within crucial wildlife habitats, including sage grouse habitats. Minimize seeding with non-native species that may create a continuous perennial grass cover and restrict establishment of native vegetation. Seed mixtures must be designed to re-establish important seasonal habitat components for sage grouse. Leks must not be re-seeded with plants that change the vegetation height previously found on the lek. Forbs must be stressed in early and late brood-rearing habitats. In situations of limited funds for ESR actions, prioritize rehabilitation of sage grouse habitats. (ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Soils																											
S-1	Avoid heavy equipment use on highly erosive soils (soils with low soil loss tolerance), wet or boggy soils and slopes greater than 30%, unless otherwise analyzed and allowed under appropriate National Environmental Policy Act (NEPA) evaluation with implementation of additional erosion control and other soil protection mitigation measures. (SUP, WFU, RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S-2	There may be situations where high intensity fire would occur on sensitive and erosive soil types during wildland fire, wildland fire use or prescribed fire. If significant areas of soil show evidence of high severity fire, then evaluate area for soil erosion potential and downstream values at risk and implement appropriate or necessary soil stabilization actions such as mulching or seeding to avoid excessive wind and water erosion. (SUP, WFU, RX)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S-3	Complete necessary rehabilitation on firelines or other areas of direct soil disturbance, including but not limited to waterbarring firelines, covering and mulching firelines with slash, tilling and/or subsoiling compacted areas, scarification of vehicle tracks, off-highway vehicle (OHV) closures, seeding and/or mulching for erosion protection. (SUP, WFU, RX)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Code	Protection Measures (and applicable fire management practices) Abbreviations for fire management actions: SUP: Wildfire suppression; NF: Non-fire fuels treatment; WFU: Wildland fire use for resource benefit; ESR: Emergency stabilization and rehabilitation; RX: Prescribed Fire.	No Action Alternative	Big Deer	Blues	Collett/50 mi	Escalante/CC	Kaibarowits	Beaver	Escalante D	Hamblin V	Mineral-Black	Mtn Home	Parowan/Antelope	Pine Valley	Wah-Wah Needles	Wah Wah V	Colo Plateau	Great Basin	Kolob	Mohave D	Buckskin/Dog	East Sands	E Zion/No Fk	Glendale Bench	Kanab-Johnson	Panguitch	Paria	West Sands
S-4	When using mechanical fuels reduction treatments, limit tractor and heavy equipment use to periods of low soil moisture to reduce the risk of soil compaction. If this is not practical, evaluate sites, post treatment and if necessary, implement appropriate remediation, such as subsoiling, as part of the operation. (NF)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S-5	Treatments such as chaining, plowing, and roller chopping would be conducted as much as practical on the contour to reduce soil erosion (BLM 1991). (NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Recreation																											
REC-1	Wildland fire suppression efforts would preferentially protect special recreation management areas and recreation site infrastructure in line with fire management goals and objectives. (SUP)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
REC-2	Vehicle tracks created off established routes would be obliterated after fire management actions in order to reduce unauthorized OHV travel. (SUP, WFU, RX, NF, ESR)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Geology/Mineral Resources, including Oil and Gas																											
M-1	A safety buffer must be maintained between fire management activities and at-risk facilities. (SUP, WFU, RX)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Paleontology																											
P-1	Plan and implement projects consistent with BLM Manual and Handbook H-8270-1, Chapter III (A) and III (B) in order to avoid areas where significant fossils are known or predicted to occur, or to provide for other mitigation of possible adverse effects. (RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
P-2	In the event that paleontological resources are discovered in the course of surface fire management activities, including fires suppression, efforts must be made to protect these resources. (SUP, WFU, RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Code	Protection Measures (and applicable fire management practices) Abbreviations for fire management actions: SUP: Wildfire suppression; NF: Non-fire fuels treatment; WFU: Wildland fire use for resource benefit; ESR: Emergency stabilization and rehabilitation; RX: Prescribed Fire.	No Action Alternative	Big Deer	Blues	Collett/50 mi	Escalante/CC	Kaibarowits	Beaver	Escalante D	Hamblin V	Mineral-Black	Mtn Home	Parowan/Antelope	Pine Valley	Wah-Wah Needles	Wah Wah V	Colo Plateau	Great Basin	Kolob	Mohave D	Buckskin/Dog	East Sands	E Zion/No Fk	Glendale Bench	Kanab-Johnson	Paneuitch	Paria	West Sands
P-3	There are important and sensitive paleontological resources in this FMU. A resource advisor and paleontologist must be ordered for every wildfire report and all fires where on-ground actions occur. (ESR)			X																								
	Lands/Access																											
LA-1	Fire management practices would be designed to avoid or otherwise ensure the protection of authorized rights-of-way and other facilities located on the public lands, including coordination with holders of major right-of-way systems within right-of-way corridors and communication sites. (WFU, RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LA-2	The actions of any fire management practice must not destroy, deface, change, or remove to another place any monument or witness tree of the Public Land Survey System. Cadastral surveys (see 18 USC Sec. 1858, Title 18, Part I, Chapter 91, Section 1858) (SUP, WFU, RX, NF, ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	To protect private structures and/or lands, fire suppression would consist of constructing a 0.5-mile buffer zone. (SUP, RX, NF)		X	X	X	X	X	X	X	X	X	X	X	X	X	X					X	X		X		X		X
LA-3	To protect private structures and/or lands, fire suppression would consist of constructing a 0.5-mile buffer zone. (SUP, RX, NF)																			X			X					
LA-4	To protect private structures and/or lands, fire suppression would consist of constructing 0.25-mile buffer zone around private structures. (SUP, RX, NF)																	X	X						X		X	
LA-5	To protect private structures and/or lands, fire suppression would consist of constructing 0.125-mile buffer zone around private structures. (SUP, RX, NF)																X											
	Wild Horse and Burros																											
WHB-1	Rehabilitation plans would not propose the construction of range fencing that could restrict wild horses and burros access to water sources. (ESR)	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

APPENDIX G
Cultural Resource Site Types

Cultural Resource Site Types in Southern Utah Support Area

Prehistoric Archaeological Sites

Burial	Evidence of human burial or interment, usually consisting of human bone or fragments, as well as funeral objects.
Ceramic Scatter	A location of scattered broken pottery sherds, usually from a single vessel.
Hunting & Gathering Camp	A temporary or seasonal habitation area that is associated with hunting and gathering of floral or fauna.
Isolated Artifacts	Artifacts, such as lithic tools and ceramic sherds, that lack association to a site.
Lithic Scatter	A location used for the manufacture of stone tools, as evidenced by the presences of lithic flakes, cores, and discarded broken tools.
Midden	A refuse area usually associated with occupation sites, such as extended campsites and villages.
Open Campsite	A temporary habitation area, usually associated with movement across the landscape.
Petroglyphs	Designs that have been pecked, etched, or scratched into a rock face.
Pictographs	Designs that have been painted onto a rock face.
Quarry/Lithic Source	A geological location, usually an outcrop, which served as a source for raw lithic material used for the manufacture of stone tools, paints, or ceramics.
Rock Cairn	A trail marker, monument, or possible religious structures consisting of stones placed in a pile or cluster.
Rock Shelter	A habitation area located within a rock shelter or cave.
Rock Alignments	A series of stones laid in an alignment that are not naturally occurring geological features.
Village	A habitation area for several families that extends over a long period of time.
Architectural Sites	Refers to sites such as granaries, cliff structures, sites with standing pueblo walls, etc.

Historic Archaeological Sites

Mining Site	Evidence of mining activities, such as mine shafts, addits, tailings/spoil piles, milling equipment, habitation sites, trams, ore cars and tracks, trash dumps, and other mining equipment.
Town Site	An amalgamation of structures and other physical remains of occupation by a substantial population.

House/Cabin	Usually a single dwelling site associated with physical remains and features from a single person or family occupation.
Homestead	A complex of structures that are associated with the exploitation of a new resource area for farming or ranching.
Ranch/Farm	A well established complex of structures devoted to farming and/or ranching activities. Associated features, such as hay derricks, wind mills and watering ponds, corrals, fences, and satellite ranch houses, may be scattered across the landscape.
Historic Campsite	Evidence of short-term occupation by people that may be associated with recreation, travel, mining, ranching, farming, grazing, and hunting.
Ranch/Farm	A well-established complex of structures devoted to farming and/or ranching activities. Associated features such as hay derricks, windmills, and watering ponds, corrals, fences, and satellite ranch houses may be scattered across the landscape.
Road or Trail	Evidence of historic use for transportation such as wagon trails, pack trains, cattle drive trails, old signs, abandoned road segments, asphalt, and stone or wooden culverts, as well as abandoned bridges or abutments.
Military Activities	Sites that are associated with military training, bombing practices, gunnery ranges, maneuver areas, camps, or air bases. Artifacts vary and may include targets, structures, ordnance, ordnance fragments, missile and aircraft debris, and other military equipment or refuse.
Trash Dump/Scatter	A concentration of various artifacts such as ceramics, glass, metal, bone, and leather, which usually form a dump. The material may have been scattered by the elements or human activity and is usually associated with a long-term campsite, habitation area or other human endeavor.
Grave	One or more historic burials that are usually located along trails or in isolated areas as opposed to cemeteries that are more formal areas of interment. The graves may or may not be marked with a headstone.
Cemetery	Historic burials that are usually located in a formal area of internment that have been laid out and enclosed by a fence. The graves are marked by headstones.
Tin Can Scatter	A concentration of tin cans that usually form a dump that may have been scattered by the elements and is usually associated with a long-term campsite, habitation area or other human endeavor.

Traditional Cultural/Religious Sites

Ceremonial Site	A prehistoric or historic area of sacred character. Physical evidence of ceremonial activities are usually present in the form of dance patterns, vision quest circles, rock cairns, etc.

Sacred Areas	A prehistoric or historic area of sacred character. Evidence of physical activities are not always present. Certain mountains, power places, and vision quest locations are examples of sacred areas.
Traditional Use Area	An area of traditional use for hunting, gathering of food or medicinal plants, fishing, or traveling.
Processing Station	One to several metates (and little else) that are stored/cached in favorable locales and returned to/used on a recurring basis.

APPENDIX H
Federally Listed, Candidate, and Petitioned Species

Federally Listed, Candidate, and Petitioned Species in the Southern Utah Support Area

Common Name[a]	Scientific Name	Federal Status[b]	Vegetation Community (substrate type identified for flowering plants only)	Field Office[c]
Flowering Plants				
Dwarf bear-poppy	*Arctomecon humilis*	Endangered	Blackbrush (sandy, clay, alluvium)	St. George
Shivwitz milk-vetch	*Astragalus ampullarioides*	Endangered	Pinyon and Juniper Woodland, Blackbrush (clay, gypsiferous)	St. George
Holmgren milk-vetch	*Astragalus holmgreniorum*	Endangered	Blackbrush (limestone)	St. George
Kodachrome bladerpod	*Lesquerella tumulosa*	Endangered	Pinyon and Juniper Woodland, Grassland (shale)	Kanab, Grand Staircase-Escalante National Monument (GSENM)
Welsh's milkweed*	*Asclepias welshii*	Threatened	Pinyon and Juniper Woodland, Sagebrush, Ponderosa Pine (sandy)	Kanab, GSENM
Jones cycladenia	*Cycladenia jonesii (=humilis)*	Threatened	Salt Desert Shrub, Pinyon and Juniper Woodland (sandy)	Kanab, GSENM
Maguire daisy	*Erigeron maguirei*	Threatened	Pinyon and Juniper Woodland, Mountain Shrub, Ponderosa Pine, Wetlands and Riparian Zones (sandstone)	Kanab, GSENM
Siler's pincushion cactus	*Pediocactus sileri*	Threatened	Salt Desert Shrub, Blackbrush (calcareous, gypsiferous, sandy, shale)	St. George, Kanab, GSENM
Ute ladies'-tresses (*H*)	*Spiranthes diluvialis*	Threatened	Wetlands and Riparian Zones (hanging gardens)	Kanab, GSENM
Birds				
Southwestern willow flycatcher**	*Empidonax traillii extimus*	Endangered	Wetlands and Riparian Zones	Kanab, Cedar City, St. George, GSENM
California condor (*H, Exp*)	*Gymnogyps californianus*	Endangered, 10(j)	Salt Desert Shrub, Pinyon and Juniper Woodland, Sagebrush	Kanab, Cedar City, St. George, GSENM
Bald eagle (*Br*)	*Haliaeetus leucocephalus*	Threatened	Sagebrush, Mixed Conifer, Wetlands and Riparian Zones	Kanab, Cedar City, St. George, GSENM
Mexican spotted owl* (*Br*)	*Strix occidentalis lucida*	Threatened	Pinyon and Juniper Woodland, Sagebrush, Wetlands and Riparian Zones	Kanab, Cedar City, St. George, GSENM

Common Name[a]	Scientific Name	Federal Status[b]	Vegetation Community (substrate type identified for flowering plants only)	Field Office[c]
Western yellow-billed cuckoo	*Coccyzus americanus*	Candidate	Wetlands and Riparian Zones	Kanab, Cedar City, St. George, GSENM
Mammals				
Utah prairie dog	*Cynomys parvidens*	Threatened	Sagebrush, Grassland	Kanab, Cedar City, GSENM
Pygmy rabbit	*Brachylagus idahoensis*	Petitioned	Sagebrush	Kanab, Cedar City, St. George, GSENM
Fish				
Humpback chub* (*H*)	*Gila cypha*	Endangered	Water	Kanab, GSENM
Bonytail chub* (*H*)	*Gila elegans*	Endangered	Water	Kanab, GSENM
Virgin River chub*	*Gila seminude(=robusta)*	Endangered	Water	St. George
Woundfin*	*Plagopterus argentissimus*	Endangered	Water	St. George
Colorado pikeminnow (=squawfish)* (*H*)	*Ptychocheilus lucius*	Endangered	Water	Kanab, GSENM
Razorback sucker* (*H*)	*Xyrauchen texanus*	Endangered	Water	Kanab, GSENM
Invertebrates				
Kanab ambersnail**	Oxyloma haydeni kanabensis	Endangered	Wetlands and Riparian Zones	Kanab, GSENM
Coral Pink Sand Dunes tiger beetle	Cicindela limbata albissima	Candidate, Petitioned	Pinyon and Juniper Woodland, Sagebrush, Ponderosa Pine	Kanab, GSENM
Reptiles				
Desert tortoise, Mojave population*	*Gopherus agassizii*	Threatened	Blackbrush	St. George

[a] Definitions for notations:

Species with an asterisk (*) have designated critical habitat. Species with a double asterisk (**) have proposed critical habitat.

Br—Species known to nest or breed within the planning area.

H—Species or populations existed in historical locations (i.e., the current range or number of individuals or populations has decreased when compared to historical standards). For extirpated species, all management areas are considered historical.

Exp—Management areas contain designated use areas for experimental, nonessential populations designated under Section 10(j) of the Endangered Species Act (ESA), as amended.

[b] Definitions for species status:

Endangered species are those species or distinct populations listed by U.S. Fish and Wildlife Service (USFWS) that have a probability of worldwide extinction.

Threatened species are those species or distinct populations listed by USFWS that are threatened with becoming endangered.

Candidate and petitioned species have no legal protection under the ESA, as amended. However, USFWS has sufficient information on biological vulnerability and threats to candidate species that they are under active consideration by the USFWS for federal listing. For petitioned species, outside entities have submitted petitions to USFWS to consider these species for federal listing. Candidate or petitioned species could be proposed or listed during the life of the proposed action for this project.

Species designated as "10(j)" are considered by USFWS to be "experimental and non-essential populations" within designated use areas in Utah, as provided by Section 10(j) of the ESA, as amended. This designation provides greater management flexibility. For BLM, 10(j) populations of federally listed species are equivalent to a "proposed" status.

[C] Field office is indicated when a species or potential suitable habitat occurs in a county with BLM-administered lands. In those cases, the specific field office that administers public lands in those counties has been identified. It does not necessarily indicate that the species or its potential suitable habitat has been inventoried within the field office.

APPENDIX I
BLM Sensitive Species

BLM Sensitive Species in the Southern Utah Support Area

Common Name[a]	Scientific Name	Federal Status[b]	Vegetation Community (substrate type identified for flowering plants only))	Field Office
Flowering Plants				
Lori's columbine	*Aquilegia loriae*	SPS	Wetlands and Riparian Zones (sandstone)	Kanab, GSENM
Gumbo milk-vetch	*Astragalus ampullarius*	SPS	Salt Desert Shrub, Blackbrush (clay)	Kanab, St. George, GSENM
Pink egg milk-vetch	*Astragalus oophorus* var. *lonchocalyx*	SPS	Salt Desert Shrub, Pinyon and Juniper Woodland, Sagebrush (sandy)	Cedar City
Escarpment milk-vetch	*Astragalus striatiflorus*	SPS	Salt Desert Shrub, Pinyon and Juniper Woodland, Ponderosa Pine (sandy)	Kanab, St. George, GSENM
Baird's camissonia	*Camissonia bairdii*	SPS	Pinyon and Juniper Woodland, Blackbrush (clay)	St. George
Slender camissonia	*Camissonia exilis*	SPS	Pinyon and Juniper Woodland, Sagebrush Grassland (calcareous, clay, gypsiferous, sandy)	Kanab, GSENM
Gould's camissonia	*Camissonia gouldii*	SPS	Pinyon and Juniper Woodland, Sagebrush (igneous)	St. George
Virgin thistle	*Cirsium virginensis*	SPS	Wetlands and Riparian Zones (hanging gardens)	St. George
Mound cryptanth	*Cryptantha compacta*	SPS	Salt Desert Shrub (dolomitic, gravelly loam)	Cedar City
Pipe Springs cryptanth	*Cryptantha semiglabra*	SPS	Salt Desert Shrub, Pinyon and Juniper Woodland, Sagebrush (clay)	St. George
Pinnate spring parsley (Beck biscuitroot)	*Cymopterus beckii*	SPS	Pinyon and Juniper Woodland, Mountain Shrub, Ponderosa Pine (sandy)	Kanab, GSENM
Hole-in-the-rock prairieclover	*Dalea flavescens* var. *epica*	SPS	Blackbrush (sandstone, sandy)	Kanab, GSENM
Nevada willowherb	*Epilobium nevadense*	SPS	Pinyon and Juniper Woodland, Mountain Shrub (limestone, quartzite)	Cedar City, St. George
Cronquist buckwheat	*Eriogonum corymbosum* var. *cronquistii*	SPS	Salt Desert Shrub, Pinyon and Juniper Woodland (granitic)	Kanab, GSENM
Scarlet buckwheat	*Eriogonum phoeniceum*	SPS	Pinyon and Juniper Woodland, Mountain Shrub (igneous)	Cedar City
Frisco buckwheat	*Eriogonum soredium*	SPS	Pinyon and Juniper Woodland, Sagebrush (limestone)	Cedar City
Utah spurge	*Euphorbia nephradenia*	SPS	Salt Desert Shrub, Blackbrush (clay, sandy)	Kanab, GSENM
Cataract gilia	*Gilia latifolia* var. *imperialis*	SPS	Salt Desert Shrub (sandstone, sandy)	Kanab, GSENM

Common Name[a]	Scientific Name	Federal Status[b]	Vegetation Community (substrate type identified for flowering plants only))	Field Office
Alcove bog-orchid	*Habenaria zothecina*	SPS	Wetlands and Riparian Zones (hanging gardens)	Kanab, GSENM
Pine Valley goldenbush	*Haplopappus crispus*	SPS	Mountain Shrub, Mixed Conifer, Ponderosa Pine, Aspen (gravelly loam, sandy)	St. George
Cedar Breaks goldenbush	*Haplopappus zionis*	SPS	Mixed Conifer, Ponderosa Pine (limestone)	Kanab, Cedar City, GSENM
Paria iris	*Iris pariensis*	SPS	Grassland (sandy)	Kanab, GSENM
Ostler's Ivesia	*Ivesia shockleyi* var. *ostleri*	SPS	Pinyon and Juniper Woodland, Ponderosa Pine (quartzite)	Cedar City
Cliff jamesia	*Jamesia americana* var. *zionis*	SPS	Pinyon and Juniper Woodland, Mountain Shrub, Ponderosa Pine (hanging gardens, sandstone)	Kanab, St. George, GSENM
Claron pepperplant	*Lepidium montanum* var. *claronense*	SPS	Pinyon and Juniper Woodland, Sagebrush Ponderosa Pine (limestone)	Kanab, GSENM
Ostler pepperplant	*Lepidium ostleri*	SPS	Pinyon and Juniper Woodland (limestone)	Cedar City
Clark's lomatium	*Lomatium graveolens* var. *clarkii*	SPS	Mountain Shrub, Ponderosa Pine (limestone, sandstone)	St. George
Cutler's lupine	*Lupinus caudatus* var. *cutleri*	SPS	Pinyon and Juniper Woodland (unspecified)	Kanab, GSENM
Murdock's evening primrose	*Oenothera murdockii*	SPS	Pinyon and Juniper Woodland (clay)	Kanab, GSENM
Barneby's breadroot	*Pediomelum aromaticum* var. *barnebyi*	SPS	Pinyon and Juniper Woodland (clay)	St. George
Kane breadroot	*Pediomelum epipsilum*	SPS	Pinyon and Juniper Woodland (clay)	Kanab, GSENM
Sandloving penstemon	*Penstemon ammophilus*	SPS	Mountain Shrub, Ponderosa Pine (sandy)	Kanab, St. George, GSENM
Franklin's penstemon	*Penstemon franklinii*	SPS	Salt Desert Shrub, Sagebrush, Grassland (sandy)	Cedar City
Pinyon penstemon (Pine Valley Mtn penstemon)	*Penstemon pinorum*	SPS	Salt Desert Shrub, Pinyon and Juniper Woodland, Sagebrush Mountain Shrub (limestone)	Cedar City, St. George
Parry's petalonyx	*Petalonyx parryi*	SPS	Salt Desert Shrub, Blackbrush (clay, gypsiferous)	St. George
Cronquist's phacelia	*Phacelia cronquistiana*	SPS	Pinyon and Juniper Woodland, Sagebrush Ponderosa Pine (clay)	Kanab, GSENM
Atwood's pretty	*Phacelia pulchella* var. *atwoodii*	SPS	Pinyon and Juniper Woodland, Sagebrush Mountain Shrub (clay)	Kanab, GSENM
Chinle chia	*Salvia columbariae* var. *argillacea*	SPS	Pinyon and Juniper Woodland, Blackbrush (alluvium, clay, gypsiferous)	Kanab, GSENM
Jones' globemallow	*Sphaeralcea caespitosa*	SPS	Salt Desert Shrub, Grassland	Cedar City

Common Name[a]	Scientific Name	Federal Status[b]	Vegetation Community (substrate type identified for flowering plants only))	Field Office
	var. *caespitosa*		(calcareous, dolomitic)	
Smoky Mountain globemallow	*Sphaeralcea grossulariifolia* var. *fumariensis (=Sphaeralcea fumariensis*)	SPS	Salt Desert Shrub, Pinyon and Juniper Woodland, Grassland Blackbrush (alluvium)	Kanab, GSENM
Kanab thelypody	*Thelypodiopsis ambigua* var. *erecta*	SPS	Salt Desert Shrub, Pinyon and Juniper Woodland (clay, shale)	Kanab, GSENM
Frisco clover	*Trifolium friscanum* (=*T. andersonii* var. *friscanum*)	SPS	Pinyon and Juniper Woodland (igneous, limestone)	Cedar City
Tropic goldeneye	*Viguiera soliceps*	SPS	Salt Desert Shrub (clay, shale)	Kanab, GSENM
Birds				
Northern goshawk	*Accipiter gentiles*	CA	Mixed Conifer, Wetlands and Riparian Zones	Kanab, Cedar City, St. George, GSENM
Short-eared owl	*Asio flammeus*	WSC	Grassland	Kanab, Cedar City, St. George, GSENM
Burrowing owl	*Athene cunicularia*	WSC	Grassland	Kanab, Cedar City, St. George, GSENM
Ferruginous hawk	*Buteo regalis*	WSC	Sagebrush, Grassland	Kanab, Cedar City, St. George, GSENM
Black swift	*Cypseloides niger*	WSC	Mountain Shrub, Mixed Conifer, Wetlands and Riparian Zones, Aspen	Cedar City, St. George
Lewis's woodpecker	*Melanerpes lewis*	WSC	Pinyon and Juniper Woodland, Mountain Shrub, Mixed Conifer, Ponderosa Pine, Wetlands and Riparian Zones	Kanab, Cedar City, St. George, GSENM
Long-billed curlew	*Numenius americanus*	WSC	Grassland	Kanab, Cedar City, St. George, GSENM
American white pelican	*Pelecanus erythrorhynchos*	WSC	Wetlands and Riparian Zones	Kanab, St. George, GSENM
Three-toed woodpecker	*Picoides tridactylus*	WSC	Mixed Conifer, Aspen	Kanab, Cedar City, St. George, GSENM
Greater sage grouse	*Centrocercus urophasianus*	WSC	Sagebrush	Kanab, Cedar City, St. George, GSENM
Mammals				
Townsend's big-eared bat	*Corynorhinus townsendii*	WSC	Mountain Shrub, Mixed Conifer	Kanab, Cedar City, St. George,

Common Name[a]	Scientific Name	Federal Status[b]	Vegetation Community (substrate type identified for flowering plants only))	Field Office
				GSENM
Spotted bat	*Euderma maculatum*	WSC	Salt Desert Shrub, Mountain Shrub, Mixed Conifer, Ponderosa Pine	Kanab, Cedar City, St. George, GSENM
Allen's big-eared bat	*Idionycteris phyllotis*	WSC	Mountain Shrub, Mixed Conifer, Ponderosa Pine	Kanab, St. George, GSENM
Western red bat	*Lasiurus blossevillii*	WSC	Mixed Conifer, Wetlands and Riparian Zones	St. George
Fringed myotis	*Myotis thysanodes*	WSC	Salt Desert Shrub, Pinyon and Juniper Woodland, Mixed Conifer	Kanab, Cedar City, St. George, GSENM
Big free-tailed bat	*Nyctinomops macrotis*	WSC	Mountain Shrub, Mixed Conifer	Kanab, Cedar City, St. George, GSENM
Dark kangaroo mouse	*Microdipodops megacephalus*	WSC	Sagebrush	Cedar City
Kit fox	*Vulpes macrotis*	WSC	Salt Desert Shrub	Kanab, Cedar City, St. George, GSENM
Fish				
Bonneville cutthroat trout	*Oncorhynchus clarki utah*	CA	Water	Kanab, Cedar City, St. George, GSENM
Colorado River cutthroat trout	*Oncorhynchus clarki pleuriticus*	CA	Water	Kanab, GSENM
Virgin spinedace	*Lepidomeda mollispinis mollinspinis*	CA	Water	St. George
Least chub	*Iotichthys phlegethontis*	CA	Water	Cedar City
Leatherside chub	*Gila copei*	WSC	Water	Kanab, GSENM
Roundtail chub	*Gila robusta*	CA	Water	Kanab, GSENM
Desert sucker	*Catostomus clarki*	WSC	Water	Kanab, St. George, GSENM
Flannelmouth sucker	*Catostomus latipinnis*	CA	Water	Kanab, St. George, GSENM
Invertebrates				
Utah physa	*Physella utahensis*	WSC	Wetlands and Riparian Zones, Water	Kanab, GSENM
Desert springsnail	*Pyrgulopsis deserta*	WSC	Wetlands and Riparian Zones, Water	St. George
Hamlin Valley pyrg	*Pyrgulopsis hamlinensis*	WSC	Wetlands and Riparian Zones, Water	Cedar City
Black Canyon pyrg	*Pyrgulopsis plicata*	WSC	Wetlands and Riparian Zones, Water	Kanab, GSENM

Common Name[a]	Scientific Name	Federal Status[b]	Vegetation Community (substrate type identified for flowering plants only))	Field Office
Amphibians				
Boreal (= Western) toad	*Bufo boreas*	WSC	Mixed Conifer, Wetlands and Riparian Zones	Kanab, GSENM
Arizona toad	*Bufo microscaphus*	WSC	Wetlands and Riparian Zones	Kanab, Cedar City, St. George, GSENM
Reptiles				
Zebra-tailed lizard	*Callisaurus draconoides*	WSC	Salt Desert Shrub	St. George
Western banded gecko	*Coleonyx variegates*	WSC	Salt Desert Shrub, Pinyon and Juniper Woodland, Mountain Shrub	St. George
Desert iguana	*Dipsosaurus dorsalis*	WSC	Blackbrush	St. George
Gila monster	*Heloderma suspectum*	WSC	Blackbrush	St. George
Common chuckwalla	*Sauromalus ater*	WSC	Salt Desert Shrub	Kanab, Cedar City, St. George, GSENM
Desert night lizard	*Xantusia vigilis*	WSC	Blackbrush	Kanab, St. George, GSENM
Sidewinder	*Crotalus cerastes*	WSC	Salt Desert Shrub	St. George
Speckled rattlesnake	*Crotalus mitchellii*	WSC	Salt Desert Shrub	St. George
Mojave rattlesnake	*Crotalus scutulatus*	WSC	Salt Desert Shrub	St. George
Western threadsnake	*Leptotyphlops humilis*	WSC	Salt Desert Shrub	St. George

[a] Species already represented as federally listed, candidate, or petitioned species are not repeated here. Sources of information: UDWR 2003, BLM 2002b.

[b] BLM sensitive species status designations are Conservation Agreement (CA), BLM Wildlife Species of Concern , and BLM Sensitive Plant Species. CA species receive special management to preclude the need for listing. CAs are voluntary cooperative plans among resource agencies that identify threats to a species and implement conservation measures to proactively conserve and protect species in decline.

APPENDIX J
Fire's Interaction with Resources

Fire's Interaction with Resources

Fire's Interaction with Air Resources

Wildland fires are a source of air pollutant emissions during the combustion of vegetation. The major pollutant of concern in smoke from fire is fine-particulate matter, both $PM_{2.5}$ and PM_{10} (Sandberg et al. 2002), which is specified in the Utah Smoke Management Plan (SMP) as the primary indicator for ambient air quality (Utah Interagency Smoke Management 2000).

The amount of particulate matter emissions depends on the size and intensity of the fire, fuel types and moisture content, and available fuels load. The level of resulting air quality impact depends on the amount and duration of emissions, atmospheric dispersion conditions, and terrain. Wildland fires may occur at any time; however, wildland fires are most likely to occur in the Southern Utah Service Area (SUSA) planning area during summer months (wildland fire season) due to higher temperatures, drier conditions, and increased fuel loads such as dry grasses. The magnitude and extent of air quality effects resulting from the wildland fire and prescribed fire are too complex to quantify due to the variability of potential fire management activities and the period of time each could occur.

Fire's Interaction with Areas of Critical Environmental Concern

In many cases, fire is a natural part of the character of an area. However, fire could damage or destroy the relevant and important values for which each area of critical environmental concern (ACEC) was originally designated (see the fish and wildlife, sensitive species, vegetation, cultural resources, and visual resources sections of Chapter 4). These disturbances, with some exceptions, would often be temporary and short-term, while relevant and important values are assessed on a long-term scale.

Fire's Interaction with Cultural Resources

The understanding of how fire affects cultural resources is necessary in order to analyze the impact of proposed management actions covered in Chapter 4. These interactions are context-dependent and vary by temperature and duration of exposure to heat. Generally, higher temperatures and/or longer duration of exposure to heat increase the potential for damage to cultural resources. Variables that affect temperature and duration include type of fuel, fuel load and distribution, fuel moisture and soil type and moisture (Wiltz n.d.). As a general rule, fire does not affect buried cultural materials. Studies show that even a few centimeters of soil cover (10 cm) are sufficient to protect cultural materials (Oster n.d.). However, there are times when conditions do carry heat below the surface, with the potential to affect buried materials. These conditions include stumps, heavy duff, surface logs, and roots that smolder and burn. Fires that burn hot and fast through a site may have less of an effect on certain types of cultural materials than fires that smolder in the duff or than logs that burn for a period of time.

Prehistoric and historic resources potentially affected by fire may be inorganic (lithic, ceramics, cans, glass, rock art, etc.) or organic (basketry, wooden structures, dendroglyphs, etc.). Certain resources that are important for dating archaeological sites are also affected. Generally, organic materials are more at risk as they tend to burn or alter at lower temperatures than inorganic items.

Fire can affect chipped and groundstone tools through changes in morphology rather than in chemistry. Exposure to heat and rapid cooling may cause fracturing, potlidding, crazing, shattering, and changes in color and internal luster, which might reduce an artifact's ability to render information about the past. Deal (n.d.), Buenger (2003), Loyd et al. (2002), Shackley and Dillian (2002), and Waechter (n.d.) provide data concerning the effects of temperature on obsidian, various silicates (including chert), basalt, and sandstone used for groundstone. Generally, hotter temperatures and longer exposure to fire may affect lithic materials. It may be necessary to take protective measures when these materials are likely to be present.

Different types of clays, inclusions, and manufacturing techniques lead to different effects among distinct ceramic types. Heat damage is not as significant a consideration for this artifact type as it is for others. Generally, structural damage does not occur until temperatures exceed the original firing temperature. The main type of damage noted is to the surface decoration or glaze (Andrews 2004; Rude and Jones n.d.). Pyne et al. (1996) suggest that when fires remain below 500° C and occur within 30 minutes (as is typical for prescribed burns), little damage to artifacts and resources even at shallow depths is likely to occur.

Inorganic historic artifacts are generally safe from fire, but some artifacts such as soldered cans may melt at temperatures as low as 137 to 177° C (Haecker n.d). Can morphology may be damaged and ceramic artifacts may crackle or spall in lower-temperature fires. Other materials, such as machinery utilized in historic mining, are less susceptible. Inorganic structures constructed of sandstone, adobe, cement-mortared fieldstone, firebrick, cinder block and cement aggregate are generally fire-resistant. Fracturing and spalling may occur at 700° C (Buenger 2003). Wooden substructures (common in adobe structures) would be destroyed, possibly compromising the structure as a whole. Historic earthworks such as trails, roads, irrigation ditches, canals, etc. are less sensitive to fire.

Fire has the potential to damage rock art. Though there are no specific temperature guidelines for rock art, fire effects include soot smudging and discoloration from smoke, which obscure the rock art images; degradation of the rock surface from spalling, exfoliation, and increased weathering; changes in organic paints due to heat; and damage to rock varnish which may destroy its potential to date the art (Tratebas 2004; Kelly and McCarthy 2001).

Organic artifacts (e.g., basketry, digging sticks, clothing, textiles) and features (e.g., structures, bow-stave trees, wikiups, culturally modified trees, historic timber structures) made of or containing organics such as wood, leather and hide, or cordage would need protection or treatment before any fire burns through a site containing such items. Bone and shell can sustain some degree of burning without complete destruction (Buenger 2003). Plant and animal residues may survive exposure to fire. Pollen may be destroyed at temperatures greater than 300° C (572° F), but animal proteins survive to 800° C (1472° F).

Determining temporal context is an important part of archaeology. Fire has the potential to adversely impact the dating potential of archaeological data. Fire is likely to destroy organic material such as bone, wood or charcoal that yield radiocarbon dates. Fire can modify or destroy obsidian hydration rinds compromising obsidian hydration dates (Deal n.d.; Buenger 2003; Loyd et al. 2002; Shackley and Dillian 2002; Solomon 2002). Finally, temperatures that exceed original firing temperatures (generally 400° C) would destroy the potential for thermoluminessence dating of ceramics (Rude and Jones n.d.).

Fire's Interaction with Minority and Low-income Populations

Pinyon nut gathering on public lands, and areas adjacent to public lands, is a subsistence activity relied upon by Native American and Hispanic populations. Nut gathering occurs on an individual basis for food or for selling and trading. Commercial harvesters provide employment to local populations as well. The effects of wildland fire can have an adverse impact on the populations who rely on these activities, as discussed in the social and economic conditions section of this chapter.

Fire's Interaction with Invasive and Non-native Species

Wherever cheatgrass or red brome dominate, the prevailing fire regime condition class (FRCC) is 3 due to the loss of key ecosystem components such as native species. The establishment of these invasive grasses fosters much more frequent fire return intervals. The presence of grass in a wildland community extends the time during which the community is susceptible to wildland fire ignitions. In the summer, cheatgrass dries out four to six weeks earlier than perennial grasses and forms a fine-textured, highly flammable fuel. Cheatgrass

may also be susceptible to fire one to two months longer in the fall (Paysen et. al. 2000). Dead culms and stems of red brome may persist on the average of two years, promoting fast, hot fires where abundant.

It is expected that as tamarisk continues to increase, desirable native communities, such as willows, would decrease, resulting in lower biodiversity, inferior wildlife habitat, and shortened fire intervals. Tamarisk does, however, provide streambank stability.

Because it is considered a halophyte, tamarisk is better adapted to persist in an environment of frequent fires than native willows (soil salinity tends to increase following fire). Even though tamarisk foliage has a high salt and water content, making it somewhat inflammable, it builds up senescent woody material within its branches resulting in increased flammability. This combined with repeated fire disturbance results in impenetrable thickets that shade-out native plants such as willows, which require direct sunlight.

Fire's Interaction with Native American Religious Concerns

The presence of fire prehistorically and historically in the planning area is an integral part of the landscape and, by association, the traditional belief system of Native Americans. Fire in its natural form, where the occurrence of more but lower severity events are more typical relative to current events, represent a continuation of the cycle of life intertwined in Native American beliefs. Both high- and low-severity fires have the potential to impact physical characteristics of features considered part of Native American religions. These may include destruction of constructed features and changes to the visual characteristics of a place important to a Native American belief system. The occurrence of high-severity fires would increase the chance that these changes would be longer lasting and alter the properties to a greater degree.

Fire Interaction with Special Status Species

Effects of fire on special status species and their habitat vary widely depending upon the size and intensity of the fire, fuel type, location, topography, season, and duration. High-severity wind and fire can destroy large areas of habitat and make the recovery of those habitats a long process. Both low- and high-severity wildland fires can destroy important habitat, displace animal species, and inflict direct mortality. However, low-severity fires have a greater potential to enhance and sustain a more natural and beneficial habitat.

Fire's Interactions with Surface Water Resources

Watersheds denuded by wildland fire are subject to accelerated soil erosion, reduced soil moisture, poor plant growth, and loss of other ecosystem components. Wildland fire can also increase water temperature, alter stream channel morphology, affect floodplain functions and values, and increase nutrient and sediment loads to downstream waters. Sediment from accelerated soil erosion and elevated levels of nitrogen and phosphorous from ash are common in water after wildland fires (NWCG 2001a).

Wildland fires reduce vegetation cover, especially in the short term, which intercepts precipitation before it hits the soil surface. The lack of vegetation cover on burned areas could allow precipitation to increase surface runoff, soil loss, and sediment input to surface waters. These sites could also have lower soil-water infiltration rates, which increase surface runoff and decrease soil moisture available for plants. The seasonal timing, size, duration, and severity of fires influence the magnitude of effects.

Burned watersheds generally respond to rainfall faster than unburned watersheds, potentially increasing the potential for flash flooding (Anderson et al. 1976). Water-repellent soils and cover loss could cause flood peaks to arrive faster, rise to higher levels, and entrain greater amounts of bedload and suspended sediments.

Wildland fire could have many effects on stream habitats, including changes in soil erosion, turbidity, sediment loads, and nutrient loads, as well as indirect effects such as changes in dissolved oxygen

concentrations and algal growth. Sediment input could reduce the area suitable for spawning or smother fish eggs with fine materials. Removal of streamside vegetation increases water temperatures, streambank erosion, and the available streamside habitat (Monsen et al. 2004).

Fire's Interaction with Groundwater

Fire can destroy accumulated forest floor material and vegetation, altering infiltration to groundwater by exposing soils to raindrop impact or creating short-term water repellent conditions (MacDonald and Huffman 2004). Burned areas could also be more susceptible to erosion, delivering minerals to recharge areas. Effects of fire on groundwater, however, are generally not substantial due to the common depth of useable groundwater (tens to hundreds of feet) in relation to the depth of fire effects on soil and recharge (inches to feet).

Fire's Interaction with Wetlands and Riparian Zones

Historically, fires were an important component of the disturbance regime for watersheds and aquatic ecosystems. Fire in riparian communities would have been infrequent and varied from small size (with highly mosaic burn patterns as a result of the higher moisture content generally present in riparian areas/species) to stand-replacing burns likely to have occurred only in extreme drought periods. Large fires supplied woody debris and triggered hydrologic events and debris flows that transported coarse substrates to stream channels. These processes may have provided the materials that maintained productive habitats for fish and other organisms (Swanson et al. 1990)

Fire suppression and control of wildfires have altered the natural process of periodic burning and have resulted in fuel load buildups, increases in understory and brush, and increases in stand density (Wright 1990; Covington and Moore 1994). The re-sprouting ability of invasive species gives them a long-term ecological edge over native species in regard to recovery after fire. After the fires, tamarisk sprouts vigorously, while native riparian trees and shrubs generally do not (Barrows 1996).

Direct effects of fires include heating or abrupt changes in water chemistry (Minshall et al. 1989; McMahon and de Calista 1990; Rinne 1996; Beeny and Parker 1998). In the Stanislaus Complex of 1987 and other prescribed fires on the Stanislaus National Forest in California, Roberson noted that vigor of riparian species increased dramatically following the fires. This was partially attributed to lack of competition from adjacent vegetation (especially shading from dense, forested canopies). Indirect effects include changes in hydrologic regime, erosion, debris flows, woody debris loading, and changes to riparian cover (Swanson and Lienkaemper 1978; Brown 1989; Megahan 1991; Bozek and Young 1994).

Fire's Interaction with Wild and Scenic Rivers Eligibility

Fire would have impacts to the resources within the eligible area (including vegetation, fish and wildlife, soils and water, etc). Temporary disturbances may occur to visual resources and scenic values, however these effects would be short-term while outstanding remarkable values are assessed on a long-term scale. High-severity wildland fire would increase the likelihood that these effects would be longer lasting and more destructive to the values identified for protection. Additional discussion of fires interaction with visual resources may be found in the visual resources section of this chapter. Fire would likely have little effect on the eligibility or suitability of a river or river segment for Wild and Scenic River designation.

Fire's Interaction with Livestock Grazing

Burning of rangeland can result in an increase in the production of perennial grasses and grazing capacity. This is primarily accomplished by removal of dense stands of sagebrush and other brush species (BLM 1991). However, a short-term loss of forage may occur following a fire event. A high-severity fire has the potential

to extend the time frame and decrease the capability for the generation of forage on rangelands through soil sterilization and loss of the native seed bank. High-severity fires may also increase the potential for undesirable forage species to extend their distribution on a rangeland. The physical destruction of allotment improvements may also occur, restricting use of the allotment until they are rebuilt. The potential for this increases with higher-severity fire events, due to increased heat or fire duration around both combustible and non-combustible allotment improvement infrastructure. Mortality of livestock can occur due to the direct effects of fire. High-severity fires moving quickly would have a greater chance at causing mortality.

Fire's Interaction with Woodlands and Forestry

From a commodity standpoint, wildland fire often precludes the use of woodland and forest for commercial products. Depending on the degree of consumption, burned wood may or may not be useful commercially. Burned trees, if only partially consumed, can still be used for firewood, lumber, pulp and some other fiber products. Wildland fire can completely consume all woodland and forest products making them unavailable for commercial uses. Even low severity fire would consume pine nuts and render some fiber unusable for certain products. In the long term, frequent, low intensity fire would remove competing vegetation and lower branches of conifers, which would eventually produce a higher quality lumber product in the form of larger trees with fewer knots.

Fire's Interaction with Pinyon and Juniper Woodland

Most of the area where pinyon and juniper woodland currently dominates was historically characterized by fires burning every 15 to 50 years (Kitchen 2004; Miller and Tausch 2001). Below 7,000 feet elevation, these woodlands are characterized by dense closed stands of pinyon and juniper, scarce understory, and high potential for cheatgrass invasion following fire, placing them in FRCC 3. Additionally, prolonged drought has predisposed many pinyon pine stands in the planning area to insect infestations, primarily the *Ips.* ssp beetle, whose larvae girdle the tree resulting in tree mortality. This has increased the fuel load. Above 7,000 feet, these woodlands are characterized by encroached pinyon and juniper. Because the woodlands are less dense than FRCC 3 and have a lower less risk of cheatgrass invasion following fire, they are considered FRCC 2.

Old-growth pinyon and juniper woodland is estimated to be less than 10 percent of the current area classified as pinyon and juniper woodland (Miller and Tausch 2001). Old-growth pinyon and juniper woodland is often restricted to fire-safe habitats (e.g., steep, dissected, and rocky terrain, and in thin substrates along ridges) where they are considered climax. Fire frequency in these climax pinyon and juniper woodland sites has been estimated at 200 to more than 300 years for old-growth pinyon and juniper woodland (Romme et al. 2002; Goodrich and Barber 1999) and would be classified as Fire Regime V.

Because it is a non-sprouter and is thin-barked when young, fire was the major historical cause of destruction for young juniper trees. However, adult juniper trees in mature stands are difficult to burn since the understory is usually sparse (older trees succumb to fire when 60 percent of the crown is scorched). Pure juniper stands need 35 mph winds or greater to carry fire through the canopy (Winward 1997). When they do ignite, these closed forests often support high intensity, stand-replacing crown fires covering large landscapes that can endanger firefighters and the general public (Keyes et al. 2003). It is generally agreed that fire was the most important natural disturbance that impacted distribution of juniper and/or pinyon and juniper woodland before the introduction of livestock in the 19th century (Miller and Rose 1999). Burkhardt and Tisdale (1976; Howard 1999) concluded that fire frequencies of 30 to 40 years would help keep juniper from expanding into mountain big sagebrush communities.

Fire's Interaction with Sagebrush Vegetation Type

Pre-settlement, stand-replacing fire frequencies for low-elevation sagebrush are estimated to vary from 60 to 110 years (Fire Regime II) (Whisenant 1990; Peters and Bunting 1994; Miller et al. 2001). Because of the high

risk of losing key ecosystem components following fire due to cheatgrass invasion on the SUSA planning area, 100 percent of the sagebrush type is in a FRCC 3 condition.

Wyoming and basin big sagebrush do not sprout after fire, and low- to high-intensity fires kill most plants. Generally, the herbaceous understory composition does not determine the intensity and severity of wildland fires—sagebrush itself is the primary fire carrier. The high canopy cover associated with late, mature sagebrush stands likely facilitated historic stand replacing fires. A sagebrush stand with a robust understory of native grasses and forbs would generally be replaced after fire with native perennial grassland, which would have eventually progressed through seral stages to sagebrush communities. Although sagebrush does not re-sprout with fire, it is a prolific seeder (a healthy, mature plant may produce 500,000 seeds) and if a seed source is present, re-establishment is quite rapid and dominance would occur within 20 years (Winward 1997).

In the absence of fire, sage canopy cover increases. According to Winward (2004) the maximum canopy cover for sagebrush is 30 percent; anytime canopy cover reaches more than 15 percent, the sage individuals compete with each other. Because sagebrush is a relatively short-lived species, approximately 60 years, in the absence of fire there is no recruitment of younger individuals. Consequently the stand has the tendency to become old and decadent.

Fire's Interaction with Salt Desert Shrub Vegetation Type

Fire frequency has been estimated at 35 to over 300 years and is historically classified as Fire Regime V. Most species of this type are not fire adapted and are considered climax. The exception is threadleaf rabbitbrush, which is sensitive to competition when growing with other species but may dominate a post-burn site. Because rabbitbrush easily establishes from seed after fire, it is considered fire adaptable. Due to the risk of losing key ecosystem components and greatly increased fire regimes as invasive annual grasses dominate, salt desert shrub is typically classified as FRCC 2 or FRCC 3, depending on the relative departure from its historic Fire Regime (**Table 3.1**).

A lack of continuous cover (fuels) made fire rare to non-existent in salt desert shrub communities. Historically, these types did not burn often enough or in large enough patches to support dominance of fire-adapted plants. Most salt desert shrub species do not readily regenerate following fire. Further expansion of invasive species following fire is a major concern for salt desert shrub communities.

Fire's Interaction with Grassland Types

Perennial grasses respond vigorously to fires of various intensities by re-sprouting following fire. Fast, high-intensity fires have lower severity that seldom causes substantial mortality to native perennial bunchgrasses. Slow-backing fires have a greater severity; mortality to native perennial bunchgrasses may be high under these conditions. With most natural ignitions, the predominant fire spread would be as a fast-moving head fire.

Fire's Interaction with Blackbrush

This ecosystem is at moderate risk of losing key ecosystem components due to fire and is classified as FRCC 2 (once cheatgrass dominates a blackbrush site, the site would then be FRCC 3). Recent experience on Utah BLM land has shown that blackbrush does not respond favorably to fire, since it is a non-sprouter and slow to reestablish. Burning has promoted succession to grassland by destroying the biological crust that stabilizes the soil. The biological crust provides important soil microflora apparently required for blackbrush survival or re-establishment (Paysen et al. 2000). Biological crusts also keep invasive, non-native annuals from getting established. Frequent large fires can be problematic from a management standpoint because recovery can

take more than four decades or, in some cases, there is no recovery (Wright and Bailey 1982; Paysen et al. 2000).

Fire's Interaction with Mountain Shrub Vegetation Type

Stand-replacing fire frequency ranges from 25 years to 100 years in mountain shrub (Gruell and Loope 1974), though return intervals may vary widely with changes in elevation, aspect, site moisture, and the associated forest or woodland type. Mountain shrubs are classified as Fire Regimes I (e.g., Gambel oak), II (e.g., mixed mountain shrub or maple), and IV (e.g., mountain mahogany), depending on the dominant species and the site. The FRCC also varies depending on the dominant species, and the understory. Mountain shrub communities at lower elevations (less than 6500 feet) are classified as FRCC 3 due to the high risk of cheatgrass invasion following fire. On the SUSA planning area, three percent of the mountain shrub vegetation type is in FRCC 1, whereas 97 percent is in FRCC 2. Some species, like oak, readily re-sprout after fire because they reproduce vegetatively. Others, like Ceanothus, have specialized seed, which enable it to readily invade burns (Knight 1994), while some are intolerant of fire (e.g., curl-leaf mountain mahogany, mountain big sagebrush, and bitterbrush). This may cause a temporary shift in the species composition, however most mountain shrub communities generally recover rapidly following wildland fire and are considered to be fire tolerant.

In general, fire suppression in this vegetation type has shifted the seral balances toward greater representations of climax vegetation and older age classes, with a corresponding loss of early seral vegetation and younger age classes. Overall, wildlife quality has declined, while acreage of decadent stands and the attendant fuel loadings have increased.

Fire's Interaction with the Creosote and Bursage Vegetation Type

Historically this vegetation type never burned, due to the lack of understory vegetation necessary to carry a fire. However, these stands are currently at a moderate risk of losing key ecosystem components following fire due to the long re-establishment timeframes (establishment of bursage in burned areas is classified as poor) and the potential for annual grass invasion. Normally fire kills creosote (it will re-sprout if the root crown is not killed). Therefore, fire suppression may also have contributed to its expansion. On the other hand, bursage is palatable to herbivores and, like creosote, is killed by fire. Because it is the intermediate vegetation layer between the herbaceous layer and the taller creosote layer, it may act as step-ladder fuel where annual grasses have invaded.

Fire's Interaction with Ponderosa Pine

Ponderosa pines have thick bark, which protects them from serious damage from surface fires. However, in the absence of fire (and an increase in grazing), ponderosa pines increase in density or other woody species like juniper or shade-tolerant firs encroach in the understory, resulting in an increased risk of crown fire. Also, increased density of shade-tolerant species can place greater stress on larger old trees, mostly due to competition from other species, resulting in increased susceptibility to insects and disease (Keyes et al, 2003).

Fire frequency for ponderosa pine communities ranges from 10 to 40 years with low to mixed-severity fires (USDA 2002). These forests have typically missed between five and 10 fire cycles in the years of fire suppression and as result may have a higher composition of woody vegetation in the understory.

Fire's Interaction with Riparian Vegetation

Historically, fire in these riparian communities would have been infrequent and varied from small size, with highly mosaic burn patterns as a result of the higher moisture content generally present in riparian areas/species, to stand-replacing burns likely to have occurred only in extreme drought periods. Willow

species typically sprout vigorously following a fast-moving fire because slow-moving fires are generally more damaging, presumably due to greater heat transfer to root crowns. The riparian vegetation type is classified as FRCC 3, mainly as a result of tamarisk invasion. Because of its high water and salt content and extensive root system, fire is ineffective in the control of tamarisk and may actually encourage its growth. Light (low temperature) fire encourages tamarisk to re-sprout and become even denser, whereas hot fire would sterilize the surrounding soil so that desirable shrubs and herbaceous species are unable to get established (Francis 2004).

Fire's Interaction with Mixed Conifer Vegetation Type

Fire frequencies in mixed conifer range from 100 to 300 years. These forests are characterized by a combination of understory and complete stand-replacement fire regimes (Arno 2000). Mixed conifer is classified as Fire Regime III or IV depending on the elevation and related dominant species. Fire Regime III would characterize conifer-shrub communities occurring at lower elevations that have pure conifer stands. Due to the longer historic fire return intervals and well-functioning vegetation attributes, mixed conifer is classified as FRCC 1 when associated with Fire Regime IV, and FRCC 2 when associated with Fire Regime III.

In recent years prolonged drought has predisposed species like Douglas-fir to insects (bark beetles), resulting in an increased fuel load. Dead woody fuels are accumulating, either standing and on the ground often in a haphazard manner; with the greatest fuel loadings occurring on the most productive sites, which are predominantly stand-replacement fire regimes. This mixed-severity fire regime often results in a mosaic pattern of stand structure and fuels. Past stand burn mosaics tend to increase the probability that subsequent fires will also burn in a mixed pattern (Arno 2000). When fires do occur, they tend to be intense and often sterilize the ground, with some 30-year-old fire scars showing very little vegetation returning (USDA 2002).

Fire's Interaction with Aspen

Fire frequencies range between 25 to 100 years with mixed severity (Gruell and Loope 1974). Because of their high water content, aspen stands do not easily burn and often act as natural fuel breaks during wildland fires. Fire regimes and vegetation structure have been moderately altered from the historical conditions, mostly as a result of conifer encroachment. Because they are thin barked, aspen-dominated sites are particularly susceptible to mortality of aboveground stems from fire of low intensity, even though aspen is well adapted to regeneration by sprouting after fire (Jones and DeByle 1985; Mutch 1970). Fires in young aspen stands tend to be low intensity surface fires unless there is a great deal of understory fuel. In older stands, during the warmest and/or driest months of the year, abundant fuel can lead to higher intensity fires. Decadent aspen stands and other areas with thin, acidic soils may be less vigorous at regenerating via suckering, and may tend to support conifers even after fire (USDA 2002).

Fire's Interaction with Fisheries and Wildlife Resources

Effects of fire on special status species and their habitat vary widely depending upon the size and intensity of the fire, fuel type, location, topography, season, and duration. High-severity wind and fire can destroy large areas of habitat and make the recovery of those habitats a long process. Both low- and high-severity wildland fires can destroy important habitat, displace animal species, and inflict direct mortality. However, low-severity fires have a greater potential to enhance and sustain a more natural and beneficial habitat.

Fire's Interaction with Soil Resources

Fires affect soils primarily by consuming live or dead vegetation cover, litter, and organic soil layers and the resulting loss of soil stabilizing organic material such as root structure. Fire may also alter soil chemical properties, post-fire soil temperatures, microorganism populations and their activity rates, erosion rates, increase nutrient availability, sterilize soil, and increase soil water repellency (NWCG 2001; Centers for

Water and Wildland Resources 1996). The degree of effect on these soil characteristics depends on amount of vegetation, and thickness and density of litter and organic layers. Soil texture and type, soil moisture at the time of burning, and depth and duration of heat penetration into soil horizons are also critical factors (NWCG 2001). Soil water repellency (hydrophobicity) from severe fire may substantially increase runoff and erosion, but repellency has not been found to persist for more than one year after a wildland fire (MacDonald and Huffman 2004.)

The single most important factor in soil health (topsoil and nutrient loss) is the timing of vegetation recovery with the severity of precipitation rates. The potential for post-fire erosion also depends on the soil type in the area of the burn, the amount of residual vegetation and organic matter, the rate and amount of vegetation recovery, and slope. If post-fire rains are relatively gentle, some nutrients released by a fire may be reabsorbed; however these nutrients are generally lost during severe, erosive rainfall. Soil microorganisms (biological crusts) may be affected by heating from fire, as well as surface disturbances that compact or disaggregate these features. Disturbance of biological crusts can increase the potential for both water and wind erosion.

Fire's Interaction with Recreation

Fires can partially or completely destroy developed facilities and can temporarily change the landscape in a manner that degrades visual quality and recreation opportunities and experiences. The landscape may be blackened or smoke could limit visibility. During periods of high fire danger and wildland fire activity, recreation use may be restricted or prohibited on large areas of public lands to protect public safety.

Fire's Interaction with Social and Economic Resources

The effects of fire in general to socioeconomic resources in may include loss of potential income from the harvesting of forest products (especially pinyon nuts); short-term displacement of game animals, resulting in decreased animal harvest; temporary loss of use of grazing allotments; permanent loss of range improvements, such as water troughs, fences, and corrals; and increased costs to feed livestock and replace range improvements. The economic impact of fire for grazing would likely be negative in the short term but can have positive economic returns due to a decrease in woody plant materials and an increase in favorable forage species (particularly if seeding occurs). Other examples of ways that fire interacts with local socioeconomic conditions may include temporary or permanent displacement from places of employment or residence, loss of personal safety and security, loss of property or reduction in property value, altered transportation patterns, health impacts due to impaired air quality, reduction in scenic quality, impacts to tourism, and direct costs to agencies tasked with suppression (which may be realized as income to firefighters and related support personnel).

Fire's Interaction with Wild Horses and Burros

Fires would likely pose a temporary loss of resources such as forage, watering areas, and corrals. High-severity fires in or around any of the 10 herd management areas (HMAs) could cause the displacement of herds and might force the herds to seek food, water and shelter outside of the management areas. High-severity fires have the potential to extend the time frame and decrease the capability for generation of forage on HMAs through soil sterilization and loss of the native seed bank. Fire events may also increase the potential for undesirable forage species to extend their distribution on an HMA. Fires could benefit wild horses and burros by modifying the vegetative community to more appropriate forage. Mortality of horses or burros can occur due to the direct effects of fire.

Fire's Interaction with Wilderness Characteristics

In many cases, fire is a natural part of the wilderness character of an area (BLM 1995). Fire would have impacts to the resources within the eligible area (including vegetation, fish and wildlife, soils and water, etc). Temporary disturbances may occur to resources and values; however these effects would be short-term while wilderness values are assessed on a long-term scale. Fire would likely have little or no effect on the wilderness characteristics of an area.

APPENDIX K

USFWS Biological Opinion's Terms and Conditions

Terms and Conditions described in this appendix only apply to the species named in Appendix H of this document.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act, as amended, prohibits take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering (50 CFR § 17.3). "Harass" is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR § 17.3).

No exemption from Section 9 of the Act is granted in this biological opinion. BLM's implementation of the Land Use Plan Amendment and Five Fire Management Plans is likely to adversely affect listed species. The likelihood of incidental take, and the identification of reasonable and prudent measures and terms and conditions to minimize such take, will be addressed in project level, and possibly programmatic level consultations. Any incidental take and measures to reduce such take cannot be effectively identified at the level of proposed action because of the uncertainty of wildland fire, broad geographic scope, and the lack of site specific information. Rather, incidental take and reasonable and prudent measures may be identified adequately through subsequent actions subject to section 7 consultations at the project and/or programmatic scale.

Even though actual take levels are unquantifiable, take will occur through harm and harassment. Therefore, we are providing the following Reasonable and Prudent Measures (RPMs) and Terms and Conditions to minimize overall take. Implementation of these RPMs and Terms and Conditions during project planning will also expedite site-specific section 7 consultation.

REASONABLE AND PRUDENT MEASURES

The U.S. Fish and Wildlife Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of black-footed ferret, Canada lynx, Utah prairie dog, Southwestern willow flycatcher, California condor, bald eagle, Mexican spotted owl, desert tortoise, Colorado pikeminnow, razorback sucker, humpback chub, bonytail, Virgin River chub, woundfin, Lahontan cutthroat trout, dwarf bear-poppy, Shivwits milk-vetch, Holmgren milk-vetch, Kodachrome bladderpod, San Rafael cactus, Siler pincushion cactus, shrubby reed-mustard, Uinta Basin hookless cactus, Ute ladies'-tresses, and last chance townsendia:

1. The Bureau of Land Management shall implement measures to minimize mortality or injury of federally listed species due to proposed project activities without placing firefighter personnel at risk. The species that were determined to be "**likely to adversely affected**" by project activities included: black-footed ferret, Canada lynx, Utah prairie dog, Southwestern willow flycatcher, California condor, bald eagle, Mexican spotted owl, desert tortoise, Colorado pikeminnow, razorback sucker, humpback chub, bonytail, Virgin River chub, woundfin, Lahontan cutthroat trout, dwarf bear-poppy, Shivwits milk-vetch, Holmgren milk-vetch, Kodachrome

bladderpod, San Rafael cactus, Siler pincushion cactus, shrubby reed-mustard, Uinta Basin hookless cactus, Ute ladies'-tresses, and last chance townsendia.

2. The Bureau of Land Management shall implement measures to minimize harm to federally listed species through destruction of their suitable or designated critical habitats, without placing firefighter personnel at risk. The species' habitats that were determined to be **"likely to adversely affected"** by project activities included: black-footed ferret, Canada lynx, Utah prairie dog, Southwestern willow flycatcher, California condor, bald eagle, Mexican spotted owl, desert tortoise, Colorado pikeminnow, razorback sucker, humpback chub, bonytail, Virgin River chub, woundfin, Lahontan cutthroat trout, dwarf bear-poppy, Shivwits milk-vetch, Holmgren milk-vetch, Kodachrome bladderpod, San Rafael cactus, Siler pincushion cactus, shrubby reed-mustard, Uinta Basin hookless cactus, Ute ladies'-tresses, and last chance townsendia.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Bureau of Land Management must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary. The following terms and conditions apply to all species covered under this biological opinion, and are to be implemented in addition to the Applicant Committed Measures described in the Proposed Action:

General Terms and Conditions

1. To implement Reasonable and Prudent Measure 1:
   a. Before the beginning of each fire season, a threatened and endangered species education program will be presented to all personnel anticipated to be within federally listed species habitats during suppression activities. This program will contain information concerning the biology and distribution of listed species throughout the Fire Management Plan Planning Area, their legal status, fire suppression goals and restrictions within suitable and critical habitat. Following training, each individual will sign a completion sheet to be placed on file at the local BLM office.
   b. All project employees (including fire fighting personnel) shall be informed as to the definition of "take", the potential penalties (up to $200,000 in fines and one year in prison) for taking a species listed under the Endangered Species Act, and the terms and conditions provided in this biological opinion.
   c. A qualified Resource Advisor will be assigned to each wildfire that occurs in or threatens listed species habitat. The Resource Advisor's role is help define goals and objectives for fire suppression efforts and informs the Incident Commander (IC) of any restrictions, but does not get involved in specific suppression tactics. Resource advisors shall oversee fire suppression and suppression rehabilitation activities; to ensure protective measures endorsed by the Incident Commander are implemented.

d. For pre-planned projects, the Authorized Officer shall designate an individual as a contact representative who will be responsible for overseeing compliance with the Applicant Committed Measures and terms and conditions contained in this biological opinion, and providing coordination with the U.S. Fish & Wildlife Service. The representative will have the authority to halt activities which may be in violation of these conditions, unless human health and safety or structures are at risk.
e. Project related personnel shall not be permitted to have pets accompany them to the project site.
f. If available, maps shall be provided to local dispatch centers showing general locations of listed species. Local BLM or UDWR biologists shall be consulted for specific locations if fires occur within or near the general locations delineated on the map.
g. In occupied habitat, pre- and post- monitoring of federally listed species' responses to the pre-planned treatments will be conducted.

2. To implement Reasonable and Prudent Measure 2:
   a. Fingers or patches of unburned vegetation within burned areas shall not be burned out as a fire suppression measure unless required for safety concerns or due to high reburn potential.
   b. Emergency Stabilization and Rehabilitation efforts must focus on areas where there is a potential of non-native species to spread, particularly within suitable habitat for federally listed species.
   c. The specific seed mix and areas to be seeded within suitable habitat for federally listed and sensitive species will be determined through coordination and section 7 consultation with the U.S. Fish and Wildlife Service.
   d. In occupied habitat burned by wildland fire, the recovery of vegetation shall be monitored, including establishment and monitoring of paired plots, inside and outside of the burned area unless the BLM and the Service concur that monitoring is not required.
   e. Site-specific projects under the Land Use Plan Amendment and Fire Management Plans will maintain, protect, or enhance the primary constituent elements of designated critical habitat in all implementation activities.
   f. The effectiveness of suppression activities and threatened and endangered species conservation measures shall be evaluated after a fire in coordination with the U.S. Fish and Wildlife Service. Procedures shall be revised as needed.
   g. In occupied habitat, pre- and post- monitoring of federally listed species' habitat responses to the pre-planned treatments will be conducted.
   h. Temporarily close burned areas to off highway vehicles (OHV) within occupied habitat after a wildland fire event until vegetation and soils recover. Consultation with the U.S. Fish and Wildlife Service may determine that an area may remain open if there is no threat to the species or habitat.
   i. Consult with the U.S. Fish and Wildlife Service to determine the need to obscure decommissioned trails and roads and illegal OHV trails within occupied habitat after a wildland fire event to prevent the trails and roads from re-opening.

Black-Footed Ferret and Utah Prairie Dog

The following terms and conditions are in addition to the general terms and conditions listed above and apply to the black-footed ferret and Utah prairie dog.

1. To implement Reasonable and Prudent Measures 1 and 2:
   a. Wildfires will be suppressed before they reach a prairie dog colony[1] or after they exit a colony. Active suppression efforts will not occur within a colony unless human health and safety or structures are at risk.
   b. Only hand lines will be authorized within colonies.
   c. Normally, only water shall be used on fires that occur within prairie dog colonies. If the fire Incident Commander decides that the situation requires use of chemical retardants in order to protect life and property, they may be used. The chemical composition will be supplied to the U.S. Fish and Wildlife Service during emergency consultation.
   d. All vehicles shall stay on existing roads within colonies, except as stated in (e). Storage of equipment and materials shall not occur within ¼ mile of colonies. Vehicle maintenance shall not occur within these areas.
   e. The Resource Advisor, biologist, or biological monitor (someone who is either qualified with a biological background or has been trained by the Resource Advisor) ensures that prairie dogs, black-footed ferrets, and their burrows are protected or avoided by walking in front of engines, tracked vehicles, or other fire fighting related vehicles within occupied prairie dog colonies.
   f. Vehicles shall not exceed a speed of 10 miles per hour (cross country) in occupied Utah prairie dog colonies unless a higher speed is determined to be prudent for safety reasons.
   g. Within colonies, precautions shall be taken to ensure that contamination of the site by fuels, motor oils, grease, etc. does not occur and that such materials are contained and properly disposed of off-site. Inadvertent spills of petroleum based or other toxic materials shall be cleaned up and removed immediately, unless during an emergency event (wildfire suppression). In which case the spill shall be cleaned up as soon as practical after the emergency situation is controlled.
   h. Camps associated with fire suppression activities shall be situated outside occupied habitat.
   i. If a dead or injured Utah prairie dog is located, initial notification must be made to the Service's Division of Law Enforcement, Cedar City, Utah at telephone 435-865-0861 or to the Cedar City office of the Utah Division of Wildlife Resources at telephone number 435-865-6100. Instruction for proper handling and disposition of such specimens will be issued by the Division of Law Enforcement. Care must be taken in handling sick or injured animals to

[1] "Prairie dog colony" refers to any occupied Utah prairie dog colony or any prairie dog colony within the range of the black footed ferret.

ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible state.

j. For the black-footed ferret, avoidance and minimization measures that should be followed are included within the *Cooperative Plan for the Reintroduction and Management of Black-Footed Ferrets in Coyote Basin, Uintah County, Utah* published by the Utah Division of Wildlife Resources in September, 1996. These measures may be updated based on the best available scientific data as it becomes available.

Canada Lynx

The following terms and conditions are in addition to the general terms and conditions listed above and apply to the Canada lynx.

1. To implement Reasonable and Prudent Measures 1 and 2:
   a. The Lynx Conservation Assessment and Strategy (LCAS) shall be incorporated into project plans as appropriate, and any applicable standards, guidelines, and objectives specifically related to linkage habitat would be followed during implementation of fire management activities.

Southwestern willow flycatcher

The following terms and conditions are in addition to the general terms and conditions listed above and apply to the southwestern willow flycatcher.

1. To implement the Reasonable and Prudent Measure 1:
   a. Prior to planned project activities, potentially affected habitat will be surveyed according to U.S. Fish and Wildlife Service Protocol (*A Southwestern Willow Flycatcher Natural History Summary and Survey Protocol; Technical Report NPS/NAUCPRS/NRTR-97/12*).
   b. Except where fires are active in occupied habitat, minimize unnecessary low-level helicopter flights during the breeding season (April 1 – September 30). If safety allows, approach bucket dip sites at a 90-degree direction to rivers to minimize flight time over the river corridor and occupied riparian habitats. Locate landing sites for helicopters at least ¼ mile from occupied flycatcher habitat unless human safety or property dictates otherwise.
   c. Minimize use of chainsaws or bulldozers to construct fire lines through occupied or suitable habitat except where necessary to reduce the overall acreage of occupied habitat or other important habitat areas that would otherwise be burned.
   d. Implement activities to reduce hazardous fuels or improve riparian habitats (prescribed burning or vegetation treatments) within occupied or unsurveyed suitable habitat for southwestern willow flycatchers only during the non-breeding season (October 1 to March 31).
2. To implement Reasonable and Prudent Measure 2:
   a. Riparian fuel reduction actions shall be considered as experimental, and initially conducted only in unoccupied habitats until the success and

ramifications are better understood. Efficacy of these actions as a fire management tool, and effects on bird habitat quality, shall be tested in a scientifically explicit, controlled fashion (Appendix L in U.S. Fish and Wildlife Service 2002).

b. In occupied or suitable flycatcher habitat, creation of fire breaks might render the habitat unsuitable (Appendix L in U.S. Fish and Wildlife Service 2002). As long as human safety and property allows, fire breaks shall be conducted in unoccupied sites, outside of proposed critical habitat, or within proposed critical habitat under the following situations:
    i. The habitat does not meet the Primary Constituent Elements of the proposed critical habitat as listed in 69 FR 60706-60786, October 12, 2004;
    ii. Minimal fire line necessary to prevent unacceptable losses of occupied habitat; and
    iii. Between fuel concentrations and flycatcher breeding sites to prevent fires from spreading into breeding sites (Appendix L in U.S. Fish and Wildlife Service 2002).
c. Prescribed fire shall be avoided in occupied habitat and considered only as experimental management techniques if dealing with suitable unoccupied habitat (Appendix L in U.S. Fish and Wildlife Service 2002).
d. Fires in occupied habitat and adjacent buffer zones shall be rapidly suppressed if safety allows.

California Condor and Bald Eagle

The following terms and conditions are in addition to the general terms and conditions listed above and apply to the California condor and bald eagle.

1. To implement the Reasonable and Prudent Measure 1:
    a. If California condors or bald eagles are found inhabiting (nesting) within the action area of a pre-planned project, a buffer of 1 mile surrounding the nesting area will be designated as non-treatment zones (Romin and Muck 2002).
    b. If California condors are observed within 0.25 miles of an open water source, such as an inflatable storage tank or "pumpkin", the water storage tank will be covered when not in use.

Mexican Spotted Owl

The following terms and conditions are in addition to the general terms and conditions listed above and apply to the Mexican spotted owl.

1. To implement Reasonable and Prudent Measure 1:
    a. Pre-planned fuels reduction projects within Mexican spotted owl designated critical habitat shall be designed to enhance habitat requirements for the Mexican spotted owl as well as for the valuable prey species they rely upon.

2. To implement Reasonable and Prudent Measure 2:
    a. Fire suppression shall be considered for wildfires in designated critical habitat.

Desert Tortoise

The following terms and conditions are in addition to the general terms and conditions listed above and apply to the desert tortoise.

1. To implement Reasonable and Prudent Measure 1:
    a. Campsites, aircraft landing and fueling areas, staging areas, and helicopter dip sites shall either be located outside of desert tortoise habitat or in areas that have been cleared by a Resource Advisor or tortoise biologist.
    b. Hand crews shall be used to build and defend fire lines. Engines can be used for support from roads. Wherever practical, fire engines must remain on roads and lay fire hose only along hand lines.
    c. The Resource Advisor, tortoise biologist, or biological monitor (someone who is either qualified with a biological background or has been trained by the Resource Advisor) ensures that tortoises, burrows, and shelter sites are protected or avoided by walking in front of engines, tracked vehicles, or other fire fighting related vehicles within designated critical habitat or suitable habitat in the Red Cliffs Desert Reserve.
    d. On-road travel within the Red Cliffs Desert Reserve shall be restricted to speeds (25 mph) that allow drivers to distinguish obstacles such as a rocks and tortoises.
    e. Firefighters shall note locations and condition of desert tortoises and carcasses, but must not attempt to touch or move them unless the animal is in immediate danger from fire or is on a road that is receiving traffic use. Firefighters shall be encouraged to provide notes to tortoise Resource Advisor or tortoise biologist.
    f. Garbage and trash must not be left in project vicinity.
2. To implement Reasonable and Prudent Measure 2:
    a. Wildfires that occur in tortoise habitats shall be suppressed as soon as possible due to the habitat changes associated with wildfire that alter food availability and the availability of plants for protection from thermal extremes and predators, unless consultation with the U.S. Fish and Wildlife Services deems suppression to be not prudent.
    b. Tracked vehicles have long-lasting impacts on desert soils and vegetation. Their use shall be restricted to improving roads, constructing lines where a short distance of line might save a large area from fire, or in order to provide protection for structures.
    c. Rehabilitation of suppression related actions must be coordinated with the Resource Advisor to avoid further impacts. For example, the rehabilitation of lines created on the sensitive desert soils may cause more damage than the initial suppression actions. Obliterate vehicle tracks at the point they leave existing roads to prevent those tracks from becoming future trails and roads.

Lahontan Cutthroat Trout

The following terms and conditions are in addition to the general terms and conditions listed above and apply to the Lahontan cutthroat trout.

To implement Reasonable and Prudent Measures 1 and 2, we recommend full implementation of the Memorandum of Understanding (MOU) between the BLM, Service, Utah Division of Wildlife Resources, and Utah Division of Forestry, Fire and State Lands. The purpose of this MOU is to provide a framework of cooperation for interagency fire management between the Bureau of Land Management (Salt Lake and Elko Field Offices), U. S. Fish and Wildlife Service (Region 1 and Region 6), and the Utah Department of Natural Resources (Division of Wildlife Resources and Division of Forestry, Fire, and State Lands), within the Bettridge and Morrison Creek drainages of the Pilot Mountains. This MOU contains Standard Operating Procedures to be used for the protection of the threatened Lahontan cutthroat trout and their habitat during fire suppression and rehabilitation activities in these two drainages. The Standard Operating Procedures developed through the MOU are listed below.

1. Standard Operating Procedures for Suppression Activities:
    a. Avoid the application of retardant or foam within 600 feet of the stream channel or waterway. With the exception of restricting the use of retardants and foams to 600 feet from stream channels or waterways, aerial application and use of retardants and foams will be consistent with national policy guidelines established by the National Office of Fire and Aviation, as amended.
        i. The exceptions to this procedure are:
            1. When alternative line construction tactics are not available due to terrain constraints, congested area, life and property concerns or lack of ground personnel, it is acceptable to anchor the foam or retardant application to the waterway. When anchoring a retardant or foam line to a waterway, use the most accurate method of delivery in order to minimize placement of retardant or foam in the waterway.
            2. Deviations from these guidelines are acceptable when life or property is threatened and the use of retardant or foam can be reasonably expected to alleviate the threat.
            3. When potential damage to natural resources outweighs possible loss of aquatic life, the unit administrator may approve a deviation from these guidelines. This determination will be made on a case-by-case basis by the Field Manager or the designated Field Manager representative in consultation with the Fire Management Officer, Incident Commander, Resource Advisor, and BLM Field Office Fisheries Biologist through development of the Wildfire Situation Analysis.
    b. Do not draft fill engines that have surfactant foam mixes in tanks, directly from the stream channel.
    c. A containment barrier will be constructed around all pumps and fuel containers utilized within 600 feet of the stream channel to prevent petroleum

products from entering the stream. The containment barrier will be of sufficient size to contain all fuel being stored or used on site.

d. Do not dump engines filled with surfactant foam mixes within 600 feet of the stream channel.
e. Do not conduct retardant mixing operations within 600 feet of the stream channel.
f. Stream flow will not be impounded or diverted by mechanical or other means in order to facilitate extraction of water from the stream for fire suppression efforts.
g. The intake end of the draft hose will be screened to prevent entrainment of fish species. Screen opening size will be a maximum of 3/16 inch.
h. Before each fire assignment in the Elko and Salt Lake Districts, all fire suppression equipment utilized to extract water from stream or spring sources (i.e. helicopter buckets, draft hoses and screens) will be thoroughly rinsed to remove mud and debris and disinfected with a chlorine solution (one part bleach to 32 parts water, or stronger). Rinsing equipment with disinfectant solutions will not occur within 600 feet of natural water sources (streams or springs).
i. Only water sources identified as specified dip sites will be used to control and/or contain fire with the Bettridge and Morrison Creek drainages. Water may be obtained from the pond on the TL Bar Ranch (Donner Springs). The coordinates of this dip site are: N 41 01 22.6 X W 113 58 04.3.
j. Water extraction from streams currently occupied by LCT (including beaver ponds) is restricted.
k. Fire control lines will not cross or terminate at the stream channel, unless human safety or private property are at risk. Control lines will terminate at the edge of the riparian zone at a location determined appropriate to meet fire suppression objectives based on fire behavior, vegetation/fuel types, and fire fighter safety.
l. Access roads and/or fords will not be constructed across the stream channel.
m. New roads or mechanical fire control lines will not be constructed and existing roads will not be improved within 600 feet of the stream channel unless authorized by the Field Manager or the designated Field Manager representative.

2. Standard Operating Procedures for Rehabilitation Measures:
   a. An assessment of the impacts of fire and fire suppression activities to LCT habitat will be completed by an interdisciplinary team of resource specialists, including the Elko and Salt Lake BLM Field Office Fisheries Biologists and Hydrologists, representatives from the Service, representatives from the Utah Division of Wildlife Resources, and representatives from Utah Division of Forestry, Fire and State Lands. Based on this assessment, appropriate rehabilitation measures will be identified consistent with Departmental Emergency Stabilization and Rehabilitation Handbook guidance, including but not limited to some or all of the following:
      i. Where determined necessary by the interdisciplinary review team, a post-fire contingency plan for immediate and effective protection, rescue, and

rehabilitation of, and minimization of risk of injury to LCT populations and their habitat will be created.

ii. Close the affected watershed and/or stream channel to livestock grazing for two or more growing seasons to allow for recovery of riparian vegetation. The appropriate length of time for closure to livestock grazing will be determined on a site specific basis based on resource data, scientific principles, and experience. Site specific monitoring will determine when resource objectives have been achieved on specific burned areas. Site specific vegetative recovery objectives will be identified by the interdisciplinary review team and included in the Notice of Closure to Livestock Grazing issued in accordance with 43 CFR 4110.3-3.

iii. Reconstruct damaged fences and/or construct new fences to ensure protection of the stream channel from grazing. In Wilderness Study Areas, fence construction and/or reconstruction will be in accordance with Interim Management Policy Guidelines.

iv. Monitor stream and riparian habitats to allow for comparison of post-fire impacts to existing baseline information.

v. Where determined necessary by the interdisciplinary review team, install appropriate erosion control structures (i.e. erosion matting and/or straw bale structures, straw wattles, etc.) to mitigate overland flow effects to the stream channel.

vi. Where determined necessary by the interdisciplinary review team, reseed and/or replant riparian/wetland areas with native plant species to facilitate re-establishment of perennial vegetation, minimize potential channel erosion, and allow for recovery of riparian functionality.

vii. Rehabilitate improved roads located within 600 feet of the stream channel as determined necessary to mitigate potential sedimentation into the stream channel.

viii. Implement appropriate integrated noxious weed control measures where determined necessary by the interdisciplinary review team and/or where determined appropriate through post-fire monitoring.

ix. Where determined necessary by the interdisciplinary review team, initiate temporary road closures for at least one year to protect and stabilize burned areas and associated watersheds. An interdisciplinary assessment will be conducted after the first year to determine if road closures are still needed.

Threatened or Endangered Plants

The following terms and conditions are in addition to the general terms and conditions listed above and apply to the federally listed plants.

1. To implement Reasonable and Prudent Measure 1:
   a. Do not allow wildland fire use within occupied habitat unless agreed to by the BLM and U.S. Fish and Wildlife Service.

b. When feasible (human life or property are not at risk) fire breaks shall be constructed down slope of plants and populations; if fire breaks must be sited upslope, buffers of 100 feet minimum between surface disturbances and plants and populations will be incorporated.

2. To implement Reasonable and Prudent Measure 2:
   a. Do not allow wildland fire use within occupied habitat unless agreed to by the BLM and U.S. Fish and Wildlife Service.
   b. For pre-planned projects within known or potential habitat, site inventories shall be conducted to determine habitat suitability prior to initiation of project activities, at a time when the plant can be detected.
   c. For riparian/wetland-associated species, e.g. Ute ladies-tresses, avoid loss or disturbance of riparian habitats.
   d. Limit disturbances to and within suitable habitat by staying on designated routes where feasible.
   e. Limit new access routes created by the project.
   f. Following a wildland fire event, place signing to limit ATV travel in sensitive burned areas.

Shivwits Milk-Vetch

The following terms and conditions are in addition to the general terms and conditions listed above as well as the terms and conditions for threatened and endangered plant species. These terms and conditions apply specifically to the Shivwits milk-vetch.

1. To implement Reasonable and Prudent Measures 1 and 2:
   a. During wildland fire events, do not suppress wildland fire within the suitable habitat (Chinle formation) unless another threatened or endangered species (i.e. desert tortoise), or life or property are at risk.
   b. In general, do not seed within the Chinle formation unless agreed to by the BLM and U.S. Fish and Wildlife Service.
   c. Do not rehabilitate areas impacted by suppression activities, such as hand lines, areas that may have been trampled, or areas that may have been impacted by fire retardant drops unless agreed to by the BLM and U.S. Fish and Wildlife Service.
   d. The effects of any fire or suppression activity within suitable habitat for the Shivwits milk-vetch will be monitored as these measures have not been tested. These measures are based on the sensitive nature of the soils that support the plant. Up-dating and fine-tuning methods to implement during wildland fire events and post emergency stabilization and rehabilitation activities shall rely upon adaptive management techniques.

Siler Pincushion Cactus

The following terms and conditions are in addition to the general terms and conditions listed above as well as the terms and conditions for threatened and endangered plant species. These terms and conditions apply specifically to the siler pincushion cactus.

1. To implement Reasonable and Prudent Measures 1 and 2:
   a. Follow and implement the restrictions to pesticide use within suitable Siler pincushion cactus habitat developed by the Environmental Protection Agency (EPA). These limitations were excerpted from the EPA's Pesticides: Endangered Species Protection Program (http://www.epa.gov/oppfead1/endanger/arizona/cocon.htm#brady):
      i. If the active ingredient is 2, 4-D (all forms), ATRAZINE, CLOPYRALID, DICAMBA (all forms), DICHLORPROP (2, 4-DP), HEXAZINONE, MCPA (all forms), PARAQUAT, PICLORAM (all forms), or TEBUTHIURON, then do not apply this pesticide in the species habitat. For ground applications do not apply within 20 yards of the habitat, or within 100 yards for aerial applications.
      ii. If the active ingredient is OXYFLUORFEN (granular or non-granular), then do not apply this pesticide in the species habitat. For ground applications do not apply within 100 yards of the habitat, or within 1/4 mile for aerial applications.
      iii. If the active ingredient is either METRIBUZIN or SULFOMETURON METHYL, then do not apply this pesticide on rights-of-way in the species habitat.

Colorado River Fishes (Colorado Pikeminnow, razorback sucker, humpback chub, bonytail) and Virgin River Fishes (Virgin River Chub and woundfin)

The BLM has incorporated Applicant Committed Resource Protection Measures into their plan that will minimize mortality or infury to these listed fish species.

Closing

The Service believes that an unquantifiable amount of incidental take will occur in the form of harm and harassment as a result of the proposed actions. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed actions. The Bureau of Land Management must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

REPORTING REQUIREMENTS

Upon locating dead, injured, or sick listed species, immediate notification must be made to the Service's Salt Lake City Field Office at (801) 975-3330 and the Service's Division of Law Enforcement, Ogden, Utah, at (801) 625-5570. Pertinent information including the date, time, location, and possible cause of injury or mortality of each species shall be recorded and provided

to the Service. Instructions for proper care, handling, transport, and disposition of such specimens will be issued by the Service's Division of Law Enforcement. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state.

The BLM shall submit a report to the Service on or before (December 1) of each year in which fire management activities occurred within occupied habitat. For the listed and candidate species covered under this consultation, the report shall include: 1) the amount of potential and/or occupied habitat affected by wildfire (i.e. stream miles burned, percentage of drainage burned, fire severity map); 2) to the extent possible, the number of individuals killed from direct and indirect effects of wildfire; 3) any habitat and/or population monitoring efforts from past wildfire events; 4) a copy of the burned area emergency stabilization and rehabilitation plan; 5) implementation and effectiveness monitoring of burned area emergency stabilization and rehabilitation treatments; 6) implementation and effectiveness monitoring of the standard operating procedures; 7) recommendations for enhancing the effectiveness of the standard operating procedures; and 8) any recommendations for additional standard operating procedures. The first report shall be due to the Service on (December 1, 2005). The address for the Utah Fish and Wildlife Office is:

Field Supervisor
U.S. Fish and Wildlife Service
2369 West Orton Circle, Suite 50
West Valley City, Utah 84119
Telephone: (801) 975-3330