BLM

United States Department of the Interior
Bureau of Land Management

Environmental Assessment
for Managing Wildland Fire for Resource Benefit

Grand Junction Field Office
and the
Dominguez-Escalante National Conservation Area
2815 H Road
Grand Junction, Colorado 81506

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CHAPTER 1 – INTRODUCTION

1.1 IDENTIFYING INFORMATION

BACKGROUND: The Bureau of Land Management (BLM) Grand Junction Field (GJFO) Managing Wildland Fire for Resource Benefit Environmental Assessment (EA) is an analysis of actions proposed for landscape scale fire management activities within an area of 1,395,105 acres of public land managed by the Bureau of Land Management (BLM) (see attached map) in Western Colorado. The proposed action gives the BLM the option, should conditions be appropriate according to a carefully defined set of considerations, to manage naturally ignited Wildland fires to meet resource objectives on 831,850 acres in the GJFO and 162,172 (for a total of) acres in the Dominguez Escalante National Conservation Area (DENCA). BLM would manage unplanned ignitions on the remaining 229,402 acres in the GJFO and the 47,149 acres in the DENCA, unplanned ignitions to meet protection objectives under a suppression strategy. The analysis contained within this EA will be incorporated into a Fire Management Plan, which details strategies and mitigations that fire managers will use during the decision making process of managing unplanned ignitions on public land managed by the BLM within the project area.

Federal fire policy defines a wildland fire as either planned or unplanned ignitions. Planned ignitions are prescribed fires, which are not analyzed by the Proposed Action. Unplanned ignitions are defined as wildland fires which are started by natural causes or human activities outside of the scope of planned ignitions. The Proposed Action refers only to naturally ignited (lightning) wildland fires.

CASEFILE/PROJECT NUMBER: DOI-BLM-CO-S080-2017-0025-EA

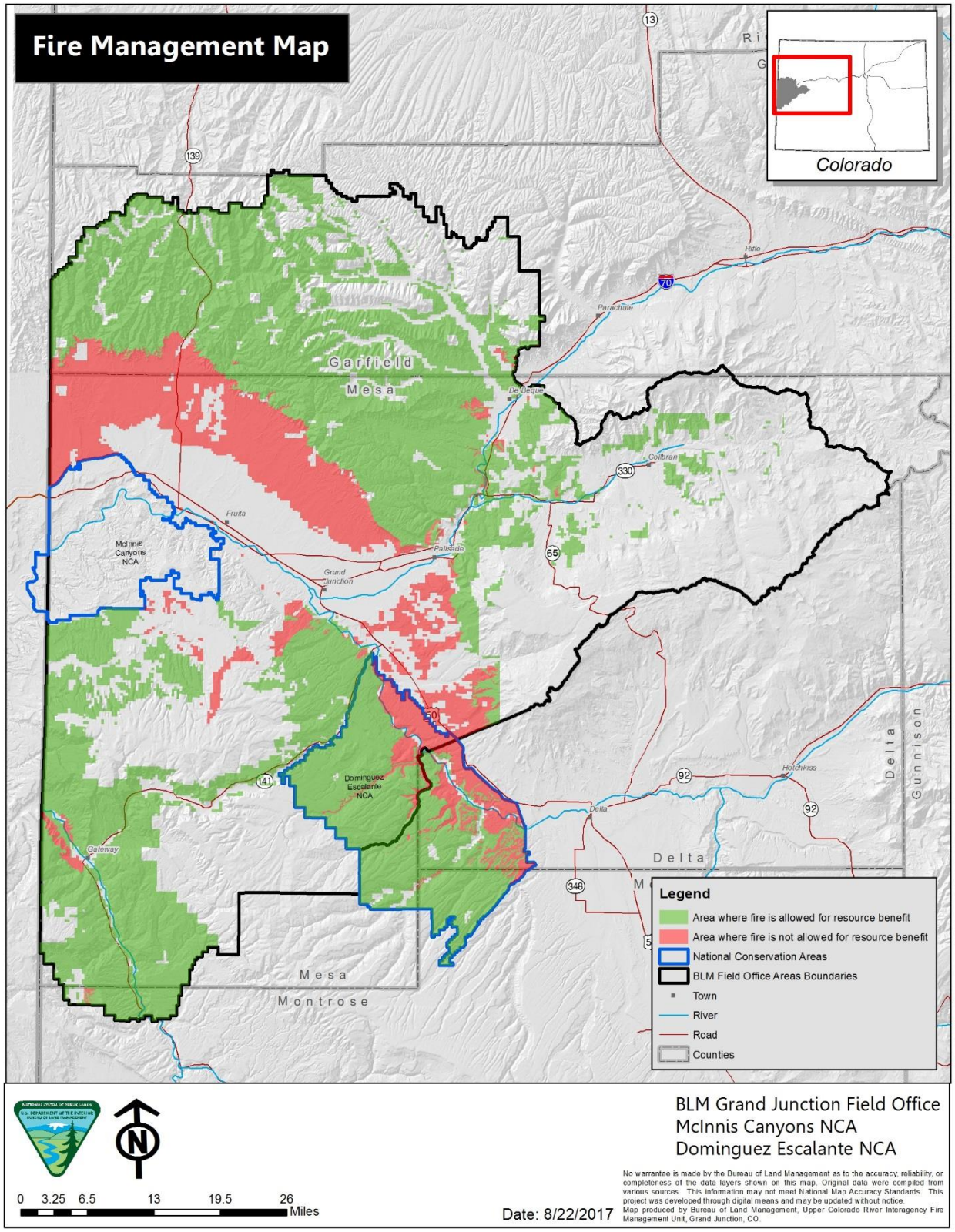
PROJECT NAME: Managing Wildland Fire for Resource Benefit

PLANNING UNIT: Grand Junction Field Office and Dominguez-Escalante National Conservation Area

1.2 PROJECT LOCATION AND LEGAL DESCRIPTION

LEGAL DESCRIPTION: The Proposed Action includes the Grand Junction Field office and the Dominguez Escalante National Conservation Area.

Figure 1.2.1 Fire Management Map



1.3 PURPOSE AND NEED

The purpose of the Proposed Action is to allow the BLM to manage unplanned ignitions in a way that uses fire suppression techniques and the use of fire to protect life, property, and natural resources. The single overriding objective of wildland fire response in general, including this Proposed Action, is public and firefighter safety during all phases of wildland fire response. While public and firefighter safety often dictate that we suppress unplanned fire, under certain conditions, fire is an effective and efficient land treatment method that can be used to achieve fire-related benefits to natural resources regulate hazardous fuels, and maintain healthy ecosystems and vegetation conditions in areas where fire has an ecological function in the ecosystem.

The BLM's need for this action is driven by national fire policy as well as a recent update of the GJFO Resource Management Plan (RMP) and the new DENCA RMP that changed management guidance for these areas.

The Secretaries of Interior and Agriculture created the Federal Wildland Fire Management Policy (FWFMP) in 1995 (updated in 2001) to require all federal lands with burnable vegetation to have a Fire Management Plan (FMP). Since 2001, additional changes and revisions have occurred, with the most recent being in February 2009 (Guidance for Implementation of Federal Wildland Fire Management Policy). This guidance directs agencies, while protecting human life, to achieve a balance between suppression and the use of wildland fire for resource benefit, to regulate fuels, and maintain healthy ecosystems in accordance with the approved RMP for an area.

1.4 PUBLIC PARTICIPATION

1.4.1 Public Scoping: The primary mechanism used by the BLM to invite public involvement in the public scoping process was posting this project on the BLM ePlanning NEPA website.

No comments were received for this project.

1.4.2 Internal Scoping: Maps of the parcel and description of the Proposed Action were distributed to the GJFO Interdisciplinary Team (IDT) and discussed at IDT meetings. The majority of IDT members have visited the project site as it covers lands within the greater part of the GJFO. Local cooperators and volunteer fire departments have also been consulted. This EA includes documentation of which resources would be impacted based on internal scoping and site visits in Table 3.1.

1.4.3 Issues Identified: The primary issues related to this project are regarding how the BLM's management of fire for resource benefit would affect specific resources.

Based on internal BLM scoping, the following issues were identified:

1. Will the Proposed Action impact recreationists wishing to access fire areas that BLM is proposing to manage for resource benefit?
2. Will the Proposed Action affect any sensitive plant species?
3. How will the Proposed Action affect soil and water quality?
4. How will the Proposed Action impact cultural resources?
5. How will the Proposed Action impact fish and wildlife species?

1.4.4 Public Comment Period:

The preliminary draft of this EA was posted to the BLM ePlanning website https://eplanning.blm.gov/epl-front-office/eplanning/nepa/nepa_register.do and announced by press release for a 30 day comment period starting 4/17/2017.

No comments were received.

1.5 DECISION TO BE MADE

The BLM will decide whether to approve the proposed Managing Wildfire for Resource Benefit project based on the analysis contained in this EA. The BLM may choose to: a) authorize the project as proposed, b) authorize the project with modifications, c) authorize an alternative to the proposed action, or d) not authorize the project at this time.

The decisions considered in this analysis anticipate how to best meet resource management direction contained within the RMPs by using fire management strategies, tactics, and alternatives. Based on this analysis, the Upper Colorado River (UCR) Fire Management Plan (FMP) will be updated as needed.

Any fuels management treatments would still require site-specific analysis compliant with the National Environmental Policy Act (NEPA), which may incorporate analysis from this document by reference.

CHAPTER 2 – PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

The purpose of this chapter is to provide information on the Proposed Action and alternatives. Alternatives considered but not analyzed in detail are also discussed within this section.

2.2 ALTERNATIVES ANALYZED IN DETAIL

2.2.1 ALTERNATIVE A – No Action Alternative

Under the No Action Alternative, the BLM would not manage wildland fire for resource benefit as described in the Proposed Action.

2.2.2 ALTERNATIVE B – Proposed Action

The BLM is proposing to allow for the option of managing natural ignitions under carefully considered conditions. The Proposed Action would provide the BLM with the option of managing fire in areas identified with an emphasis towards using fire to meet RMP goals and objectives (994,022 combined GJFO and DENCA acres). The BLM would not manage fires to meet RMP goals and objectives if fires were human caused in any area, or in areas identified as not having a fire emphasis (276,551 combined GJFO and DENCA acres). The BLM would manage these types of fires with the intent of minimizing fire size after providing for firefighter and public safety.

BLM fire managers and resource advisors would evaluate each wildland fire on a case-by-case basis to determine its feasibility to meet specific area objectives as identified in the RMPs. BLM considerations, which would be included in the evaluation criteria of individual naturally ignited unplanned ignitions, include the following:

- Public and Firefighter Safety
- Current and predicted fire behavior and effects
- Potential fire size
- Potential airsheds that may be affected
- Adjacent lands managed by other entities (other agencies or private land) that may be affected
- Level of public use
- Proximity to improvements and infrastructure on both public and private lands
- Historic fire regime and current fire regime condition class (https://www.nifc.gov/prevEdu/comm_guide/appendix/2BACKGROUND_FrccDefinitionsFinal.pdf)
- Seasonal severity and fire weather forecasts
- Fuel conditions
- Potential for sedimentation to municipal or public water supply
- Unique biological, cultural, historical, or archaeological resources
- Potential for non-native species establishment or spread
- National and Regional planning levels in regards to resource availability

Based on these factors, the potential responses will include the following strategies:

- Monitor: Under this strategy, the BLM would periodically assess the fire situation to reduce exposure to responders. This is appropriate for fire situations assessed as having acceptable

fire behavior given proximity and/or low threat to values at risk. .Fire situations that require the physical placement of resources on the fire site to document fire behavior characteristics and first order fire effects.

- Confine and Contain: When a fire has ignited within an area bounded by either natural or man-made barriers, the fire may be allowed to spread within the area.
- Point Protection: Usually put in place when fire behavior does not allow for safe engagement, or the BLM is allowing fire to spread over the area, but values are at risk from the fire spread. Firefighting resources may attempt to mitigate the risk to values through different tactics. This strategy does not address perimeter control of the fire, but the BLM may also use this strategy at the same time as any of the other listed strategies.

Even within areas where unplanned fire is allowed, these decisions are dynamic and complex. In some instances, BLM fire managers may manage one part of a fire for resource benefits while suppressing another part. In other situations, full suppression may be required, even in areas where fire can be allowed, due to proximity to values at risk, seasonality, fire behavior, or other factors.
The BLM would suppress wildland fires, regardless of cause, on 276,551 acres within the GJFO and DENCA. This may be accomplished through strategies including confine and contain and point suppression, based on firefighter safety.

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After providing for the safety of all responders and the public, as well as evaluating and mitigating any risks to non-BLM managed land and any real property or improvements, the following GJFO and D-E NCA design features apply. The following design features apply to actions, which would be authorized under this action regardless of the planning unit, including any action required to manage fire, as well as access to fire areas. These design features will always be considered, and best efforts will be given to adhere to them, but in cases where doing so would risk firefighter or public safety, firefighter and public safety will always be the top consideration.

SOILS (S)

S-2: When saturated soil conditions exist on access roads or location, or when road rutting becomes deeper than 3 inches, operations should be halted until soil material dries out or is frozen sufficiently for operations to proceed without undue damage and erosion to soils, roads, and locations.

WATER RESOURCES (H)

H-43: Maintain appropriate vegetative/riparian buffers around water features to slow runoff and trap sediments and protect water quality. A minimum buffer distance should be 200 meters or greater where site conditions warrant.

VEGETATION: RANGELAND (VR)

VR-7: Minimize disturbance to soil and native vegetation as much as possible.

VEGETATION: RIPARIAN HABITAT AND WETLANDS (VRW)

VRW-9: Minimize crossing of streams (intermittent and perennial) and wetlands with vehicles, heavy machinery, and facilities (e.g., pipelines).

VRW-13: Locate project staging areas for refueling, maintenance equipment, materials, operating supplies, and boring in areas not designated as riparian and/or wetland areas.

NOXIOUS AND INVASIVE WEED PREVENTION (WEED)

Incident Planning

WEED-65: Increase weed awareness and weed prevention by providing training to new and/or seasonal fire staff on invasive weed identification and prevention.

WEED-67: On wildfires or prescribed burns in or near weed-infested areas, ensure that a Qualified Resource Advisor familiar with weeds issues or who has access to the relevant information is assigned. Include a discussion of weed prevention operational practices in all fire briefings.

WEED-68: Use operational practices (e.g., avoiding weed infestations when locating fire lines) to reduce weed spread.

WEED-69: Identify and periodically inspect potential helispots, staging areas, incident command posts, and base camps and maintain a weed-free condition. Encourage network airports and helibases to do the same**.**

WEED-70: Develop a burned area integrated weed-management plan, including a monitoring component to detect and eradicate new weeds early.

Fire-fighting

WEED-71: Ensure that all equipment (including borrowed or rental equipment) is free of weed seed and propagules before entering incident location.

WEED-72: When possible, use fire-suppression tactics that reduce disturbances to soil and vegetation, especially when creating fire lines.

WEED-73: Use wet or scratch-lines where possible instead of fire breaks made with heavy equipment.

WEED-74: Given the choice of strategies, avoid ignition and burning in areas at high risk for weed establishment or spread.

WEED-75: Hose off vehicles on site if they have traveled through infested areas.

WEED-76: Inspect clothing for weed seeds if foot travel occurred in infested areas.

WEED-77: When possible, establish incident bases, fire operations staging areas, and aircraft landing zones in areas that have been inspected and are verified to be free of invasive weeds.

WEED-78: Cover weed-infested cargo areas and net-loading areas with tarps if weeds exist and cannot be removed or avoided.

WEED-79: Flag high-risk weed infestations in areas of concentrated activity, and show weeds on facility maps.

WEED-80: If fire operations involve travel or work in weed-infested areas, a power wash station should be staged at or near the incident base and helibase. Wash all vehicles and equipment upon arrival from and departure to each incident. This includes fuel trucks and aircraft service vehicles.

WEED-81: Identify areas affected by suppression activities that may be vulnerable to weed invasion, and utilize suppression funds to repair.

Post-fire Rehabilitation

WEED-82: Have a weed specialist review burned area rehabilitation reports to ensure that proper and effective weed prevention and management is addressed.

WEED-83: Thoroughly clean the undercarriage and tires of vehicles and heavy equipment before entering a burned area.

WEED-84: Treat weeds in burned areas. Weeds can recover as quickly as two weeks following a fire.

WEED-85: Schedule inventories one month and one year post-fire to identify and treat infestations. Eradicate or contain newly emerging infestations.

WEED-86: Restrict travel to established roads to avoid compacting soil that could hinder the recovery of desired plants.

WEED-87: Determine soon after a fire whether revegetation is necessary to speed recovery of a native plant community, or whether desirable plants in the burned area will recover naturally. Consider the severity of the burn and the proportion of weeds to desirable plants on the land before it burned. In general, more severe burns and higher pre-burn weed populations increase the necessity of revegetation. Use a certified weed-free seed mix. **(SOP)**

WEED-88: Inspect and document weed infestations on fire access roads, equipment cleaning sites, and staging areas. Control infestations to prevent spread within burned areas.

WEED-89: Seed and straw mulch to be used for burn rehabilitation (e.g., for wattles, straw bales, and dams) shall be certified weed-free. **(SOP)**

WEED-90: Replace soil and vegetation right side up (i.e., any uprooted plants still in a clump of

soil are replaced upward) when rehabilitating fire line.

FISH AND WILDLIFE MANAGEMENT AND SPECIAL STATUS SPECIES (FWS)

FWS-22: In wildland fire situations work with Fire Resource Advisors during suppression efforts in the GJFO when considering dipping water from ponds, reservoirs, and lakes throughout the Grand Valley. Select reservoirs, ponds, and lakes harbor native and/or endangered fishes and should be avoided if at all possible. If these waters must be used, screen water intakes with 0.25-inch mesh to avoid fish entrainment.

CULTURAL RESOURCES (CR)

CR-1: Evaluation of all BLM activities and BLM-authorized activities shall be made in compliance with BLM Manual 8100, The Foundations for Managing Cultural Resources (BLM 2004a) and subsequent 8100 series (BLM 2004b, 2004c, 2004d, 2004e, 2004f, 2004g, and 2004h); Handbook of Guidelines and Procedures for Inventory, Evaluation, and Mitigation of Cultural Resources (BLM 1998); and the current State Protocol Agreement between the Colorado BLM and the Colorado State Historic Preservation Office.

CR-4: The National Historic Preservation Act, as amended, requires that if newly discovered historic or archaeological materials or other cultural resources are identified during project implementation, work in that area must stop and the BLM Authorized Officer must be notified immediately. Within five working days, the BLM Authorized Officer will inform the proponent as to:

a) Whether the materials appear eligible for the National Register of Historic Places;

b) The mitigation measures the proponent will likely have to undertake before the site could be used (assuming in situ preservation is not practicable) (36 CFR 800.13); and

c) A timeframe for the BLM Authorized Officer to complete an expedited review under 36 CFR 800.11 to confirm, through the State Historic Preservation Office, that the BLM Authorized Officer's findings were correct and mitigation was appropriate.

WILDLAND FIRE ECOLOGY AND MANAGEMENT (WFM)

Fire Suppression

WFM-1: Resource Advisors and other applicable specialists shall be utilized to advise the Incident Commander and suppression resources on the natural resource values during the suppression effort.

WFM-2: Avoid applying fire retardant in or near drinking water sources.

WFM-3: Avoid the application of retardant or foam within 300 feet of a waterway or stream channel. Deviations from this procedure are acceptable if life or property is threatened.

WFM-4: Fire lines will not be constructed by heavy equipment within riparian stream zones. If construction is necessary due to threats to life or property, control lines shall 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.

WFM-5: For streams currently occupied by cutthroat trout or other aquatic special status species, extractions of water from ponds or pools shall not be allowed if stream inflow is minimal and water extraction will lower the existing pond or pool level.

WFM-6: Lands will be temporarily closed to other uses in areas where fire suppression is being implemented.

WFM-7: Stream flow shall not be impounded or diverted by heavy equipment in order to facilitate extraction of water from the stream for fire-suppression efforts.

WFM-8: If it is determined that use of retardant or surfactant foam within 300 feet of a waterway or stream channel is appropriate due to threats to life or property; alternative line construction tactics are not feasible because of terrain constraints, congested areas, or lack of ground personnel; or potential damage to natural resources outweighs possible loss of aquatic life, then the unit administrator shall determine whether there have been any adverse effects to federally listed species. If the action agency determines that adverse effects were incurred by federally listed species or their habitats, then the action agency must consult with US Fish and Wildlife Service, as required by 50 CFR 402.05, as soon as practicable.

WFM-9: Avoid whenever possible burning out unburned islands of native vegetation, specifically sagebrush communities.

WFM-10: Minimize/mitigate impacts to cultural resources and pristine vegetative communities.

WFM-11: Prior to use on BLM-administered lands, thoroughly rinse to remove mud and debris from all fire-suppression equipment from off-district or out of state and used to extract water from lakes, ponds, streams, or spring sources. Examples of this equipment are helicopter buckets, draft hoses, and screens. After cleaning the equipment, disinfect it to prevent the spread of invasive aquatic species. Do not rinse equipment with disinfectant solutions within 100 feet of natural water sources. GJFO suppression equipment used to extract water from sources known to be contaminated with invasive aquatic species, as identified by US Fish and Wildlife Service and Colorado Parks and Wildlife, also shall be disinfected beforehand on GJFO BLM-administered lands.

WFM-12: Vehicle and equipment shall be washed before being assigned to fires to minimize the spread of noxious weeds. Larger fires with incident management teams assigned may need to have a weed wash station.

Emergency Stabilization, Burned Area Rehabilitation, and Suppression Repair

Treatments from these three programs include the following:

WFM-13: Stabilize areas that have low potential to naturally revegetate and that have high wind and soil erosion potential. Treatments include the following:

a) Installing water bars and other drainage diversions, culverts along fire roads, dozer lines, and other cleared areas;
b) Seeding and planting to provide vegetative cover;
c) Spreading mulch to protect bare soil and discourage runoff;
d) Repairing damaged roads and drainage facilities;
e) Clearing stream channels of structures or debris that is deposited by suppression activities;
f) Installing erosion control structures;
g) Installing channel-stabilization structures;
h) Fencing or restricting areas to livestock and wild horse and burro grazing to promote success of natural revegetation or establishment of seeded species;
i) Temporarily closing lands to other uses during emergency stabilization and rehabilitation practices if activities inhibit treatment;
j) Repairing or replacing range improvements and facilities; and
k) Monitoring emergency stabilization and rehabilitation treatments.

WILDERNESS, WILDERNESS STUDY AREAS, AND LANDS WITH WILDERNESS CHARACTERISTICS (WSA)

From the 2017 Dominguez-Escalante National Conservation Area and Dominguez Canyon Wilderness RMP. These design features would also be applied to the GJFO if absent from the GJFO RMP.

WIL –GOAL-01: Preserve, protect, or enhance the qualities of wilderness character in the Dominguez Canyon Wilderness.

WSA-GOAL-01: Preserve the wilderness character of remaining wilderness study areas.

WSA-MA-02: In the response to wildfire, use Minimum Impact Suppression Tactics to limit impact to wilderness characteristics. Only allow ground-disturbing mechanical tactics (e.g., bulldozers) if life and/or property is threatened.

LWC-OBJ-01: Preserve and/or enhance wilderness characteristics in lands managed for their wilderness characteristics.

LWC-MA-04: For any non-emergency implementation action in the Dry Fork of Escalante and Cottonwood Canyon, consider how proposed actions would impact inventoried naturalness and opportunities for solitude and/or primitive and unconfined recreation.

In the response to wildfire, use Minimum Impact Suppression Tactics (MIST) to limit impact to wilderness characteristics. Do not allow tactics involving ground disturbance with heavy equipment unless life and/or property is threatened.

Managed fires, if feasible, without equipment that would ordinarily be prohibited by Section 4(c) of the Wilderness Act (wilderness areas only).

Assigned resource advisor or resource staff with knowledge and experience in wilderness stewardship to the firefighting team to assist in the protection of wilderness character.

From the 2015 Grand Junction Resource Management Plan; amended by the Northwest Colorado Greater Sage-grouse Approved Resource Management Plan Amendment

WSA-1: All WSAs will be managed in accordance with BLM Manual 6330, Management of Wilderness Study Areas (BLM 2012).

WIL-GOAL-01: Manage lands to protect wilderness characteristics (e.g., appearance of naturalness, outstanding opportunities for primitive and unconfined recreation or solitude) while considering competing resource demands and manageability, such as valid and existing rights, mineral potential, proximity to residential and other development, existing and potential recreation areas.

RIGHTS-OF-WAY AND OTHER USES

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 and communications sites.

2.2.3 Alternatives considered but not analyzed in detail
Both the Grand Junction and Dominguez-Escalante RMPs considered different levels of wildland fire use and suppression.

2.3 PLAN CONFORMANCE REVIEW

PLAN CONFORMANCE REVIEW: The Proposed Action is subject to and has been reviewed for conformance with the following plan (43 CFR 1610.5, BLM 1617.3):

Name of Plan: Grand Junction Resource Management Plan; amended by the Northwest Colorado Greater Sage-grouse Approved Resource Management Plan Amendment, approved September 15, 2015.

Date Approved: August, 2015

Decision Number/Page: WFM-OBJ-01 page 77 and WFM-MA-01 page 77

Decision Language: Use a full range of wildfire management strategies, from full suppression to resource benefit on unplanned ignitions. Multiple strategies can be applied to different areas of the same fire. Utilize wildfires on 857,400 acres as identified in Figure 2-26 in Appendix A to manage diversity in desired plant communities.

Name of Plan: Dominguez-Escalante National Conservation Area and Dominguez Canyon Wilderness RMP

Date Approved: January, 2017

Decision Number/Page: WFM-OBJ-01-39 and WFM-MA-01-39

Decision Language: Use a full range of wildfire management actions when responding to unplanned ignitions, from full suppression to managing for multiple objectives including, but not limited to, resource benefit. Allow natural unplanned ignitions to be managed for multiple objectives (including resource benefit) within 208,568 acres of the D-E NCA to meet biological resource objectives. This excludes the Gunnison River riparian corridor

2.4 STANDARDS FOR PUBLIC LAND HEALTH

In January 1997, the Colorado State Office of the BLM approved the Standards for Public Land Health and amended all RMPs in the State. The BLM also incorporated the standards into RMPs that have been revised. Standards describe the conditions needed to sustain public land health and apply to all uses of public lands.

Standard 1: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes.

Standard 2: Riparian systems associated with both running and standing water function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100-year floods.

Standard 3: Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat's potential.

Standard 4: Special status, threatened and endangered species (federal and state), and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

Standard 5: The water quality of all water bodies, including ground water where applicable, located on or influenced by BLM lands will achieve or exceed the Water Quality Standards established by the State of Colorado.

Because standards exist for each of these five categories, a finding must be made for each of them in an environmental analysis. These findings are located in Chapter 3 of this document.

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

This section provides a description of the human and natural environmental resources that could be affected by the Proposed Action. It also presents comparative analyses of the direct, indirect, and cumulative effects on the affected environment stemming from the implementation of the actions under the Proposed Action and other alternatives analyzed.

This EA draws upon information compiled in the Grand Junction Field Office RMP (BLM 2015) and the DENCA RMP (BLM 2017).

3.1.1 Elements Not Affected

The following elements, identified as not being present or not affected are not brought forward for additional analysis in this EA:

- Geology/Mineral Resources – Fires do not normally affect geologic/mineral resources. Outcropping coal seams may be the only exception to this, which occur in the Book Cliffs area, but require extreme heat to ignite/maintain a coal seam fire.
- Paleontological – Fires do not normally affect paleontological resources, except in circumstances where the resource is located in an alcove or overhang above where a fire might occur. In those instances, protection of the resource should probably be on a case-by-case basis due to safety. The primary location for this is within the MCNCA, which is not part of the Proposed Action area.
- Transportation and Access – Access to and across BLM managed public lands would not change as a result of the Proposed Action.

3.1.2 Past, Present, Reasonably Foreseeable Actions

NEPA requires federal agencies to consider the cumulative effects of proposals under their review. Cumulative effects are defined in the Council on Environmental Quality (CEQ) regulations 40 CFR §1508.7 as "…the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency…or person undertakes such other actions." The CEQ states that the "cumulative effects analyses should be conducted on the scale of human communities, landscapes, watersheds, or airsheds" using the concept of "project impact zone" or more simply put, the area that might be affected by the proposed action. The area that may be affected by this project includes the Grand Junction Field office and the Dominguez Escalante National Conservation Area and their airsheds. The BLM GJFO reviewed their NEPA log and our field office GIS data to assess past, present, and reasonably foreseeable actions that may occur within the affected area. The following list includes all past, present, and reasonably foreseeable actions known to the BLM that may occur within the affected area:

Past Actions:
Action - date

- BLM mechanical thinning (Hydro axe) and seeding to reduce hazardous fuels and improve wildlife habitat. 2004 – 2016
- BLM broadcast burning. 2004 – 2016
- Livestock grazing has a long history in the area and continues to occur across most of the GJFO and DENCA.
- Wild horse management.
- Commercial and Residential development.
- Recreation (motorized and non-motorized)
- Right-of-way grants for a variety of uses such as oil and gas facilities, roads, utilities, and communications sites.
- Oil and gas development.
- Mineral development.
- Habitat improvement projects.
- Cultural resource protection and restoration projects
- Weed treatments (mechanical and herbicide).

Present Actions:

- BLM mechanical thinning (Hydro axe) and seeding to reduce hazardous fuels and improve wildlife habitat. 2017
- BLM broadcast burning. 2017
- Livestock grazing continues to occur across most of the GJFO and DENCA.
- Wild horse management.
- Commercial and Residential development.
- Recreation (motorized and non-motorized).
- Right-of-way grants for a variety of uses such as oil and gas facilities, roads, utilities, and communications sites.
- Oil and gas development.
- Habitat improvement projects.
- Cultural resource protection and restoration projects.
- Weed treatments (mechanical and herbicide).

Reasonably Foreseeable Actions

- BLM mechanical thinning (Fecon/Chainsaw). 2017-2027
- BLM slash piling and pile/broadcast burning. 2017-2027
- Ongoing oil and gas development as well as construction and maintenance of ROWs.
- Livestock grazing management.
- Habitat improvement projects.
- Cultural resource protection and restoration projects.
- Weed treatments (mechanical and herbicide).
- Recreation (motorized and non-motorized).
- Oil and gas development

- Mineral development

Table 1– Potentially Impacted Resources

Resources	Not Present On Location	No Impact	Potentially Impacted	Mitigation / Design Features Necessary ?	BLM Evaluator Initial & Date
PHYSICAL RESOURCES					
Air and Climate	☐	☐	☒	☐	KH 7/18/17
Water (surface and subsurface, floodplains)	☐	☐	☒	☐	KH 7/18/17
Soils	☐	☐	☒	☐	KH 7/18/17
Geological and Mineral Resources	☐	☒	☐	☐	EE 2/7/17
BIOLOGICAL RESOURCES					
Special Status Plants	☐	☐	☒	☐	ARL 5/16/17
Special Status Wildlife	☐	☐	☒	☐	HLP 5/12/17
Migratory Birds	☐	☐	☒	☐	HLP 5/12/17
Other Important Wildlife Habitat	☐	☐	☒	☐	HLP 5/12/17
Vegetation	☐	☐	☒	☐	BP 5/12/17
Forestry	☐	☐	☒	☐	BP 5/12/17
Invasive, Non-native Species	☐	☐	☒	☐	MT 4/17/17
Wetlands and Riparian Zones	☐	☐	☒	☐	ARL 5/16/17
HERITAGE RESOURCES AND HUMAN ENV.					
Cultural or Historical	☐	☐	☒	☐	NFC 5/10/17
Paleontological	☐	☒	☐	☐	EE 2/7/17
Tribal and Native American Religious Concerns	☐	☐	☒	☐	NFC 5/10/17
Visual Resources	☐	☐	☒	☐	DB 5/17/17
Social and Economic	☐	☐	☒	☐	
Transportation and Access	☐	☒	☐	☐	AW 2/21/17
Wastes, Hazardous or Solid	☐	☐	☒	☐	AEK 4/20/17
LAND RESOURCES					
Recreation	☐	☐	☒	☐	AW 4/27/17
Special Designations (ACEC, SMAs, WSR)	☐	☐	☒	☐	DB 5/17/17
Wilderness and Wilderness Characteristics	☐	☐	☒	☐	DB 5/17/17
Range Management	☐	☐	☒	☐	BP 5/12/17
Wild Horse and Burros	☐	☐	☒	☐	JD 5/12/17
Land Tenure, ROW, Other Uses	☐	☐	☒	☐	RBL 5/16/17
Fire and Fuels	☐	☐	☒	☐	JP 4/17/17

3.2 PHYSICAL RESOURCES

3.2.1 Air Quality and Climate Change

Current Conditions:

Air quality in the project area is typical of undeveloped regions in the western United States. No designated Class I airsheds are located within the project area. The primary sources of air pollutants in the region are fugitive dust from the desert surrounding the planning area, unpaved roads and streets, seasonal sanding for winter travel, and emissions from motor vehicles. Seasonal wildfires locally and throughout the western U.S. may also contribute to air pollutants and regional haze.

Air quality in the project area is considered to be good, with levels of ozone (O_3) and particulate matter less than 10 µm in diameter (PM^{10}), and particulate matter less than 2.5 µm in diameter ($PM^{2.5}$) well below the thresholds established by the EPA (EPA 2016; CDPHE 2016). The closest air monitoring stations to the project area are in Rifle, about 29 miles to the north; and Palisade, about 13 miles to the southwest. The Palisade monitoring station only reports O_3 levels, while the Rifle station reports both O_3 and $PM^{2.5}$ levels. The project area is outside of any non-attainment areas, and there is no air quality plan that applies.

Colorado Department of Public Health and Environment sets standards for the impacts to air quality from certain activities. Most fugitive dust and total suspended particles (TSP) from fire activities are greater in size than PM^{10} and $PM^{2.5}$, but may still have an impact on the environment, including reduced visibility, respiratory, and nuisances that interfere with the enjoyment of the environment (CDPHE 2016). The EPA General Conformity regulations require that an analysis (as well as a possible formal conformity determination) be performed for federally sponsored or funded actions in nonattainment areas and in designated maintenance areas when the total direct and indirect net air pollutant emissions (or their precursors) exceed specified levels. The Clean Air Act conformity regulations do not apply because the GJFO is not within a non-attainment or a maintenance area.

Environmental Consequences:

Alternative A – No Action:

Wildland fires, both planned and unplanned, are potentially substantial sources of air pollutants. The amount of emissions depends upon the size and intensity of the fire. Factors that influence the release of emissions include meteorological conditions such as temperature, wind speed, wind direction, fuel type, moisture content of fuels, and vegetation type. Burning produces reactive organic compounds, nitrogen oxides, carbon monoxide, inhalable particulate matter (PM 10), fine particulate matter (PM 2.5), and greenhouse gas pollutants, all of which impact air quality.

Under the No Action alternative fires would not be managed for resource benefit. Suppression tactics would be utilized to extinguish the fire to the quickest extent possible and acreage burned should be minimized. Under this alternative direct effects include an increase in particulate matter from smoke for the duration of the fire which would reduce

visibility, create respiratory concerns for the public, and could be a nuisances that interferes with the enjoyment of the environment. The direct effects related primarily to smoke emissions should only last for the duration of the event and indirect effects could last until soils and vegetation recover. However, over the long term, continuing fire suppression would allow for further accumulation of fuels leading to the possibility of larger uncontrolled fires. If vegetation continues to accumulate and build unnatural canopy structure, the likelihood for larger wildfires would increase. This could lead to an increase in air pollution resulting from a higher burn intensity and larger scale fires. Allowing for naturally occurring fires to burn for resource benefits would ultimately reduce air pollution potential over the long term.

Indirect effects include similar issues after the fire is out in severely burned areas. Areas where vegetation and soils are completely removed or severely altered can be sources of fugitive dust. Impacts from fugitive dust would be limited to the local area, but in extreme wind events it could impact areas miles away.

Cumulative Effects:
The direct and indirect effects could cumulatively decrease visibility, cause respiratory issues, and interfere with the enjoyment of the environment. During and after the fire issue identified in section 3.1.2 combined with the fire could increase the severity and duration of the impacts. The other actions identified in section 3.2.1 create similar particulate matter or dust that cause the impacts.

The cumulative effects should last until soils and vegetation recover. Studies on fire recovery indicate that recovery can take about three years or longer depending on the conditions.

<u>Alternative B – Proposed Action:</u>
Under the Proposed Action alternative fires would be managed for resource benefit. Suppression tactics would utilized to allow the fire to burn to meet varying objectives. This could cause the burned area and area of severe burn to increase. Under this alternative the direct effects are similar to the No Action alternative, but the magnitude of the impacts may increase due to fire size increases. Under this alternative direct effects include an increase in particulate matter for the duration of the fire which would reduce visibility, create respiratory concerns for public, and could be a nuisances that interfere with the enjoyment of the environment.

Indirect effects include similar issues after the fire is out if the area burned is severely burned. Areas where vegetation and soils are completely removed or severely altered can be sources of fugitive dust. Due to the size (>PM^{10}) of this fugitive dust, the area which is impacted typically would be minimized to the immediate area of the burned area.

The direct effects should only last for the duration of the event and indirect effects could last until soils and vegetation recover. Timing and severity of effects would be greater if suppression of the fire is extended to manage for resource benefit.

Cumulative Effects:
The direct and indirect effects could cumulatively decrease visibility, cause respiratory issues, and interfere with the enjoyment of the environment. During and after the fire issue identified in section 3.1.2 combined with the fire could increase the severity and duration of the impacts. The other actions identified in section 3.2.1 create similar particulate matter or dust that cause the impacts. Allowing naturally ignited fires to burn may help to reduce the intensity and extent of fires over time throughout the GJFO and DENCA, which could reduce the number and intensity of large fires over time.

Fire managers will cooperate with local land managers and the State of Colorado Air Pollution Control Division to minimize impacts to air quality on local communities. Fire managers will also apply management techniques to minimize smoke production and enhance spoke dispersion when deciding to let a fire burn. Furthermore, fire managers will establish and maintain close communications with state and local agencies regarding the status of managed fires. The public will be informed of the status of the fire and potential smoke impacts through the local press.

The cumulative effects should only last for the duration of the event or until soils and vegetation recover. Studies on fire recovery indicate that recovery can take about three years or longer depending on the conditions. Cumulative effect's duration and intensity could increase for a particular fire if a fire is managed for resource benefit.

3.2.2 Soils (includes a finding on Standard 1)

Current Conditions:
Many different soil types occur in the project area because of the varying climatic, vegetative, topographic, and geologic conditions. In the planning area, impacts on soil resources have resulted from energy development, grazing, recreation, natural processes, and other activities. Soil resources support range and forest plant communities that stabilize the soil surface and protect watershed function and condition. The potential for maintaining or restoring these communities and conserving the soil resource depends on the specific soil types and how the resource is managed.

The soil types in the project area occur from 4,400 feet above mean sea level on the valley floor to 8,600 feet above mean sea level in the higher elevations. The average annual precipitation and temperature in the project area vary greatly by elevation and aspect (Western Region Climate Center 2009). Many of the soils have developed from alluvium that was deposited over time as the Colorado, Dolores, and Gunnison Rivers and their tributaries eroded through the surrounding mountain ranges. Soils also vary with vegetative cover, including range and forest plant communities.

When making land management decisions based on soil-related hazards or limitations, the GJFO evaluates soil surveys available from the NRCS. Soils are mapped according to the boundaries of major land resource areas, which are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses. Each soil survey describes the specific

properties of soils in the area surveyed and shows the location of each kind of soil on detailed maps. The BLM evaluates soil map units to make management decisions that would likely affect soils. Each soil survey applicable to the project describes soil map units by the individual soil or soils that make up the unit. These descriptions indicate the limitations and hazards inherent in each unit. Descriptions include soil depth, range of elevation, origin, climate, physical properties, runoff capabilities, erosion hazard, associated native vegetation, wildlife habitat use, and capability for community development and other uses.

Generally, soils in the project area are loams, clays, and rock outcrop complexes. The depth of all soils range from 0 to 60 inches, depending on slope and aspect. Some soils have a very high runoff potential and erosion hazard rating. Complete descriptions of the affected soil units are available from the NRCS (NRCS 2017).

Biological (or cryptobiotic) soil crusts are composed of highly specialized communities of cyanobacteria, mosses, and lichens. These biological crusts cover open spaces between vascular plants on relatively barren soils. Biological crusts generally occur where vascular plant cover is sparse. Crust cover is generally greatest at lower elevation sites in semiarid areas (Belnap et al. 2001).

Erosion is a continuing natural process that can be accelerated by human disturbances. Factors that influence soil erosion include soil texture, structure, length and percent of slope, vegetative cover, and rainfall or wind intensity. Soils most susceptible to erosion by wind or water are typified by bare or sparse vegetative cover, non-cohesive soil particles with low infiltration rates, and moderate to steep slopes. Wind erosion processes are less affected by slope angles but are highly influenced by wind intensity.

The potential for soil erosion increases with increasing slope. Steep slopes are concentrated adjacent to stream courses, particularly in the northern portion of the planning area and around the edge of the Grand Mesa in the southern portion of the planning area. NRCS soil map unit descriptions rate soils in the planning area according to their susceptibility to water and wind erosion. Wind erosion is particularly a hazard when surface litter and vegetation are removed by fire or other disturbances. Soils in the planning area were screened based on several relevant characteristics that indicate potentially fragile soils or high erosion hazards. These characteristics include:

- Soils rated as highly or severely erodible by wind or water, as described in NRCS soil survey reports;
- Landslide Areas, as identified in NRCS soil survey reports;
- Soils on slopes greater than 35 percent, particularly with the following attributes:
- Surface texture of sand, loamy sand, very fine sandy loam, fine sandy loam, silty clay, or clay;
- Depth to bedrock less than 20 inches;
- Erosion hazard rating of high or very high; and
- K (soil erodibility potential) factor greater than 0.32.

Most fragile and slumping soils occur in the northern portion of the planning area, along the rise up to the Roan Plateau to the north. Slumping soils also occur in the Plateau Valley and Grand Mesa slopes areas.

One geologic formation in the planning area that experiences substantial instability is the Mancos Shale. The Mancos Shale is susceptible to hydration and flow. A thin, water-resistant lens of montmorillonite clay keeps water from moving to the bottom of this unit, restricting mass wasting to the upper Mancos Shale (Sinnock 1978). Mancos Shale occur predominately in the northern portion of the project area.

Finding for Public Land Health Standard 1 for Upland Soils:
Land Health Assessments (LHA) have been completed for the majority of the project area. Assessments were conducted in geographic areas. This projects includes areas in the West Salt, West Creek, Roan and Carr Creek, North Desert, Dominguez, Gateway, and Debeque-Roan Creek land health area.

Project locations within the West Salt assessment area are generally meeting Land Health Standard (LHS) 1. Area not meeting LHS 1 are located in or near drainage bottoms and invasive plants and some surface erosion.

Project locations within the West Creek assessment area are generally meeting LHS 1. A few locations are meeting with problems due to lack of understory vegetation.

Project locations within the Roan and Carr Creek LHA area are meeting LHS 1 in the headwaters, but locations near the mouth of the watershed are not meeting LHS 1 due to signs of erosion and vegetation issues.

Project location within the North Desert area are meeting LHS 1 in the headwater areas. Area not meeting LHS 1 are located in or near drainage bottoms and invasive plants and some surface erosion are caused for not meeting LHS 1.

Project location within the Dominguez-Escalante NCA area are meeting LHS 1 in the headwater areas. Area not meeting LHS 1 are located in or near drainage bottoms and invasive plants and some surface erosion are causes for not meeting LHS 1. LHA indicate more areas of soil erosion occur.

Project location within the Gateway area are meeting LHS 1 in the headwater areas. Area not meeting LHS 1 are located in or near drainage bottoms and invasive plants and some surface erosion are causes for not meeting LHS 1. LHA indicate areas of soil erosion occur, bares soils, pedalstaling, and surface litter movement are present.

Project locations within the De Beque-Roan Creek assessment area are generally meeting LHS 1. A few locations are meeting with problems due to lack of understory vegetation and signs of erosion.

<u>Environmental Consequences:</u>

Alternative A – No Action

Direct and Indirect impacts on soil resources related to wildland fires are complex and involve changes in nutrient cycling, water infiltration and runoff, and erosion potential (Moody et al. 2008; Martin and Moody 2001; Moody and Martin 2001). These impacts can be caused by the fire itself or can occur due to fire suppression activities. Impacts are a function of fire size, burn severity, whether the vegetation community is adapted to fire, the vegetation community fire condition class, and the soil moisture condition.

Impacts include soil erosion by wind and water, changes in soil structure and chemistry, and soil compaction and displacement. Suppression action can include, but may not be limited to, the operation of equipment off roads and trails, line construction, and the use of retardants. Fire suppression and the fire cause physical changes in soil structure, vegetation community (both by removing and allowing establishment of invasive plants), and increasing physical disturbances to the soil itself. Soils chemistry can also be altered when soils are mixed, heated, or when retardant is applied.

The severity and magnitude of the impacts are typically driven by the complexity of the fire. When potentially effected resource value increases, the impacts increase. More resources, equipment, line construction, and retardant are used to suppress fires around high priority resources. This increases the potential for more direct effects related to fire suppression activities but can reduce the direct effects of the fire itself.

Causes for indirect effects are the same as the direct effects. Indirect effects can be caused by the fire itself or from the suppression activities and these effects can last for three or more years. The effects can be transported downslope and downstream. For example, sedimentation from soil erosion can reduce biologic complexity in the stream, the long-term changes in vegetation can increase upland erosion rates for decades if not permanently, and soil tilth may be effected making it hard for any plants to establish.

Additionally, fire suppression can allow for the buildup of fuels increasing the potential for large high severity fires. When fuels are denser, the fire can burn hotter and the impacts can last longer. Legacy fire suppression has created a greater potential for high severity fires and the continued suppression of all fires would cause the fuels to get worse. Fires that burn in these fuel dense systems can have more impacts on soil resources. If complete fire suppression continues, soils would be expected to be impacted more with the increasing large fires occurrence.

Finding for Public Land Health Standard 1 for Upland Soils:
The No Action Alternative will have the potential to increase areas not meeting LHS1. Suppression action can create localized areas of high erosion potential. These areas include, but are not limited to line construction, access routes, and other disturbed areas due to suppression action. All fires regardless of the action taken creates the potential for vegetation changes short or long term. These areas are inherently more prone to have no1-native plants establish and have decreased soil function. Finally, if long-term suppression occurs, and large high intensity fires increase due to the buildup of fuels, larger areas of non-attainment of LHS 1 could occur.

Cumulative Effects:
Geology, current and historical uses, and climate can increase the potential for cumulative effects. Immediate and effective suppression of wildfires can reduce the cumulative effects on a short term. If the fires are suppressed at a minimal size the direct and indirect effects would not contribute to other watershed actions and increase the watershed soil function. The exception would be when fires suppression and current fuel loading creates large fires, then there would be cumulative effects. Sediment production, transport, and deposition changes can be expected in watershed where there are multiple ground disturbing activities, where there is high use, and in watersheds that have had large fires.

Complete fire suppression can lead to less short term cumulative effects, but historic fire suppression has created higher than normal fuel loading which leads to larger and more server fires. Fire suppression can create the potential for larger fires when the natural fire regimes are not in balance. The larger burn areas can cause larger amounts of soil erosion and surface runoff. These effects can increase rapidly when the large fires occur in watersheds with highly erosive geology, in historically overgrazed areas, and where there is a high degree of ground disturbances.

Alternative B – Proposed Action:

Under the Proposed Action Alternative fires would be managed for resource benefit. Direct and indirect effects would be similar to the No Action Alternative, but the timing, extent, and intensity of the fires could increase in an effort to meet resource objectives. Fires would be managed when conditions are expected to be optimal for meeting resource objectives. This type of fire management should allow the fire to burn in a manner that would limit the impacts to soils, help re-establish the natural fire regime, and reduce fuel loading.

The proposed action would only allow the use of managing fire for resource benefit under condition which should minimize the areas that have high severity burns and create more areas with a more appropriate vegetation condition class. Soils in areas with proper fuel conditions can better tolerate fire and the burned material may help improve organic matter in the soils.

The direct effects should only last for the duration of the event and indirect effects could last until soils and vegetation recover. Typically, post fire high erosion rates typically start to return to normal three to five years after a fire. This can vary depending on local precipitation.

Finding for Public Land Health Standard 1 for Upland Soils:
If fires are managed for resource benefit, improvement in some areas may result. In areas managed with low or moderate severity, fire can improve vegetation health over time and allow natural soil function to improve.

Cumulative Effects:
Under the Proposed Action, cumulative effects are expected to be minor. Fires that are allowed to be managed could improve soils. The exception would be in the minimally

expected high burn severity areas. The long-term soil function in the watershed should improve when natural fire regimes manage vegetation at healthy levels.

3.2.3 Water (surface and groundwater, floodplains) (includes a finding on Standard 5)

Current conditions:

The Clean Water Act, Colorado River Salinity Control Act, Public Land Health Standards, Colorado Water Quality Standards, and other laws, regulations, and policy guidance at the federal, state, and local levels regulate surface water on public lands. The GJFO strives to manage for and sustain good water quality and adequate flows in area streams for the benefit of people and aquatic, riparian, and upland animals and plants on a watershed scale.

The project area lies within the Upper Colorado River Basin in western Colorado. Within the planning area, the Colorado River includes four major sub-basins. From east to west, these include Roan Creek, Plateau Creek, Gunnison River, and Dolores River. Peak flows on the major tributaries of the Colorado River typically occur in May and June, resulting from snowmelt. Base flows occur in late fall and winter from groundwater when surface runoff is minimal. Intense summer thunderstorms are often responsible for peak flows on the smaller tributaries that can cause severe flooding in localized areas.

While there are many perennial rivers and streams within the project area, the majority of streams are intermittent or ephemeral, flowing seasonally or from storm events, respectively. According to the National Hydrography Dataset, 68 percent of all streams in Colorado are ephemeral or intermittent (Levick et al. 2008).

The headwater stream segments within the project area generally have good water quality, meeting or exceeding water quality standards established by the State of Colorado for the beneficial uses on the streams. Many stream segments in lower-elevation areas have water quality concerns, with the primary pollutants being salinity, sediment, and selenium. Salinity and selenium are typically associated with sediment, as the ions tend to be bound to soil particles. Elevated pollutant levels commonly originate from eroding saline soils developed from the Mancos, Morrison, Wasatch, and Green River Formations. While erosion rates are naturally high in many areas, erosion tends to be accelerated by land uses. These saline soils exist in the Grand Valley north of the Colorado River, in the lower portions of Roan Creek, in areas east of the Gunnison River below the Grand Mesa, and in other localized areas.

Salinity is the presence of elevated levels of soluble salts in soils or waters. These salts are sodium chloride, magnesium and calcium sulfates, and bicarbonates. Salinity is one of the greatest water quality concerns within the Colorado River Basin and is subject to the Colorado River Basin Salinity Control Act (Public Law 98-569). Section 203(b)(3) of this act directs the Secretary of the Interior to "…develop a comprehensive program for minimizing salt contributions to the Colorado River from lands administered by the Bureau of Land Management…". High salinity levels threaten the multitude of uses, including municipal, agricultural, and industrial, supported by Colorado River water. The

highest sediment loads occur during periods of high flow, spring snowmelt on the larger streams, and intense summer storms on the smaller tributaries. In general, high flows tend to dilute pollutant concentrations but increase pollutant loading within a stream. Low or base flows occur in late fall and winter, correlating with high dissolved salt concentrations.

Selenium is another pollutant of concern in the planning area. Studies conducted by the USGS and the National Irrigation Water Quality Program indicated primary source areas for selenium in the Colorado River near the Colorado/Utah state line to be the eastern side of the Uncompahgre Valley and the western one-half of the Grand Valley, where extensive irrigation is located on Mancos Shales (National Irrigation Water Quality Program 1993). Elevated selenium in surface waters is due in large part to above-average erosion rates and deep percolation from irrigated agriculture and irrigation return flow on soils derived from Mancos Shale or other formations with marine depositional origins.

Surface water quality varies greatly depending on natural and anthropogenic factors, including geology, precipitation, vegetation cover, and land use. The bedrock geology within a watershed is a key determinant of its surface water quality. In areas with sandstone, basalt, or granite bedrock, the surface water tends to be of good quality. Where the Morrison, Mancos, Wasatch, and Green River Formations are exposed within the project area, water quality tends to be poorer, with high total dissolved solids and/or selenium concentrations.

Precipitation pattern also influences water quality. Average precipitation within the GJFO ranges from eight inches in the Grand Valley desert to eighteen inches or more in the higher elevation Book Cliffs and Uncompahgre Plateau. Most rainfall occurs in the form of isolated, short-duration, and intense summer thunderstorms, creating localized flood flows that have the power to erode, mobilize, and transport sediment downstream.

All surface waters within Colorado are organized by basin and labeled by stream segment. For each stream segment, the state has set water quality standards for physical, chemical, and biological parameters based on the existing or potential beneficial uses for water supply, aquatic life, recreation, and agriculture.

Colorado's List of Water-Quality-Limited Segments Requiring Total Maximum Daily Loads (TMDL) fulfills Section 303(d) of the Clean Water Act, which requires that states submit to the US EPA a list of those waters for which technology-based effluent limitations and other required controls are not stringent enough to implement water quality standards. For these impaired water bodies, TMDL calculations would have to be completed to determine the loadings from anthropogenic and natural sources and to determine the loading allocations for the different polluting sources (Title 5 Colorado Code of Regulations [CCR] 1002-93). Colorado's Monitoring and Evaluation List identifies water bodies where there is reason to suspect water quality problems, but where there is also uncertainty regarding one or more factors such as the representative nature of the data. Water bodies that are impaired, but it is unclear whether the cause of impairment is attributable to pollutants as opposed to pollution, are also placed on the Monitoring and

Evaluation List (Title 5 CCR 1002-93). Sediment and selenium are the primary water quality impairments within the GJFO planning area.

Colorado's water quality standards and regulations are codified in Regulation No. 31 of Title 5 CCR 1002-31 (Basic Standards and Methodologies for Surface Water). Colorado's regulations set forth provisions regarding the adoption of water quality-based designations for certain surface waters and establish an antidegradation review process applicable to certain activities impacting the quality of surface waters. Regulation No. 37 of Title 5 CCR 1002-37 for the Lower Colorado River Basin and Regulation No. 35 of Title 5 CCR 1002-35 for the Gunnison and Lower Dolores River Basins define the state-identified water quality standards for the planning area.

Groundwater and Groundwater Quality

The project area lies within the larger Colorado Plateau and Wyoming Basin Groundwater Region. This region covers an area of 160,000 square miles throughout Colorado, Utah, Wyoming, Arizona, and New Mexico. A broad plateau averaging 4,000 to 7,000 feet dominates this region and is underlain primarily by horizontal to gently dipping layers of consolidated sedimentary rocks predominantly composed of Paleozoic to Cenozoic sandstone, shale, and limestone. Mountain ranges border this area on the north, west, and east (Heath 1984). Surface water is the principal water resource in the project area with groundwater used for less than five percent of the water needs. The primary sources of groundwater in the planning area are the alluvial aquifer systems associated with the Colorado, Gunnison, and Dolores Rivers. Bedrock aquifers of the Piceance Basin account for a very small proportion of water use (Topper et al. 2003).

Alluvial groundwater occurs in unconsolidated deposits formed along drainage courses. The alluvial aquifer is capable of yielding sufficient water for domestic and stock water uses, and as irrigation water in some locations. Groundwater in the alluvial drainages occurs primarily under unconfined conditions. Localized confined conditions may occur where clay layers are laterally extensive. The direction of groundwater flow in the alluvium is generally parallel or sub-parallel with the axis of the drainage.

The Plateau Valley consists of quaternary alluvial deposits as well as glacial till deposits. These sediments serve as an important source of domestic and municipal water in the Plateau Valley. The Mesa and Powderhorn Source Water Protection Areas contain a significant amount of these types of deposits and also have a high density of water wells.

Alluvial groundwater is recharged by stream flow in the upper reaches of the drainages where there is more likely to be a separation between the channel bottom and the underlying alluvial water table. Recharge of the groundwater is greatest during precipitation events or snow melt runoff when the stage of the creeks increases and more water is able to infiltrate. A lesser amount of recharge may occur from bedrock formations and from irrigation return flows.

The valley fill deposits or alluvium in the Colorado River basin consists generally of unconsolidated boulders, cobbles, gravel, sand, silt, and clay. The thickness of the

alluvium can be extremely variable depending on location. Alluvium in the upper reaches of the basin tends to be thin due to increased slopes and higher flow velocities. Thicker deposits tend to accumulate in the lower reaches.

Alluvium is very limited or nonexistent in the canyon sections of the Colorado River where bedrock is exposed. Alluvial groundwater resources are used for public water supply and agricultural irrigation, and represent an important resource in rural areas for domestic supplies. The principal agricultural area is the Grand Valley from Palisade to Fruita; other agricultural areas include Plateau Creek in the Collbran area (Topper et al. 2003).

The Gunnison River flows northwest through portions of the project area at Whitewater and joins the Colorado River at Grand Junction. Groundwater is used for irrigation, public and domestic water supply, and livestock. The alluvium of the Gunnison River basin consists of clay, silt, sand, gravel, and cobbles. Alluvial deposits are very thin or nonexistent in the canyon areas of the main stem of the Gunnison River and tributaries (Topper et al. 2003).

The Dolores River Basin passes through the southern part of the project area. Alluvium within the Dolores River basin is comprised of typical Quaternary alluvial valley fill. These deposits consist of gravel, sand, silts, clay, and various mixtures. The alluvial extent is limited to areas near the rivers and their tributaries and disappears entirely in areas where active canyon downcutting occurs. Mapped alluvial deposits are localized around the town of Gateway and in West Creek in Unaweep Canyon. Although restricted in extent, the alluvium is an important aquifer to those people who utilize it for domestic, livestock, and minor irrigation use (Topper et al. 2003).

Much of the northern part of the project area is in the Piceance Basin, an elongated structural depression trending northwest to southeast. The basin is more than 100 miles long and has an average width of over 60 miles. The principal bedrock aquifers in the northern portion of the Piceance Basin are the saturated, porous members of the Uinta Formation and Parachute Creek Member of the Green River Formation (both of Tertiary age). Bedrock aquifers in the Piceance Basin are typically under confined conditions, except along outcrops at the basin edge. The potentiometric surface indicates that the pressure head is at or very near the surface within the drainage valleys. This suggests that groundwater is moving from the aquifers to the creek alluvium (Topper et al. 2003). The thickness of Tertiary-age rocks in the Piceance Basin varies from 2,000 to approximately 12,000 feet. South of the Colorado River, the upper Tertiary-age aquifers have largely been eroded off, exposing a thick basal confining unit of the lower Green River and Wasatch Formations (Topper et al. 2003).

In the planning area, the Entrada sandstone provides most of the artesian fresh water, and the Wingate sandstone is the source of the deepest artesian fresh water supply. The sandstone layers of the Salt Wash member of the Morrison Formation also provides artesian fresh water, but at lesser amounts. The Burro Canyon and Dakota sandstones often provide artesian water too, but typically the water is saline (Lohman 1965). In many

areas, groundwater wells must be drilled to depths of roughly 1,000 feet or more depending on the location within the basin to tap the fresh waters of the most permeable sandstones and limestones. The shales and siltstones usually contain salty waters, or water containing more than 1,000 milligrams per liter of dissolved solids (Heath 1984). As such, most water supply wells in the southern portion of the Piceance Basin are completed in the alluvial aquifers associated with the Colorado and Gunnison River tributaries (Topper et al. 2003).

Colorado's water quality criteria are set by the CDPHE, Water Quality Control Division. Basic Standards for Ground Water are contained in CDPHE Regulation 41. For groundwater, specified areas are designated to delineate a special activity or use. Site-specific uses and standards are then promulgated for the specified area. Where there is no specified area, and therefore no sites specific standards, a general standard applies.

There is one small underground coal mine in the Book Cliffs north of Loma that uses groundwater inflows for mining processes, and one small underground uranium mine on the Uncompahgre Plateau that is idle and no longer pumping, treating and discharging groundwater inflows to the surface. A lease for a larger underground coal mine (11,000 acres) has been proposed in the Book Cliffs north of Loma.

Water Use

The GJFO manages lands that support municipal, residential, agricultural, livestock watering, and industrial mining uses. Municipal watersheds and source water protection areas have been identified in the planning area. Source water protection areas providing drinking water to local towns and communities were delineated by the State of Colorado as required by the Safe Drinking Water Act Amendments of 1996. To date, source water assessments have been completed for Grand Junction, Palisade, Collbran, De Beque, and Clifton. Assessments have also been completed for smaller municipalities, resorts, homeowner associations, and ski areas. Notable municipal water supply areas and storage reservoirs that have been mapped in the planning area include the following:

- Grand Junction municipal watershed;
- Palisade municipal watershed;
- Jerry Gulch watershed;
- Collbran source water protection area;
- Mesa/Powderhorn source water protection area;
- Cabin Reservoir; and
- Jerry Creek Reservoir.

Smaller systems and private potable water sources are tapped throughout the planning area (CDPHE 2000, 2009).

Finding for Public Land Health Standard 5 for Water Quality:

In several situations where stream segments on BLM-administered lands are not meeting water quality standards, it is due to land uses on private land beyond the management

control of the BLM. As one example, the main stem of the Gunnison River from the Uncompahgre River to the Colorado River was listed for selenium on the 303(d) list of impaired water bodies (this segment now has a TMDL). However, the primary cause of the elevated selenium through the segment is deep percolation of irrigation water through croplands on Mancos Shale in the Uncompahgre Valley. Likewise, many tributaries on the north side of the Colorado River within the Grand Valley are listed for selenium on the 303(d) list. While the lower Book Cliffs and north desert on public lands may contribute selenium to streams from natural erosion and surface-disturbing activities, the scale of the pollution contribution is much less than that of irrigated agriculture in the Grand Valley.

Water quality in the planning area is generally meeting Standard 5, but there are localized areas that are functioning at risk (FAR) or not functioning (NF) according to Proper Functioning Condition (PFC) assessments for riparian areas, which if not improved could lead to water quality degradation.

Environmental Consequences:

Alternative A – No Action:

Wildfires and suppression activities that occur in areas adjacent to rivers, streams, or waterbodies may affect water quality. Wildfires can remove protective vegetation, cause soil characteristic changes leading to higher runoff rates, and increase the organic matter in waterbodies. Suppression activities can have similar effects and in addition there are chances for petroleum based products to enter water ways. The use of surface water as a source of water for fire suppression activities can impair water quality. Because surface water sources for fire suppression are not specified, the primary general impacts on surface water sources used for fire suppression include the lowering of surface water levels and the loss of water for groundwater recharge. Fire retardants are also known to cause water quality impacts. Impacts are a function of the size of the fire, severity of the burn, whether the vegetation community is adapted to fire, the fire condition class of the vegetation community, and the condition of fuels before the burn.

Suppression can have conflicting concerns. If suppression actions are effective, fires should remain relatively small. This limits the potential impacts on water resources. The other concern with suppression is when too much suppression occurs and fuel loading is above normal conditions, large high severity fires are more probable leading to greater impacts to water quality.

Finding for Public Land Health Standard 5 for Water Quality:

Water quality in the planning area is generally meeting Standard 5, but there are localized areas that are FAR or NF for riparian areas, which if not improved could lead to water quality degradation. Large wildfires have the potential to cause watershed scale water quality issues. If the No Action alternative is selected fires would be suppressed, limiting the extent of burned areas, which would keep the potential for areas meeting, FAR, or NF the same in the short term. If fires are not allowed to reduce fuel loadings then there is a

greater potential for larger more severe fires, which could lead to more areas not meeting LHS 5.

Cumulative Effects:

Complete fire suppression can lead to less short term cumulative effects, but historic fire suppression has created higher than normal fuel loading which leads to larger and more server fires. Fire suppression can create the potential for larger fires when the natural fire regimes are not in balance. The larger burn areas can cause larger amounts of soil erosion and surface runoff. These effects can increase rapidly when the large fires occur in watersheds with highly erosive geology, in historically overgrazed areas, and where there is a high degree of ground disturbances.

Alternative B – Proposed Action:
If the Proposed Action is selected fires may be allowed to grow larger impacting more area. Wildfires can remove protective vegetation, cause soil characteristic changes leading to higher runoff rates, and increase the organic matter in waterbodies. Although wildfires managed for resource benefit may be larger, these type of fires would only be allowed to burn when conditions were appropriate. Allowing the fire to burn when conditions are appropriate would reduce the potential for high severity burns. Moderate or low severity fires have less harmful impacts on water quality and more beneficial impacts. The benefit comes in the form of reducing the potential for areas in the future with a high burn severity. Managed fire can result in positive impacts, but at the same time could lead to poor water quality if more area is burned.

Finding for Public Land Health Standard 5 for Water Quality:
Water quality in the planning area is generally meeting Standard 5, but there are localized areas that are FAR or NF for riparian areas, which if not improved could lead to water quality degradation. Large wildfires have the potential to cause watershed scale water quality issues. If the Proposed Action is selected fires could burn larger areas. These areas could increase the burned area and increase the potential for areas meeting, FAR, or NF to increase on the short term. After the burned areas recover and the fuels are reduced, the potential for large fires and water quality effects decrease. At the same time if managed fire areas are only moderately burned, the potential for areas with high burn severity would be decreased. The more areas that are within the appropriate fire condition class rating could cause improvement in LHS 5

Cumulative Effects:
Managing wildfires for resource benefit should help reduce the cumulative effects. The managed fires should promote healthy vegetation, improve watershed function, and reduce the chances of catastrophic wildfires which can disrupt watershed function.

3.3 BIOLOGICAL RESOURCES

3.3.1 Invasive, Non-native Species

Current Conditions:

The BLM weed management program began a thorough search for noxious weeds beginning in 2000, and concluded the search in 2004. The survey provided the office with a strategic picture of weed locations for about 17 listed species. Using global positioning system (GPS) technology crews identified approximately 8,000 infestations of weeds in all areas of the Field Office and both NCAs. The survey was integral to completing an Integrated Weed Management Plan (IWM), which includes the strategic management of invasive species. The IWM Plan and GIS data are tools for Resource Advisors engaged in fire activity.

Environmental Consequences:

Alternative A – No Action:

Under this alternative, all fires would essentially fall under a suppression status. It is difficult to ascertain how this would affect weed issues in the short and long term. On one hand, weeds which thrive after a fire disturbance, may be less likely to do so if suppression is successful in keeping fires small. On the other hand, disturbance caused by suppression resources may increase the chance of weeds. One could assume that a suppression response to all fires would increase inadvertent weed spread by vehicles, especially if vehicles arrive from other regions.

Cumulative Effects:
Similar to direct and indirect effects mentioned above, it is difficult to know how long-term suppression would affect weed management. The answer probably lies in a species-by-species context, as some weeds are more opportunistic than others following fire.

Alternative B – Proposed Action:

Under this alternative, managers will have the option to manage fires for resource benefit. Part of the determination of whether to do so lies in the potential for a post-fire weed problem. Fires occurring in a high-risk area for weed invasion may be suppressed if the risk is deemed too high.

This alternative will require close coordination between fire staff and resource staff on virtually every new fire that has the potential to grow in size. Singletree fires that have little or no potential for spread will not be an issue.

Weed management is just one of many considerations when determining whether a fire will truly benefit resource management.

There are a number of design features included in the Proposed Action to help the BLM determine whether management of a wildland fire as opposed to suppression, may lead to an increase in the abundance and extent of weeds in area if it is susceptible to weed invasion and establishment.

Cumulative Effects:

As stated earlier, there are numerous factors to consider (weeds being one factor) before a fire is allowed to run its course for resource benefit. Assuming resource managers are correct in their determination that managing a fire would be beneficial, the cumulative effects of fire in the ecosystem should be positive from a weed management standpoint. Fires are a natural way to reset the successional clock, and assuming weed problems do not occur or increase afterwards, the rejuvenated plant community should be resilient to weed invasion.

3.3.2 Threatened, Endangered and Sensitive Species (includes a finding on Standard 4)

Current conditions:

Current conditions for these species are similar to those described in the Grand Junction Field Office Resource Management Plan (2015), the Northwest District Greater Sage-grouse Plan Amendment (2016), and the Dominguez Escalante National Conservation Area Resource Management Plan (2017).

The United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) (May 11, 2017) lists the following species potentially occurring in the Grand Junction Field Office and Dominguez Escalante NCA:

Common Name	Scientific Name	Status	Critical Habitat in the project area	Likely to occur in the project area
Gunnison Sage-grouse	Centocercus minimus	Threatened	Yes	Yes
Mexican Spotted Owl	Strix occidentalis lucida	Threatened	No	No
Yellow-billed Cuckoo	Cuccyzus americanus	Threatened	Proposed, Yes	Yes
Bonytail Chub	Gila elegans	Endangered	Yes	Yes
Colorado Pikeminnow	Ptychocheilus lucius	Endangered	Yes	Yes
Humpback Chub	Gila cypha	Endangered	Yes	Yes
Razorback Sucker	Xyrauchen texanus	Endangered	Yes	Yes
Colorado Hookless Cactus	Sclerocactus glaucus	Threatened	No	Yes
Debeque Phacelia	Phacelia submutica	Threatened	Yes	Yes
Parachute Beardtounge	Penstemon debilis	Threatened	Yes	Yes
Ute Ladies'-tresses	Spiranthes diluvialis	Threatened	No	No
Canada Lynx	Lynx Canadensis	Threatened	No	No
North Americal Wolverine	Gulo gulo luscus	Proposed Threatened	No	No

BLM Sensitive Wildlife Species known to occur in the Field office and DENCA include

Wildlife	
Common Name	Scientific Name
Big Free-tailed Bat	Nyctinomops macrotis
Fringed Myotis	Myotis thysanodes
Spotted Bat	Euderma maculatum
Townsend's Big-eared Bat	Corynorhinus townsendii
White-tailed prairie dog	Cynomys leucurus
Desert bighorn sheep	Ovis canadensis nelsoni
Kit Fox	Vulpis macrotis
Rocky mountain bighorn sheep	*Ovis canadensis*
Northern Goshawk	Accipiter gentilis
Burrowing Owl	Athene cunicularia
Ferruginous Hawk	Buteo regalis
Greater Sage Grouse	Centrocercus urophasianus
American Peregrine Falcon	Falco peregrinus
Golden Eagle	Aquila chrysaetos
Bald Eagle	Haliaeetus leucocephalus
Brewers Sparrow	Spizella berweri
Bluehead Sucker	*Catostomus discobolus*
Colorado R. Cutthroat Trout	*Oncorynchus clarki pleuriticus*
Flannelmouth Sucker	*Catostomus latipinnis*
Roundtail Chub	*Gila robusta*
Canyon Treefrog	*Hyla arenicolor*
Longnose Leopard Lizard	*Gambelia wislizenii*
Midget Faded Rattlesnake	*Crotalus viridus concolor*
Northern Leopard Frogs	*Rana pipiens*
Great Basin Silverspot	*Speyeria Nokomis nokamis*
Plants	
Narrow-stem gilia	Aliciella stenothyrsa (Gilia stenothyrsa)
Jones' bluestar	Amsonia jonesii
DeBeque milkvetch	Astragalus debequaeus
Horseshoe milkvetch	Astragalus equisolensis
Grand Junction milkvetch	A. linifolius
Ferrons' milkvetch	A. musiniensis
Naturita milkvetch	A. naturitensis
Fisher milkvetch	A. piscator
San Rafael milkvetch	A. rafaelensis
Grand Junction suncup	Camissonia eastwoodiae
Gypsum Valley cateye	Cryptantha gypsophila (Oreocarya revealii)

Common Name	Scientific Name
Osterhout's cryptantha	Cryptantha osterhoutii (Oreocarya osterhoutii)
Kachina fleabane	Erigeron kachinesis
Grand buckwheat	Eriogonum contortum
Tufted frasera	Frasera paniculatum
Piceance bladderpod	Lesquerella parviflora
Canyonlands biscuitroot	Lomatium latilobum
Dolores River skeletonplant	Lygodesmia doloresensis
Roan cliffs blazingstar	Mentzelia rhizomata (Mentzelia argillosa)
Eastwood's monkeyflower	Mimulus eastwoodii
Aromatic Indian breadroot	Pediomelum aromaticum
Cathedral Bluff meadow-rue	Thalictrum heliophilum
Strigose Easter-daisy	Townsendia strigosa

Finding for Public Land Health Standard 4 for Threatened and Endangered Species: Special Status species occur across the planning area in a variety of habitats. Currently, the majority of the planning area is meeting standards, however there are many areas determined by the BLM to be meeting with problems, or not meeting standards.

Environmental Consequences:

Wildfires could destroy known and undiscovered special status plant populations, depending on the location and severity. In certain circumstances the seed bank could be destroyed through denaturing or lost by erosion. Fire could threaten Colorado hookless cactus, similar to effects observed for fishhook barrel cactus (Ferocactus wislizenii; see Matthews 1994), although the thick cortex associated with barrel cacti (especially with older individuals) may increase resistance to fire. Fire could result in mortality to cacti as a direct result of fire damage to the apex, especially within shorter plants, or as an indirect result from burning of spines that could increase successful herbivory. Mortality generally occurs within the first 2 years of a fire, and was observed to be substantially greater within closed vegetation types rather than open areas. In addition, depending on the extent, location, severity, and seral stage affected, fire would have short-term impacts on special status wildlife by removing habitat for some species or by destroying streamside cover. In the long term, habitat for late seral-dependent species such as Mexican spotted owl (Strix occidentalis lucida) and Canada lynx (Lynx canadensis) may be lost, but habitat for other species may be improved through removal of decadent vegetation, improved vegetative health, and increased structural diversity.

Increased human activity and noise associated with wildland fire suppression and wildland fire use in areas occupied by special status species would affect nesting, breeding, foraging, or roosting behavior. Important habitats could be altered because of the use of heavy equipment, hand tools, and noise associated with intensive human activity. However, there

is also a risk of habitat loss in areas where wildland fire suppression is absent or limited due to the increased potential for large and more severe wildfires. This in turn is balanced by the fact that a large fire could require extensive suppression operations, such as extensive staging areas and fire-line construction, that could themselves result in long-term effects on special status species and their habitats. Smaller fires that would require less extensive suppression operations would generally avoid these long-term effects.

Alternative A – No Action:

Under the No Action Alternative managing wildland fire for resource benefit would not be permitted. Under this alternative some threatened, endangered and sensitive species would not be impacted, however species that may benefit from the effects of this type of habitat treatment would be negatively impacted. This alternative has the potential to increase the likelihood of higher intensity, larger fires as fuel loads build up, which could negatively impact species that are not fire adapted in the long term and could also result in larger impacts as a result of fire suppression activities.

Finding for Public Land Health Standard 4 for Threatened and Endangered Species:
Alternative A is not expected to impact the ability of the planning area to meet Public Land Health Standard 4 in the short term. However, in the long-term if fires increase in intensity and size as a result of this action Standard 4 could be negatively impacted.

Cumulative Effects:
Wildfires have a large potential to increase cumulative effects when combined with impacts from recreation, oil and gas development, mining, and other uses that impact the landscape. Severe burn areas can have lasting effects to vegetation. Effects can last for years, and within the No Action alternative, any positive impacts would be limited to initial containment boundaries.

Alternative B – Proposed Action:

Under all alternatives, no decision will be approved or authorized on BLM-administered lands that will jeopardize the continued existence of special status species that are listed, proposed, or candidates for listing as threatened or endangered. Impacts to individual Threatened, Endangered and Sensitive species could occur as a result of the use of wildland fire for resource benefit but these impacts would be minimized through coordination efforts with BLM resource management specialists.

Finding for Public Land Health Standard 4 for Threatened and Endangered Species:
Alternative B is expected to help the planning units attain Land Health Standard 4 across a broader range of the planning area through the appropriate use of wildland fire for resource benefit.

Cumulative Effects:
Wildfires have a large potential to increase cumulative effects when combined with recreation, oil and gas development, mining, and other uses that affect the landscape.

Severe burn areas can have lasting effects to vegetation resources. Effects can last for years; however, under the Proposed Action management would be for resource benefit, which has the potential to decrease cumulative effects of wildfire on a landscape scale.

3.3.3 Vegetation (grasslands, forest management) (includes a finding on Standard 3)

Current conditions:

The project area encompasses the majority of the Grand Junction Field Office and the Dominguez-Escalante National Conservation Area. The vegetation resources within these areas were described and analyzed within the 2015 GJFO RMP EIS and 2017 DENCA RMP EIS, and are incorporated by reference. There are three main physiognomic groups in the GJFO and DENCA planning areas: Rangelands, forests and woodlands, and riparian areas and wetlands. Barren land, also a physiognomic group, comprises less than one percent of the planning area. Physiognomic groups can be further divided into plant communities. There are 14 general vegetation plant communities in the GJFO planning area. A plant community is a group of plant populations that coexist in space and time and affect each other's population dynamics directly or indirectly. Distinct plant communities within the project area are influenced by characteristics such as soil depth, texture, and salinity; climate variables, particularly temperature, total and seasonal distribution of precipitation, and wind; and topographic features, most importantly elevation, aspect, and slope. The following discussion of plant communities that occur within the project area shows the diverse and complex nature of vegetation resources in the area.

Barren/talus/rock outcrops

This community, representing less than one percent of the planning area, includes areas of barren soil, cliffs, and talus slopes that support little or no vegetation, and rock outcrops. Barren areas, talus slopes, and rock outcrops are too steep and too sparsely vegetated to be beneficial to livestock or big game animals for forage. Barren areas are usually caused by soil conditions that preclude the growth of vegetation. Although vegetation in these areas is quite sparse, microbiotic crusts are abundant and diverse and are key to holding these soils intact. Other barren areas are found as small inclusions on Wasatch soils that are too steep or lack the proper soil characteristics to support vegetative growth. Talus slopes form below cliffs of the Green River Formation as the cliffs begin to weather and crumble. These talus slopes consist of shale shards of various size and often have very little soil development or are too steep and unstable to support most forms of vegetation. However, many endemic rare plant species in the GJFO and DENCA planning area occur on these talus slopes. Most of these species have biological characteristics that enable them to grow in extreme conditions. Rock outcrops are usually areas of sandstone that are resistant to weathering. These areas are exposed rock ledges and benches, with soil deposition occurring only in cracks and low spots where soil accumulates.

Rangelands

Rangelands can be subdivided into grasslands and shrub communities. These vegetation types and the roles they play in the project area are described below.

Grasslands

No true grasslands (where grass is dominant over shrubs) occur within the project area; however, grass plays an important ecological role. In the lower elevations with sandier soils, needle-and-thread (Hesperostipa comata), sand dropseed (Sporobolus cryptandrus), galleta (Hillaria jamesii), Indian ricegrass (Achnatherum hymenoides), and blue gramma (Bouteloua gracilis) are common. In the more mesic settings, grass communities shift to junegrass (Koeleria macrantha), wheat grasses (Agropyron sp.), and bluegrasses (Poa sp.). In general, the only pure stands of grass within the GJFO planning area occur as a result of some type of disturbance. Chaining and seeding activities from the 1960s have resulted in crested wheat grasslands on the Uncompahgre Plateau and Glade Park (crested wheat is an introduced but naturalized grass) (Weber 2001). In the lower desert (valley floor) and in areas of De Beque, cheatgrass (Bromus tectorum) dominates the more degraded areas. Degradation into cheatgrass dominated areas is most commonly associated with past or present overgrazing, drought, and/or fire. Cheatgrass-degraded sites tend to also contain other weedy species, including annual wheatgrass (Eremopyrum triticeum), filaree (Erodium cicutarium), halogeton (Halogeton glomeratus), Russian thistle (Salsola iberica), annual mustards, and in some areas, jointed goat grass (Aegilops cylindrica). Increasing stands of non-native bulbous bluegrass (Poa bulbosa) have also been noticed across the GJFO planning area at all elevations.

Shrub Communities

Approximately 41 percent of the BLM-administered lands in the GJFO planning area are considered shrublands (salt desert shrub, mountain shrub, sagebrush, greasewood, and blackbrush) (BLM 2010a). These communities are very diverse in plant composition, size, location, habitats, and forage they provide to wildlife and livestock. Therefore, this section discusses several shrub community types: salt desert shrub, mountain shrub, sagebrush (three dominant sagebrush species discussed within this type), greasewood, and blackbrush.

Salt Desert Shrub

Salt desert shrublands are characterized by drought-tolerant shrubs, with few grasses and forbs in the understory (BLM 2009d). The soils of these areas are shallow saline clays and loams. Typical shrubs in this vegetation type are shadscale (Atriplex confertifolia), Gardner's saltbush (A. gardneri), mat saltbush (A. corrugata), four-wing saltbush (A. canescens), spiny hopsage (Grayia spinosa), greasewood (Sarcobatus vermiculatus), winterfat (Krascheninnikovia lanata), broom snakeweed (Gutierrezia sarothrae), and bud sagebrush (Picrothamnus desertorum). Big sagebrush (Artemisia tridentata) and rabbitbrush (Chrysothamnus sp.) occur in looser and rockier soils and are much less abundant than in the other desert shrub types. Juniper (Juniperus osteosperma) is occasionally found on the lee side of rocky hills and ridges. Understory vegetation includes globemallow (Sphaeralcea sp.), wild parsley (Lomatium sp. and Cymopterus sp.), prickly pear cactus (Opuntia sp.), galleta (Hilaria jamesii), needleand-thread, and Indian ricegrass. These areas are often important winter ranges for wildlife and livestock, as they provide forage that is not buried in snow, and the shrubs and rough topography provide cover from

wind and predators. The forage of these areas is excellent in the winter, as these shrubs maintain relatively high levels of protein and carbohydrates. In addition to winter forage, this shrub community is an important soil stabilizer in areas too salty or xeric for other plants to survive in. The salt desert shrub community occurs on 16 percent of the lands managed by BLM and is located in the lower elevations, from 5,000 to 7,000 feet (BLM 2009d). In a degraded condition, these communities are dominated by invasive annuals; degradation often results from fire, historic grazing, or recreational activities. This vegetative community does not respond well to disturbance and is typified by extremely slow recovery.

Mountain Shrub

Mountain shrub communities include Gamble oak (Quercus gambelii), service berry (Amelanchier sp.), snowberry (Symphoricarpos rotundifolius), squaw apple (Peraphyllum ramosissimum), antelope bitterbrush (Purshia tridentata), and various other shrubs (BLM 2009d). These shrubs may reach 10 to 15 feet in height, occurring in dense stands or in scattered patches, often adjacent to aspen or willow. These areas are important wildlife summer and transition ranges, as well as spring, fall, and summer livestock ranges. This community provides hiding and thermal cover for deer, elk, and other wildlife species. The mountain shrub community comprises 15 percent of the land managed by BLM and generally occurs in all mid- to upper-elevation ranges (6,500 to 9,500 feet) across the GJFO planning area (occurring between the lower pinyon-juniper woodlands and upper-elevation aspen and conifer stands). Since this community typically occurs in areas of relatively abundant moisture, understory species are abundant, and density of the understory is determined by canopy cover. Common understory species are Letterman's and Columbia needlegrass (Achnatherum lettermanii and A. nelsonii, respectively), junegrass, penstemon (Penstemon sp.), Indian paintbrush (Castilleja sp.), and aster (family Asteraceae). The mountain shrub community tends to respond favorably to fire due to its resprouting capabilities (BLM 2009d).

Sagebrush

Sagebrush communities in the project area are dominated by Wyoming big sagebrush, mountain big sagebrush, and black sagebrush (BLM 2009d). Less frequent species are silver sagebrush (A. cana ssp. bolanderi), basin big sagebrush (A. tridentata ssp. tridentata), bud sage (A. spinescens), and an unidentifiable hybrid on the Uncompahgre Plateau. Collectively, sagebrush communities make up eight percent of the GJFO public lands. Sagebrush communities are especially rich in wildlife species that live only or predominately in this vegetation type, or as with mule deer, species that would be far less numerous if sagebrush were absent. Fire is an important component of all sagebrush-dominated plant communities. Degraded Wyoming big sagebrush and mountain big sagebrush communities are susceptible to cheatgrass invasion, and at extremes may have understories devoid of all perennials, populated solely by cheatgrass. The three dominant species are described below.

Wyoming Big Sagebrush

The Wyoming big sagebrush (Artemisia tridentata ssp. wyomingensis) is the most tolerant big sagebrush species in arid locations, existing in areas with precipitation of 7 to 11 inches. Wyoming big sagebrush tends to grow at mid elevations in well-drained soils but can exist at elevations reaching 8,000 feet (Winward 2004). This species is important winter forage for big game species and sage-grouse. This species is the most diminutive of the big sagebrush group, with typical heights of 24 to 36 inches. Some mature plants may surpass four feet. Canopy cover is not as extensive as for either basin or mountain big sagebrush, usually topping out between 30 and 40 percent. Wyoming big sagebrush often appears as the dominant plant in mosaic communities intermixed with other shrubs and open grasslands. In shallow, rocky to gravelly soils, Wyoming big sagebrush may be co-dominant with black sagebrush, viscid rabbitbrush (Chrysothamnus viscidiflorus), and sometimes winterfat. Grass and forb species vary depending on soil texture, aspect, and slope. Common grass species include Sandberg bluegrass (Poa secunda), Indian ricegrass, needle-and thread, and bottlebrush squirreltail (Elymus elymoides).

Common forbs include phlox (Phlox sp.), buckwheat (Eriogonum sp.), penstemon, Indian paintbrush, globemallow, and prickly pear cactus. It is also one of the dominant species found on antelope and mule deer crucial winter ranges.

Mountain Big Sagebrush/Grassland

Common to pinyon-juniper woodlands, mountain big sagebrush (A. tridentata ssp. vaseyana) grows in moderately deep, well-drained soils at elevations ranging from 6,500 to 8,500 feet. Most sites supporting this sagebrush are very productive and diverse. The fire return interval in mesic mountain big sagebrush sites with abundant grass and forb cover is more frequent than other sagebrush sites, roughly 25 to 30 years. Mountain big sagebrush can increase in canopy cover without periodic fire, disease, or other disturbance. Canopy cover on areas that have not had disturbance for several decades can reach between 40 and 50 percent (Winward 2004). This sagebrush type is an important component of sage-grousebrood-rearing habitat, so any sagebrush reduction projects must be designed to consider sage-grouse habitat requirements (Winward 2004).

Black Sagebrush

Of the three dominant sagebrush species in the project area, black sagebrush (A. nova) is the smallest (4 to 12 inches). Black sagebrush is found in shallow argillic or clay pan soils, with an elevation range of 4,000 to 8,500 feet. In order to survive, it must endure saturated soils in the spring and extremely dry soils in the summer (Winward 2004). In low-elevation winter ranges (during snow-free periods), black sagebrush is extremely important to pronghorn and mule deer. This species is particularly nutrient-rich winter forage and is highly palatable to domestic sheep.

Greasewood

Greasewood communities make up approximately two percent of the GJFO planning area, occurring in uplands and washes (lower desert) (BLM 2009d, 2010a). Areas populated by greasewood tend to have extremely saline soils, with limited plant associations. Plants most likely occurring within greasewood communities are greasewood, seep weed (Suaeda sp.),

cheatgrass, and halogeton, and, in less saline sites, sagebrush and shadscale. In general, greasewood-dominated communities are the most resistant vegetative community to treat and to revegetate. While domestic livestock will graze greasewood, animals not adapted to it can suffer from oxalate poisoning, causing kidney failure. Greasewood provides important cover for upland game birds, big game animals, and other wildlife species.

Blackbrush

Blackbrush (Coleogyne ramosissima) is found in less than one percent of the GJFO planning area. Blackbrush is a drought-tolerant, low- to mid-level shrub (11 to 48 inches), with an elevation range of 2,500 to 6,000 feet. Blackbrush can be found on the north side of the Dolores River near the town of Gateway, and on a lower bench overlooking Unaweep Canyon near Casto Draw. Monitoring studies are established in both locations. While deer may utilize blackbrush in the winter, monitoring has determined that this species receives very little use. The blackbrush community near Gateway contains very little understory and is characterized by large bare-ground interspaces, while the Casto Draw location has a slightly more robust understory consisting of needle and-thread grass, sand dropseed, Indian ricegrass, and winterfat.

Forests and Woodlands

Forest and woodland vegetation is primarily composed of pinyon-juniper woodlands, Douglas-fir, aspen, and ponderosa pine and collectively account for 55 percent of the GJFO planning area (BLM 2009d, 2010a). Pinyon-juniper woodlands make up the majority of this vegetation community. The forested areas within the project area are found mainly within the mountainous areas of the Uncompahgre Plateau, Grand Mesa, areas accessed by Douglas Pass, and the extreme northern areas of the Book Cliffs (north of De Beque). Pinyon-juniper is much more widespread, accounting for nearly all mid-elevation areas. Forested lands and woodlands managed by the BLM within the GJFO planning area total 588,200 acres.

Pinyon-Juniper Woodlands

Consisting of approximately 539,900 acres and accounting for 53 percent of the GJFO planning area, pinyon-juniper (PJ) (*Pinus edulis*, *Juniperus osteosperma*) woodlands are the most dominant vegetative community in the GJFO planning area (BLM 2009d, 2010a). At lower elevations, many of the woodlands exhibit a greater dominance of juniper than pinyon, with many communities entirely dominated by juniper. Due to a lower xylem pressure, juniper is more drought tolerant than pinyon (BLM 2010d). The denser woodlands are found mainly at the intermediate elevations (4,900 to 8,000 feet) where precipitation averages 12 to 14 inches per year. As pinyon juniper stands age, understory is drastically reduced. At extremes, older stands can be devoid of perennial grasses, containing only sparse forbs. Moss mats are also commonly found around the trunks of juniper within the drip lines of trees. While it has been thought that the allelopathic properties of the Utah juniper were to blame for the lack of understory, research has not supported this theory. In studies done by Horman and Anderson (1998), Utah Juniper leachate was applied to seeds, and germination rates were found to be positively linked to the application instead of suppressed as would be expected of allelopathic effects.

Understory amounts are more likely influenced by canopy cover, with older woodlands having a greater canopy and a sparser understory. Cheatgrass invasion following fire is an increasing problem in the pinyon-juniper woodlands. Across the west, pinyon stands have been decimated by the Pinyon ips beetle. Mild winters, plentiful stands of drought-stressed pinyon, and large numbers of ips beetle have teamed together to create the optimal conditions for beetle infestations. Ips beetle-related mortality can be found in Bangs Canyon and Glade Park. The project area has not experienced the same level of mortality that southern Colorado and other areas of the Southwest have, where entire stands have been lost. No estimates are available for the number of acres affected by ips beetle within the project area.

Douglas-fir and Mixed Conifer

Douglas-fir (*Pseudotsuga menziesii*) stands are generally found on northern and eastern aspects of the Book Cliffs and the Roan Plateau. There are very few grasses or forbs in the understory. This forest type represents approximately three percent of the GJFO planning area.

Aspen

The aspen forest type accounts for 7,800 acres, equaling less than 1 percent of the GJFO planning area (BLM 2010a). Aspen (*Populus tremuloides*) is typically relegated to areas above 8,000 feet on northern and eastern slopes. Within the project area, aspen can be found on Douglas Pass, Mud Springs, and the Uncompahgre Plateau. Understories are highly variable. Across Colorado, aspen stands have been in a state of decline. Recent research has indicated that aspen stands are drought stressed, making them more susceptible to disease and insect infestation.

Ponderosa Pine

Ponderosa pine (*Pinus ponderosa*) occurs on the higher mesas and mountains of the planning area at about 8,000 feet, including the Uncompahgre Plateau, Douglas Pass, and other scattered areas. Ponderosa pine represent less than one percent of the project area (BLM 2010a). Ponderosa pine stands tend to be small, with a mountain shrub understory. While Ponderosa pine is a fire adapted species, records indicate little fire history in the northern portion of the Uncompahgre Plateau.

Significant Plant Communities

Significant plant communities (not significant under NEPA definition of significant) that are tracked by the Colorado Natural Heritage Program are those that are globally rare, rare within the state, or ancient, exemplary, in that they have not been substantially altered by human activity. The first category includes vegetation communities in which the individual species may not be rare but the unique assemblage is rare or uncommon. The second category of significant plant communities involves plant community types that are significant not because of their rarity, but because they represent relatively pristine plant communities with few nonnative species.

Significant plant communities on BLM managed lands are important for many of the same reasons that special status plants are important. Urbanization, agriculture, and other human activities have greatly modified many of the natural plant communities on private lands. BLM managed lands are therefore critical to maintaining the diversity of natural plant communities and biological diversity (Fish and Wildlife 2000: Rare Plants and Natural Plant Communities – A Strategy for the Future, 1992). Significant plant communities constitute relict areas and may serve as comparison areas to assess public land health and analyze the impacts of human activities. These areas may also prove to be important to future studies and research.

In the GJFO planning area, 50 occurrences of 28 significant plant communities have been identified. The list is neither complete nor conclusive as changes are expected over the lifetime of the RMP, and new significant plant communities are expected to be located and recorded over time.

Finding on Public Land Health Standard 3 for plant communities:
The GJFO and DENCA categorizes land health findings as Meeting, Meeting with Problems, and Not Meeting. Currently, the majority of the project area is within the Meeting category; however, there are many areas that the BLM has determined are meeting with problems, or not meeting standards. There are a variety of causal factors for meeting with problems or not meeting, which include noxious weeds/invasive, livestock grazing, fire regimes, industrial use, drought, and reclamation.

Environmental Consequences:

Alternative A – No Action:

Under the No Action alternative fires would not be managed for resource benefit, therefore all fires would be managed for full suppression. Impacts from fire include loss of vegetation and vegetative cover along with the modification of plant community structure, species composition, and increased soil exposure. Indirect impacts include the potential for non-native/noxious plant establishment, accelerated wind and water erosion from the removal of vegetation, soil impacts that affect plant growth (soil erosion or siltation), shifts in species composition and/or changes in vegetative density, and changes in visual aesthetics.

Direct and indirect impacts to significant plant communities would be similar to those described above for vegetation. However, because significant plant communities tend be rare, and smaller in size, impacts would be greater. Surface disturbing activities would have adverse, direct, and long term impacts. Due to the small and often pristine nature of these communities, adverse impacts would occur if surface disturbing activities resulted in plant loss, weed invasion, or a change in species composition or diversity.

Finding on Public Land Health Standard 3 for plant communities:
No major changes in land health findings would be expected from the No Action alternative. Since most fires would be managed under full suppression, fires would not extend past initial containment boundaries, therefore limiting any positive impacts from

fire that could potentially improve land health findings in areas of PJ encroachment or decadent sagebrush steppe ecosystems. There is always a potential for fire to increase spread of noxious and invasive vegetation species, which would have negative impacts to land health findings, however with the use of design features for all managed wildfires, these impacts would be reduced.

Cumulative Effects:
Wildfires have a large potential to increase cumulative effects. Severe burn areas can have lasting effects to vegetation. Effects can last for years, and within the No Action alternative, any positive impacts would be limited to initial containment boundaries.

Alternative B – Proposed Action:

Direct Impacts of the Proposed Action would result in a short term, loss of vegetation and vegetative cover along with the modification of plant community structure, species composition, and increased soil exposure. In woodland and forested areas over-story and canopy cover would be removed which would allow for new growth of perennial grasses, forbs, and shrubs. In areas of encroachment from PJ, canopy cover would be reduced allowing the expansion of shrub/grass communities. It would be expected that impacts of the proposed action would include increased age class diversity, new growth of grasses, forbs, and shrubs, reduced encroachment of PJ, and in the long term areas would progress towards the potential natural community. Indirect impacts include the potential for non-native/noxious plant establishment, accelerated wind and water erosion from the removal of vegetation, soil impacts that affect plant growth (soil erosion or siltation), shifts in species composition and/or changes in vegetative density, and changes in visual aesthetics. The BMPs and design features of the proposed action should mitigate the negative impacts (i.e. non-native/noxious plants establishment). The project boundary excludes areas of the field office that would not be expected to benefit from fire (i.e. desert/low elevation ecosystems) which would reduce and mitigate negative impacts of fire (establishment/spread of invasive) in these locations. Overall vegetation communities would benefit more from the Proposed Action than compared to the No Action alternative because it would allow the management of fires to extend beyond initial containment boundaries to benefit vegetation resources.

Finding on Public Land Health Standard 3 for plant communities:
In locations that are meeting with problems, or not meeting due to lack of fire regimes, PJ encroachment, or lack of species diversity, with the proposed action these areas could shift from meeting with problems, or not meeting to meeting land health standards. There is always a potential for fire to increase spread of noxious and invasive vegetation species, which would have negative impacts to land health findings, however with the use of BMPs and design features of the proposed action, these impacts would be reduced.

Cumulative Effects:
Wildfires have a large potential to increase cumulative effects. Severe burn areas can have lasting effects to vegetation resources. Effects can last for years; however, under the Proposed Action management would be for resource benefit, which over time would have positive cumulative impacts due to improved resource conditions.

3.3.4 Wetlands & Riparian Zones (includes a finding on Standard 2)

Current conditions:

Riparian areas are ecosystems that occur along rivers, streams, or waterbodies (NRCS 2007). These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Typical riparian areas are lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers, streams, glacial potholes, and shores of lakes and reservoirs with stable water levels. Excluded are such sites as ephemeral streams or washes that do not exhibit vegetation dependent on free water in the soil (BLM 2006a). Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and which, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include marshes, shallows, swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas (BLM 2006a). Even though riparian and wetlands areas occupy only a small percentage of the GJFO and DENCA planning area, these areas provide a wide range of functions critical to many different wildlife species, improve water quality, provide scenery, and provide recreational opportunities. A variety of physiognomic groups (Carsey et al. 2003) of riparian zones and wetlands occur within the project area, including evergreen riparian forests and woodlands, mixed coniferous and deciduous forests and woodlands, deciduous-dominated forests and woodlands, tall willow shrublands, short willow shrublands, non-willow shrublands, and herbaceous vegetation.

The health of many special status species is tied to the health of this vegetative type. These species are considered "nested" species for this vegetative/habitat type: canyon tree frog, southwest willow flycatcher, bald eagle, yellow-billed cuckoo, longnose leopard lizard, big free-tailed bat, spotted bat, Townsend's big-eared bat, fringed myotis and waterfowl. Various migratory birds and big game species are also dependent on the health of the riparian habitat type.

Fining on Public Land Health Standard 2 for Riparian Systems:
Information on the condition of riparian areas and wetlands is available from Proper Functioning Condition (PFC) assessments that have been conducted by the BLM from 1993 to the present. Many of these assessments have been conducted as part of the BLM Land Health Assessments on various landscapes within the planning area. Based on hydrology, vegetation, and erosion/deposition (soils) attributes and processes (BLM 1998a), the BLM PFC assessments place the riparian area in one of three ratings: PFC, FAR, and NF. A trend is also identified for the FAR ratings, which may be upward, not apparent, or downward. Since the approach of the PFC assessment is to evaluate most of the indicators for land health Standard 2, the resultant functional rating (PFC, FAR, NF) for each riparian area determines whether the standard is being achieved.

The BLM's assessments for evaluating the health of the Gunnison River are made separate from tributaries to the Gunnison River, because the BLM's ability to influence the management of the Gunnison River is limited within the planning area. These limitations include public-

private interface, development along the riparian corridor (roads, utility corridors and railroad), and lack of control over water flows needed to maintain healthy riparian vegetation.

Overall, the majority of riparian zones and wetlands in the Field Office and NCA are meeting Standard 2. The BLM determined that the most common reasons for not achieving Standard 2 are insufficient streambank vegetation related to livestock grazing, OHV use, and road crossings.

Environmental Consequences:

Alternative A – No Action:

Under the No Action alternative, the BLM would not manage fires for resource benefit, therefore all fires would be managed as full suppression. Impacts from fire include loss of cottonwood galleries and vegetative cover along with the modification of plant community structure, species composition, and increased soil exposure. Indirect impacts include the potential for non-native/noxious plant establishment, accelerated wind and water erosion from the removal of vegetation, soil impacts that affect plant growth (soil erosion or siltation), shifts in species composition and/or changes in vegetative density, and changes in visual aesthetics.

Finding on Public Land Health Standard 2 for Riparian Systems:
The ability to achieve Standard 2 would be unchanged under the No Action Alternative. Fire would not be managed for resource benefit, resulting in full suppression of fires in the riparian zones. While fires along the Colorado, Gunnison, and other perennial streams could result in the loss of cottonwood galleries, fire size would be minimized to reduce impacts to native vegetation, and the spread of noxious and invasive vegetation species (which would have negative impacts to land health findings). Although fires in areas adjacent to riparian zones could be managed for resource benefit, managed wildfire may be avoided to minimize fire impacts, and could over time lead to a build of fuels in adjacent areas.

Cumulative Effects:
Wildfires have a large potential to increase cumulative effects. Severe burn areas can have lasting effects to vegetation. Effects can last for years, and within the No Action alternative.

Alternative B – Proposed Action:
Direct and Indirect Impacts would be similar to the No Action alternative, as fire would be suppressed in this community to protect cottonwood galleries, and riparian vegetation. While isolated riparian zones and wetlands may be impacted by fire, fire would not be used for resource benefit in these areas. If fire occurred in this community, impacts would be similar to those described in the Vegetation section: loss of vegetation and vegetative cover along with the modification of plant community structure, species composition, and increased soil exposure. Indirect impacts include the potential for non-native/noxious plant establishment, accelerated wind and water erosion from the removal of vegetation, soil impacts that affect plant growth (soil erosion or siltation), shifts in species composition and/or changes in vegetative density, and changes in visual aesthetics. The BMPs and

design features of the proposed action should mitigate the negative impacts (e.g. non-native/noxious plants establishment). The project boundary excludes areas of the field office that would not be expected to benefit from fire (e.g. desert/low elevation ecosystems/ riparian areas) which would reduce and mitigate negative impacts of fire (establishment/spread of invasive) in these locations.

Finding on Public Land Health Standard 2 for Riparian Systems:
The ability to achieve Standard 2 would be unchanged from the present condition, and the No Action Alternative. Alternative B would allow for the use of fire for resource benefit, however fires in riparian areas would continue to be suppressed.

Cumulative Effects:
No changes to the cumulative effects are anticipated under the Alternative B, as fire would not be used for resource benefit in riparian zones. Fire suppression is not anticipated to lead to a build-up of fuels in the riparian zones, nor lead to larger, more severe fires in these areas. However, fires in adjacent areas could impact riparian vegetation if they spread into the riparian zones. Habitat treatments would not utilize unplanned fire in areas immediately adjacent to riparian zones, thus other means would be used to achieve objectives: mechanical treatments, hand thinnings, pile burning, plantings, and weed treatments. Management of wildland fire in areas that are not immediately adjacent to riparian zone would reduce vegetation density and continuity, which would provide a fuel break that would reduce fire spread into these areas.

3.3.5 Wildlife (includes fish, aquatic and terrestrial) (includes a finding on Standard 3)

Current Conditions:
Within the GJFO and DENCA the BLM manages approximately 1.3 million acres of fish and wildlife habitat. The presence and interspersion of many habitat types support a large number of wildlife species. A minimum of 84 species of mammals, 215 species of birds, 30 species of amphibians and reptiles and 30 species of fish occur in the project area. Current conditions for these species are similar to those described in the Grand Junction Field Office Resource Management Plan (BLM, 2015), the Northwest District Greater Sage-grouse Plan Amendment (BLM, 2016), and the Dominguez Escalante National Conservation Area Resource Management Plan (BLM, 2017).

Wildlife utilize all of the habitats described in the vegetation section above. For most fish and wildlife species habitat loss and fragmentation have been and remain the primary cause for declines in population. Some of these species have also suffered from historic efforts to extirpate them, and some suffer competition or predation from species that have expanded their range or that have been introduced. Management efforts by the BLM, USFWS, Colorado Parks and Wildlife (CPW) and others have reversed the downward trend for a number of these populations, but few populations are near their historic levels.

Finding on Public Land Health Standard 3 for Animal Communities:
Currently, the majority of the planning area is meeting Land Health Standards, however there are many areas designated as meeting with problems, or not meeting (see table 3-29

page 3-163 of the Grand Junction Field Office Proposed Resource management plan and final Environmental Impact Statement). There are a variety of causal factors for meeting with problems or not meeting, which include noxious weeds/invasive, livestock grazing, fire regimes, industrial use, drought, and reclamation.

Environmental Consequences:

Alternative A – No Action:
Under the No Action alternative fires would not be managed for resource benefit, therefore all fires would be managed for full suppression. Impacts from fire include loss of vegetation and vegetative cover along with the modification of plant community structure, species composition, and increased soil exposure. Fire kills wildlife that is not able to escape in time, and displaces species from suitable habitat, which could increase competition for resources in adjacent habitats. In the long term, wildland and prescribed fires, improve habitat by increasing structural diversity. In some portions of the field office the fire return interval has been altered due to invasive species (e.g., cheatgrass) and in these areas vegetation diversity and wildlife habitat suitability has been decreased due to the frequent fire return interval which appears to support a monoculture of cheatgrass. Often, fire and fuels treatments lower the risk for an uncharacteristically large or severe wildfire that would destroy a large acreage of wildlife habitats. Under this alternative wildfires would not be allowed to be managed for resource benefit, which may increase the potential for larger, higher intensity wildfires in the future.

Finding on Public Land Health Standard 3 for Animal Communities:
Alternative A is not expected to affect the ability of the project areas to meet Public Land Health Standard 3 in the short-term. However, in the long-term if fires increase in intensity and size as a result of this action Standard 3 could be negatively impacted.

Cumulative Effects:
Wildfires have a large potential to increase cumulative effects when combined with impacts from recreation, mining, and other uses that impact the landscape. Severe burn areas can have lasting effects to vegetation. Effects can last for years, and within the No Action alternative, any positive impacts would be limited to initial containment boundaries.

Alternative B – Proposed Action:
Direct Impacts of the Proposed Action would result in a short-term, loss of vegetation and vegetative cover along with the modification of plant community structure, species composition, and increased soil exposure. Fire kills wildlife that is not able to escape in time, and displaces species from suitable habitat, which could increase competition for resources in adjacent habitats. In the long-term, wildland and prescribed fires, improve habitat by increasing structural diversity. The Proposed Action is expected to maximize the habitat benefits by providing for wildland fire use where it is compatible with resource objectives. These include considerations for wildlife habitat. Under this alternative wildfires would be allowed to be managed for resource benefit, which may reduce the potential for larger, higher intensity wildfires in the future.

Finding on Public Land Health Standard 3 for Animal Communities:

Alternative B is expected to help the planning units attain Land Health Standard 3 across a broader range of the planning area through the appropriate use of wildland fire for resource benefit, including for the benefit of animal communities and their habitat.

Cumulative Effects:
Wildfires have a large potential to increase cumulative effects when combined with recreation, mining, and other uses that impact the landscape. Severe burn areas can have lasting effects to vegetation resources. Effects can last for years, however under the Proposed Action management would be for resource benefit, which over has the potential to decrease cumulative effects of wildfire on a landscape scale.

3.4 HERITAGE RESOURCES AND HUMAN ENVIRONMENT

3.4.1 Cultural Resources

Current Conditions:
The GJFO and D-E NCA RMPs summarize the current conditions of the cultural resources within the geographic area under analysis in this EA. According to the BLM GJFO's current geographic information systems data, approximately 12 percent of land within the planning units has been inventoried for cultural resources (this includes not-to-standard and to-standard Class II [sampling] and Class III [intensive] inventories). These inventories have located approximately 15,500 cultural resource sites (including isolated finds) (GJFO FEIS p. 130 – 132 and DENCA FEIS p. 307 – 309). The cultural resources in the project area include all periods and cultural affiliations typically found in west central and northwestern Colorado. Sites date from the Paleoindian period to the historic period and include prehistoric open or sheltered camps and habitations, open or sheltered lithic sites, open or sheltered architectural sites, wickiups/wickiup villages, brush fences, game drives, kill/butchering sites, ceremonial/sensitive sites, rock art, quarries, and culturally modified trees; and historic camps, habitations, homesteads/ranches, towns, roads, pipelines, ditches, mines, railroads, bridges, cattle trails, cemeteries, brush fences and corrals, water control features, rock art, and transmission lines.

Environmental Consequences:

Alternative A – No Action:
Direct and Indirect Effects:
Under the No Action alternative, wildland fire may still occur, though BLM would not manage fire for resource benefit. The direct and indirect effects would be the same as those described below under the Proposed Action.

Cumulative Effects:
The cumulative effects under the No Action Alternative would be similar to those described in the Proposed Action. The cumulative impacts of the No Action Alternative could also include the build-up of vegetation in and around sites, which can lead to more catastrophic or higher intensity fire. Longer duration, more intense fires can cause more harm to cultural resources than low-intensity and low-duration fires (Ryan et al. 2012; Winthrop 2004).

Alternative B – Proposed Action:

Wildland fire has the potential to impact cultural resources to varying degrees, depending on fuels, terrain, site types and cultural materials present, fire intensity, duration of heat, and penetration of heat into soil (Traylor et al. 1983; Winthrop 2004). Impacts to features and artifacts increase with temperature, exposure, and fuel loads (Buenger 2003; Deal 2012). Wildland fire has the potential to affect or destroy flammable cultural resource artifacts and features if these types of historic properties are not identified and avoided through design features. Organic artifacts on the ground surface are likely most heavily impacted by fire. Intense heat and burning can destroy analytical data from bone, pollen, or botanical specimens, though these impacts vary and appear to lessen if artifacts or specimens are subsurface (Oster et al. 2012).

Fire also has the potential to impact flaked and ground stone artifacts resulting in spalling, discoloration, cracking, changes in color or luster, loss of hydration rinds (obsidian), and changes in morphology (Deal 2012; Winthrop 2004). Rock art or rock surfaces can also spall or stain due to fire (Kelly and McCarthy 2012), and other non-flammable artifacts (e.g. ceramics) can be impacted by heat from fire through breakage, sooting, or loss of analytical data (Rude and Jones 2012; Winthrop 2004; see also various chapters from Ryan et al. 2012).

Following fires, other processes can also indirectly impact cultural resources. These include increased surface runoff and erosion, increased tree mortality, increased borrowing rodent and insect populations, and increased looting (Christensen 1992; Ryan et al. 2012). Sheet erosion can relocate cultural materials and localized, heavy downpours are capable of produced a puddling effect, concentrating flaked-stone debitage into pools that might later be mistaken for activity areas. Trees killed or severely weakened by fire are susceptible to collapse. If cultural resources are located near or among a stand of weakened trees, any collapse could cause severe damage by the upheaval of root systems, or crushing by the trunk or main branches.

Finally, fire can distort the chronometric and functional analysis of surficial and subsurface artifacts and features by heating soils and artifacts and by depositing modern and/or old wood charcoal, thereby obscuring results of thermoluminescence, radiocarbon, obsidian hydration, or archaeomagnetic dating (Oster et al. 2012; Winthrop 2004; see also various chapters in Ryan et al. 2012).

The design measures included in the Proposed Action allow the BLM to address cultural resource inventory and mitigation needs following a wildfire. Resource advisors assigned to incidents will work through the cultural resource staff to initiate emergency consultation with the State Historic Preservation Officer (SHPO) or tribal entities whenever fire management activities on a wildfire could or have impacted cultural sites. The BLM, in consultation with the SHPO, shall determine the precise nature of effects to historic properties identified in the incident area for each individual wildfire, using the Protocol as guidance. The BLM shall consult with the SHPO and Tribe(s) for any portion of the undertaking resulting in an adverse effect determination. Resolution of effect and specific

mitigation needs will be determined through consultation with the SHPO and Tribe(s) on a case-by-case basis and will account for direct, indirect, and cumulative impacts.

Cumulative Effects:
Because wildfire has the potential to reduce ground cover and root development, erosion could increase and cause modification to cultural resource sites, compounding over time. Erosion (such as sheet-washing or down-cutting) following wildfire can cause deflation or disturbance of features or displacement of artifacts unless mitigation measures are taken to control erosional processes after a wildfire occurs.

3.4.2 Tribal and Native American Religious Concerns

Current conditions:
American Indian religious concerns are legislatively considered under several acts and Executive Orders (EO), namely the American Indian Religious Freedom Act of 1978 (PL 95-341), the Native American Graves Environmental Assessment Protection and Repatriation Act of 1990 (PL 101-601), and Executive Order 13007 (1996; Indian Sacred Sites). In summary, these require, in concert with other provisions such as those found in the National Historic Preservation Act (NHPA) and Archaeological Resource Protection Act (ARPA), that the federal government carefully and proactively take into consideration traditional and religious Native American culture and life and ensure, to the degree possible, that access to sacred sites, the treatment of human remains, the possession of sacred items, the conduct of traditional religious practices, and the preservation of important cultural properties are considered and not unduly infringed upon. In some cases, these concerns are directly related to "historic properties" and "archaeological resources." In some cases elements of the landscape without archaeological or other human material remains may be involved. Identification of these concerns is normally completed during the land use planning efforts, reference to existing studies, or via direct consultation. Sites and landscapes of importance to tribes are known to exist in the Grand Junction Field Office and Dominguez-Escalante National Conservation Area.

Previous general consultation has occurred for response to wildland fire with tribes who traditionally used the GJFO and DENCA. Concerns identified typically have to do with protecting cultural resources, sacred sites, and landscapes only in the instance of human-caused wildland fire. As of this analysis, the Ute Mountain Ute, Ute Tribe of the Uintah and Ouray, and Southern Ute tribes have not expressed concerns about letting unplanned, naturally ignited wildland fires burn in areas where this is appropriate under the BLM GJFO and DENCA RMPs.

Environmental Consequences:

Alternative A – No Action:

Under the No Action alternative, wildland fire may still occur, though BLM would not manage fire for resource benefit. The direct and indirect effects would be similar to those described below under the Proposed Action alternative analysis.

Cumulative Effects:
Under the No Action alternative, wildland fire may still occur, though BLM would not manage fire for resource benefit. The cumulative effects would be similar to those described below.

Alternative B – Proposed Action:

The direct and indirect effects analyzed in the Cultural Resources section apply to archaeological sites or historic properties that may be of special interest to the tribes. In addition, wildland fires have the potential to change the setting and feeling of landscapes and could impact traditional use areas by altering the landscape from its historical appearance. Wildland fire also has the potential to impact plant populations valuable to Native American practices. In some cases, however, wildland fire and subsequent mitigation may restore landscapes to the historic vegetative communities in the area.

The Proposed Action would not prevent access to sacred sites, prevent the possession of sacred objects, or interfere or otherwise hinder the performance of traditional ceremonies and rituals pursuant to American Indian Religious Freedom Act (AIRFA) or EO 13007.

The design measures under the Proposed Action allow for BLM to address cultural resource or traditional property inventory and mitigation needs following a wildfire. Resource advisors assigned to incidents will work through the cultural resource staff to initiate emergency consultation with tribal entities whenever fire management activities on a wildfire could or have impacted cultural sites. The BLM, in consultation with the Tribe(s), shall determine the precise nature of effects to cultural resources, traditional landscapes, or sacred sites identified in the incident area for each individual wildfire, using the Protocol as guidance. Resolution of effect and specific mitigation needs will be determined through consultation with the Tribe(s) on a case-by-case basis and will account for direct, indirect, and cumulative impacts.

Cumulative Effects:
Cumulative effects to archaeological sites or historic properties that may be of special interest to the tribes are the same as analyzed in the Cultural Resources section. Other cumulative effects would be the same as those described above.

3.4.3 Visual Resources

Current Conditions:

Visual resource inventories (VRI) for the Grand Junction Field Office and Dominguez-Escalante National Conservation Area were completed in 2009, and visual resource management (VRM) classes have been developed from these inventories. The 2015 GJFO Resource Management Plan gives direction to manage public lands in a manner that protects the quality of scenic values, specifically protecting those areas of cultural importance and highly valued scenic resources. The 2017 DENCA Resource Management Plan gives direction to protect open spaces, the natural aesthetics, and the scenic vistas that are considered a social, economic, and environmental benefit.

The BLM maintains visual quality and integrity in accordance with the following visual resource management classes:

- *Class I Objective:* The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it allows for very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- *Class II Objective:* The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Changes can be seen but should not attract the attention of the casual viewer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- *Class III Objective:* The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- *Class IV Objective:* To provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high.

Lands are managed according to the objectives for each class as shown in the table below.

Table 3.4.4-1 Acres per Visual Resource Management Class

Visual Resource Management Class	**Acreage**
GJFO	
VRM I	98,700
VRM II	392,400
VRM III	396,800
VRM IV	173,700
D-E NCA	
VRM I	82,830
VRM II	127,169

Environmental Consequences:

Alternative A – No Action:

Under the No Action alternative, wildland fire may still occur, though BLM would not manage fire for resource benefit. Fire suppression activities would have an effect on the visual landscape, but not as great as if a fire were to occur. The direct and indirect effects for wildland fires that were to occur would be similar to those described under the Proposed Action alternative.

Cumulative Effects:

Under the No Action alternative, wildland fire may still occur, though the BLM would not manage fire for resource benefit. Fire suppression activities would have an effect on the visual landscape, but not as great as if a fire were to occur. The cumulative effects for wildland fires would be similar to those described under the Proposed Action Alternative.

Alternative B – Proposed Action:
Under the Proposed Action alternative, wildland fire may occur for resource benefit, possibly resulting in high levels of change to the characteristic landscape. Wildfires have the potential to dramatically change the visual aesthetics of a landscape. The level of change would be dependent upon the size of the fire. Direct impacts include an immediate loss of vegetation and increased contrast in burn areas, possibly changing values to scenic quality scores. Although there may be some initial impacts,, in the long-term, the visual quality of the surrounding landscapes may improve from healthier vegetative conditions in burned areas.

Indirect impacts include the potential for the introduction of non-native/noxious species and increased erosion in areas disturbed by fires, as well as the degradation or enhancement of other resources in the area, all of which result in changes in visual aesthetics.

Cumulative Effects:
Wildfires do have a potential to increase cumulative effects. Severe burn areas can have lasting effects to visual landscape. For fires that have been managed for the benefit of a resource, there may be long-term positive impacts to visual resources, which include re-establishment of native vegetation in areas that have realized the increased presence of invasive species.

3.4.4 Social, Economic, Environmental Justice

Current Conditions:

The largest portion of lands managed by the GJFO, some 938,000 acres or 73 percent of the total, lie within Mesa County, and the remainder of lands are spread between three other counties: Garfield with 322,000 acres (25.2 percent), Montrose with 17,000 acres (1.3 percent), and Delta with 2,000 acres (0.1 percent). Because it contains the largest portion of the GJFO land, and nearly 100 percent of the population (BLM FEIS, p. 3-257). The largest portion of land managed by the DENCA is also located within Mesa County. The DENCA contains approximately 123,121 acres (56 percent) within Mesa County, 64,456 acres (30 percent) in Delta County, and 30,816 acres (14 percent) located within Montrose County.

The population base for the project area is located in Mesa County. Grand Junction, Colorado is the largest city, and the regional hub of banking, health care, retail trade, and government services in western Colorado and eastern Utah, according to the Census estimates (U.S. Census Bureau 2014). Additional important industries in all of these Western Colorado counties include tourism, energy services, ranching, and fruit and

vegetable farming. Tourism in the counties focuses on outdoor recreation activities, including hunting, fishing, rafting, kayaking, bicycling, hiking, and skiing.

Table 1. Population and Population Change, 2000 to 2014.

Location	Population 2000	Population 2010	Population 2014	Population Change 2000-2010	Population Change 2010-2014
Colorado	4,301,261	4,887,061	5,197,580	13.6%	6.35%
Mesa County	116,255	142,284	147,509	22.4%	3.67%
Garfield County	43,791	56,389	56,077	28.8%	-0.01%

Source: USCB 2014

Between 2000 and 2014, Colorado and Mesa County have experienced population grown commensurate with their economic growth. Mesa County and Colorado are expected to continue to grow over the coming years. The workforce in Mesa County is characterized by management and business occupations (31 percent); sales and office occupations (26 percent); and natural resources, construction, and maintenance occupations (13 percent).

The population of the Garfield county grew by an average of approximately 2.5% per year from 2000 to 2011 but decreased by 2.6% from 2008 to 2011 due to the national economic downturn, resulting in a net increase of 27% from 44,259 to 56,270 residents (CDOLA 2013a). From 2010 to 2015, however, the population grew by 3.0% resulting in a total estimated population of 56,389 (CDOLA 2016). Population growth in Garfield County is expected to nearly double to 109,887 in 2040 (CDOLA 2012).

As a result of a recent energy boom and amenity seekers, the region has experienced population gains over the last two decades. Delta grew by 46.1 percent from 1990 to 2010, while Mesa and Montrose Counties grew by 64.0 and 68.4 percent, respectively. Over this period, the three-county area grew by 61.8 percent—well over the national growth rate of 26.0 percent and over the State rate of 59.2 percent. Over previous decades, population change was not always positive. Between 1983 and 1990, Delta, Mesa, and Montrose Counties decreased by 10.4, 2.3 and 5.5 percent, respectively, while the entire three-county area shrank by 4.2 percent (see Figure 3.6 below) (U.S. Department of Commerce 2011a).

Mesa County's population can be characterized as urbanized with 87 percent of its population living in an urban setting and 13 percent living in rural areas. Montrose County has 55 percent of its residents living in an urban setting and 45 percent in rural areas. Delta County has 37 percent of its residents in urban areas and 63 percent living in rural areas (U.S. Department of Commerce 2010). In 2014, the Garfield County population was 76 percent urban and 24 percent rural, with a population density of approximately 19 people per square mile (City Data 2014).

The Colorado Department of Local Affairs (CDOLA) projects moderate growth in Mesa County in coming years. Between 2010 and 2020, Colorado's population is projected to increase 19 percent, Northwest Colorado's population is projected to increase 22 percent

and Mesa County's population is projected to increase 17 percent (to 171,581) (CDOLA, 2012a).

The NEPA process requires a review of the environmental justice issues as established by Executive Order 12898 (February 11, 1994). The order established that each Federal agency identify any "disproportionately high and adverse human health or environment effects of its programs, policies, and activities on minority and low-income populations." Mesa County is predominantly white (89.4 percent), with people of Hispanic or Latino origin comprising 13.3 percent of the population and an additional 5.5 percent minority population consisting primarily of Native Americans (USCB 2010). In 2010 population census, approximately 28% of the residents of Garfield County identified themselves as Hispanic/Latino, compared to 17 percent in 2000 (CDOLA 2013b). Statewide, the population of Hispanic/Latino residents grew 41.2 percent during the same 10-year period (CDOLA 2013b). African-American, American Indian, Asian, and Pacific Islander residents accounted for a combined 1.6% of the Garfield County population in 2010, compared to a statewide level of 7% (CDOLA 2013b).

Environmental Consequences:

Alternative A – No Action:

Under the No Action alternative the BLM would suppress all wildland fire starts. All wildland fires would be suppressed and no wildland fires would be used under appropriate conditions to follow natural processes to reduce vegetation densities or fuel loads. The costs of fire suppression includes direct expenditures related to use of equipment such as aircraft, dozers, water tenders, etc. as well as labor costs for firefighters. Rehabilitation or stabilization efforts are also often considered direct costs because they usually occur immediately following suppression efforts. Other related costs to wildland fires include damage or loss of infrastructure such as utility facilities, homes, and out buildings. Wildland fires that spread onto private property can lead to the loss or damage of property. Indirect costs associated with wildland fire can include damage to watersheds and decreased water quality and damage to property or facilities from landslides or excessive erosion from unstable slopes. Decreased quality of habitat or forage from barren ground or spread of noxious or invasive weeds is a more difficult cost to quantify.

The costs associated with suppression activities and damage resulting from wildland fire vary with the location and size of the fire. There are numerous small communities and isolated homes and ranges located within the GJFO and DENCA. These smaller communities and isolated homes or ranches face the unique threats associated with being located in the wildland urban interface where controlling and containing wildland fires can be more difficult to achieve. It can be more difficult to protect infrastructure that is located in the wildland urban interface due to decreased vegetation breaks from human developments and activities.

Effective and aggressive wildland fire suppression efforts can reduce the direct and indirect costs associated with suppressing fires by reducing the size of fires and duration of suppression effort. However, historic fire suppression efforts that focused on containing

and controlling all wildland fires on public land and restricted the natural role of fire in ecosystems has altered fuel densities, vegetation types, and fire regimes in many ecosystems. In many cases, this has created conditions that have caused larger and more intense fires to occur across the landscape. This scenario is particularly problematic in wildland urban interface settings where protection of infrastructure is already more difficult, which can lead to an increased cost of firefighting efforts and loss of infrastructure. In areas where vegetation reduction projects and managed fire are not used or allowed to reduce vegetation densities and continuity long-term costs, property damage, and loss of life will likely be higher.

Cumulative Effects:
The cumulative effects of wildland fire suppression on socioeconomic conditions is dependent on multiple variables. Cumulative effects can include high costs associated with intensive suppression efforts, or they can include costs associated with damage or loss of property as well as alteration of ecological integrity and conditions. The BLM can reduce cumulative effects associated with direct costs if fires are contained and controlled early while they are still small. While this strategy may reduce short-term direct costs, it may drive up costs of suppressing future fires if the BLM is not able to reduce fuel loads through other methods such as vegetation treatments.

Alternative B – Proposed Action:
The socioeconomic impacts associated with the managing wildland fire for resource benefit are similar to those that are described for the No Action alternative. The primary difference results from using fire as a mechanism to allow for natural ecological processes to reduce vegetation density or fuel loading as opposed to human efforts. Careful management of wildland fire to select appropriate location to control the spread of fire within desired treatment areas could reduce long-term effects associated with the damage and cost of managing larger more intense fires. The costs of managing a wildland fire would escalate if a fire were to escape the determined management areas and shift into a full suppression fire. The costs of an escaped fire could also be higher if property was lost or damaged. The amount of equipment and personnel necessary for managing fires is sometimes less than the amount necessary for fire suppression efforts, but duration of commitment of resources can be longer if a fire is in monitoring status for a prolonged period. Management of wildland fire can also help the BLM achieve wildland urban interface protection goals and objectives for improving habitat quality, while reducing the costs and need for other types of vegetation reduction techniques.

Cumulative Effects:
The ability of BLM to manage wildland fire will provide the agency with tools that could reduce costs associated with this activity, and it could have long-term benefits associated with managing vegetation conditions that influence fire spread and habitat quality. Wildland fires will continue to burn whether or not the BLM is allowed to manage them. Allowing the BLM to manage wildland fires where appropriate would enable achievement of resource management or wildland urban interface protection objectives to be met through the BLM's use of fire.

3.4.5 Wastes, Hazardous or Solid

Current Conditions:

Neither solid nor hazardous wastes would generally be a part of the affected environment. In rare instances, a fire might impinge on illegal trash or hazardous waste dumps. This would be expected to be rare. Impacts would depend on the nature of the materials but could result in harm to the environment, firefighters, or the public. Such instances would be dealt with on a case-by-case basis in accordance with the Grand Junction Field Office Oil and Hazardous Materials Incident Contingency Plan. Hazardous materials may also be introduced as a result of firefighting or reclamation activities. This might be in the form of equipment fuel and lubricants and herbicide waste.

Environmental Consequences:

Alternative A – No Action:

Improper use or disposal of fuel and herbicides and the containers for these materials could cause environmental harm and violate state and federal laws. For the No Action alternative, firefighting activities would still occur, and perhaps to a greater extent than for the Proposed Action since all fires would be managed so as to minimize fire size. The best management practice of not constructing fire lines with heavy equipment within 300 feet of riparian areas reduces the potential for fuel spills in these important areas. Following manufacturer's instructions for the use of herbicides and disposal of containers further minimizes harm from these materials. With proper use of fuels and herbicides, negative impacts from these substances would be expected to be minimal.

Cumulative Effects:
Negligible if not immeasurable.

Alternative B – Proposed Action:
The proposed action would include employing the use of heavy equipment and the attendant use of fuels. Fuels, lubricants, and herbicides can be used properly with no harmful impacts to the environment. Spills will occur and can be cleaned up properly with no residual harmful impacts (direct, indirect and cumulative) to the environment.

3.5 LAND RESOURCES

3.5.1 Areas of Critical Environmental Concern

Current Conditions:
There are thirteen Areas of Critical Environmental Concern (ACEC) within the GJFO and four within the DENCA management area (Table 3.5.1-1). ACECs are managed 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" (FLPMA, Public Law 94-579, Section 103(a)). The range of values for these special areas are listed below in Table 3.5.1-1.

Table 3.5.1-1 Areas of Critical Environmental Concern

Area of Critical Environmental Concern	***Acres***	***Important Values***	***Manage Wildland Fire for Resource Benefit?***
Grand Junction Field Office – Areas of Critical Environmental Concern			
Atwell Gulch	2,859	Rare plants, cultural resources, scenic values, and wildlife habitat	Yes
Badger Wash	2,243	Rare plants and hydrologic study.	No
Dolores River Riparian	7,427	Riparian, hydrology, scenic values, and paleontological resources.	Yes
Indian Creek	2,345	Research and cultural values	Partial, 1,919 acres (*Excludes salt desert shrub community*)
Juanita Arch	1,624	Rare plants and geologic values	Yes
Mt. Garfield	2,361	Scenic values.	Partial, 1,793 acres (*Excludes salt desert shrub community*)
The Palisade	32,197	Rare plants and special status wildlife.	Yes
Pyramid Rock	1,256	Rare plants, paleontological and cultural resources.	Yes
Roan and Carr Creeks	33,566	Riparian habitat, greater sage-grouse, and special status fish.	Yes
Rough Canyon	2,778	Geologic, wildlife habitat, cultural resources, and plants.	Partial, 2,057 acres (*Excludes salt desert shrub community*)
Sinbad Valley	6,388	Rare plants, wildlife and cultural resources, and geologic and scenic values.	Yes
South Shale Ridge	27,838	Rare plants, wildlife habitat, and scenic values.	Yes

Unaweep Seep	83	Rare plants, special status wildlife species, riparian habitat, and hydrologic values.	Yes
Dominguez-Escalante National Conservation Area – Areas of Critical Environmental Concern			
Gunnison Gravels	15	Geologic	Yes
Escalante Canyon	2,281	Plants, wildlife, fish, geology, cultural resources, and unique natural hazards.	Yes
Gibbler Mountain	1,265	Paleontology and sensitive plants	Yes
River Rims	5,313	Sensitive plants and paleontology.	Partial, 4,936 (*excludes Gunnison River riparian vegetation corridor*)

Environmental Consequences:

Alternative A – No Action:
Under the No Action alternative the BLM would not manage wildland fire for resource benefit within any ACECs where this use may be beneficial. The BLM would suppress all wildland fires. Impacts to resources from fire suppression would include those that are described in the special status species, cultural resources, visual, hydrologic, riparian, paleontology, and wildlife sections of this EA. Impacts could be direct, resulting from on the ground disturbance by heavy machinery, aircraft, or personnel. Indirect impacts on the important values for each ACEC would be related to but not limited to the following: loss of vegetation, soil instability, erosion, slope and channel instability, spread of noxious and invasive weeds, and being burned over or scorched.

Under this alternative the BLM would not be able to use fire to enhance habitat quality by reducing or altering vegetation density and type through managing fire. The BLM would have to use other methods to complete vegetation treatments, which can be cost prohibitive.

Cumulative Effects:
Full suppression of all fires in or adjacent to ACECs over the long-term could protect important values of the ACECs from direct exposure to fire if fires are caught early. If multiple fire suppression efforts are necessary within the ACECs there could be longer lasting broader impacts in these areas from retardant drops, heavy equipment, and other human activity. Full suppression of all fires within and adjacent to ACECs could also lead to increased vegetation density and continuity of fuels, which could cause larger more intense fires to burn that are more difficult to control. Under this scenario, it would be more challenging to protect the important values within the ACECs, which may cause more severe impacts.

Alternative B – Proposed Action:
Direct and indirect impacts under the Proposed Action resulting from fire suppression activities would be similar to the No Action alternative. Various suppression activities may be necessary while managing a fire for resource benefit. Allowing fires to burn within ACECs during times that support low fire intensity and spread would reduce fuel loading and potential direct impacts from wildland fire. This option would also likely reduce direct impacts to resources with important values within the ACECs from fire suppression activities. Managing fires near or adjacent to ACECs for resource benefit would also reduce fuel loads that could carry fires into ACECs, which would provide a protection buffer or fuel break from intense wildland fires that are more difficult to control.

Cumulative Effects:
Cumulative effects associated with the Proposed Action are similar to the No Action alternative. The BLM would only manage wildland fires in ACECs in the project area if wildland fire would enhance the important resource values for the ACEC. Long-term benefits of managing fire across the landscape would be a decrease vegetation density and continuity that often allow for increased fire spread and higher intensity fires. Wildland fires that burn through areas with high vegetation density and increased ladder fuels are often more difficult to control and would cause greater damage to resources with important values in the ACECs.

3.5.2 Recreation

Current Conditions:
Recreation use in the Grand Junction Field Office and the Dominguez-Escalante National Conservation Area is highly valued by local residents and visitors outside the area. Outdoor recreation outings provide a wide variety of experiences that result in individual benefits to on-the-ground users, social and economic benefits to local communities, and stewardship benefits to the environment.

Visitors participate in a wide variety of motorized and non-motorized recreational activities in the project area. In 2016, there were over 800,000 recreational visits in the field office and over 100,000 visits in the NCA.

The BLM issues Special Recreation Permits to support recreation objectives, meet demand for guided services, provide recreation business opportunities on public lands, and to ensure that the American public receives fair value and fair return for the use of public lands. The Grand Junction Field Office manages over 70 recreation permits.

In the project area, there are four boat ramps, five campgrounds, 22 trailheads, and 23 toilet facilities. The BLM also manages five Special Recreation Management Areas (SRMA) in the GJFO and three SRMAs in the DENCA, as well as six Extensive Recreation Management Areas (ERMA) in the GJFO and three ERMAs in the DENCA. The SRMAs are administrative units where the existing or proposed recreation opportunities and desired recreation setting characteristics are recognized for their unique value, importance, and/or distinctiveness, especially as compared to other areas used for recreation. While ERMAs

are recreation areas that are managed to support and sustain the principal recreation activities and the associated qualities and conditions of the ERMA. ERMA management is commensurate and considered in context with the management of other resources and resource uses.

Alternative A – No Action:
Impacts to recreation from suppressing wildland fires would include limiting access to public lands during fire operations, damage to recreational facilities, and changes to the recreational setting as a result of fire.

Under the No Action Alternative, fires would likely be suppressed quicker. As such, the duration of public land closures or limitations associated with fire operations would be shorter. Fire managers and resource advisors would continue to protect recreation facilities from fire damage. There would be less changes to the recreational settings as a result of quicker suppression. That said, the benefits of managed fire to wildlife habitat would not be realized. Recreation opportunities associated with wildlife (hunting and wildlife viewing) would not realize the benefits associated with the effects of fire (habitat improvement).

Cumulative Effects:
Under the No Action Alternative, the cumulative effects would be similar to those described above in the direct and indirect effects.

Alternative B – Proposed Action:
Under the Proposed Action, fire would be managed for resource benefits on a case-by-case basis. As such, fire duration would be longer, and recreational access could be limited for longer periods of time. That said, these limitations would be short-term (typically less than one month). Under the Proposed Action, fire managers and resource advisors would consider developed recreation assets when making a determination to manage a fire or determining trigger points for action. This would continue to protect recreational facilities. Areas were fires would be managed for resource benefit could improve wildlife habitat. As a result wildlife related recreation opportunities (hunting and wildlife viewing) could improve.

Cumulative Effects:
Under the Proposed Action, the cumulative effects would be similar to those described above in the direct and indirect effects.

3.5.3 Wild and Scenic Rivers

Current conditions:
The project area contains two stream segments that have been determined as suitable for inclusion in the National Wild and Scenic Rivers System:

1. The Dolores River in the GJFO from where the river enters the GJFO at the southwest border of the Field Office, to a point 10.38 miles downstream.
2. Cottonwood Creek in DENCA, from approximately 2.5 miles above the confluence with Roubideau Creek, to a point 14.41 miles upstream.

The 2015 Grand Junction Field Office RMP has the objective of implementing interim protective management of each suitable segment by protecting its tentative classification, free-flowing condition, water quality, and outstandingly remarkable values (ORVs). The 2017 Dominguez-Escalante National Conservation Area RMP has the objective of managing rivers and creeks found suitable for Wild and Scenic Rivers designation to protect their free-flowing condition, outstandingly remarkable values, water quality, and tentative classification, as identified in the suitability report in the final record of decision.

The Dolores River is tentatively classified as recreational, with the ORVs of scenery, fish, recreation, geology, and paleontology. BLM Manual 6400: Wild and Scenic Rivers – Policy and Program Direction for Identification, Evaluation, Planning, and Management give the following definitions for these ORVs:

- *Scenery.* The landscape elements of landform, vegetation, water, color, and related factors result in notable or exemplary visual features and/or attractions. The BLM Visual Resource Inventory Handbook, H-8410-1, may be used in assessing visual quality and in evaluating the extent of development upon scenic values. The rating area must be scenic quality "A" as defined in the BLM Visual Resource Inventory Handbook. When analyzing scenic values, additional factors, such as seasonal variations in vegetation, scale of cultural modifications, and the length of time negative intrusions are viewed, may be considered. Scenery and visual attractions may be highly diverse along the majority of the river or river segment.
- *Recreation.* Recreational opportunities within the subject river corridor are, or have the potential to be, popular enough to attract visitors from throughout or beyond the region of comparison or are unique or rare within the region. River-related opportunities include, but are not limited to, sightseeing, interpretation, wildlife observation, camping, photography, hiking, fishing, hunting, and boating. Such a recreational opportunity may be an outstandingly remarkable value without the underlying recreational resource being an outstandingly remarkable value (e.g., fishing may be an outstandingly remarkable value without the fish species being an outstandingly remarkable value). The river may provide settings for national or regional usage or competitive events.
- *Geology.* The river area contains one or more examples of a geologic feature, process, or phenomenon that is unique or rare within the region of comparison. The feature(s) may be in an unusually active stage of development, represent a "textbook" example, and/or represent a unique or rare combination of geologic features (erosional, volcanic, glacial, or other geologic features).
- *Fish.* Fish values include either indigenous fish populations or habitat, or a combination of these river-related conditions:

- *Populations.* The river is nationally or regionally an important producer of indigenous resident and/or anadromous fish species. Of particular importance is the presence of wild stocks and/or Federal or state listed or candidate, threatened, endangered, or BLM sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination that it is an outstandingly remarkable value.
- *Habitat.* The river provides exceptionally high-quality habitat for fish species indigenous to the region of comparison. Of particular importance is habitat for wild stocks and/or Federal or state listed or candidate, threatened, endangered, or BLM sensitive species. Diversity of habitat is an important consideration and could, in itself, lead to a determination that it is an outstandingly remarkable value.

- *Paleontology.* While no specific national evaluation guidelines have been developed for paleontological value, these ORVs fall under the "other similar values" category. The assessment of additional river-related values may be developed as part of the eligibility process.

The narrative from the River's Wild and Scenic Eligibility Report identifies the ORVs:

> "This segment has outstandingly remarkable scenic value. Scenic quality is a measure of the visual appeal of a tract of land. The BLM uses a scenic quality rating process to assign public lands an A, B, or C rating based on seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. In a recent visual resources inventory, this area was determined to have a scenic quality rating of A (BLM 2009c). The Dolores River has formed a spectacular canyon, with cliffs sometimes up to 2,000 feet higher than the river, with many geologic layers exposed. The variety of different colors including deep reds, purples, and lighter earth tones are in stark contrast to the green riparian vegetation along the river. The cottonwoods along the river and the river itself change color seasonally adding to the scenic beauty.
>
> This segment has outstandingly remarkable recreational value. The scenic and geologic values readily visible from the river make this segment of the Dolores a popular boating destination. During the spring runoff and the summer, the segment is popular with canoeists, kayakers, and rafters. This segment parallels Highway 141, part of the Unaweep-Tabequache Scenic and Historic Byway, offering opportunities for vehicular recreation, picnicking, camping, and viewing of the wildlife and geologic features of the river canyon. Though the Dolores River receives less use than the Gunnison River and Colorado River Segment 3, the segment is seeing an increase in recreational use. The segment offers challenging whitewater rapids between late April and early June during high water years. Flows are controlled by releases from the McPhee Reservoir and are sometimes unpredictable. There are no official boat launches along the segment on BLM land, though an unofficial boat launch is located at the county highway property on Highway 141 near Gateway. The launch is suitable for trailer and raft use, although the most traffic is by kayak or canoe.

> This segment also has outstandingly remarkable geologic value. The Dolores River has exposed and extensive sequence of rocks including additional layers not found farther north along the Colorado River. Additional Permian and Triassic layers including the Cutler and Moenkopi formations are found between the Precambrian bedrock (not exposed) and the Chinle formation. This wide range allows one to examine many of the important layers for the Colorado Plateau.
>
> This segment has outstandingly remarkable paleontological value. Along this segment of the Dolores River are rock slabs containing dinosaur and ancient mammal footprints. Although the BLM has not completed full surveys, there are hundreds of fossilized footprints and track ways, and there likely may be more than a 1,000 tracks along the river.
>
> The segment has outstandingly remarkable fishery value. Colorado Division of Wildlife (currently Colorado Parks and Wildlife) provided the BLM with additional data following the completion of the Eligibility Study that the Dolores River supports a native fish population that meets the guidelines for evaluating ORVs as described in the BLM Manual 8351."

Cottonwood Creek is tentatively classified as wild, with the ORV of vegetation. Similar to the ORV for paleontology above, the ORV for vegetation falls under the "other similar values" category, and was developed as part of the eligibility process. From the 2010 BLM Uncompahgre Final Wild and Scenic River Eligibility Report:

> "The entire length of this segment supports a superior (A-ranked) occurrence of the globally vulnerable (G3) narrowleaf cottonwood/skunkbush sumac riparian woodland *(Populus angustifolia/Rhus trilobata).* The Colorado Natural Heritage Program (CNHP) includes this segment within the Cottonwood Creek Potential Conservation Area."

<u>Alternative A – No Action:</u>
Under the No Action alternative, wildland fire may still occur, though BLM would not manage fire for the benefit of the resource, therefore all fires would be managed for full suppression. Wildfire suppression along rivers and streams has the potential to cause impacts to the suitability of Wild and Scenic Rivers segments by affecting the water quality, free-flowing condition, and ORVs.

See Section 3.2.3 for discussion on how the No Action Alternative affects water quality and the free flowing condition of rivers and streams.

Suppression activities may have both positive and negative effects to each of the ORVs identified in the Wild and Scenic Rivers eligibility and suitability reports. The Dolores River was identified as having ORVs for its scenery, recreation, geology, and paleontology. Cottonwood Creek was identified as having an ORV for vegetation.

1. Scenery – Scenic quality is a measure of the visual appeal of a tract of land. In the BLM's visual resources inventory process, public lands are given a rating of A, B, or C based on the apparent scenic quality, which is determined using seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. Here are the results of the Scenic Quality Analysis for the area surrounding the Dolores River within the GJFO:

Landform	**Vegetation**	**Water**	**Color**	**Adjacent Scenery**	**Scarcity**	**Cultural Modifications**
5	3.5	4	5	0	3.5	3.5

   Wildfire suppression will have little effect on the landform or water components of the scenic quality score, but may indirectly influence the scores for vegetation and color. This area received a medium score for its vegetation. The Wild and Scenic Suitability Reports notes, "The variety of different colors including deep reds, purples, and lighter earth tones are in stark contrast to the green riparian vegetation along the river. The cottonwoods along the river and the river itself change color seasonally adding to the scenic beauty." Suppression activities may help to preserve the vegetation present along this riparian area.

2. Recreation – The No Action Alternative would have little long-term impacts to recreation opportunities along the Dolores River. The reports notes, "This segment parallels Highway 141, part of the Unaweep-Tabequache Scenic and Historic Byway, offering opportunities for vehicular recreation, picnicking, camping, and viewing of the wildlife and geologic features of the river canyon. The segment offers challenging whitewater rapids between late April and early June during high water years." Impacts to recreational use along the Dolores River would include limiting access to public lands during fire operations, damage to recreational facilities, and changes to the recreational setting as a result of fire.

3. Geology – The No Action Alternative will have little effect on the geology along the Dolores River.

4. Paleontology – The No Action Alternative may potentially have substantial impacts to the paleontological features along the Dolores River. Full surveys have not been completed, and the Wild and Scenic Suitability Report notes, "there are hundreds of fossilized footprints and track ways, and there likely may be more than a 1,000 tracks along the river." Wildfire suppression activities may destroy some of these resources present.

5. Fisheries – Wildfire suppression activities associated with the No Action Alternative would have a small effect on the Dolores River's fishery.

6. Vegetation – Cottonwood Creek has been recognized as having a globally vulnerable population of narrowleaf cottonwood/skunkbush sumac riparian woodland vegetation. This population would be vulnerable to wildfire, and under the No Action Alternative, wildfire suppression activities may protect this resource. Alternatively, the buildup of vegetation under the No Action Alternative would lead

to increased fuel loading, which would make it more difficult to control the spread of wildfire and increase wildfire intensity.

Cumulative Effects:
Wildfires have a large potential to increase cumulative effects. Severe burn areas can have lasting effects and can last for years.

Alternative B – Proposed Action:

Under the Proposed Action, direct and indirect impacts would be similar to the No Action alternative, as fire would be suppressed along Wild and Scenic Rivers to protect riparian vegetation. Fire would not be used for resource benefit in riparian zones. Impacts from wildfire may include loss of vegetation and vegetative cover, modification of plant community structure and species composition, and increased soil exposure.

Indirect impacts include the potential for non-native/noxious plant establishment, accelerated wind and water erosion from the removal of vegetation, soil impacts that affect plant growth (soil erosion or siltation), shifts in species composition and/or changes in vegetative density, and changes in visual aesthetics.

Cumulative Effects:
Some changes to the cumulative effects are anticipated by the BLM under the Proposed Action, as fire would not be used for resource benefit in riparian zones, and increased fuels loading is expected in some riparian areas. Fuels treatments projects would not utilize unplanned fire, thus other means would be used to achieve objectives such as mechanical treatments, hand thinning, pile burning, plantings, and weed treatments.

3.5.4 Wilderness and Wilderness Study Areas

Current Conditions:

The project area contains two federally designated wilderness areas, and four Wilderness Study Areas (WSA). The table below outlines the wilderness areas and WSAs in the GJFO and D-ENCA. The BLMs management directives for wilderness areas and WSAs vary slightly. For designated wilderness, the BLM's objective is to manage and protect the area in such a manner as to preserve wilderness character. For WSAs, the BLM's objective is to manage and protect the WSA to preserve wilderness characteristics so as to not impair the suitability of such areas for designation by Congress as wilderness.

Table 3.5.5-2. Wilderness and Wilderness Study Areas

Area	Acreage
Dominguez Canyon Wilderness	66,280
Demaree Canyon WSA	22,700
Little Book Cliffs WSA	29,300
The Palisade WSA	26,700
Sewemup Mesa WSA	17,800

Wilderness Areas

Section 4(b) of the Wilderness Act (16 U.S.C. 1131 *et seq.*) sets forth the BLM's responsibilities in administering areas and states that the preservation of wilderness character is the primary management mandate. The Act states, "Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area."

Wilderness character is defined in Section 2(c), and is composed of five qualities.

1. *Untrammeled* - The Wilderness Act states that wilderness is "an area where the earth and its community of life are untrammeled by man." A "trammel" is literally a net, snare, hobble, or other device that impedes the free movement of an animal. Here, used metaphorically, "untrammeled" refers to wilderness as essentially unhindered and free from modern human control or manipulation. This quality is impaired by human activities or actions that control or manipulate the components or processes of ecological systems inside wilderness.
2. *Natural* - The Wilderness Act states that wilderness is "protected and managed so as to preserve its natural conditions." In short, wilderness ecological systems should be as free as possible from the effects of modern civilization. Management must foster a natural distribution of native wildlife, fish, and plants by ensuring that ecosystems and ecological processes continue to function naturally. Watersheds, water bodies, water quality, and soils are maintained in a natural condition; associated ecological processes previously altered by human influences will be allowed to return to their natural condition. Fire, insects, and diseases are allowed to play their natural role in the wilderness ecosystem except where these activities threaten human life, property, or high value resources on adjacent non-wilderness lands. Intended or unintended effects of human activities on the ecological systems inside the wilderness may affect this quality.
3. *Undeveloped* - The Wilderness Act states that wilderness is an area "of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation," "where man himself is a visitor who does not remain," and "with the imprint of man's work substantially unnoticeable." Wilderness has minimal evidence of modern human occupation or modification. This quality is impaired by the presence of structures or installations, and by the use of motor vehicles, motorized equipment, or mechanical transport that increases people's ability to occupy or modify the environment.
4. *Opportunities for Solitude or Primitive and Unconfined Recreation* - The Wilderness Act states that wilderness has "outstanding opportunities for solitude or a primitive and unconfined type of recreation." Wilderness provides opportunities for people to experience: natural sights and sounds; remote, isolated, unfrequented, or secluded places; and freedom, risk, and the physical and emotional challenges of self-discovery and self-reliance. Any one wilderness does not have to provide all these opportunities, nor is it necessary that they be present on every acre of a given wilderness. Where present, however, the preservation of these opportunities is important to the preservation of wilderness character as a whole. This quality is

impaired by settings that reduce these opportunities, such as visitor encounters, signs of modern civilization, recreation facilities, and management restrictions on visitor behavior.

5. *Unique, Supplemental, or Other Features* - The Wilderness Act states that wilderness areas "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." Though these values are not required of any wilderness, where they are present they are part of that area's wilderness character, and must be protected as rigorously as any of the four required qualities. They may include historical, cultural, paleontological, or other resources not necessarily considered a part of any of the other qualities. These values are identified in a number of ways: in the area's designating legislation, through its legislative history, by the original wilderness inventory, in a wilderness management plan, or at some other time after designation.

Wilderness Study Areas

Designated wilderness is managed pursuant to the Wilderness Act, which states that these areas shall be administered to "preserve wilderness character." For WSAs, the Federal Land Policy Management Act (43 U.S.C. 1701 *et seq.*) (FLPMA) mandates that the BLM "not impair the suitability" of areas we have identified as "having wilderness characteristics." There is a difference between these two mandates. The BLM's management policy is to continue resource uses on lands designated as WSAs in a manner that maintains the area's suitability for preservation as wilderness. The BLM's policy will protect the wilderness characteristics of all WSAs in the same or better condition than they were on October 21, 1976.

The inventory phase mandated by FLPMA identified areas that were found to have the characteristics of wilderness enumerated by Congress in Section 2 (c) of the Wilderness Act of 1964:

> "A wilderness…
>
> (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 five thousand 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."

When these characteristics were found within a defined boundary, the presence of the wilderness resource was documented and the area was classified as a WSA.

<u>Alternative A – No Action:</u>

Under the No Action alternative, wildland fire may still occur, though BLM would not manage fire for the benefit of the resource. All fires would be suppressed. In designated wilderness, fire suppression is a trammeling action, that is, an action that hinders natural processes, and degrades wilderness character. Suppressing all wildland fire would negatively affect the resource.

Although the management prescription is similar in WSAs, the rationale is different. The overall goal of managing fire in WSAs is to allow the frequency and intensity of the natural fire regime to play its inherent role in the ecosystem. This means both allowing fire where ecosystems evolved in the presence of fire, and preventing unnatural spread of fire in ecosystems that evolved without broad-scale fires. Suppression of all wildland fires in WSAs may negatively affect the naturalness of an area. Developments associated with wildfire suppression leads to the development of roads and other human impacts that may impair the suitability of the WSA for preservation as wilderness.

Cumulative Effects:
Wildfire suppression, combined with other impacts to both wilderness character in designated wilderness and wilderness characteristics in WSAs, has the potential to cause substantial negative effects to these areas. The Wilderness Act, FLPMA, and agency policy in wilderness areas and WSAs mandate the BLM to consider the effects of fire on the landscape. For these areas, the management response to wildfire should vary along a continuum from monitoring to suppression.

Alternative B – Proposed Action:
Allowing for the natural role of wildland fire in wilderness areas and WSAs is in alignment with management prescriptions in the Wilderness Act and BLM policy. Fires have the potential to be a great benefit to wilderness character in wilderness areas, and may positively affect wilderness characteristics in WSAs.

Cumulative Effects:
Fires managed for the benefit of wilderness character in wilderness areas and for the preservation of wilderness characteristics in WSAs provide a net benefit for the resources.

3.5.5 Land with Wilderness Characteristics

Current Conditions:
Managing the wilderness resource is part of the BLM's multiple use mission. Section 201 of FLPMA requires the BLM to maintain on a continuing basis an inventory of wilderness characteristics. The Grand Junction Field Office last complete inventory of lands with wilderness characteristics occurred in 2012, and several units have been updated subsequently. The D-E NCA had a complete inventory completed prior to the release of the 2017 Resource Management Plan, and the MCNCA is currently updating its wilderness characteristics inventory. The table below shows the current units found to possess wilderness characteristics in the project area, and whether the BLM has established a management decision in the respective Resource Management Plans.

Unit	Acreage	Managed for the Protection of Wilderness Characteristics
GJFO		
Bang's Canyon	20,434	Yes
East Demaree	4,796	No
East Salt Creek	17,008	No
Hunter Canyon	32,228	No
Kings Canyon	9,606	No
Lumsden Canyon	10,072	No
Maverick	20,401	Yes
South Shale Ridge	27,540	No
Spink Canyon	13,081	No
Spring Canyon	8,848	No
Unaweep	7,154	Yes
West Creek	111	No
D-E NCA		
Cottonwood Canyon	6,576	Yes
Dry Fork of Escalante	7,021	Yes
Dominguez Addition	3,025	No
Gunnison Slopes	5,194	No

The management of lands with wilderness characteristics is similar to management of Wilderness Study Areas, that is, these areas are managed to protect the wilderness characteristics present. These wilderness characteristics include:

1. *Size* - Roadless areas with over 5,000 acres of contiguous BLM lands or roadless areas of less than 5,000 acres of contiguous BLM managed lands which are adjacent to designated wilderness, BLM managed Wilderness Study Areas, USFWS areas proposed for wilderness designation, USFS Wilderness Study Areas or areas of recommended wilderness, NPS areas recommended or proposed for wilderness designation, or and roadless island of public lands. Additionally, any areas where it is demonstrated that it is of sufficient size as to make practicable its preservation and use in an unimpaired condition.
2. *Naturalness* - The area must appear to have been affected primarily by the forces of nature, and any work of human beings must be substantially unnoticeable.
3. *Outstanding Opportunities for Solitude or a Primitive and Unconfined Type of Recreation* – An area provides opportunities to avoid the sights, sounds, and evidence of other people in the area or for dispersed, undeveloped recreation which do not require facilities, motor vehicles, motorized equipment, or mechanized transport.
4. *Supplemental Values* – Does the area contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Alternative A - No Action:
Direct and indirect effects under the No Action Alternative will be similar to those for Wilderness Study Areas under Section 3.5.5.

Cumulative Effects:
Cumulative effects under the No Action Alternative will be similar to those for Wilderness Study Areas under Section 3.5.5.

Alternative B – Proposed Action:
Direct and indirect effects under the Proposed Action Alternative will be similar to those for Wilderness Study Areas under Section 3.5.5.

Cumulative Effects:
Cumulative effects under the Proposed Action Alternative will be similar to those for Wilderness Study Areas under Section 3.5.5.

3.5.6 Range Management

Current Conditions:

The project area encompasses the majority of the Grand Junction Field Office and the Dominguez-Escalante National Conservation Area. Allotments not included within the project area include the Hunting Grounds, Mt. Garfield, Hunter Wash, Little Salt, and portions of the West Salt, East Salt, and Badger Wash allotments. The range management resources within these areas vary and were described and analyzed within the 2015 Grand Junction Resource Management Plan EIS (GJFO FEIS p. 3-165 – 3-66), and are incorporated by reference. "There are 207 allotments managed by the GJFO in the RMP planning area. Of these allotments, 186 are permitted for livestock grazing and 21 are vacant. In addition to BLM-administered land, these allotments may contain National Forest System, US BOR, municipal, state, and private lands. There are 145 permits authorizing grazing on these allotments. Total active preference (permitted use) is 63,859 animal unit-months (AUMs), with an additional 24,344 AUMs in suspension. Total permitted numbers adjust occasionally due to conversions of the class of livestock, changes in allotment boundaries or livestock management, and changes to meet carrying capacities as determined by vegetative inventories.

The majority of the allotments are used for grazing cattle (99 percent), primarily cow/calf operations. The authorization of both sheep and cattle use occurs on only two allotments (1 percent). Two allotments also include a small amount of horse use. Sheep grazing diminished throughout the years based on economics and changes in the industry. Sheep grazing was eliminated in two allotments through livestock agreements to reduce conflicts with Desert Bighorn sheep.

Three selective management categories for allotments have been developed: Custodial, Maintain, and Improve. The initial categorization occurred prior to the 1987 RMP and was updated in 2000. Custodial allotments in the planning area are generally small parcels of public land intermingled with larger tracts of private land. Due to the small amount of

public land involved, these allotments require substantial investments of time or money that are not justified. In Maintain category allotments, the BLM is either satisfied with the current conditions or the allotment does not contain many sensitive resources. Although some investment in time or money would be justified in these allotments, they are not as high a priority as Improve category allotments. Improve category allotments are either in unsatisfactory condition or contain substantial sensitive resources that would justify investments of time and money. These allotments have the highest priority for monitoring and range improvement development. In addition, changes have occurred as needed on a case-by-case basis as circumstances deem necessary. As of 2008, 42 allotments are part of an implemented allotment management plan (AMP) or grazing use agreement that identifies a change in livestock management and/or more intensive management. Thirty-four of these allotments are in the Improve category, three are in the Maintain category, and five are in the Custodial category. Changes in management may be due to conflicts with other uses, conflicts with other resources, adjustment in authorized active AUMs based on Ecological Site Inventory, or a Land Health Assessment where livestock grazing has been determined to be a causal factor. Improve category allotments have priority in completing AMPs, but due to new resource issues and increased focus in some areas, some AMPs have been established for lower-priority allotments.

Monitoring and Inventories
Monitoring continues to be an important component of the livestock management program. All allotments within the GJFO have some sort of monitoring study. Study methods include photo points, nested frequency transects, utilization, apparent trend, actual use, big game transects, and allotment supervision. Each allotment has one or more of these studies depending on the issues and concerns and prioritization category. Monitoring data are analyzed during the grazing permit renewal process or as needed" (BLM 2015).

Alternative A – No Action:

Under the No Action alternative impacts from wildland fire suppression to range management would include a temporary loss of forage and associated AUMs. The level of AUM loss would be dependent on size and location of the fire and would be for two to three growing seasons until seeded and existing native forage species establish and recover. Any positive impacts (e.g. improved forage/rangeland condition) would be limited to initial containment boundaries. Livestock grazing would generally be deferred or modified in treatment areas during this period requiring grazing permittees to make adjustments in their livestock management. Range improvement projects could be damaged or destroyed by fire. There is always a potential for fire to increase spread of noxious and invasive vegetation species, which would have negative impacts, however with the use of BMPs and design features for all ignitions, these impacts would be reduced.

Cumulative Effects:
Wildfires have a large potential to increase cumulative effects. Severe burn areas can have lasting effects to forage condition. Effects can last for years. Any impacts, both positive and negative would be limited to the initial containment boundaries.

Alternative B – Proposed Action:

Impacts to Range Management would be similar to the No Action alternative. However, if fires are managed for resource benefit this could allow areas that meeting with problems, or not meeting standards and guidelines due to lack of fire regimes, PJ encroachment, or lack of species diversity, the Proposed Action could allow these areas to shift from meeting with problems, or not meeting to meeting land health standards. This would improve resource condition, which would then result in increased forage production, which would be a positive impact for range management. There is always a potential for fire to increase spread of noxious and invasive vegetation species, which would have negative impacts, however with the use of BMPs and design features of the Proposed Action, these impacts would be reduced.

Cumulative Effects:
Wildfires have a large potential to increase cumulative effects. Severe burn areas can have lasting effects to forage condition. Effects can last for years; however, under the Proposed Action management would be for resource benefit, which over time would have positive cumulative impacts due to improved resource conditions.

3.5.7 Wild Horse and Burro

Current Conditions:
The project area encompasses the Little Book Cliffs Wild Horse Range. In the 2000s several mechanical treatments occurred throughout the range. Many of these treatments occurred in areas previously chained in the 1960s and 70s. The primary purpose of the treatments was to remove the woody species (PJ) that had enchroached back into the chained areas to increase forage for the wild horses. These treatments included seeding the area with a mixture of grasses and forbs. In 2011 approximately 1,700 acres burned within the range from a managed wildfire. The area was reseeded the following winter by aerially seeding the area on top of snow. Portions of the range were identified for fire use in the Fire Management Plan.

Alternative A – No Action:
Under this alternative wildland fires would not be managed for resource benefit. This would remove a tool to improve forage conditions in some areas of the wild horse range. As in the past many of the open sagebrush and grass areas become dominated by pinyon and juniper forests resulting in less available forage for wild horses. Wildland fire in some areas would not benefit wild horses particularly those where soils are shallow with low potential for herbaceous vegetation or areas where cheatgrass would dominate following a fire.

Cumulative Effects:
Overtime suppression of wildland fire would result in conversion of a substantial portion of the wild horse range to a pinon /juniper forest.

Alternative B – Proposed Action:

The Proposed Action allows for wildland fires to be managed within the range. Wildland fire that removes woody species will generally increase the forage base for wild horses.

Factors to determine whether to allow fire for wild horse benefit would include the potential of improving the herbaceous plant component (forage), potential for cheatgrass dominance, amount of forage removed for the current year, and the specific area that start occurs. Wildland fires that may occur in areas previously burned or treated would not benefit from fire. There will be a short term loss of forage for wild horses from the area burned. This is forage removed from the forage base for possibly the next two years. The amount of area allowed to burn must be balanced with the forage needed to sustain the wild horse population for the next two years or possibly longer.

Cumulative Effects:
Managing wildland fire for resource benefit along with other tools such as prescribed fire or mechanical treatments will result in maintaining a forage base that meets the appropriate management level (AML) within the wild horse range.

3.5.8 Rights-of-Way, Other Uses

Current Conditions:

Within the project area, there are many authorized rights-of-way of varying types such as public utility lines, oil and gas pipelines/facilities, communication sites, water facilities, and roads. The types and approximate number of ROW that are granted within the project area are described in the 2015 GJFO RMP FEIS on pages 3-210 through 3-211 and on page 361 of the 2017 DENCA RMP FEIS. ROWs with in the GJFO are primarily scattered across the field office, but there are higher concentrations of ROWs within the five ROW corridors (GJFO Approved RMP, p. 172)

Alternative A – No Action:
Under the No Action alternative, all fires would be managed for full suppression; therefore, impacts to rights-of-way and other land use authorizations are expected to be minimal. However, if fuel loads increase due to 100% fire suppression on lands around ROWs, then the chances for larger, more intense fires would increase, which may make it more difficult to protect infrastructure from wildland fire.

Impacts to ROWs vary based upon the types of facilities that are authorized under the ROW. Above ground power, telephone, and fiber optic lines that are placed on wood poles are some of the most susceptible facilities to damage from wildland fire. Above ground pipelines can also be damaged from fire firefighting equipment or direct contact with flames, especially polymer types of pipelines. Shallow high presser natural gas pipelines can be damaged during construction of fire lines with dozers, which also presents a serious safety concern for firefighters or personnel on the ground. Most ROWs are susceptible to damage from direct exposer to heat or flames and damage from heavy equipment cutting fire lines. Above ground structures such as power lines can also be damaged from aviation activities associated with fire suppression. These types of facilities also pose a risk to aviation resources.

Cumulative Effects:

Cumulative effects on ROWs from wildland fire suppression are expected to be minimal because any damaged incurred during these activities would be promptly repaired. The greatest potential impact from full suppression of all wildland fires is related to increasing fuel loadings on lands surrounding these facilities, which may result in an increase in large intense fires that are difficult to contain and control.

Alternative B – Proposed Action:
Under the Proposed Action, impacts to ROWs are expected to be similar to those described under the No Action alternative. Fire would be managed for resource benefits on a case-by-case basis if they are determined to be suitable for this type of management. Fire managers and resource advisors would consider proximity to authorized rights-of-way, infrastructure and improvements on the public lands when making a determination, and action points would be identified to protect facilities. Therefore, impacts to rights-of-way and other land use authorizations are expected to be minimal. However, if fuel loads increase due to fire suppression on lands around ROWs, then the chances for larger, more intense fires would increase, which may make it more difficult to protect infrastructure from wildland fire.

Cumulative Effects:
Cumulative effects would be similar to those described above.

CHAPTER 4 - CONSULTATION AND COORDINATION

4.1 LIST OF PREPARERS AND PARTICIPANTS

INTERDISCIPLINARY REVIEW

NAME	TITLE	AREA OF RESPONSIBILITY
Natalie Clark	Archaeologist	Cultural Resources, Native American Religious Concerns
Andy Windsor	Supervisory Outdoor Recreation Planner	Access, Transportation, Recreation
Dan Ben-Horin	National Conservation Land Specialist	Wilderness, Wild & Scenic Rivers, WSA, NHT, VRM, Wilderness Characteristics
Bob Price	Range Management Specialist	Range, Forestry, Vegetation
Jim Dollerschell	Range Management Specialist	Wild Horse & Burro Act
Eric Eckberg	Geologist	Geology, Paleontology
Alan Kraus	Hazardous Materials Specialist	Hazardous Materials
Robin Lacy	Realty Specialist	Land Tenure/Status, Realty Authorizations
Heidi Plank Nikki Hoffman (NCA)	Wildlife Biologist	T&E Species, Migratory Bird Treaty Act, Terrestrial & Aquatic Wildlife
Anna Lincoln Nikki Hoffman (NCA)	Ecologist	Land Health Assessment, Special Status Plants, Riparian and Wetlands
Kevin Hyatt	Hydrologist	Soils, Air Quality, Water Quality, Hydrology, Water Rights
Jeff Phillips	Fire Ecologist Natural Resource Specialist	Fire Ecology, Fuels Management
Mark (Sparky) Taber	Range Management Specialist	Weed Coordinator, Invasive, Non-Native Species
Christina Stark	Assistant Field Manager (Resources Programs / Planning & Environmental Coordination)	Environmental Justice, Socioeconomics, ACECs, Prime & Unique Farmlands, P&EC, Renewable Resources Supervisor
Wayne Werkmeister	Associate Field Manager	Non-Renewable Resource Program Supervisor

4.2 TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONSULTED

Colorado State Historic Preservation Office, Colorado Division of Parks and Wildlife, Mesa County, Garfield County, Colorado Division of Fire Prevention & Control, U.S. Forest Service, Glade Park, Lower Valley, De Beque and Plateau Valley Fire Departments.

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