PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL ASSESSMENT NUMBER:
CO-SJPLC-03-044 EA

PROJECT NAME:
Wildland-Urban Interface Hazardous Fuels Reduction

TYPE OF PROJECT:
Mechanical Vegetation Treatment Activity Plan

ECOREGION/PLANNING UNIT:
Lands within the San Juan Center encompassed by the San Juan/San Miguel Resource Management Plan.

LEGAL DESCRIPTION:
Lands administered by the Bureau of Land Management, San Juan Public Lands Center in southwest Colorado.

APPLICANT and PREPARING OFFICE:
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DATE OF PREPARATION:
Winter/Spring 2004

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INTRODUCTION

Wildland fires on public lands have been suppressed and extinguished immediately upon discovery of their ignition since the federal agencies were established. This has taken away the natural role that fire has historically played in these ecosystems, allowing many areas to become dense and susceptible to catastrophic wildfires. Many areas that had large, widely spaced trees with a grass and low shrub understory are overgrown with oak brush, piñon pine, juniper, and small diameter ponderosa pine.

In addition to the unnatural fuel buildup developing in the forests and rangelands, wildland firefighting has become more complex due to dramatic increases in the West's population. Of the ten fastest-growing states in the U.S., eight are in the interior west, which has growth rates ranging from 2.5 to 13 percent. New housing developments are occurring in fire-prone areas, often adjacent to federal land, creating a "wildland-urban interface or WUI." This relatively new phenomenon means that more communities and structures are threatened by wildland fires. Consequently, firefighting has become more complicated, expensive, and dangerous.

The Healthy Forests Restoration Act of 2003 has defined the term WILDLAND-URBAN INTERFACE to mean the following:

(A) an area within or adjacent to an at-risk community that is identified in recommendations to the Secretary in a community wildfire protection plan; or
(B) in the case of any area for which a community wildfire protection plan is not in effect--
  (i) an area extending 1/2 mile from the boundary of an at-risk community;
  (ii) an area within 1-1/2 miles of the boundary of an at-risk community, including any land that--
    (I) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community;
    (II) has a geographic feature that aids in creating an effective fire break, such as a road or ridge top; or
    (III) is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; and
  (iii) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuel reduction to provide safer evacuation from the at-risk community.

The Bureau of Land Management (BLM) is obligated to put the health and safety of the public and employees first in its management of public lands. The hazardous fuel conditions that currently exist in or near WUI subdivisions constitutes a threat to the general public, local fire department personnel, public land's employees, and affected resources if a wind-driven, catastrophic, canopy fire event were to occur within these areas. The potential for a fire event of this nature to spread onto adjacent private and public lands, to destroy natural and cultural resources, and to destroy structures, is high when this type of burning event occurs.

Summary Description of the Proposed Action:

The BLM proposes to implement mechanical thinning projects within the WUI on lands administered by the BLM-San Juan Public Lands Center. This proposed action does not include lands within Wilderness areas, Wilderness Study Areas, or the Canyon of the Ancients National Monument. Project implementation using the recommended mitigating measures within this document would occur over five years following the date of the Decision Record. This decision as well as the mitigating measures will also be reviewed with the upcoming RMP revision.

Prior to implementation of an individual project, nearby landowners would be notified and consulted. Site-specific cultural and Threatened/Endangered Species surveys will be completed prior to implementation of individual projects through a Categorical Exclusion (CX), Documentation of Land Use Plan Conformance and National Environmental Policy Act (NEPA) Adequacy (DNA), or an Environmental Assessment (EA).

The primary resource management objectives of the proposed fuels-reduction projects are to:

- Reduce the risk of catastrophic wildfire
- Reduce the hazardous fuels complex by opening the woodland and forest canopy across the landscape

Secondary objectives may include opportunities to:

- Increase palatability of forage species
- Improve forage distribution, use, and production for big-game species
- Improve access and availability of forage to herbivores within dense oak and piñon-juniper woodland areas
- Improve soil moisture by reducing tree and shrub densities
- Improve watershed stabilization to reduce the loss of soil and cultural resources by erosive forces where they exist
- Improve overall forest health conditions

Purpose of the Environmental Assessment

This programmatic Environmental Assessment (EA) was started prior to the BLM being given the authority to use categorical exclusions (CE) for hazardous fuels projects in July 2003. We intend to make full use of the CE authority when possible, but in order to use the authority effectively we felt it was important to have a document that addresses the cumulative impacts of proposed hazardous fuels treatments, as well as the mitigation measures that will address those impacts. The mitigation measures will be included in each project CE, as appropriate.

This EA examines only two alternatives: the proposed action and the No-Action alternative. The No-Action alternative is essentially a “status quo” or “business as usual” alternative. It does not mean that we would not propose and conduct fuels treatments. However, it means that we would continue to analyze each project through its own NEPA documentation, which is time consuming, costly, and inefficient considering the similarities

in terrain, vegetation, and treatment options for the lands on which treatments are proposed. We feel that this approach will provide greater acceptance of our proposed projects and the use of the categorical exclusion.

Need for the Proposed Action:

Within the BLM-San Juan Public Lands the WUI is covered with highly flammable plant communities consisting of piñon pine, Utah and Rocky Mountain juniper, shrub communities (oak brush, serviceberry, and other), and pockets of ponderosa pine. Natural fuel build-up in and around communities and subdivisions is high partly due to nearly 130 years of vegetative manipulation – that is, alteration of forest and woodland vegetation through heavy grazing initially, harvesting of timber, and in particular, fire suppression begun around 1925 or so. There are also many parcels of private property located adjacent to or within the planning area. Preventative action can be taken on public lands to help reduce the risk of catastrophic fire occurrence, thereby protecting public and private lands.

Much of the overall area proposed for thinning has not had any treatment to reduce the vegetative fuel loading. In the 1960s and 1970s, areas were chained to remove vegetation, primarily to improve grazing. The time lapse since the chaining treatments has been long enough that the treated areas warrant another treatment. Many areas have grown back with more piñon-juniper stems per acre than nearby unchained areas.

Within much of the WUI, the lack of recent vegetation management has allowed the forest to grow dense with a nearly continuous crown closure. The potential for a hot, rapid spreading wildfire has increased to unacceptable levels. A fire under windy conditions could eliminate all existing vegetation within an area and threaten properties. Other resource management issues include:

- There are extremely heavy fuel loadings consisting of oak brush, piñon pine, juniper, and ponderosa pine (areas of complete canopy closure). Development of an extremely hazardous fuels situation, which potentially threatens other associated resources in addition to firefighter and the general public's safety when unmanaged ignitions occur within the area.
- There has been growth of the Rocky Mountain elk herd over the last several years and the concentrated use by these animals on private lands within the WUI. The elk are spending much of their time on private land due to the old, decadent vegetation on public land.
- There is watershed resource deterioration comprised of active head cutting, wind, sheet, and rill erosion within the project planning area due to minimal surface vegetation under the existing overstory.
- There is a need to protect archeological resources from the active forces of erosion where they are currently occurring within the proposed project planning area and from the potential devastating effects of catastrophic wildfire as fuel loads continue to accumulate.
- There is cumulative grazing pressure on forage by both big game and livestock on public lands.

The San Juan Public Lands Center administers approximately 187,000 acres of BLM public land in the WUI. During the past three years, the field offices have implemented approximately 13,000 acres of fuels-reduction projects. This activity-level EA will enable the field offices to implement hazardous fuels reduction projects using well thought out guidance and research. It is anticipated the mechanical fuels treatments should average from 3,000 to 8,000 acres per year, depending on the budget.

DESCRIPTION of the PROPOSED ACTION and ALTERNATIVES

Proposed Action

The Bureau of Land Management proposes to implement mechanical thinning projects within the WUI on lands administered by the BLM San Juan Center, consisting of the Pagosa Springs, Columbine, and Dolores Field Offices. Project implementation using the recommended mitigating measures within this document would occur over five years following the date of the Decision Record. This decision as well as the mitigating measures will also be reviewed with the upcoming RMP revision.

This proposed action does not include WUI lands within Wilderness areas, wilderness study areas (WSAs), and the Canyon of the Ancients National Monument (CANM). Hazardous fuel reduction projects will continue to be identified and implemented in the CANM, but will be analyzed under a separate site-specific document or within the upcoming CANM management plan. Any projects identified within a WSA will require a separate environmental assessment and will have to comply with the "Interim Management Policy and Guidelines for Lands under Wilderness Review" dated July 5, 1995.

Fuels-reduction projects would be concentrated along the boundaries of the BLM-administered public property which adjoins other lands. Primary project concentration would be next to adjacent subdivisions and other property where wildfires may threaten life or property (see attached county maps identifying public lands that may need fuel reduction). This proposed action would reduce the potential for a strictly wind-driven fire within the crown of the trees, and put the fire back on to the ground where traditional firefighting methods are able to suppress it.

Prior to implementation of an individual project, nearby landowners would be notified and consulted. Site-specific cultural and Threatened/Endangered Species surveys will be completed prior to implementation of individual projects through a Categorical Exclusion (CX), Documentation of Land Use Plan Conformance and National Environmental Policy Act (NEPA) Adequacy (DNA), or an Environmental Assessment (EA).
The following are treatments that would occur within differing vegetation communities:

●**Piñon pine and Utah juniper woodland**: Vegetation will be thinned using a hydro-mower, which can include machines such as a hydro-ax, Fecon flail, or other machines with

similar results and impacts. The proposed action would selectively thin piñon and juniper trees less than ten inches in diameter by approximately 55 to 65 percent overall. The area would be mowed in a mosaic pattern leaving islands and stringers. Openings of ¼ to 3 acres in size will be developed, which will allow new openings and strips to reduce the continuous crown fuels and substantially abate the potential for a high severity wildfire. This will also allow desirable grasses, forbs, and shrubs to establish in the treated areas providing forage for wintering big game, as well as domestic livestock grazing, where allowed. The remaining untreated areas as well as the islands and stringers of vegetation will provide hiding and thermal cover for wildlife.

The hydromower is approximately eight to nine feet wide and has floatation-type tires that create little disturbance to the ground's surface. The mower mulches the plant debris and distributes it over the bare soil creating a layer of protective vegetal material for the rubber-tired tractor to drive over. The mat layer, or mulch, enhances conservation of affected resources and has been shown to provide increased protection for archaeological sites where erosion has been reducing site integrity. The machine can meander in and out of the trees, treating natural openings where sagebrush and piñon/juniper trees are encroaching. Areas that are inaccessible to the mower may be treated manually.

Photo 1. *Piñon-juniper in the* ***Grandview Ridge area, southwest of Durango, before thinning.***

Photo 2*. Grandview Ridge after thinning with the hydromower.*

Any trees cut within 200 feet of a maintained roadway will be cut as close to the ground as possible for visual reasons. No additional roads will be created to complete any portion of the project regardless of the method used. The result will be a more open stand of trees with better resistance to a high severity wildfire or crown fire event. With less competition for water, sunlight, and nutrients the remaining trees will be healthier and more resistant to insects and disease.

Consistent with the purpose of hazardous-fuels reduction, vegetation near archaeological/historic sites such as rock shelters, rock art, and sites with wooden structures or features will be thinned by hand to prevent damage from wildfire.

Vegetative thinning projects of this kind have occurred on the following areas over the last three years:

- Grandview Ridge, southwest of Durango, CO. 900 acres.
- Mayhan, between Durango and Bayfield, CO. 532 acres.
- Kernan Canyon, east of Cortez, CO. 677 acres
- Stinking Springs, northeast of Cortez, CO. 851 acres
- Cash Canyon, northeast of Cortez, CO. 513 acres

Hazardous-fuels reduction thinning is currently occurring on the Summit Ridge and Aqueduct project locations between Mancos and Cortez, Colorado.

●**Mountain Shrubland**: This vegetative type represents a very small portion of the planning unit. It is usually a component of the other more prominent piñon/juniper or ponderosa pine woodland. The treatment method for this vegetation would be similar to that described above for piñon/juniper woodlands. Shrubs will be thinned using a hydromower or similar machine, which can include a hydro-ax, fecon flail, or other machines with similar results and impacts. Thinning will reduce existing shrub vegetation by approximately 55 to 65 percent. Most of the larger oakbrush stands will be left untouched to preserve wildlife habitat.

Photo 3. ***Oakbrush was up to 10 feet tall in some areas on the Dolores Rim prior to mowing.***

In 2002, the Dolores Rim hazardous-fuel reduction project encompassing 4,415 acres in this vegetation type was completed using a hydro-ax. Once the thinning was completed, the area was treated by prescribed fire to further reduce the fuels.

●**Sagebrush Shrubland:** Sagebrush will be mowed using a brush beater or a hydro-mower. Sagebrush will be mowed in a random mosaic pattern that will remove approximately 75 percent of the shrubs.

To date, the San Juan Public Lands Center has not treated any large acreages of sagebrush by mechanical means. We have mowed small 1-5 acre sagebrush plots as part of other larger treatment units. It is anticipated that we will continue to treat small plots of sagebrush within larger piñon/juniper woodlands.

●**Ponderosa Pine Forest:** The proposed action is an improvement thinning that removes trees from the lower crown classes to favor those in the upper crown classes, improving the composition and quality of the residual stand and reducing stand density. Thinning would

concentrate heavily on trees less than 10 inches dbh (diameter at breast height) and more moderately on small sawtimber in the 10 to 14 inch range. Individual trees or clumps of trees left would be widely spaced to reduce the threat of a crown fire with a target average basal area of 40-60 square-feet/acre (70-110 trees/acre). An occasional larger tree may need to be removed to improve overall forest health, such as those infected with mistletoe or other diseases. The old, large healthy trees are considered a rare component of most stands and will be protected. Several healthy trees per acre, particularly in clumps, in the less than 10-inch size class will be saved for stand structure and age class diversity. Small openings and corridors will be created where they will provide a fuel break and improve horizontal diversity. Openings would range from ¼ to ½ acre in size depending on stand conditions. When possible, existing natural openings would be expanded. Slash created by the activity would either be piled and burned or scattered as slash for nutrient recycling. The removed trees would either be stockpiled along existing roads and made available to the public (with current wood permit) as firewood or pole material, or removed from the location by a commercial vendor. This will depend upon timing of operations and current insect activity.

A follow-up treatment of mechanical-fuels reduction specific to piñon and juniper trees, small ponderosa pine, and thinning slash may be accomplished with the use of hydraulic mower/mulcher equipment, as described previously. Similar mowing or masticating heads can be mounted on the extendable booms of track-hoe or feller-buncher machines. These track-mounted machines have low ground pressure and are capable of operating on 30-50% slopes. The mower can be set to clip vegetation from four- to twelve-inches above the ground. The mower mulches the plant debris and distributes it over the bare soil creating a layer of protective vegetal material for the rubber-tired tractor to drive over. These machines can meander in and out of the trees, treating natural openings where piñon/juniper trees are encroaching. Only those acres accessible to the mower on operable slopes of less than 30% will be treated. Areas identified as inaccessible to the mower could be treated manually with chainsaws. The areas would be mowed in a random shape creating new openings and strips to reduce the continuous crown fuels and substantially abate the potential for a catastrophic wildfire.

Photo 4. *This ponderosa pine forest on an isolated parcel of BLM land in Edgemont Ranch (Durango) had approximately 175 stems per acre prior to treatment.*

All trees cut with chainsaws or other mechanical means would have a stump height of less than 6 inches. No additional roads will be created to complete any portion of the project regardless of the method used. The result will be a more open stand of healthy trees with

better resistance from a catastrophic wildfire. With less competition for water, sunlight, and nutrients the remaining trees will be healthier and more resistant to insects and disease.

Photo 5. *Following hand thinning by the Southwest Youth Corps the number of stems per acre was about 75; the thinned material was removed by a commercial logger.*

Most treated areas would not need to be seeded because there are currently enough grasses, forbs, and shrubs throughout to revegetate these areas. These plants will respond quickly to the reduction in competition for water, nutrients, and light. Some dense stands of trees with bare soil may be seeded with native seed to stimulate the growth of more desirable and palatable species.

The proposed action would include monitoring of the selected alternative to assure the effects of implemented management actions are properly documented, and that needed adjustments to the management of the project area are noted and acted upon in a timely manner.

A goshawk habitat reserve area (HRA) would be placed around all known goshawk nests and any additional nests discovered during the implementation of the projects. A 10-acre buffer would be left around nesting sites capturing the best available goshawk habitat. The dense forest overstory canopy within these HRAs would not be treated. Ladder fuels up to 8 inches in diameter within the HRAs would be slashed and piled. This would prevent a wildfire from reaching the tree canopy destroying nest sites and nesting habitat. All areas with active nest sites would maintain prohibit activities within approximately ¼ mile of the nest site during the breeding season (March 1 through August 30) unless surveys confirm that goshawks are not nesting.

●**Combination of any of the above communities:** Many project sites will contain a combination of the above vegetation communities. The prescriptive guidelines listed above will be adhered to for the vegetation communities represented on the project site.

*A *hydro-axe* and a *fecon flail* are mower/mulcher attachments that can be mounted on the front of a rubber-tired, articulated tractor. The tractors have rubber flotation-type tires that create little disturbance to the surface of the ground. The machines can cut and mulch shrubs or trees up to about 12 inches in diameter.

Explanation of the features on the attached maps:

The five attached project maps identify six counties that contain public lands managed by the San Juan Public Lands Center. A legend on each map shows currently planned treatment areas, most with completed NEPA documentation, potential treatment areas, and other related information. The following data has specific information by county along with an approximate amount of WUI acres that could receive some type of thinning project. For the purpose of this EA, the acreage was calculated using a ½-mile buffer from non-BLM managed public lands. Actual treatments could increase to 1-1/2 miles from specific communities depending upon fuel, slope, topography, aspect, and other conditions.

Archuleta County: 6,463 WUI acres, consisting of scattered parcels of public land surrounded by private and state lands. All acres would be considered for hazardous-fuel reduction.

La Plata County: 21,823 WUI acres, consisting of scattered parcels of public land surrounded by private and state lands. All acres would be considered for hazardous-fuel reduction.

Montezuma County: 24,419 WUI acres, consisting of scattered parcels of public land surrounded by private, state and other federal lands, as well as the CANM and some WSAs. The scattered portions of public land with potential for hazardous-fuel treatments are identified on the map.

Dolores County: 27,487 WUI acres, consisting of scattered parcels of public land surrounded by private, state and other federal lands, as well as the CANM, WSAs, and the Dolores River Canyon. Lands identified as candidates for hazardous-fuel reductions are identified on the map.

San Miguel / Montrose County: Approximately 106,412 WUI acres, consisting of the largest continuous block of public lands managed by the San Juan Public Lands Center, and also has many scattered parcels of public land surrounded by private, state and other federal lands, as well as WSAs. Specific WUI acres have not been identified on the continuous portions of public land, mostly due to the lack of inventory and remoteness of the area, but could be defined as those areas up to 1/2 mile around private land. Each potential project area would be evaluated to determine if it meets the WUI definitions as described on page two. If a potential treatment does not meet the WUI criteria, the project would require a categorical exclusion or an individual environmental assessment.

Design Features of the Proposed Action:

The following mitigating measures have commonly been used on all thinning operations to date, and have proven to be tried and true. They will continue to be used in the future.

*A cultural resource inventory, appropriate for the work proposed for a specific project, will be completed prior to fuels reduction operations. Tribal consultations with affiliated Indian tribes will be completed for all traditional cultural properties and sacred sites found. All sites with the potential to be affected by project activities would be flagged for avoidance. Sites with standing architecture or wooden elements will be avoided and the trees removed by hand or included in untreated mosaics. All site datum points for sites less than 1 acre in size (210' X 210') and site boundaries for sites greater than 1 acre in size will have an on the ground Global Positioning System (GPS) survey for ease in location and leave area design. This is also necessary as the surface of some sites may be obscured for several years by the mulch generated during the mechanical treatments. All site flagging will be removed as soon as possible (target: within 14 days of treatment completion) and all sites inspected for inadvertent impacts and post-treatment risks. Selected sites will be monitored for three years following treatment to detect and mitigate any long-term or unexpected impacts.

*A Threatened, Endangered and Sensitive species (TES) survey will be conducted prior to any phase of project implementation. If necessary, consultation with USFWS will occur.

*For safety purposes, notification will be posted in the local newspaper prior to beginning operations. Notification will state the location, date, and duration of the project (treatments). For hydro-mowing operations, signs will be posted on all access points leading to the project area. Signs will state that mowing operations are ahead, and will advise people to stay at least 300 feet from all machinery. Hydromowing contracts will require the operator to immediately stop all operations when people are observed within the project area.

*Riparian areas will be avoided during mechanical treatments, except to cross at designated points. When required to cross these zones with equipment, the operator shall cross perpendicular to the drainage.

*Machines and associated equipment will be washed prior to entering the project site to prevent the spread of noxious weed seed.

*Project sites will be monitored for the spread of weeds, and spot treated as needed for a (minimum) three-year period.

*Large dead trees (snags) will be left in place, unless they represent a hazard to nearby landowners or land users.

*Once a project has begun, it shall continue progressively until completion in order to minimize disturbance to wildlife.

*Heavy machinery shall not be operated when soils have reached the plastic limit (i.e., when soil can be rolled into 3 mm threads without breaking or crumbling) or when ruts exceed 4 inches in depth over contiguous stretches of ground.

*The San Juan Public Lands Center Hazardous Material (Hazmat) Coordinator will be contacted in the event there are any hazardous materials spills during project implementation, and hazardous materials will be cleaned up using standard hazmat procedures.

Alternative No. 1: No Action.

Hazardous-fuels reduction and vegetative manipulation on BLM-managed public lands within the San Juan Public Lands would continue to occur. The resource management "status quo" would continue through the preparation of multiple environmental documents without well prepared mitigation and cumulative effects.

PLAN CONFORMANCE REVIEW: The proposed action is subject to the following plan:

Name of Plan: San Juan/San Miguel Resource Management Plan.
Date Approved: September 5, 1985
Page or Decision Number LIVESTOCK GRAZING MANAGEMENT, Range Improvements Page 6, WILDLIVE MANAGEMENT, Resource Objectives Page 12, and TIMBER MANAGEMENT, Resource objectives and Planned Actions Page 21. All of these resources discuss vegetation manipulation projects benefiting the respective programs. The proposed action does not conflict with any of the Land Use Plan Decisions in the San Juan/San Miguel RMP.

The National Fire Plan of 2000 and the Healthy Forests Restoration Act of 2003 have made hazardous fuel reduction a priority program for the BLM and other federal land management agencies. This program will be an integral part of all future resource management plans and decisions. In the meantime, this EA is intended to supplement the analysis contained in the San Juan/San Miguel Resource Management Plan and Final Environmental Impact Statement (EIS) so the maximum benefit to all programs can be achieved during project implementation.

Relationship to Statutes, Regulations, or other Plans

Name: *Federal Land Policy and Management Act* (FLPMA) of 1976.
The Federal Land Policy and Management Act (FLPMA) of 1976 (43 U.S.C. 1701 et seq.: 90 Stat. 2743; P.L. 94-579) directs that the public lands be managed in a manner that will provide food and habitat for fish and wildlife.

Name: *Healthy Forests Restoration Act of 2003*.
To improve the capacity of the Secretary of Agriculture and the Secretary of the Interior to conduct hazardous fuels reduction projects on National Forest System and Bureau of Land Management lands aimed at protecting communities, watersheds, and certain other at-risk

lands from catastrophic wildfire, to enhance efforts to protect watersheds and address threats to forest and rangeland health, including catastrophic wildfire, across the landscape, and for other purposes.

Name: *National Fire Plan of 2000*.
The Secretary of Agriculture and Secretary of the Interior, through the National Fire Plan, have directed offices to reduce fuels in order to help reduce the risk of large catastrophic fires. In our current Appropriations Bill, approved by Congress and the President, funding was provided to continue implementation of the National Fire Plan. Additionally, BLM has been directed to manage fire and resources together to protect people, natural resources and property, and to restore forest, wildlife and rangeland health. Project areas identified in this document are designed to meet this goal.

Name: *Prescribed Fire Plan*, April, 1997
The Prescribed Fire Plan activity-level RMP amendment allowed for prescribed fires and wildland fire use. Once the proposed action is completed, the openings within the area may be maintained with the use of low intensity prescribed fires. These prescribed fires would be executed in the spring or fall to continue control of the oak brush, piñon/juniper encroachment and reduce natural forest litter accumulation. Any possible consideration to introduce prescribed fire to maintain the desired conditions would be evaluated as described in the San Juan Prescribed Fire Plan.

Name: *Sikes Act of 1960*.
The Sikes Act provides for the conservation, restoration, and management of species and their habitats in cooperation with State Wildlife Agencies, including the implementation of on-the-ground wildlife habitat improvement, maintenance, and protection programs.

Name: *Final Environmental Impact Statement (FEIS) Vegetation Treatment on BLM Lands in Thirteen Western States*, dated May 1991.
This FEIS assessed the environmental consequences of federal approval of different vegetative treatments on a variety of vegetative species on public lands in the western United States. The proposed action included manual, mechanical, biological, prescribed burning, and chemical treatments. The plant communities analyzed include sagebrush, piñon-juniper, coniferous/deciduous forest, chaparral-mountain shrub, desert shrub, and riparian. In summary, the FEIS analyzed the following:

*Effects of treatments on vegetation.
*Effects of treatments on fish and wildlife and their habitats.
*Effects of mechanical treatments and prescribed burning on soils.
*Effects to all natural resources, both positive and negative.
*Effects of herbicides and prescribed burning on human health and safety.

This environmental analysis tiers to the FEIS for the description of the various plant communities, vegetative treatments, and associated impacts. This EA will disclose and analyze the site-specific resources and impacts resulting from the proposed action and alternatives.

Name: *Integrated Weed Management in the Montrose District, San Juan Resource Area*, dated 1995.
This EA discusses the use of herbicides on BLM managed public lands. It gives the BLM authority to use a variety of means to control the spread of invasive, non-native species.

Additional laws governing the management of public lands include the Archeological Resource Protection Act of 1974, National Historic Preservation Act of 1966 as amended (1980), National Environmental Policy Act of 1969 as amended, 1973 Endangered Species Act as amended, Migratory Bird Treaty Act of 1918 as amended, the Bald Eagle Protection Act of 1940 as amended, the Clean water Act of 1977 as amended, the Colorado River Basin Salinity Control Act of 1984 as amended, and the Clean Air Act of 1977 as amended.

STANDARDS FOR PUBLIC LAND HEALTH:

Standards for Public Land Health are expressions of physical and biological conditions or degrees of function required for healthy and sustainable lands, and define minimum resource conditions that must be achieved.

The impacts on the standards, resulting from the proposed action, are addressed in the appropriate Affected Environment/Environmental Impacts sections.

The five components of the standards are:

Standard 1: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, landform, and geologic processes. Adequate soil infiltration and permeability allows for the accumulation of soil moisture necessary for optimal plant growth and vigor, and minimizes surface runoff.

Standard 2: Riparian systems associated with both running and standing water function properly and have the ability to recover from major disturbances such as fire, severe grazing, or 100-year floods. Riparian vegetation captures sediment, and provides forage, habitat, and biodiversity. Water quality is improved or maintained.

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. Plants and animals at both the community and population level are productive, resilient, diverse, vigorous, and able to reproduce and sustain natural fluctuations and ecological processes.

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 qualities 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. Water Quality Standards for

surface and ground waters include the designated beneficial uses, numeric criteria, narrative criteria, and anti-degradation requirements set forth under State law as found in (5 CCR 1002-8).

AFFECTED ENVIRONMENT / ENVIRONMENTAL IMPACTS / MITIGATION MEASURES

CRITICAL ELEMENTS

The following elements of the human environment are subject to requirements specified in statute, regulation, or executive order and must be considered in all EAs. If the resource or value is not present or is not affected by the proposed action or alternatives, this will be documented as a negative declaration.

There are no impacts to Areas of Critical Environmental Concern (ACEC), Prime and Unique Farmlands, Wild and Scenic Rivers, or Wilderness because there are none identified in the project areas. There would be no direct impacts to floodplains, wetlands or riparian zones because no vegetative treatments would occur in these areas.

AIR QUALITY

Affected Environment: Southwest Colorado is known for its clean air and blue skies, although perceptible visibility degradation can occur seasonally. Within the region, there are large emission sources that negatively impact air quality. Several coal-fired power plants are located in the greater Four Corners area and they are a primary source of local sulfate emissions. Other contributors are oil and gas industrial development, automobiles, and wood burning (wood stoves, fireplaces, forest and rangeland fires). Regional haze is generated from sources as far away as southern California. Due to the amount of dirt and gravel roads throughout the West, fugitive dust is present in the Four Corners area most any given time.

Impacts of the Proposed Action:

- All vegetation types: dust and engine emissions

Direct Impacts: In the short term, fugitive dust would be present during the treatment and from vehicular traffic, as well as emissions from gasoline and diesel engines. Dust and emissions would terminate each day upon equipment shutdown, as well as upon completion of each project.

Indirect Impacts: none

Impacts of Alternative 1 – No Action: Impacts to air quality could be significant if the fuels reduction projects do not occur. Large wildfires have a significant effect on air quality and can last from several days to several weeks as witnessed with the recent fires on Mesa

Verde National Park and the San Juan National Forest. Air quality in the Four Corners area has been affected by large wildfires as far away as California.

Cumulative Impacts: During the operational phase of the mowing treatment, dust and engine emissions would contribute to the overall air quality degradation when added to the dust from all other activities (if any) in the area. Overall, the use of a mower would not be significantly noticed, or add to the degradation of air quality.

Mitigation Measures: none

CULTURAL RESOURCES

Affected Environment: BLM WUI areas in southwest Colorado have not been intensively inventoried for cultural resources. Currently, (independent of a handful of inventories recently conducted for hazardous fuels treatments) less than 7% of these areas have received any cultural resource inventories at all. As a result, not much data about the cultural resources that lie within these lands currently exists. Based on what information does exist, and also information from adjacent areas, projections about the nature and extent of the archaeological, historic, and sacred resources in the WUI can be estimated. In general, site densities are known to be high; within the neighborhood of 30-60 sites per square mile. Some areas, particularly those near the communities of Cortez, Dolores, and Dove Creek, may have even higher site densities. The types of cultural resources that can be expected include:

- Ancestral Puebloan habitations with pit structures, middens, and associated agricultural features such as field houses, processing areas, and camps

- Archaic artifact scatters, rock shelters, and camps from upland resource procurement and processing

- Early historic Ute and Navajo habitations, camps, and associated subsistence resource hunting and gathering features

- Historic mining, ranching, and transportation features such as small settlements, homesteads, coal mines, livestock-herding camps, railroads, and wagon roads

When evaluating or interpreting the value of the above resources, how they incorporate or reflect their setting or landscape characteristics can be very important. Many sites have notable and fragile surface features such as rubble mounds, upright slab room alignments and hearths, rock and artifact scatters, wooden pole or brush alignments, wood or stone buildings, rock images or inscriptions, or shallowly buried architecture that could be exposed or damaged by heavy machinery. Over 80% of the sites currently documented in the WUI are considered eligible, or potentially eligible, to the National Register of Historic Places. Site size can vary from less than 1 acre to greater than 10 acres; however, most sites are 1-2 acres in size.

Due to the age of past vegetative treatments, especially chainings (ca 1960-1970s) completed in piñon pine and juniper woodland, and the need to re-treat some of these areas, inventory data gathered from these chainings over the past 10 years was evaluated to determine if sites in these areas would retain enough integrity to warrant avoidance by mechanical treatments. It was discovered that many sites, particularly those with shallowly buried features and use surfaces, still retain integrity. Sites such as Basketmaker field houses, farmstead, hamlets or villages, late Pueblo habitations with rubble mounds, room blocks and towers, and processing areas with small thermal features still remarkably retain surface integrity in some cases. More obvious sites were even avoided by the chaining activity although not visibly detectable without site-specific inspection.

Most of these areas, because of their location receive heavy human use in the form of recreation, target shooting, woodcutting, ORV use, vandalism, and illegal dumping, all of which have impacted archaeological and historic sites. In some areas, more than half of the sites documented were looted (some recently) or damaged by ORV use. They have received such a high level of vandalism, and repeated vandalism, that evidence is still clearly visible and will require immediate emergency stabilization treatment to prevent further site degradation and loss. Many sites have one or more 2-track roads or foot or mountain-bike trails passing near or through them. Several had established turnarounds within the site areas and had exposed site features that were eroding or had been looted. In one area, there was so much illegal trash dumping that the identification and evaluation of the archaeological site was not possible as very little of the ground surface was unencumbered by recent trash or had been chewed up by vehicles dumping trash.

In addition, paleontological resources are known to exist in WUI areas in southwest Colorado. The potential for fossil resources to be found on the ground surface in any of these areas can be predicted given the geologic formation where projects are proposed. Their significance is determined by their state of preservation and their museum-quality characteristics. They have been documented in the past through the cultural resource inventory process or a specific paleontological inventory completed by a professional paleontologist.

Impacts of the Proposed Action: "All treatment methods"

Direct Impacts: Shallowly buried prehistoric sites, such as slab-lined room blocks, processing areas with features observable on the surface, and early Puebloan habitations, could be impacted by mowing and thinning operations that use motorized vehicles. These sites could also be impacted by casual off-road vehicle use resulting from fewer visual and vegetative barriers after treatment. Architectural elements such as slabs and room block alignments could be upended and scattered via tire traffic, particularly during wet conditions, and datable deposits in shallowly buried features can be compromised. Mowing operations can also impact low-profile historic features such as sweat lodges, brush fences, and corrals that were obscured by dense vegetation prior to mowing. Follow-up maintenance burning can destroy wooden buildings and features, damage rock art, and compromise the scientific value of shallowly buried hearths and other charcoal-datable features.

The Proposed Action (mowing and thinning) can benefit cultural resource protection in the more erosive-soil regions of the project area especially where there are fragile surface deposits or subsurface remains as it will provide an overlay of mulch material that has been shown in other treatment areas to drastically reduce erosion, levels of site visibility (and subsequent vandalism and collection) and subsequent site loss. The proposed action will also benefit cultural resources by reducing the incidence of catastrophic wildfire: the resultant potential damage from emergency fire-suppression activities (that are exempt from cultural resource preservation laws), the burning and destruction of cultural resources, and site loss due to subsequent erosion events.

Methods of treatments vary with regards to the potential impact to cultural properties depending on vegetation type and machinery proposed. In general, the hydro-axe has the least potential to impact cultural resources and the greatest potential to benefit them, followed by the fecon flail. In treatments where these machines are used, it is not necessary to avoid all types of cultural resources, but more intensive monitoring and project compliance is necessary. Only shallowly buried, surface features or wooden components typically require complete avoidance. On the other hand, treatments that use roller choppers, brush-hogs or Dixie-harrows all have a much higher potential to indiscriminately disturb the surface and impact cultural resources. Treatments where these machines are used will require complete avoidance of all sites eligible, or potentially eligible, to the National Register of Historic Places. Hand thinning, of course, has the least potential to impact cultural resources, unless vehicles, skidders or tracked vehicles are used to drag timber to access roads. Then the level of surface disturbance from the equipment is directly related to the level of potential impact to cultural resources, and is usually high.

Indirect Impacts: Sites avoided by hydromowing operations can be subjected to a higher risk from collection and vandalism if isolated stands of trees are left in these (site) areas only. This makes them more identifiable and visible from existing adjacent access roads. Since a mosaic pattern of leave areas are to be designed into each treatment project, sites that need to be avoided by mechanical treatments can be easily incorporated into these. The result will be a reduction in the visibility of these sites and their exposure to collection, vandalism, and looting.

Cumulative Impacts: After treatments, fragile surface features and wooden site elements in these areas could be impacted by ORVs and other increases in vehicle access and human use once the vegetation that provided a barrier to uncontrolled use traffic is removed. These types of impacts are especially prevalent in urban-interface areas.

Where the mulching form of mechanical treatment (hydromowing) is used, there is a dense cover of mulched and shredded woody material fairly continuously across the surface of the ground when the treatment is concluded. It then becomes a problem to identify sites subsequent to treatment. This can be an impact where other uses might occur in the future and the ground cover precludes the identification and evaluation of the cultural resources.

Beneficial cumulative effects from the proposed action include increased surface site stability and reduced surface artifact loss and displacement due to the presence of a layer of erosion-resistant mulch atop the sites. This can also serve to screen surface artifacts

from potential collectors, thereby protecting them from theft, if the vegetative mulch is thick enough. Another beneficial cumulative effect is the obvious site protection from otherwise catastrophic wildfire events in the near and distant future.

Impacts of Alternative 1 – No Action: If fuels-reduction projects are not implemented as quickly as possible, the threat to cultural resources from catastrophic wildfire cannot be mitigated. Hundreds of sites will be damaged and completely destroyed. Scientific data in these sites will be compromised or lost. The public and Native American values inherent in these resources will degrade. Site avoidance measures for mechanical treatments can frequently be incorporated into the treatment design and are easy and cost effective to implement.

Mitigation Measures:

1. Due to the increased chance of collection and looting from isolating site areas as the only areas free of treatment, a mosaic pattern of treatment will be used and site-avoidance areas included in these mosaics to the degree possible. Sites with buried or no features could be treated in order to better protect them from erosion and vandalism. In addition, selected sites in the treatment areas will be monitored for at least three years following treatment to identify and mitigate any residual long-term impacts, especially those from additional ORV use or vandalism due to increased visibility. Long-term benefits such as improvements in site resistance to erosion and illegal surface collection will be documented. If monitoring data reveals that additional management actions are needed to control or eliminate impacts to the cultural resource sites, they will be implemented in a timely manner.

2. A Class II or Class III intensive inventory will be completed for all project areas, including those proposed for existing chaining areas, and will identify all cultural properties within the proposed treatment area. Once this is done, these can be easily protected through project design and avoidance. However, total avoidance of all potentially eligible sites may not be necessary if further investigations such as limited testing can provide additional data useful for site evaluation and determination of significance.

3. In actuality, a total avoidance practice in urban-interface areas frequently does not protect the more easily recognizable sites, especially those with stone or wooden features, midden areas, or structures because public use in these areas often increases once the barriers to off-road vehicle traffic and visual screens provided by a wooded landscape have been reduced. Subsurface testing prior to treatment can mitigate the long-term effect and some residual effects to smaller or more enigmatic sites or site features.

4. Selected site testing will enable suitable evaluation of the sites to be done and to recover information that might be threatened. It will also increase the efficiency and cost-effectiveness of the treatment by increasing the acreage that can be treated without potentially impacting cultural properties or leaving isolated stands of untreated timber that could easily be identified as “site areas” that could attract

vandals, looters or collectors. A research design and testing plan will be implemented prior to treatment. It will enable the necessary evaluation of these sites and ultimately prevent indirect and cumulative impacts to them.

5. Due to the high density of eligible sites in most WUI areas in southwest Colorado, and the high incidence of existing and repeated vandalism to these sites as described above, short sections of wire or brush fencing may be needed to prevent increases in ORV use, the development of additional roads and trails across sites or illegal dumping while re-vegetation occurs and the sites are more exposed and visible. Fences will be placed by hand prior to treatment at critical sections only if necessary and these problems have been documented prior to treatment. Fences will be maintained for three years following treatment in order to deter trash dumping, and damage to archaeological sites from ORV abuse, vandalism, and looting, and to allow revegetation to occur. This will ultimately also reduce erosion and better protect the more fragile archaeological sites. Brush fences will be allowed to deteriorate naturally at the end of the three-year period once revegetation has occurred and ground cover is reestablished.

6. All vegetation thinning done for archaeological/historic site protection will be done by hand and will be completed or directed by a BLM or BLM-permitted archaeologist.

7. If subsurface cultural resources are unearthed during operations, activity in the vicinity of the cultural resource will cease and a BLM representative notified immediately. Pursuant to 43 CFR 10.4 the holder of this authorization must notify the authorized officer, by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, the operator must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the authorized officer.

8. The operator is responsible for informing all persons associated with this project that they will be subject to prosecution for knowingly disturbing Native American Indian shrines, historic and prehistoric archaeology sites, or for collecting artifacts of any kind, including historic items and/or arrowheads and pottery fragments from federal lands.

9. If a potentially significant paleontological area is known to exist, a paleontological inventory and evaluation will be completed by a professional paleontologist and any museum-quality specimens avoided through project design.

MIGRATORY BIRDS

Affected Environment: The Migratory Bird Treaty Act (MBTA) of 1918 was passed to put an end to the commercial trade in birds and their feathers that, by the early years of the 20th century, had severely impacted the populations of many native birds. The MBTA protected all migratory birds and their parts (including eggs, nests, and feathers). The MBTA is a domestic law that enforces treaties between the US, Mexico, and Canada, for the

protection of a shared migratory bird resource. The primary concern for migratory birds from actions authorized by this EA is in regards to the loss or disturbance of occupied nests.

An Executive Order (EO 13186) enacted in 2001 requires federal agencies to consider the effect of projects on migratory birds, and directs agencies to review the list of Birds of Conservation Concern (USFWS 2002) for species that may occur in the project area. A review of this list (Bird Conservation Region 16) found eight bird species that could breed in the analysis area and whose nests might be affected by the proposed action. These species include: Lewis's Woodpecker, Williamson's Sapsucker, Gray Vireo, Pinyon Jay, Virginia's Warbler, Black-throated Gray Warbler, Grace's Warbler, and Sage Sparrow.

Impacts of the Proposed Action: The activities proposed under this EA will pose no risk for take of adult birds. Grace's Warbler nests are usually in trees that would not be targeted for removal. Actions done outside the period of May 15 to July 15 have a reduced risk of take of occupied nests of the vireo, the woodpeckers, the other two warblers and sage sparrow. The pinyon jay, which is a communal nester, could have his nesting disrupted if tree removal occurred between April 1 and July 15. The chance of encountering a nesting site is low and a quick check of the project site before treatment can confirm the presence or absence of these jays. Removal of diseased and standing dead (i.e. snags) ponderosa pine trees between May 15 and July 15 has some risk for loss of cavity nests. A quick check of diseased trees and snags greater than 12 inches diameter (dbh) prior to removal can confirm the presence or absence of nest cavities. With the mitigation measures (surveys and timing of implementation) described below, the actions proposed by this EA are consistent with the MBTA and the conservation measures set forth in Section 3 of the Executive Order.

Impacts of Alternative 1 – No Action:
Alternative 1 proposes no change to current management practices. Under this alternative, the impacts to migratory birds would be the same as the impacts described for the proposed action. The affected bird species and the likelihood of take due to project activities would be the same as that described for the proposed action.

Cumulative Impacts: The MBTA regulates actions that directly affect individual migratory birds. With the mitigation measures (surveys and timing of implementation) described below, the actions proposed by this EA are consistent with the MBTA and therefore no cumulative impacts are anticipated.

Mitigation Measures:

1. Where possible, operate outside the time period of May 15 to July 15.
2. When operating in pinyon-juniper woodland between April 1 and July 15, conduct a survey for pinyon jay presence/absence two weeks prior to project implementation. If presence of nesting jays is confirmed, reschedule activities to avoid impacting the area prior to July 15.
3. When operating in ponderosa pine forest between May 15 and July 15, conduct a survey for the presence of nest cavities in all diseased or standing dead (i.e. snags),

especially “yellow bark” trees greater than 12 inches diameter (dbh) that are marked for removal, prior to project implementation.

4. Where possible, protect and maintain all diseased and standing dead (i.e. snags) ponderosa pine, especially “yellow bark” trees greater than 21 inches diameter (dbh).
5. Where possible, protect and maintain all trees, including healthy, diseased or standing dead trees that contain multiple nest cavities (hotel trees) for their high value as wildlife habitat.

THREATENED, ENDANGERED, & BLM SENSITIVE WILDLIFE SPECIES

(includes all information related to Standard 4)

The purpose of this section is to evaluate the potential impacts to threatened or endangered wildlife and determine if there is a need for formal or informal consultation with the U.S. Fish and Wildlife Service in accordance with legal requirements set forth under the Endangered Species Act of 1973. Under the act, federal agencies are prohibited from authorizing, funding or carrying out any action that would jeopardize a listed species, or destroy or modify critical habitat. Threatened, Endangered, Proposed, or Candidate species that could potentially occur within the planning area include; Bald Eagle (T), Southwestern Willow Flycatcher (E), Yellow-billed Cuckoo (C), Gunnison Sage Grouse (C), Mexican Spotted Owl (E), Canada Lynx (T), Bonytail (E), Razorback Sucker (E), Humpback Chub (E), and Colorado Pikeminnow (E). The U.S. Fish and Wildlife Service last updated this list of species on June 25, 2003. For this proposed action, only Southwestern Willow Flycatcher, Bald Eagle, Mexican Spotted Owl and Gunnison Sage Grouse warrant further discussion due to the specific vegetation types proposed for treatment and the treatment methods.

Bald eagle *Haliaeetus leucocephalus*

Affected Environment: The bald eagle was down-listed from federally endangered to threatened in the lower 48 states in 1995 (50 CFR 17.41 (a)). The current nesting population in the lower 48 States constitutes more than a ten-fold increase from the known population level in 1969. The bald eagle was proposed for removal from the list of Threatened and Endangered species on July 6, 1999 (Federal Register / Vol.64, No 128, pp. 36455-36464), however, there has been no change to the eagle’s status since the proposal.

The bald eagle is largely a bird of aquatic ecosystems and in Colorado frequents large lakes, reservoirs, and major rivers. Fish are the major component of its diet, but waterfowl, seagulls, and carrion are also eaten. Bald eagles usually nest in trees near water, but are known to nest on cliffs and rarely on the ground. Nest sites are usually in large dominant or co-dominant trees along shorelines or within one mile of a shoreline in relatively remote areas that are free of disturbance. Bald eagles in the Four Corners area are also known to occupy dry land sites far from water sources, feeding largely on prairie dogs and nesting in large cottonwoods. In winter, bald eagles often congregate at specific wintering sites that

are generally close to open water and offer good perch trees and night roosts; however, no consistent or predictable roosts sites are known for this area.

Impacts of Proposed Action: No treatments would be proposed in dry land habitats where eagles nest in cottonwoods and feed on prairie dogs. Direct impacts to bald eagles could occur in treatment areas adjacent to large rivers such as the Animas, Pine, Florida, Navajo, San Juan, and Dolores, and associated reservoirs. The use of noisy equipment and increased human activity in these areas may disrupt nesting eagles during this critical period of their life cycle. In addition, if large dominant or co-dominant trees were taken within one mile of open water, nesting and roosting opportunities may be decreased.

Mitigation Measures:

1. No dominant or co-dominant conifer trees or large snags are to be removed within one mile of major rivers and reservoirs.

2. A limited operating period would be applied prohibiting all fuels-reduction activities within ½ mile of nest sites during the breeding season from February 15 to July 30. A limited operating period would be evaluated by a wildlife biologist and would depend on the location, as well as the scale, of fuel treatments and current bald eagle nest locations and activities. If there is partial or complete visual screening of the area of activity, the limited operating period may be lifted or less restrictive. During years when a nest site is unoccupied by or after May 15, the limited operating period may be lifted. It may also be lifted once the young have fledged and dispersed from the nest site.

The above mitigation measures would provide that all roost and nest trees would be maintained and that disturbances would be kept at an appropriate distance so as not to disrupt birds during critical time periods of their life cycle. Therefore, this project would have no effect on bald eagles.

Southwestern Willow Flycatcher *Empidonax traillii extimus*

Affected Environment: The Southwestern willow flycatcher was listed as endangered in 1995. Southwestern willow flycatchers are currently found in six states from near sea level in southern California to 9,000 feet in southwestern Colorado. The total known population of the southwestern willow flycatcher is estimated to be only 549 territories. This bird breeds only in densely vegetated riparian habitats near the surface of water or saturated soil. The continued survival of this species is threatened directly by the loss, modification, or fragmentation of riparian habitat.

Impacts of Proposed Action: No riparian areas are proposed for treatment in this proposed action; however, riparian areas may be located within treatment units or may be crossed in order to access treatment units. Mitigation measures listed under Water Quality, Surface and Ground, Water Rights (below) establish proper riparian buffers and would protect willow flycatcher habitat. Thus, no loss or degradation of habitat would be anticipated with the implementation of this project. However, the operation of equipment

near breeding sites during the breeding season (May 1 through August 15) may disrupt normal breeding behavior. However, this potential impact could be easily remedied by applying the following mitigation.

Mitigation Measures:

1. Apply a limited operating period during the breeding season from May 1 to August 15 prohibiting all project-related activities within ¼ mile of densely vegetated riparian areas near surface water or saturated soil.

With this mitigation, this project would have no effect on the Southwestern willow flycatcher.

Mexican Spotted Owl *Strix occidentalis*

Affected Environment: The Mexican spotted owl was listed a threatened species in March of 1993 (58 FR 14248). This owl inhabits canyon and mountain forest habitats across a range that extends from southern Utah and Colorado, through Arizona, New Mexico, and West Texas to the mountains of central Mexico. Mexican spotted owls are most commonly found inhabiting mature mixed-conifer and ponderosa pine-gamble oak forests. The smallest number of spotted owls occurs in the Southern Rocky Mountains-Colorado Recovery Unit according to the Recovery Plan for the Mexican Spotted Owl (United States Department of the Interior 1995). In this area, spotted owls are largely confined to steep canyons, with significant rock faces and various amounts of mature coniferous forest. Sandstone cliffs have also been shown to be important for nesting. No spotted owls have ever been found on BLM lands within the project area. The closest known populations are found in Mesa Verde National Park. A final rule on the designation of critical habitat was published in the Federal Register in February of 2001 (66 FR 8530), and no critical habitat has been identified within the project area.

Impacts of Proposed Action: Treatments in ponderosa pine-gamble oak forest types may be considered spotted owl habitat if other characteristics such as steep canyon walls with sandstone cliffs for nesting are also present. No such habitat types have been proposed for treatment, however, spotted owls have been known to roost on the rims of such canyons. Thus, treatments near the rim of canyons have the potential to impact this species. However, if such roosting areas are ever encountered within this large project area they could easily be avoided.

Mitigation Measures:

1. No treatments could occur within ¼ mile of steep canyons that have spotted owl habitat characteristics.

With this mitigation, this project would have no effect on the Mexican Spotted Owl.

BLM SENSITIVE SPECIES

BLM sensitive species may require special management considerations. Bureau policy is that no action should be taken that would contribute to sensitive species becoming listed as candidate species through actions funded, authorized, or implemented by BLM.

Northern goshawk *Accipter gentilis*

Affected Environment: The northern goshawk occurs in Alaska, Canada, and mountain ranges of the western U.S., and is partly migratory in the northern portions of its range. The northern goshawk prefers middle and higher elevation mature, dense coniferous forest for nesting and foraging habitat. Within the project area, ponderosa pine types may provide suitable habitat for goshawks.

Impacts of Proposed Action: In general, this proposed action has great potential for improving goshawk habitat. Goshawks are a perch-and-pounce predator that require a relatively open understory in order to spot and attack their prey. Short-term disturbances may occur with the use of equipment and increased human activity, especially during the breeding season.

Mitigation Measures:

1. A goshawk Protected Activity Center (PAC) would be placed around all known goshawk nests and any additional nests discovered during the implementation of this project. PACs would consist of a 30-acre buffer around nesting sites capturing the best available goshawk nesting habitat. The dense forest overstory canopy within these PACs would be left under existing conditions.
2. Ladder fuels up to 8 inches in diameter within the PAC could be removed. This would prevent a wildfire from reaching the tree canopy and destroying nest sites and nesting habitat.
3. All active nest sites would maintain a limited operating period prohibiting activities within approximately ¼ mile of the nest site during the breeding season (April 1 through August 15) unless surveys confirm that goshawks are not nesting.

Gunnison Sage Grouse *Centrocercus minimus*

Affected Environment: The Gunnison sage grouse is listed as a candidate species meaning that listing under the Endangered Species Act is warranted but precluded due to other priorities. This designation does not afford the bird any real protection under the Endangered Species Act; however, consideration of this species is critical for its continued existence and may prevent its eventual listing. Big sagebrush-dominated plant communities characterize sage grouse nesting and early brood rearing habitat. The desired condition for this habitat type is to have big sagebrush with 20 to 40% canopy cover, a minimum of 30% canopy cover in grasses, and a minimum of 10% canopy cover in forbs.

Impacts of Proposed Action: In all probability, no occupied sage grouse habitat would be treated during this project. Mechanical treatment in piñon pine and Utah juniper would help set back succession in some areas allowing sagebrush to reestablish itself through time, provided a seed source is available. This could increase the amount of nesting, early brood rearing, and winter habitat available for sage grouse. Mechanical treatments in areas currently suitable for nesting, early brood rearing, and winter habitat could also benefit sage grouse by providing new lek (strutting grounds) sites and re-invigorating grasses and forbs that are a critical component of high quality habitat. However, due to human influences in the WUI area to be treated, the benefits of such treatments to sage grouse would be greatly diminished.

Mitigation Measures:

1. Within sage grouse nesting habitat, treat no more than 20% of the area dominated by big sagebrush and avoid treating patches of sagebrush that are more than 20 acres in size.
2. Apply a limited operating period from April 15 to July 1 to avoid impacts to sage grouse nesting and early brood rearing.
3. Apply this limited operating period in big sagebrush habitat within two miles of an active lek.
4. If seed is applied after piñon and Utah juniper treatments and the area is capable of supporting sage grouse habitat, include big sagebrush in the seed mix used on treated areas.

Bats

Affected Environment: Four sensitive bat species may occur within the project area including Yuma myotis (Myotis Yumanensis), Fringed myotis (Myotis thysanodes), Allen's big-eared bat (Idionycteris phyllotis), and the spotted bat (Euderma maculatum). Due to the small stature of bats, and the difficulty of surveying for them, it is difficult to determine where they are roosting. Chainsaw activity or the use of heavy equipment may cause noise disturbance significant enough to cause temporary or permanent roost abandonment resulting in lowered reproductive success. These bats have been known to utilize large conifer snags and tree hollows as day roosting sites, so some roosting habitat may be lost.

Mitigation Measures:

1. Retain four of the largest snags/acre within all treatment units supporting conifer habitats.

Indirect effects**:** No permanent roads will be constructed so no long-term increases in human activity are expected as a result of this action. As part of a strategic system of defensible fuel profile zones, this project will help eliminate understory fuel buildup and may reduce the potential for high-severity wildfires, which have a great potential to eliminate vast tracts of habitat for these species.

Cumulative effects**:** Cumulative effects on the above-mentioned species could occur with the incremental loss of the quantity and/or quality of habitat. Overall, increases in

urbanization, increases in recreational use of public lands, and the utilization of natural resources on state, private and federal lands may contribute to habitat loss for these species. High-intensity, stand-replacement fires, and the means by which land managers control them, have contributed, and may continue to contribute, to loss of habitat for these species.

Impacts of Alternative 1 – No Action:

Impacts will be similar to the proposed action. If some type of fuels reduction is not implemented, large high-intensity wildfires have the potential to destroy vast tracks of habitat for listed species. High-intensity wildfires often destroy nest trees for bald eagle, goshawks, spotted owls and other raptors. Stand-replacing fires often destroy foraging habitat for spotted owls and goshawks that are dependent on mature, closed-canopy forests. Fire in riparian areas may also impact species such as the Southwestern willow flycatcher that depends on dense, late successional and often decadent, riparian vegetation. Although low intensity patchy fire can often benefit species such as sage grouse that are dependent on having a variety of successional stages available to them, large intense fires can leave habitat in an unsuitable condition for many years. The intent of these treatments would be to protect the wildland-urban interface from wildfire, however; treatments will also protect wildlands from the fires that often start on private lands.

NATIVE AMERICAN RELIGIOUS CONCERNS

Affected Environment: Southwest Colorado is considered to be the ancestral homeland to 25 modern Indian tribes. Many of the topographic features and archaeological resources as well as the landscape markers are considered to be sacred or traditional cultural properties. In addition, members from several of the Pueblo tribes, the Ute tribes, and the Navajo Nation still use the landscapes and resources on public lands in southwest Colorado for their traditional ceremonies and life ways. This information has been provided in general through past consultations with these Indian tribes as well as from ethnographic studies done in conjunction with land use projects and permits.

Impacts of the Proposed Action: "All treatment methods"
Direct, Indirect and Cumulative Impacts: Mechanical treatments have the potential to impact archaeological historic and sacred sites and features of importance to modern American Indian tribes. Some treatments, such as hydromowing, have minimal impacts on individual sites and can be designed to avoid sites of concern, but can affect the viewshed and landscape values, which may have traditional importance. Other types of treatments, such as roller chopping or brush hogging can damage or destroy sites as well as landscape values. These treatments can also alter the vegetation in these treatment areas and impact or eliminate plant and animal communities that tribes use as a resource for traditional hunting and gathering practices or perhaps for medicinal purposes. These "traditional uses" could thus also be impacted by forest thinning treatments.

Impacts of Alternative 1 – No Action: Impacts from the No-Action alternative are similar to the Proposed Action, however, the consequences of a longer time lag between projects

to reduce fuels could result in more devastating fires which can damage or destroy individual sites as well as landscape values.

Mitigation Measures:

1. During the initial project scoping, general consultations with Native American tribes will be completed to identify any site-specific concerns that are known by tribal representatives or can be found by the agency examination of existing ethnographic data.

2. Once the cultural resource inventory is completed for the project, identified traditional cultural properties or sacred sites will be evaluated by the agency and affiliated tribes will be notified. Should these sites be potentially impacted by the project, a project-specific consultation will be initiated and the concerns of the affiliated tribe will be taken into account and the project redesigned accordingly.

WASTES, HAZARDOUS OR SOLID

The only material, as defined by the EPA, that constitutes a hazardous waste associated with the proposed thinning operation would be motor fuel (gasoline or diesel) and motor oil. These materials will be used by most machinery and equipment associated with any treatment method. All personnel associated with hazardous fuel reduction will be required to transport motor fuels in containers designed for their use. Caution would be exercised when transferring the material so as not to allow spills to occur. If a spill does happen, it would be cleaned up immediately and moved to a site that is designed to handle the recycling or disposal of the material.

WATER QUALITY, SURFACE AND GROUND, WATER RIGHTS

(includes all information related to Standard 5*).*

Affected Environment: The project encompasses a large area including many different types and sizes of streams and rivers located over several counties. Proposed treatments could occur adjacent to large rivers such as the Animas, Pine, Florida, Navajo, San Juan, and Dolores. The majority of streams in the analysis area are small, and many flow only intermittently.

The State Department of Public Health and the Environment has the primary responsibility to protect surface and groundwater quality in Colorado. Surface waters have water quality standards that have been designed to protect established beneficial uses identified for each water body. The classified beneficial uses for lakes and streams in Colorado are drinking water supply, recreation (primary and secondary contact), agriculture, and aquatic life (cold and warm water) (Colorado Water Quality Control Commission, 2002).

All the streams and lakes within the analysis area support their established beneficial uses except for the following listed on the State's Impaired Waters List:

1) Upper Animas River and its tributaries near Silverton are impacted by heavy metals from historic mining,

2) McPhee Reservoir and the Dolores River from Bear Creek to Bradfield Bridge are impacted by mercury from an as yet undetermined source,
3) Narraguinnep, Totten and Puett reservoirs are impacted by mercury of which the source is unknown. (Colorado Water Quality Control Commission, 2002).

The San Juan River Basin Alluvial Aquifer is considered a major shallow aquifer on the West Slope and was recently studied by the State of Colorado. Wells were tested for nitrates and pesticides in 1998 and 2000. The results of the study showed that agricultural practices have not impacted this aquifer (Colorado Water Quality Control Commission, 2002). Methane gas groundwater contamination in south La Plata County has become a concern as gas extraction in the San Juan basin accelerates. Since 1993, the BLM has monitored domestic wells for methane gas every three years. Monitoring data helps identify contamination sources and initiates the well repair process.

Impacts of the Proposed Action:

Mowing and thinning piñon-juniper and oakbrush woodlands: very minor, localized impacts
Sagebrush mowing: very minor, localized impacts
Thinning ponderosa pine: very minor, localized impacts

Direct Impacts: Direct impacts to water quality would be localized, very minor, and limited to machinery stream crossings. There would be no new roads, no road reconstruction or reconditioning associated with the proposed treatments. Specific measures designed to protect streams are discussed in the mitigation section. Thinning in piñon-juniper and oakbrush is not expected to detrimentally affect water yield, and may result in favorable increases in available soil moisture. Localized impacts from machinery stream crossings could include soil disturbance or soil compaction. It is not expected that any activity with the proposed treatments would impact any stream on the Colorado Impaired Waters list, or contribute to a stream's impaired status.

Indirect Impacts: Monitoring of a local mowing/thinning fuels reduction project occurred in 2001 on BLM lands. No impacts to soil or grass understory were observed. Mulch from the hydromower provided groundcover protection (Jensen and Lange 2001). By reducing the risk of wildfire, the risk of post-fire runoff, erosion and water quality impacts could also be reduced. With the implementation of mitigation measures, indirect impacts are expected to be minor or undetectable.

Cumulative Impacts: Several studies have documented that with the removal of vegetation, changes can occur in how water interacts with the landscape. The amount of water available to streams or soils can increase because it is no longer being consumed by vegetation (Dunne 1978). Patterns of precipitation accumulation or runoff can also change. For example, when shrub and tree leaves no longer intercept precipitation, more moisture can reach the ground (DeBano 1998). Generally, the wetter the climate, the greater the expected water yield changes (DeBano 1998).

In the lower-elevation portions of the project area, changes in water yield or increases in average annual flow are not expected. The BLM lands projected for fuels reduction in

piñon-juniper-oakbrush, ponderosa pine, sagebrush vegetation types tend to be on water-limited, dry sites. Ephemeral and intermittent streams that flow in the spring and during summer flash floods dominate the landscape. It is not expected that water yield changes as a result of the proposed action would be detectable in streams in these dry areas primarily because only small percentages of any watershed would be treated (typically less than 25 percent of 6th-level HUCs). Available soil moisture may beneficially increase locally. Water-yield changes have the greatest potential in the high elevation spruce-fir areas in Silverton. Because only very small areas of trees would be treated (less than 5 acres) to protect individual structures, no cumulative impacts are anticipated in this vegetation zone.
No direct, indirect, or cumulative impacts are anticipated to groundwater or to water rights.

Impacts of Alternative 1 – No Action:
Impacts would be similar to the proposed action. If some type of fuels reduction is not implemented, large wildfires could occur. When fire destroys the surface litter and vegetation canopy, soils are exposed to the erosive effects of precipitation and any subsequent runoff that is generated. Fire has a typical effect of increasing the rate of erosion on the landscape (DeBano et. al. 1998; DeBano et. al. 1996). Moderate to high severity fires (wildland fires) that cover a large portion of a basin have the potential to cause large impacts to watersheds (Baker 1990). In the long term (the next several decades), the trend of ever-increasing frequency of uncharacteristically large, high-severity, high-intensity wildfires will continue. These fires have the highest risk of negatively impacting watersheds.

Mitigation Measures:

ATV use
- Avoid riparian areas
- Prohibit ATV use in wetlands
- Avoid slopes greater than 30%
- Do not cross perennial streams and rivers unless temporary crossings are used. Remove temporary crossings when project work is complete.
- Limit intermittent and ephemeral stream crossings to the minimum number necessary to treat a unit.
- For intermittent and ephemeral streams, cross perpendicular to the direction of flow, and do not cross stream if banks exceed 30% slope.
- Do not cross water-conveyance structures such as ditches, pipelines, flumes, etc. unless temporary crossings are used. Remove temporary crossings when project work is complete. Repair any damage to water-conveyance structures.
- Reseed ATV trails in areas of exposed mineral soils that were established as a result of implementation.
- Scatter brush/limbs into disturbed areas.

Other
- Pick up all flagging.

Hydromowing

- Cross swales perpendicular to the direction of flow.
- Avoid slopes greater than 30%.
- Do not drive machinery or reduce fuels within riparian or wetland vegetation.
- Prohibit mechanical operation on wet soils exceeding the plastic limit or when ruts exceed 4 inches depth for 10 feet or more.
- Prohibit machinery operation within 30 feet of gullies having vertical banks with a depth of 3 feet or more.
- Do not cross perennial streams and rivers.
- Limit intermittent and ephemeral stream crossings to the minimum number necessary to treat a unit.
- For intermittent and ephemeral streams, cross perpendicular to the direction of flow, and do not cross stream if banks exceed 30% slope.
- Do not cross water-conveyance structures such as ditches, pipelines, flumes, etc unless temporary crossings are used. Remove temporary crossings when project work is complete. Repair any damage to water-conveyance structures.
- For forested areas such as ponderosa pine, treatments should be limited to less than 25% of the total basal area of the watershed (6^{th} level HUC).
- Horizontal shaft cutting, mulching, and shredding machines could be used if soil disturbance is limited to less than 10% of the treatment unit.

Thinning Forested Landscapes

- No equipment operation within riparian areas or wetlands.
- Mechanical treatment of riparian or wetland vegetation would occur only with the consultation of a hydrologist during prescription development.
- Prohibit machinery operation within 30 feet of gullies having vertical banks with a depth of 3 feet or more.
- Do not cross perennial streams and rivers.
- Limit intermittent and ephemeral stream crossings to the minimum number necessary to treat a unit.
- For intermittent and ephemeral streams, cross perpendicular to the direction of flow, and do not cross stream if banks exceed 30% slope.
- Do not cross water-conveyance structures such as ditches, pipelines, flumes, etc unless temporary crossings are used. Remove temporary crossings when project work is complete. Repair any damage to water-conveyance structures.
- Prohibit mechanical operation on wet soils exceeding the plastic limit or when ruts exceed 4 inches depth for 10 feet or more.

INVASIVE, NON-NATIVE SPECIES

Affected Environment: Many of the public land parcels being considered for treatment have noxious weed populations present. While BLM does not have a complete noxious weed inventory available, we believe it is reasonable to assume that some of the more common noxious weeds species such as Russian knapweed, Canada thistle, Dalmatian

toadflax, musk thistle, cheatgrass, and whitetop are present. Noxious weed management activities are ongoing on the majority of large public land parcels; however, noxious weed management has been sporadic on smaller, more isolated public land parcels.

Impacts of the Proposed Action: On parcels where noxious weeds are present, any kind of ground disturbance has the potential to increase noxious weed densities and to contribute to the spread of noxious weeds on and off site. On parcels where noxious weeds are not present, noxious weeds can become established from seed sources brought in on vehicles and other equipment.

Desirable vegetation should increase in density, area, and diversity under the proposed action. Desirable vegetation should effectively compete with noxious weeds to reduce their establishment and rate of spread.

Impacts of Alternative 1 – No Action: Impacts would be similar to the proposed action. If hazardous fuel reductions do no occur, devastating wildfires could rapidly spread noxious weeds on those public land parcels where weeds are already present. On parcels where noxious weeds are not present, post-fire site conditions will be conducive to noxious weed establishment from local seed sources. Once noxious weeds are established, they effectively compete against desirable native vegetation.

Cumulative Impacts: There are other activities, such as oil and gas development and motorized recreation, within the project area that contribute to the establishment and spread of noxious weeds. While noxious weed control requirements are included in lease stipulations, it is difficult to completely control noxious weed populations caused by other uses. Weed control is ongoing throughout the analysis areas within funding limits.

Overall, as desirable species increase and overall ground cover increases, noxious weed populations should decline over time; however, noxious weed populations will not be completely eradicated. As noxious weed populations decrease, there should be a corresponding decrease in the amount of herbicides used.

Mitigation Measures:

1. Areas selected for treatment should be inventoried at least one growing season prior to treatment. If noxious weed populations are present, they should be treated the growing season prior to treatment and, if needed, within the growing season after treatment.

2. On areas where treatment is necessary, effectiveness monitoring should occur for three growing seasons after treatment. On areas where noxious weed populations were not present at the time of treatment, monitoring needs to be completed to ensure that no new populations become established.

3. Equipment needs to be cleaned prior to working on public lands. Certification that equipment has been cleaned will be provided to the Contracting Officer's Representative (COR) prior to starting the project.

4. Noxious weed control costs should be funded by the benefiting function. Control costs should be figured for impacted County roads as well, as weeds are most easily spread along existing roads.

5. Where desirable, landings, staging areas, and temporary trails will be seeded using native species (certified seed) adapted to local site conditions.

6. Where noxious weeds become established the appropriateness of using livestock as a biological control agent, as well as other integrated noxious weed management strategies, should be considered.

7. Post-treatment livestock grazing systems should be designed to allow different seasons of use to improve native plant vigor in order to effectively compete against noxious weed species.

8. Where feasible and desirable, BLM should coordinate noxious weed control activities with adjoining landowners.

ENVIRONMENTAL JUSTICE

On February 11, 1994, the President issued Executive Order No. 12898 on Environmental Justice. The purpose of the Order is to have federal agencies make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

Environmental Consequences of the proposed action: The proposed action was developed based upon resource conditions, with an objective of reducing hazardous fuels and improving wildlife habitat. The action will not have a disproportionately high or adverse human health or environmental effect on minority or low-income populations.

NON-CRITICAL ELEMENTS

AQUATIC WILDLIFE

There are no direct impacts to Aquatic Wildlife because there are none identified in the project areas.

SOILS

Affected Environment: The project area is mostly associated with sedimentary deposits. Prominent geologic formations include the Mancos Shale, Morrison, Dakota Sandstone,

and Burro Canyon formations. Soil parent materials are predominantly sandstone, shale, and alluvium. Soils have mostly loam, sandy loam, and silt loam surface textures, and loam, clay loam, silty clay loam, and silty clay subsurface textures. Soils tend to be deep to bedrock (greater than 40 inches) on flat slopes, on mesas and in valleys, and shallow to moderately deep to bedrock (less than 40 inches) on steeper slopes (greater than about 25%) on hill and canyon sideslopes. Abundant surface rock fragments and sandstone rock outcrop are common on hill and canyon sideslopes.

Soils have mostly slight to moderate soil erosion potential, except on slopes greater than about 35% where soil erosion potential is severe. Soils have mostly slight to moderate soil compaction potential except on soils with high surface silt and clay content (Mancos Shale formation), where soil compaction potential is high. Soil infiltration and permeability rates are slow for soils associated with the Mancos Shale formation, and moderate to rapid on most other soils of the project area.

Biological soil crusts occur on the soil surface of the project area in some places. These crusts are composed of multiple organisms including cyanobacteria, green algae, lichens, mosses, microfungi, and other bacteria (Belnap at al. 2001). They reduce wind and water erosion, fix atmospheric nitrogen, and contribute to soil organic matter (Eldridge and Greene 1994). They are a rough carpet on the ground surface, and their below-ground components form a matrix that binds soil particles together (Belnap 1995). They are most common in the pinyon-juniper vegetation type. They occur in a random manner, and typically occur as small patches ranging from about 1 to 16 square inches. Cyanobacteria-dominated and moss-dominated crusts are likely the most common within the project area, but lichen-dominated crusts also occur. Cyanobacteria-dominated biological soil crusts that are in a very early successional stage are often present on or just below the soil surface but are not readily visible (Belnap 2001, Jayne Belnap - personal communication 2002).

SOILS - Environmental Consequences

Impacts of the Proposed Action: Proposed mowing and thinning activities will disturb the ground surface due to equipment operation involved in the cutting, skidding, decking, and loading of trees. Ground cover will be disturbed and will result in some mineral soil being exposed. Although direct harvest operations may cause some local soil movement, soil displacement and soil erosion are expected to be minimal. Soil compaction resulting from the weight of harvest equipment will be minimal throughout the analysis area if soils are adequately dry when harvest activities occur.

Slash and debris mulched on site by the hydromower will help to protect exposed mineral soils from raindrop impacts, reduce water runoff and erosion, improve water infiltration, and aid in nutrient cycling. Following treatments, it is anticipated that forbs and graminoids (grasses and sedges) will increase in abundance, which should help protect the soil surface from erosion.

Vehicular traffic can rapidly destroy cryptogrammic crusts (Johansen and Rushforth 1985, Belnap et al. 1994). Where vehicles come in contact with such crusts, they would disturb the biological soil crusts that occur on the soil surface of the project area. The weight of the

vehicles and their tire action would crush the crusts, break them apart, overturn them, and bury them to various degrees (Belnap 2002, Jayne Belnap - personal communication 2002). Impacts to crusts would be greater the more times vehicles pass over the same crust.

Disturbance to crusts from this project is expected, and will likely include crushing the crusts, breaking them apart, overturning them, and burying them to various degrees. Slash and debris mulched on site by the hydromower will help to protect the crusts. Recovery rates for biological soil crusts are dependent on many factors including disturbance type, severity, and extent; vascular plant community structure; adjoining substrate condition; inoculation material availability; and climate during and after disturbance (Belnap et al. 2001). Cyanobacteria-dominated crusts, the most common ones in the project area, are the most resistant to mechanical disturbance, are highly mobile, and can recolonize disturbed surfaces rapidly (Belnap et al. 2001). A study on the Colorado Plateau reported recovery rates of 14 to 34 years after a severe disturbance (scalped plots) to cyanobacteria-dominated crusts. Research on biological soil crusts in the Moab, Utah area indicates recovery rates of soil crusts after severe soil surface disturbance ranging from 50 to 300 years (Belnap). Considering this research and considering that this project area occurs on the Colorado Plateau in a similar environmental setting (climate and substrates) to the research sites, it is likely that the recovery rates for the disturbance to the biological soil crusts in this project area following the proposed action will be less than 50 years, at least for the cyanobacteria-dominated crusts. Recovery rates for the other more complex biological soil crusts of the project area will likely be longer due to their higher susceptibility to mechanical disturbance and their more advanced successional stage (Belnap et al. 2001).

Impacts of Alternative 1 – No Action: Impacts would be similar to the proposed action.

Cumulative Impacts: Following these treatments, there will be no additional mowing and thinning in the forseeable future. Past activities in the project area did not cause detrimental erosion or compaction. Mowing and thinning activities proposed for this project will not cause detrimental erosion or compaction. Since past and proposed treatment activities did not and will not cause detrimental erosion or compaction, and since no additional mowing and thinning will occur to treated stands in the forseeable future, there will be no adverse cumulative effects to the long-term productivity of the soils in the project area.

Mitigation Measures:

1. Mowing and thinning equipment is not allowed to operate when soils are too wet. Soils are too wet when the soil moisture content exceeds the plastic limit. If soils within six inches of the surface can be rolled into threads which are 3 millimeters in diameter without breaking or crumbling, they are too wet.

2. Avoid activities on slopes over 35 percent where the risk of erosion is high.

3. Avoid biological soil crusts whenever possible.

4. Minimize the potential for soil compaction and for impacts to biological soil crusts by minimizing vehicle passes over the same piece of ground.

VEGETATION and FOREST MANAGEMENT

Affected Environment: The project will occur in four vegetation types: ponderosa pine, piñon-juniper woodland, mountain shrubland, and sagebrush shrubland which are described below. Threatened, endangered, and BLM sensitive plant species may also be present in the project area, and are discussed below.

PONDEROSA PINE FOREST TYPE

Ponderosa pine trees dominate this forest type on both BLM lands administered by the San Juan Public Lands Center and on the San Juan National Forest. It is associated with the lower montane climate zone, and occurs on mountains, hills, and mesas at elevations ranging from about 7000 to 8500 feet. Mean annual precipitation ranges from about 16-25 inches.

This type occurs as relatively pure stands of ponderosa pine trees comprising greater than 80% of the canopy cover. Rocky Mountain juniper, white fir, Douglas fir, southwestern white pine, blue spruce, aspen, and piñon pine trees may be present as minor components (< 10% canopy cover). Gambel oak is a significant component in these forests, occurring in most stands. On the warmest and driest sites within this type, a piñon pine phase is recognized where piñon pine is co-dominant with ponderosa pine and displays a canopy cover greater than 10%.

Common shrubs found in the ponderosa pine forest type include Oregon grape, buckbrush, Gambel oak, bitterbrush, skunkbush, snowberry, mountain mahogany, and serviceberry. Common herbs include mountain parsley, butterweed, pussytoes, vetch, peavine, strawberry, cinquefoil, goldenrod, beardstongue, geranium, paintbrush, puccoon, deervetch, buckwheat, lupine, skyrocket, pasqueflower, daisy, yarrow, Kentucky bluegrass, bottlebrush squirreltail, junegrass, mountain muhly, Parry oatgrass, Arizona fescue, pine dropseed, little bluestem, muttongrass, blue gramma, and elk sedge.

Fire is the major disturbance agent in ponderosa pine forests, and influences forest conditions at the stand and landscape levels. The historic fire disturbance regime consisted of frequent, low-severity ground fires with median fire-return intervals ranging from about 12 to 30 years (Romme et al. 1997). Other disturbance agents associated with these forests include insect outbreaks (mountain pine beetle), disease (*Armillaria* and other fungi), dwarf mistletoe, and wind events. Small-scale disturbance events associated with these agents influence forest conditions at the stand level, but are relatively insignificant at the landscape level. Historically it is believed that ponderosa pine stands had between 25 to 50 large widely spaced trees per acre and wildfires were confined to the surface with an occasional singletree flare-up.

This vegetation type represents a small portion of the project area and BLM planning unit. It is estimated that there are less than 30,000 acres of this type in the planning area. Although the abundance and distribution of seral stages of the ponderosa pine forest type throughout the project area is unknown, it is assumed that late seral or old growth ponderosa pine stands are not present. If they are present, they are an ecologically important part of the project area, since they provide a key component of biological diversity and habitat for wildlife and plant species. The old growth definitions found in "Old-growth Forests in the Southwest and Rocky Mountain Regions: Proceedings of a Workshop (GTR 213) will be used as a guide in this EA.

Stand structure of the ponderosa pine type can vary from dense (300+ Basal Area) single-storied stands which are at high risk for stand-replacement fire and insect damage, to widely spaced (40-60 Basal Area) stands of large "yellow bark" ponderosa pine which have a fairly low risk of significant damage from fire or insect attack. The types of stands considered for treatment in this analysis area are generally the higher density single-story stands of small diameter ponderosa pine, or multiple-storied stands which generally have large diameter ponderosa pine in the overstory, and have developed dense understory ladder fuels consisting of gambel oak, young ponderosa pine, white fir, piñon pine, or juniper species.

These stands are at high risk of mortality from two primary disturbance agents:

1) The high densities, low crown base height, and closed canopy nature of the dense pine patches will carry a crown fire even at fairly low wind speeds killing both the second-growth trees and the scattered old yellow-bark trees. Oak and juniper in the understory act as ladder fuels to carry fire into the crowns initiating crown fire spread. Ponderosa pine is adapted to survive surface fires, which do not kill significant portions of the crown.
2) The high-density portions of the stand are also susceptible to insect attack, including western pine beetle, mountain pine beetle and Ips pine beetle, due to the overstocking, low vigor, and slow growth rate.

Mistletoe is the most common pathogen on the trees in the project area. It is a natural parasitic enemy of ponderosa pine. Mistletoe reduces growth, slowly weakening and eventually killing trees. Mistletoe infections usually come from nearby infected trees, though birds are known to spread the disease over long distances.

PINON-JUNIPER WOODLAND TYPE

Piñon pine and Utah juniper trees dominate the piñon-juniper woodland type on both BLM lands administered by the San Juan Public Lands Center and on the San Juan National Forest. It occurs on mountains, hills, and mesas at elevations ranging from about 6000 to 7500 feet. It is associated with the semi-arid climate zone. Mean annual precipitation ranges from about 13-18 inches. It is described as woodland because the trees are shorter than 20 feet and their crowns rarely touch (Eyre 1980).

Piñon pine and Utah juniper occur together in most stands, and either one can be dominant on any given site. Piñon pine tends to be more abundant on the cooler, moister sites and

Utah juniper more abundant on the warmer, drier sites within this type. Rocky mountain juniper, ponderosa pine, or Douglas fir may be present in some stands, usually as minor components (< 10% canopy cover). Shrub cover tends to be high. Stands vary from closed-canopy with dense trees and shrubs, and little herbaceous vegetation to open-canopy with widely scattered trees and shrubs, and relatively high herbaceous cover. On the coolest and wettest sites within this type, a ponderosa pine phase is recognized where ponderosa pine is co-dominant with piñon pine and displays a canopy cover ≥ 10%.

A variety of shrubs are associated with this type including Gambel oak, big sagebrush, bitterbrush, buckbrush, skunkbush, mountain mahogany, serviceberry, snakeweed, Oregon grape, prickly pear, and banana yucca. Common herbs found in the Piñon-Juniper type include butterweed, pussytoes, cinquefoil, goldenrod, beardstongue, geranium, paintbrush, puccoon, deervetch, buckwheat, redroot buckwheat, lupine, skyrocket, daisy, sagewort, goldeneye, yarrow, hairy golden aster, Kentucky bluegrass, bottlebrush squirreltail, needle-and-thread, junegrass, pine dropseed, little bluestem, muttongrass, blue grama, side-oats grama, western wheatgrass, and Indian ricegrass.

Biological soil crusts composed of algae, lichen, moss, fungi, or liverwort are significant components in piñon-juniper ecosystems formimg crusts on the ground surface that contribute to soil stability, nutrient supply (organic matter and nitrogen), and biodiversity (Ladyman and Muldavin 1996).

Fire- return interval estimates vary a great deal in this type with some research suggesting intervals as short as 50 years (Ecology and Management of Piñon-Jjuniper Communities within the Interior West RMRS-P-9), and others (Floyd et al 1998) as long as 400 years Estimates used for modeling in the project area are 160-180 years. Piñon pine and Utah juniper are very fire sensitive and are easily killed even by low-intensity burns (Jameson 1966, Floyd 1982 and 1986). The Gambel oak-dominated mountain shrubland type occurs following stand-replacing fire in the piñon-juniper woodland type, and may persist for long periods as a fire disclimax community (Daubenmire 1966, Floyd et al. 1998).

This vegetative type represents the majority of the project area and BLM planning unit. The RMP estimates reflect a total of 599,000 acres of the piñon-juniper woodland type on BLM lands administered by the San Juan Public Lands Center, and only 66,500 acres of that contain some type of commercial value. Although the abundance and distribution of seral stages of the piñon-juniper woodland type throughout the project area is unknown, it is assumed that late seral or old growth piñon-juniper stands are present and uncommon. Late seral or old growth piñon-juniper stands are an ecologically important part of the project area, since they provide a key component of biological diversity and habitat for wildlife and plant species.

There is currently a fully developed *Ips* bark beetle epidemic within the mature piñon-juniper type in the analysis area. The *Ips* beetle attacks only the piñon trees and is producing up to 90% mortality in some piñon stands. Juniper and some piñon will likely survive the epidemic, but stand composition and structure will be much different in the future. Red needles will create a significant increase in fire intensity and spread rates for 1-3 years following mortality. Following the loss of the red needles, large woody debris will

keep fire intensity and spotting intensities high for many years, but spread rates will be much slower.

MOUNTAIN SHRUBLAND TYPE

The mountain shrubland type on BLM lands administered by the San Juan Public Lands Center is a diverse type that occurs on mountains, hills, and canyon slopes at elevations ranging from about 6000 to 9000 feet. It occurs on upland sites with well-drained soils, and is often found on steep slopes with southerly aspects. It is found in association with piñon-juniper, ponderosa pine, and warm-dry mixed conifer types in the semi-arid, lower montane, and montane climate zones. Mean annual precipitation ranges from about 14-25 inches.

This tall shrubland type occurs as relatively pure stands of Gambel oak, or as a mix of Gambel oak and other deciduous shrubs. It also includes stands dominated by mountain mahogany, serviceberry, or other shrubs where Gambel oak is absent or a minor component. Other shrubs associated with this type include bitterbrush, snowberry, skunkbrush, fendlerbush, squaw apple, Woods rose, big sagebrush, Oregon grape, prickly pear, and chokecherry. Stands tend to be closed canopy with dense shrubs, and low to moderate herbaceous cover.

Piñon pine, Utah juniper, Rocky mountain juniper, ponderosa pine, or Douglas fir trees may be present, usually occurring as scattered individuals in these stands. Although usually found in shrub form, Gambel oak also occurs in tree form with a large-diameter trunk and a height of 10 feet or more. Common herbs in the mountain shrubland type include goldenrod, locoweed, milkvetch, lupine, geranium, yarrow, dandelion, meadowrue, American vetch, mules ears, daisy, trailing fleabane, cinquefoil, muttongrass, junegrass, blue grama, bottlebrush squirreltail, needle-and-thread, Indian ricegrass, Kentucky bluegrass, elk sedge, and mountain muhly.

This vegetation type represents a small portion of the project area and BLM planning unit. Although the abundance and distribution of age classes of the mountain shrubland type throughout the project area is unknown, it is assumed that old growth mountain shrubland stands are present and may be uncommon. Old growth mountain shrubland stands are an ecologically important part of the project area, since they provide a key component of biological diversity and habitat for wildlife and plant species.

The Gambel oak-dominated mountain shrubland type is an earlier seral stage of piñon pine-Utah juniper, ponderosa pine, and warm-dry mixed conifer types (DeVelice et al. 1986, Crane 1982, Floyd et al. 1998). Following stand-replacing fire in these conifer types, the mountain shrubland type is established and often persists for long periods as a fire disclimax community (Daubenmire 1966) maintained by frequent, recurrent fires which limit the conifer seed source. Over time (hundreds of years) without additional fire disturbance, these shrublands will likely succeed to the conifer types mentioned above.

This type is described as Mountain Shrubland (Mutel and Emerick 1984, Blair et al. 1996), Gambel oak cover type (IRI-CVU), Petran Chaparral (Keeley and Keeley 1988, Floyd et al. 1998), Montane Scrub (Dick-Peddie 1993), Successional-Disturbance Scrub (Dick-Peddie

1993), Montane Shrubland (Spence et al. 1995), Oak Woodland (Spence et al. 1995), Southwest Chaparral Ecosystem (Paulsen Jr. 1975), Brushy Loam (SCS ecological site), Gambel Oak series (Johnston 1987), Oak-Serviceberry Community Type (Johnston 2001), and Gambel Oak Habitat Type (Crane 1982).

SAGEBRUSH SHRUBLAND TYPE

The Sagebrush Shrubland type on BLM lands administered by the BLM San Juan Public Lands Center occurs on hills, mesas, and valley floors intermixed with piñon-juniper woodlands, ponderosa pine forests, and mountain grasslands. It is dominated by sagebrush species, and occurs mostly on well-drained soils. It is associated with the semi-arid and lower montane climate zones at elevations ranging from about 6000 to 9000 feet. Mean annual precipitation ranges from about 14-25 inches. This vegetation type represents a very small portion of the project area and BLM planning unit.

Within the general sagebrush shrubland type, there are four more specific sagebrush types on the SJPLC, all of which are dominated by the species for which they are named. Stands vary from a dense cover of sagebrush with little herbaceous cover, to sparse sagebrush with relatively high herbaceous cover. The basin big sagebrush, Wyoming big sagebrush, and black sagebrush types occur at elevations below about 8000 feet, while the mountain sagebrush type occurs mostly above about 8000 feet. The basin big sagebrush type is a tall community often found on valley floors, while the others are shorter and more often found on higher landscape positions. Black sagebrush, Wyoming big sagebrush, and mountain sagebrush are short species usually less than 4 feet tall, while basin big sagebrush is usually over 4 feet tall. The black sagebrush type tends to occur on soils with high clay contents, and often occurs as small patches within the other sagebrush communities.

Other shrubs associated with this type include silver sagebrush, snakeweed, rubber rabbitbrush, longflower rabbitbrush, bitterbrush, and snowberry. Common herbs include Indian ricegrass, junegrass, Arizona fescue, mountain muhly, blue grama, galleta, western wheatgrass, needle-and-thread, needlegrass, bottlebrush squirrel tail, Kentucky bluegrass, smooth brome, lupine, fringed sage, paintbrush, yarrow, trailing fleabane, buckwheat, redroot buckwheat, daisy, owl clover, hairy golden aster, and globemallow.

This type is described as sagebrush cover type (IRI-CVU), Sagebrush Shrublands (Mutel and Emerick 1984, Spence et al. 1995), a Shrub-Steppe community (Blair et al. 1996), Great Basin Desert Scrub (Dick-Peddie 1993), Loamy Foothills (SCS range site), Semi-desert Loam (SCS range site), Dry Sagebrush Shrublands (Johnston 2001), Big Sagebrush Shrublands (Johnston 2001), Subalpine Sagebrush Shrublands (Johnston 2001), and Big Sagebrush series (Johnston 1987).

THREATENED, ENDANGERED, AND BLM SENSITIVE PLANT SPECIES

Four Endangered or Threatened plant species, or Candidates for such designation occur or may reasonably occur with this project area (U.S. Fish and Wildlife Service, 1/29/03). They are *Sclerocactus mesae-verdae, Astragalus humillimus, Astragalus tortipes*, and

Pediocactus knowltonii. Nine BLM Sensitive plant species occur or may reasonably occur with this project area (BLM Information Bulletin No. CO-2000-014, 4/14/00). They are *Amsonia jonesii, Astragulus cronquistii, Astragulus naturitensis, Erigeron kachinensis, Eriogonum clavellatum, Ipomopsis polyantha var. polyantha, Lesquerella pruinosa, Lygodesmia doloresensis,* and *Mimulus eastwoodiae.*

VEGETATION and FOREST MANAGEMENT - Environmental Consequences

Impacts of the Proposed Action to the Piñon-Juniper woodland type: Proposed mowing and thinning in the piñon-juniper woodland type will remove some piñon and juniper trees and some associated shrubs in the treated stands. This will reduce the density of trees and open up the canopy cover, thereby reducing the probability of crown fires by increasing the distance between trees and crowns. Cutting the stems of the shrubs that may be present in these stands, including Gambel oak, mountain mahogany, serviceberry, bitterbrush, buckbrush, and skunkbush, will trigger the sprouting response in these plants, which may increase the abundance and distribution of these shrubs compared to pre-treatment conditions. This will increase the young age class of the shrubs, which may be good for the overall diversity and sustainability of these shrubs and the site they occupy. The newly sprouted shrubs will remain short (less than 4 feet) for years (maybe 10), so they won't be a significant ladder fuel in need of treatment for a long time.

Fewer trees per acre will increase the growth rate and vigor of the remaining trees, allowing piñon pine and juniper to resist insect attack (*Ips* beetle and western cedar bark beetle, respectively) and disease (e.g., black stain fungus in piñon), which are currently present and a concern for many of these stands. The proposed action will result in a more open stand of healthy trees with better resistance to a devastating wildfire.

If proposed mowing and thinning creates openings in the tree-dominated woodland that are greater than about 1/2 acre, the woodland character of those openings and the character of the surrounding woodland stand will be changed, since openings that size will create small shrublands or grasslands within the woodland matrix. Openings created in the woodlands that are less than about 1/2 acre will appear as natural openings within the woodland matrix, resulting in the overall woodland character of the stand being maintained.
If proposed mowing and thinning occurs in late seral or old growth piñon-juniper stands, the ecological integrity or value of these stands may be reduced due to loss of ecological components including large trees and shrubs, old trees and shrubs, snags, large wood on the ground, and biological soil crusts. This would reduce the biological diversity of these stands and the surrounding landscape that these stands are a part of.

Proposed mowing and thinning will also disturb (crush, uproot, kill) herbaceous vegetation (graminoids and forbs), but the openings created in the canopy should facilitate the growth of new herbs, and may increase the abundance and distribution of herbaceous species that have been suppressed due to the dense overstory of trees and shrubs. This may increase forage for wildlife and domestic livestock.

The resins produced by trees that have been mowed or cut may attract bark beetles to the project site if treatments are implemented during beetle flights. Damaged leave trees may also attract beetles particularly where bark is skinned causing sap to flow. Mowing of trees which contain beetle broods can destroy the brood within the tree being mowed helping to reduce beetle populations. Timing of projects and entomologist recommendations should be taken into account particularly if projects are proposed in areas where the beetle population has not reached epidemic proportions and attraction is a concern. (See mitigation measures).

Mowing of stands within the piñon-juniper woodland type will result in a loss of commercially valuable fuelwood or post-and-pole opportunities. Thinning in these stands should be accomplished through wood-product sales where practical. In addition, easily accessible areas where public wood-product gathering typically takes place should be considered for thinning with means other than mowing, and making wood products available to the public.

Impacts of the Proposed Action to the Ponderosa Pine forest type: Proposed mowing and thinning in the ponderosa pine forest type will remove some ponderosa pine trees and associated shrubs present in the treated stands. Removal of the shrubs, including Gambel oak and other ladder fuels that may be present such as piñon or juniper trees, will reduce the likelihood of crown fire initiation and the mortality to overstory trees that would result. Removal of trees and shrubs will open up the canopy cover and reduce the probability of crown fires by increasing the distance between trees and crowns. Cutting the stems of the shrubs that may be present in these stands, including Gambel oak will trigger the sprouting response in these plants, which may increase the abundance and distribution of the oak compared to pre-treatment conditions. The newly sprouted shrubs will remain short (less than 4 feet) for years (maybe 10), though on better growing sites, some sprouts can grow two feet per year. For most sites, mowed oak will not be a significant ladder fuel in need of treatment for 10 years or more.

The proposed action is an improvement thinning that removes trees from the lower crown classes to favor those in the upper crown classes, improving the composition and quality of the residual stand and reducing stand density. Thinning would concentrate heavily on small trees less than 10 inches DBH (diameter at breast height) and more moderately on small sawtimber in the 10 to 14 inch range. Trees left would be widely spaced to reduce the threat of a crown fire with a target average basal area of 40-60 square-feet/acre (70-110 trees/acre). An occasional larger tree may need to be removed to improve overall forest health, such as those infected with mistletoe or other diseases. The older, larger healthy trees are considered a rare component of most stands and will be protected. Several healthy trees per acre in the less than 10-inch size class will be saved for stand structure and age class diversity. Small openings and corridors will be created where they will provide a fuel break and provide for improved horizontal diversity. Openings would range from ¼ to ½ acre in size depending on stand conditions. When possible, existing natural openings would be expanded.

Thinning may help provide sites for ponderosa pine regeneration, and would allow more moisture and sunlight to reach the forest floor, which could increase grass, forbs, and shrub

production. Ponderosa pine seedlings may become reestablished in places where trees are removed. The new seedlings will start a new age class, improving the tree age class distribution and the vertical diversity of the area. Depending on how much regeneration occurs, it may require future management activities to prevent it from recreating the current overstocked situation.

Control of dwarf mistletoe does not require eradication. Treatment actions should aim at reducing the amount of mistletoe to a low level. Opening the canopy and increasing the spacing between trees, and reducing the crown layering should serve to hinder the spread of this disease.

If proposed thinning occurs in late seral or old growth ponderosa pine forest stands, the ecological integrity or value of these stands may be reduced due to loss of ecological components including large trees and shrubs, old trees and shrubs, snags, and large wood on the ground. This would reduce the biological diversity of these stands and the surrounding landscape that these stands are a part of.

However, the risk of losing old growth to fire and insects can be reduced without treating essential components of "old growth." Large, older trees can be left, older shrub patches can be protected during treatment, snags need not be cut under most circumstances, and large woody debris can be avoided.

Fewer trees per acre will increase growth rate and vigor of the remaining trees, allowing them to resist insect attack and diseases. The result will be a more open stand of healthy trees with better resistance to a catastrophic wildfire.

Impacts of the Proposed Action to the Mountain Shrubland type: Mowing and thinning in the Mountain Shrubland type will remove Gambel oak and other shrubs from these stands. This will reduce the density of shrubs and open up the canopy cover, thereby reducing the probability of crown fires by increasing the distance between shrubs and crowns. Cutting the stems of the shrubs, including Gambel oak, mountain mahogany, serviceberry, bitterbrush, buckbrush, and skunkbush, will trigger the sprouting response in these plants, which may increase the abundance and distribution of these shrubs compared to pretreatment conditions. This will increase the young age class of the shrubs, which may be good for the overall diversity and sustainability of these shrubs and the site they occupy. The newly sprouted shrubs will remain short (less than 4 feet) for years (maybe 10), so they won't be a significant ladder fuel in need of treatment for a long time.

Proposed mowing and thinning will also disturb (crush, uproot, kill) herbaceous vegetation (graminoids and forbs), but the openings created in the canopy should facilitate the growth of new herbs, and may increase the abundance and distribution of herbaceous species that have been suppressed due to the dense overstory of trees and shrubs. This may increase forage for wildlife and domestic livestock.

If proposed mowing and thinning occurs in old growth mountain shrubland stands, the ecological integrity or value of these stands may be reduced due to loss of ecological components including large shrubs, old shrubs, snags, large wood on the ground, and

biological soil crusts. This would reduce the biological diversity of these stands and the surrounding landscape that these stands are a part of.

Impacts of the Proposed Action to the Sagebrush Shrubland type: Proposed mowing and thinning activities in the sagebrush shrubland type will remove sagebrush and other shrubs from these stands. This will reduce the density of shrubs and open up the canopy cover, thereby reducing the probability of crown fires by increasing the distance between shrubs and crowns. Sagebrush does not sprout when cut.

Proposed mowing and thinning will also disturb (crush, uproot, kill) herbaceous vegetation (graminoids and forbs), but the openings created in the canopy should facilitate the growth of new herbs, and may increase the abundance and distribution of herbaceous species that have been suppressed due to the dense overstory of shrubs. This may increase forage for wildlife and domestic livestock.

Impacts of the Proposed Action to Threatened, Endangered, and BLM Sensitive Plant Species: There will be no impact to Endangered, Threatened or Candidate plant species, or BLM Sensitive plant species. If a known population of Endangered, Threatened or Candidate plant species, or BLM Sensitive plant species is likely to be impacted by this action, then the project will not be implemented. This policy will be adhered to in order to make sure that the Endangered, Threatened or Candidate plant species will be protected, and that the BLM Sensitive species will not suffer a loss of viability, and a trend toward federally listing these plants as threatened or endangered species.

Cumulative Impacts of the Proposed Action: Following this treatment, it is anticipated that maintenance mowing and thinning would occur every 15 -20 years. Prescribed fire could be used in the future in the ponderosa pine forest type. Fire would remove shrubs, including Gambel oak, and other ladder fuels that may be present such as piñon or juniper trees. Prescribed fire would help reduce the likelihood of crown fire initiation and the resulting mortality to overstory trees. Removal of trees and shrubs from a prescribed fire will further open up the canopy cover and reduce the probability of crown fires by increasing the distance between trees and crowns. It would improve forest health by reducing the risk of catastrophic wildfire and the spread of insects and diseases, which would be a positive effect.

Impacts of Alternative 1 – No Action: This alternative would be similar to the proposed action. If hazardous fuel reductions are not implemented, stand densities would remain high and individual tree growth rates will remain very slow. The relative health of individual trees would likely continue to decline due to the competition for water and nutrients. Large diameter ponderosa pine trees may continue to die from competition with younger trees, and from endemic level bark beetle attacks. The risk of stand-replacing crown fires, which are uncharacteristic in ponderosa pine forests, will continue to be high. Risk of epidemic insect attacks (primarily bark beetles) in ponderosa pine and piñon-juniper types would continue to be high until the outbreak actually occurs. Following the epidemic, the risk of beetle attack should decline and fire hazard would dramatically increase for 1-3 years until red needles are lost from the trees. This is currently occurring in many piñon-juniper stands throughout the project area. Following large-scale crown fires or insect epidemics, stand

characteristics (such as the loss of large diameter ponderosa pine, or mature piñon-juniper stands) may remain in an unnatural or undesirable state for many years.

Mitigation Measures:

1. A silviculturist or other professional forester should review, prior to implementation, the design of individual treatments that include ponderosa pine thinning, to assure long-term stand development concerns are considered.

2. Remove oak and juniper ladder fuels directly under the canopy of desired ponderosa pines that are to be left.

3. Leave all disease-free “yellow bark” ponderosa pine trees.

4. Maintain or promote patchy structure across the project areas.

5. Implementation of these projects must consider the current intense bark beetle activity in the region.

6. To prevent an escalation of bark beetle activity in the area, in both the residual stand and on adjacent private lands, it may be necessary to delay implementation to late fall and winter months when bark beetles are inactive. This should be assessed on a project-by-project basis.

7. In ponderosa and piñon pine stands, concentrate cutting on trees already killed by bark beetles, fading trees, or green trees with pitch tubes or other evidence of beetle attack.

8. Give consideration to the treatment of slash generated during winter operations so that it does not provide habitat for spring and summer beetle flights.

9. During mowing operations avoid damage to leave trees.

10. Minimize or avoid the mowing and cutting of young piñon trees, saplings or larger live piñon pine trees, since their abundance and distribution in the project area and throughout the Four Corners region has and continues to decline due to the *Ips* beetle and drought conditions. Particularly avoid large, old piñon pine trees that provide the necessary seed source and genetic diversity needed for the regeneration and sustainability of piñon pine trees.

11. Minimize or avoid disturbance to late-seral or old-growth stands of the piñon-juniper woodland type, the ponderosa pine forest type, and the mountain shrubland type in order to protect the ecological integrity, biological diversity, and habitat value of these stands and the landscapes that they are a part of.

12. Minimize the size of openings that are created in the piñon -juniper woodland type. Create openings that are less than about 1 acre in order to retain the woodland character of the stands being treated.

WILDLIFE, TERRESTRIAL

Affected Environment: The study area provides habitat for an undetermined number of terrestrial wildlife species. Some species are yearlong residents while others migrate seasonally. The affected environment includes areas of wildland-urban interface within the piñon-juniper woodland type, mountain shrubland type, ponderosa pine forest type, and sagebrush shrubland type. These types occur in association with each other as well as in pure stands. Descriptions of the existing vegetation in the Vegetation and Forest Management section of this EA provide a good overview of the majority of wildlife habitats that will be affected by the proposed action. In addition, the Special Status Species section of this EA more specifically discusses the federally listed, proposed, and BLM Sensitive species found within the study area.

The Colorado Division of Wildlife (CDOW) is responsible for managing the State's fish and wildlife populations, while the BLM works cooperatively with the CDOW to manage wildlife habitats on public lands. Because the CDOW manages several species for sporting values, many of these species and their habitats have received management priority. While this EA will focus on the habitat for these species, it will more specifically address the wildlife species and habitats that are most likely to be affected by implementation of the proposed action.

WILDLIFE, TERRESTRIAL (non TEPS)
Environmental Consequences & Project Design: Direct, indirect, and cumulative effects are evaluated in a programmatic context. These can be evaluated with greater detail in the five-year review considering actual project implementation with additional information concerning design, magnitude, scope, timing, and placement of individual projects.

Impacts of the Proposed Action: All treatment types.

Mule deer and elk:
Mule deer and elk are common within the BLM lands managed by the San Juan Public Lands Center and are present year round. However, higher densities of animals use these BLM lands during the winter when big game animals concentrate on limited winter range. Some summer range and an abundance of transitional range are also located on BLM lands.

Mule deer and elk generally occupy the same habitats across the landscape and many key habitat components overlap, particularly on winter range. The intensity of winter use varies widely from year to year and from site to site, and is generally controlled, in the short term, by annual variation in the timing and amount of snowfall, and in the long-term by fluctuations in population levels.

Most of the treatment areas proposed in this alternative are located within winter range, which is widely distributed throughout the planning area. The CDOW has designated three categories of winter range: normal winter range, severe winter range, and winter

concentration areas. The condition of winter range habitat varies greatly. Many pine, piñon-juniper, and oak brush stands are decadent with dense, woody under- or over-stories. Others have little herbaceous understory and show signs of moderate to severe use by wintering animals where forage remains. Many times they are not used due to lack of available forage, animals preferring the conditions on adjacent private lands. Lack of herbaceous forage can be a combination of several factors such as interception of available moisture, sunlight, and limited nutrients by the dominant woody vegetation. A lack of fire impact on the landscape is thought to be a meaningful factor regarding the current condition of many winter range habitats. Both deer and elk evolved with fire and fire has historically played an important role in maintaining habitat quality and diversity.

Direct and Indirect Impacts: Removing decadent fuels materials and creating openings within stands will improve forage production, distribution, and availability to mule deer, elk, and other herbivores. As mechanical means are utilized to reduce fuels and approximate natural conditions expected within these fire-dependant ecosystems, habitats important for both species could be maintained and improved.

Some short-term negative impacts could result as time lags associated with revegetation could affect short-term losses of forage, and hiding, thermal, and escape cover, depending on the project treatment. Temporary displacement of animals to adjacent habitat will generally not be a problem except under conditions where adjacent habitat is lacking or during severe winter conditions. In some cases, displacement could last the remainder of the winter; in others, some limited use of the project site will occur during implementation. These issues will be addressed as part of individual project design. Because winter range is a limiting factor for these species, and mule deer in particular, some parameters for amounts of desired vegetative treatments in these habitats will be important. Treatments need to be designed and scheduled to provide sufficient winter range needs for deer and elk at any one time.

Long-term effects include availability and improvement of forage growth on deer and elk winter range. This becomes increasingly important to wildlife across the San Juan area considering lands of other ownership. Winter range continues to decline on these lands, as they are dedicated to other uses such as agriculture and urban development.

Predators/Furbearers:

A variety of predator/furbearer species are known to reside within the planning area. The most notable predator species are coyote, mountain lion, and black bear. Relative to the general population of their species, there appears to be abundant numbers of all three species present.

Coyotes are generalists and are capable of occupying a wide variety of habitat types. This species evolved with diverse habitats and a diverse food base.

Mountain lions are tied closely to the availability of their prey - mainly mule deer. Thus, mountain lions are generally found in the same habitats as mule deer and elk.

Black bears generally prefer mesic habitats with good cover and abundant food resources. This species is closely tied to habitat conditions that favor good mast crops such as berries, acorns, seeds, nuts, and other herbaceous plants. Fire has historically helped to maintain a diversity of habitats in differing seral stages that favor production of food sources important to this species.

Other mesocarnivores (i.e. medium-size carnivores) include striped skunk, red fox, bobcat, and raccoon. These species have varying habitat needs and range from specialists to generalists. Some interspecific competition between mesocarnivores, such as competition between coyotes and red fox or bobcats, exists and has been known to affect population abundance. Mesocarnivore species utilizing the proposed treatment areas fall into the generalist category and will benefit from diversity of habitat types created by the mechanical treatments.

Direct and Indirect Impacts: These species will gain long-term benefit from the proposed action with the inclusion of proper project design and coordination with unit biologist in cooperation with CDOW at the critical stages for planning and implementation. As more diverse and natural vegetative conditions are returned to these ecosystems, habitats important for these species will be maintained and improved. In addition, vegetative treatments will be designed to help improve habitats for predatory species by maintaining travel corridors and cover as well as a diversity of habitats for prey species.

Some short-term negative impacts could result as time lags associated with revegetation could result in short-term reductions in prey populations or density. In addition, project implementation could cause displacement of animals from established home ranges and fragment habitats for a short time. However, many prey species and will increase once vegetative treatments to approximate natural condition are implemented.

Land birds:

A wide variety of land bird species utilize these habitats and include resident species such as magpie and turkey as well as migratory species. Among land birds, neotropical birds are birds that winter in the tropics and nest in the continental United States. These birds are present throughout the planning area.

Birds are particularly responsive to changes in the physical structure of habitats in which they nest and forage. The diversity of bird life that a vegetative type can support has been directly linked to the degree of vegetative layering. As vegetative structure becomes more complex, opportunities for nest sites and food resources increase, which allows for a larger variety of birds to inhabit the area. Mechanical thinning should help maintain a diversity of habitat types and seral stages within vegetative communities.

Direct and Indirect Impacts: Effects to species will vary. Some species will benefit more as habitat for them is increased while treatments may decrease habitat for others. Species such as bluebirds and goshawk will benefit from created openings and thinning of the understory vegetation resulting from treatment. Species such as the green-tailed towhee that prefer thickets will have less extensive habitat then under current conditions. Treatments, however, are expected to provide adequate habitat to support populations.

Treatments will generally move habitat condition closer to those expected within the range of natural variability for community types. Project design should provide a better mosaic of habitat for land bird species expected to utilize these communities. Short-term direct effects include some temporary displacement to adjacent habitats and incidental loss of reproductive success within the project area during implementation. Again, the inclusion of proper project design and coordination with unit biologist in cooperation with CDOW at the critical stages for planning and implementation will help to maximize project benefit and minimize adverse effects to these species.

Riparian areas are especially important to many species of land birds. These habitats are not prone to fire and generally respond favorably following disturbance events, however, treatments are not planned within riparian zones.

Fragmentation of habitats is a concern for bird species. Fire, vegetative treatments, and fire-suppression activities could all result in some habitat fragmentation. However, maintaining a diverse age class of vegetation and habitat configuration will be to the long-term benefit of land birds.

Small mammals:

An undetermined number of small mammals reside within the planning area. These species include prairie dogs, ground squirrels, mice, chipmunks, rabbits, and bats among many others. Many of these small mammals provide the main prey sources for raptor and larger carnivore species. Some species are generalists such as the raccoon and can utilize a variety of habitats and vegetative successional stages. Others, while being mainly generalists, have a propensity for certain successional stages, such as the deer mouse preference for early succession. Still others, like bats, have specific habitat requirements such as particular snag characteristics, or cliff overhangs and caves for roosts or hibernacula.

Direct and Indirect Impacts: Incidental direct mortality is expected to some individuals during project implementation as well as some temporary displacement to adjacent habitat. Generally, a mosaic of habitat condition would be left in the treatment area offering a variety of cover and forage condition for small mammal species. There is the potential for some short-term impacts associated with the vegetative treatments. Short-term reductions in available forage could have impacts on numbers of some small mammals within local populations. In addition, treatments could fragment and reduce habitats important to some species. However, as areas are treated, long-term forage quantity and quality should improve, which should increase habitat productivity. Many species of small mammals respond favorably after disturbance as in many cases, old, decadent plants are replaced with new grasses, forbs, and shrubs, which provide nutrient rich forage.

Changing the mix of habitat and successional stages will increase or decrease effective habitat for particular animals based on the species' requirements. Some species will benefit more as effective habitat for them increases while treatments may decrease habitat for others. Many changes have occurred to habitats under heavy fire suppression over the last 100 years creating more monotypic, less diverse, ecosystems. Treatments will generally move habitat condition closer to those expected within the range of natural variability for

community types and provide a diversity of habitat types and successional stages for small mammal species. Most of the small mammal species within the proposed treatment area should benefit in the long-term from proposed treatments through greater diversity and stability of habitats.

Amphibians and Reptiles:

Amphibians and reptiles constitute two distinct classes of vertebrates and serve an important role in the ecology of an area since they adapt to various niches. They are an important source of food for prey species and also play a predatory role on insect and rodent populations.

Direct and Indirect Impacts: Treatments will generally avoid amphibian habitats along riparian corridors and other wetlands. Minor direct impacts may occur such as mortality from machinery crossing a riparian area or to individual amphibians utilizing an upland site being treated.

Treatments will affect reptiles in varied ways. Some limited temporary displacement or direct mortality may occur during implementation. This will not result in a significant change to populations across the planning area and range-wide. Effects to individual species will vary. Some species such as skinks will utilize the undergrowth and heavy litter found under oak stands while other reptile species may prefer more open, drier habitats. Species abundance is expected to balance to the mix of habitats available to each following treatment. Treatments will provide a mosaic of habitats considered more representative of natural conditions found under a normal fire regime. Overall, the proposed action would support a higher diversity of reptile species across the area in more stable habitats. This again will help to supplement some of the habitat loss occurring on lands of other ownership where more diverse wildland habitats are being converted to other land uses of agriculture and urban development.

Invertebrates:

A majority of invertebrates are wide ranging, “r strategists,” depending on large reproductive broods with a small percentage reaching maturity and reproductive status. This strategy allows many species to exploit conducive environments and changing habitat condition.

Direct and Indirect Impacts: Effects of treatment to individual invertebrate species will vary. Some direct mortality and displacement is expected from treatment implementation. Local changes in populations are expected for differing habitat conditions created under the proposed treatments. Some species will increase while others decrease as local populations adjust to the mix of habitat conditions created by treatments. While some local changes to treatment areas may be apparent, these shifts are not expected to result in significant shifts to species populations. Invertebrates are generally wide-ranging and while some changes are expected at project area level such as an increase in local diversity, no significant changes to populations are expected across the planning area as a result of the proposed action.

Cumulative Impacts: Expected private land development will affect large areas that are currently habitat for wildlife species. This will generally result in decreasing habitat effectiveness for most species on these private lands. Treatments under the proposed action will help to offset losses to habitat condition across the area as adjacent lands of other ownership continue to be converted to non-wildland uses. The habitat benefits from treatments will help support wildlife populations and help draw animals such as elk and deer from potential conflict sites on private land. Fuels treatments are also expected on private lands within the WUI. Public lands fuels treatments will serve as a model for private land actions and benefit additional wildlife habitat through adoption of treatment design for private wildlands. Less uncontrolled, catastrophic loss of wildlife habitat is expected to occur to lands of all ownerships across the area then would otherwise occur without the proposed action. This will result in higher sustainability of habitats for wildlife populations.

Impacts of Alternative 1 - No Action: This alternative would be similar to the proposed action. If hazardous fuel reductions are not implemented, wildland fires would likely become very large. Long-term impacts from this alternative would be negative and cumulative to most all terrestrial species. This is due to uncontrolled and catastrophic loss of habitat condition necessary to support wildlife populations across lands of all ownerships in areas of wildfire occurrence. For example, if large blocks of winter range are rendered ineffective by wildfire at any one time, it is likely to have significant impacts on the local big-game populations.

Diversity of habitat condition, approximating natural fire regimes, would not be returned to the ecosystems dependent on it. This will result in further deterioration of habitats important to a variety of terrestrial wildlife species.

Mitigation Measures: (*Project Design)*

A wildlife biologist will be part of each project ID Team and involved at the outset of treatment design and on-the-ground layout. Many wildlife considerations are discussed as part of project design or mitigations elsewhere within this EA and not repeated in this section. Some considerations will remain constant across vegetative community types such as for winter range, snags, cover, etc.

Winter Range: Each project should be evaluated for winter range considerations. Generally, long-term benefits are expected as described in the deer and elk section above. Issues discussed within this EA may lead to implementation during the winter months. Winter range concerns are generally associated with project implementation during this time. Temporary displacement of herds from project areas to adjacent habitat may occur during implementation. Displacement of animals may continue for the remainder of the winter in some cases following the end of operations. In others, animals may utilize project areas to some level during or shortly following the end of operations. Project areas should be evaluated to assure sufficient adjacent habitat is available during implementation. Sufficient adjacent habitat is expected to be available for most project sites during normal and mild winters when winter habitats are more open and free of deep snow.

Severe winter conditions bring about other concerns. Accumulations of snow across the area can severely limit available forage to the herds, concentrating them into small areas. Additionally, animals become stressed with lowered body condition during severe winters. At a certain point, additional stress and movement associated with project implementation can have significant negative effect on individuals including mortality. Stresses can be at their greatest in the latter part of winter just prior to green up. A variety of methods can be used to lessen impacts to important winter range areas such as scheduling treatments to impact only a certain portion of key areas at any one time. The biologist should be involved in this process. Project implementation during severe conditions will be subject to suspension when conditions warrant. The wildlife biologist in cooperation with the Colorado Division of Wildlife will monitor projects to determine if and when suspension of activities is necessary. Sufficient instrumentation will be built into contracts, etc. to insure suspensions can be implemented in a timely manner.

Snags: Snags are a necessary component of habitat for many wildlife species. Larger-diameter snags generally have higher wildlife value. Size and value for wildlife will vary based on tree species, size, configuration, and juxtaposition within the project area. Where snags are lacking, additional snags can be created. Where snags are overabundant, such as in *Ips* kill areas, many must be removed to meet fuels objectives. Generally, snags with high wildlife value will be preserved. The wildlife biologist will provide direction for project design to maintain this habitat component while providing for public health and safety and meeting fuels objectives. In ponderosa pine stands, as many snags as possible that are10" DBH and larger should be retained.

Cover: Cover will be maintained for wildlife species. As mentioned under the proposed action, untreated areas, islands and stringers will provide hiding and thermal cover for big game. Maintaining sufficient hiding cover along roadways is a concern. Low stature vegetative growth in piñon-juniper and mountain shrubland types can provide quality cover as they occur in pure stands or intermixed with other types. Width of buffer strips along roads will vary according to factors such as vegetation density and topography. Hiding cover can be defined as vegetation capable of hiding 90% of a standing adult elk or deer from human view, at a distance less than or equal to 200 feet. Many methods can be utilized to achieve this. For example, an alternating mosaic pattern of leave islands can overlap with feathered edges along roadways to meet both wildlife and fuels objectives. Generally, buffer strips of approximately 50 meters in width provide sufficient sight cover.

Untreated islands and stringers will provide thermal, hiding, nesting, and foraging cover for many species. The vegetative undergrowth can be important to the reproductive success of species such as turkey and other land birds.

Ponderosa Pine Forest type: Where opportunities exist, use treatments to improve/stimulate aspen intermixed with pine, aspen stringers, or pure aspen for diversity of habitat types. The biologist will also identify areas of special habitat to protect or enhance on a project-by-project basis. For example, Abert's squirrels need adequate nest site tree groups to maintain their populations.

Piñon-Juniper Woodland and Mountain Shrubland type: In addition to meeting fuels objectives there is a high opportunity for achieving significant improvement of winter range characteristics for big game as well as providing for other wildlife benefit. These are general recommendations for fuels treatments within these types. They will vary from site to site based on the specific conditions for each project (ex.: slope, aspect, topography, acreage size, adjacent habitat, etc.). The intent is to provide project designers with the types of wildlife issues needing consideration in an interdisciplinary planning effort. These coarse-scale recommendations may include:

1. Creating openings of adequate size for habitat characteristics on flat, south, and east exposures, and maintaining cover on north and west aspects when appropriate.

2. Maintaining cover on ridge tops, drainages, and saddles of sufficient size for habitat characteristics where appropriate.

3. Creating numerous small openings in valleys and along protected hillsides where appropriate.

4. Maintaining mature- and old-growth characteristics within the range of natural variability to provide for diversity.

5. Leaving patches of adequate size for hiding and thermal cover where appropriate.

6. Maintaining non-linear or feathered stringers out of canyons, over saddles, or along ridge tops of sufficient size to provide for travel corridors and hiding cover.

7. Leaving healthy pine in areas of heavy *Ips* infestations to maintain this component of the ecosystem on which some wildlife species specialize.

Within the mountain shrub community, generally avoid treating oak stands above 6” DBH. This will aid in preserving a seral diversity component that can provide quality habitat components to a variety of wildlife species. Provide rationale to support the need to treat these stands within a project. Fuels treatments would on average target 30 to 60% of the existing cover.

Islands of oak left will be designed and laid out to meet both fuels and wildlife habitat objectives. Generally we would expect a mosaic of islands varying in size from one half to ten acres in size.

Follow up treatments are necessary within the oak type to maintain treated areas due to oak re-sprouting. These treatments will generally consist of periodic prescribed burns. Islands should be configured with this in mind to reduce the labor intensity of follow-up treatments while meeting both fuels and wildlife objectives.

Opening up access, which may attract vehicle use, is an issue. Re-close roads where appropriate. Hydromower tracks can be covered with slash to disguise and discourage additional use.

Maintaining sight cover along roadsides was discussed. Generally 50 meters is considered a good buffer from the roadside. Feathering and alternating islands along the roadway can maintain the cover while achieving fuels objectives. Within this type on steeper slopes, fuels treatments are effective at the base of the slope or along ridgelines. Alternating islands with fuel breaks may be an effective method of maintaining wildlife values and achieving fuels objectives along ridgelines instead of a solid fuel break running the entire ridgeline.

Sagebrush Shrubland type: Provide a project activity buffer around sage grouse leks of about 2 miles. Avoid treatments to areas providing important sage grouse habitat such as ephemeral wetlands.

When removing sage, widths of removal over 50 yards will be too wide for seed from adjacent seed bank to carry and recolonize within a reasonable period of time. Maintain strips adjacent to shrublands or other edge habitats whenever possible.

Monitoring:
Monitoring will be utilized in an adaptive management context to determine effectiveness of project design, and used as a basis to adjust design for future projects accordingly. Pre- and post-treatment monitoring will be utilized to assess changes to wildlife abundance and utilization of habitat. A monitoring plan will be developed, determining the necessary intensity and extent to answer pertinent management questions.

GRAZING MANAGEMENT

Affected Environment: Table 1 shows potentially affected allotments and respective management categories. Allotments in the "M" category will be managed for to maintain current satisfactory resource conditions, "I" category allotments will be managed to improve resource conditions, and "C" category allotments will receive custodial management to prevent resource deterioration (USDI BLM 1985). While the individual categories may not be as important today, they nevertheless show the intended allotment management intensity as defined in the Resource Management Plan.

Table 1. BLM Grazing Allotments by County and Management Category

County	Management Category			
	Intensive	**Maintain**	**Custodial**	**Totals**
Archuleta		2	14	16
Dolores	5	2	14	21
La Plata		1	14	15
Montezuma		6	12	18
San Miguel*	14	2	14	30
San Juan**		8		8
TOTALS	19	21	68	108

* Includes portions of Montrose County; however, the majority of acres proposed to be treated are within San Miguel County.
** These are all sheep allotments.

With the exception of the eight sheep allotments in San Juan County, the remaining, potentially affected allotments are cattle allotments. Permitted seasons of use vary from winter to spring to fall use on cattle allotments, with only summer use on sheep allotments.

Generally, allotments in the "I" and "M" categories have multiple pastures and are managed under a rotational or rest-rotation grazing system. These grazing systems allow some flexibility to mitigate other proposed actions as well as to provide regular rest during the critical portion of the growing season. Allotments in the "C" category generally are within intermingled public and private lands. Often public lands are not fenced out of larger private land holdings and incorporated into improved grazing management systems.

Impacts of the Proposed Action: The proposed action should improve forage conditions by reducing tree and shrub densities, and reducing piñon-juniper encroachment into sagebrush/grasslands. Ground cover would also be expected to improve so soil productivity and hence, forage quality and quantity should be maintained. Improved forage quantity and quality on uplands will reduce grazing pressure on more sensitive riparian and wetland vegetation types assuming proper livestock management techniques are encouraged.

Impacts to BLM grazing permittees could be difficult to mitigate especially on those allotments containing single pastures that would be rested after treatment. Other permittees holding permits on allotments with improved grazing management systems should not be as impacted since the grazing systems provide some flexibility. Sheep permittees should not be impacted since sheep can be herded and made to graze away from proposed treatment areas. Affected permittees would likely need to buy hay, lease pasture, or sell down livestock numbers depending on their individual ranching operations. At present, BLM has no available vacant cattle allotments to use to mitigate temporary loss of forage.

Impacts of Alternative 1 – No Action:
Impacts would be similar to the proposed action. If hazardous-fuel reductions do not occur, devastating wildfires could eliminate the forage base and replace it with undesirable weeds such as cheatgrass. Should this be the case, the amount of livestock permitted on public lands would have to be reduced to meet the reduced forage base. Devastating wildfires could also damage or destroy range improvements such as fences and reservoirs, which if not replaced, would also likely contribute to reduced livestock numbers on public lands.

Cumulative Impacts: Long-term impacts of the proposed action should be positive in that increased forage production would be maintained. Assuming proper post-treatment management and a local seed source, this should also translate into a recovery of desirable cool season perennial grass species such as Indian ricegrass, muttongrass, and needle-and-thread grass. This benefit should overcome any short-term impacts to grazing permittees where pasture or allotment rest is needed. Overall, the proposed action should help move rangelands towards achieving rangeland health objectives.

Mitigation Measures:

1. Inform permittees holding grazing permits on potentially affected allotments of proposed management actions at least two grazing seasons prior to treatment in order to make satisfactory arrangements to mitigate forage losses on public lands.

2. Defer treated areas for at least two growing seasons after treatment to assure recovery of desirable native species.

3. Consider treating as much of a particular pasture or allotment with one entry, as opposed to multiple entries over a shorter term, in order to mitigate impacts to grazing permittees' operations.

4. Treat only one pasture per year. Treating multiple pastures within an allotment severely reduces grazing management flexibility.

5. Consider spending $8,100 dollars to help construct needed fences, reservoirs, etc. to mitigate potential adverse livestock grazing affects on newly improved rangelands. Allotments in the "I" and "M" categories should be considered priority allotments.

6. Do not increase permitted livestock numbers and/or seasons until monitoring shows additional capacity is available.

7. Implement grazing systems where needed, that will maintain forage quality and quantity.

8. Utilize temporary structures such as electric fencing to keep livestock off improved areas for the short term while providing maximum flexibility for ongoing grazing use.

9. Require contractors to keep gates closed when livestock are present.

10. Completely replace fences between, and including, braces if fence needs re-construction or repair as a result of a proposed treatment. No fence cutting or wire splicing of cut fences should be allowed.

LAND STATUS/REALTY AUTHORIZATIONS/ACCESS

All lands available for hazardous-fuel reduction identified in this document are public lands administered by the Bureau of Land Management, San Juan Public Lands Center.

A new law was recently enacted, named the Wyden Amendment (Public Law 105-277, Section 323 as amended by Public Law 106-73, Section 330, Title III Watershed Restoration and Enhancement Authority), which authorizes the BLM to enter into cooperative agreements with willing Federal, tribal, State, and local governments, private

and nonprofit entities, and landowners for the protection, restoration, and enhancement of fish and wildlife habitat, and other resources on public or private land that benefit those resources within the watershed. The BLM, as part of the hazardous fuels management program may perform thinning on lands other than public lands if there would be a benefit to adjacent public lands. This could only occur in close coordination with the other property owners, through a cooperative agreement.

Much of the area identified as WUI are isolated tracts of public lands surrounded by private property or state-administered lands. Many of these parcels of public land do not have public or administrative access to get personnel or equipment to the areas needing thinning. Access will be a large part of the overall process for selection of which parcels of public land would receive hazardous-fuels reduction. The BLM will negotiate with surrounding landowners or administrators to secure access to treatment areas.

Many private and public rights-of-ways exist across the public lands identified in this proposal, consisting of roads, pipelines, power lines and various other utilities. There are numerous gas wells located throughout the project area as well. These rights-of-ways and services could be damaged from the thinning operations if they are not located and protected prior to executing any mechanical treatments.

Hazardous-fuels reductions should have a positive affect on any improvements located on public lands by mitigating the potential fire hazards around them.

Mitigation Measures:

1. Locate proposed treatments to avoid or mitigate all rights-of-ways and improvements within the project areas prior to commencing any thinning operations.

NOISE

Affected Environment: The common sounds of passing vehicles on the county roads, light industry, and domestic animals from surrounding homes can be heard in most areas of the wildland-urban interface. The sounds can be heard throughout the day and night, even though the remoteness of the public land provides some feeling of solitude.

Impacts of the proposed actions: "All thinning methods":
Short-term impacts from chainsaws and vehicles would be heard immediately within the project area throughout the duration of the project. Once the project has been completed these impacts will disappear and noise levels would revert to pre-project conditions. The maximum distance that thinning equipment can be heard is approximately ¼ mile during normal operations. In areas with dense tree cover, this distance would decrease due to the buffer of the trees.

Impacts of Alternative 1 No action: The existing conditions would continue as is.

Cumulative Impacts: The effects of this project combined with the existing conditions would increase the cumulative noise levels immediately within the project area. This

increased activity should be short duration and when the project is complete, should not add to the overall cumulative noise level within the area.

Mitigation Measures:

1. The project should be accomplished during daylight between the hours of 6:00 am and 7:00 pm, Monday thru Saturday.

2. Adequate mufflers will be required on all equipment used in the thinning operation.

RECREATION

Affected Environment: A variety of recreation activities occur in the potential treatment areas including hunting, ATV use, dirt biking, mountain biking, horseback riding, hiking, 4-wheel driving, firewood gathering, Christmas tree cutting, sightseeing, wildlife viewing, and dispersed camping.

Several established County and BLM roads provide access to many of the treatment areas, and in some cases traverse the areas. Also, historic or user-generated two-track roads traverse some of the areas. People are accustomed to using these roads. Depending on the treatment area, designated trails may exist.

A variety of travel management plans are in effect across the treatment areas. Travel management plans show where motorized use is allowed and whether it is allowed on designated routes only, or is allowed off road. Due to openness in vegetation, motor vehicles are driving off of designated routes and creating new single- and two-track routes that continue to get used. With the current piñon mortality from *Ips* beetle, the vegetation is becoming even more open and accessible by vehicles. Mountain bikers also continue to create new routes that over time criss-cross and parallel existing routes, creating a spider web of trails.

The recreation use is year-round, with the highest use normally happening in the spring and fall. This seasonal use is linked to preferable weather and hunting seasons. Areas located near a community receive year-round use for hiking, mountain biking, and horseback riding.

The tourism economy is directly linked to recreation on public lands. Several large wildfires in the past three years have had a detrimental effect on the number of tourists and on tourism revenues. Recreation and Law Enforcement Staffs are under funded to handle current workload.

Key recreation issues include:

1. Access to and ability to cross public lands.
2. Management of motorized vehicles on public lands.
3. Changing traditional recreation uses on public lands.
4. Downturn in tourism due to recent large wildfires.
5. Public safety.

Impacts of the Proposed Action:

The impacts to recreation are basically the same for all of the vegetation types -- piñon-juniper and oakbrush woodlands, sage, and ponderosa pine. The Proposed Action will not affect access to public lands. The treatments could affect the ability to cross the treatment area and use of motor vehicles in two ways:

1) Clearing vegetation will open up the stands and make vehicle access easier. This could lead to more vehicle use off of established roads and the creation of more two-track routes. This would create additional travel management and law enforcement workload.

2) Slash created by the treatment, could obscure existing trails and two-track routes, which would impede further use and eliminate a route that people are accustomed to. If the route leads to a hunter camp or dispersed campsite, loss of the campsite would be another impact. The loss of the route would be a change of a traditional use that could be a surprise to the public. This could add fuel to an already volatile issue with the public.

Conversely, slash from the treatment could help implement travel management plans for an area by obscuring existing trails and two-track routes. If approved travel management plans call for a reduction in off-road vehicle use or a reduction in trails, slash treatment could be designed to help accomplish that.

Hunter camps or other dispersed campsites could be eliminated by slash. This would be a change of a traditional use that could be a surprise to the public. Public safety is adequately addressed in the Proposed Action; therefore, there are no impacts.

Cumulative Impacts: The long-term reduction in catastrophic and newsworthy, large wildfires will have a positive impact on the tourism industry.

A potential cumulative impact is a large increase in motorized vehicle use in the treatment areas. The Recreation and Law Enforcement Staffs are not funded to handle this additional workload.

A potential cumulative impact is the loss of existing motorized vehicle routes in the treatment areas. Over several treatment areas, this could be substantial and could accentuate an already volatile issue. This could shift the issue to a venue that local managers have little influence on.

Mitigation Measures:

1. During project planning, identify all existing trail and travel routes used by the public. Based on existing travel management plans, determine whether the routes will stay open or be obscured by slash. Incorporate specifications in the contracts to either keep it open or obscure it. Implement a notification plan, a year ahead of the treatment, which informs the public of a road to be closed. The plan could include posting a sign on the road to be closed, a news release, or letters to interested parties. Provide a phone number and address for comments or questions. The intent

of this notification is to provide information in a timely manner to avoid surprises to the public.

2. During project planning, identify hunter camps or other dispersed campsites that would be impacted by the treatment. For campsites that will remain open, incorporate specifications in the contracts to keep it open. For campsites that will be closed, post a sign at the campsite a year ahead of the treatment. Provide a phone number and address for comments or questions
3. Provide information on project scheduling, impact to travel routes, and impact to campsites to Visitor Information (VIS) personnel. Provide information ahead of project implementation, so that VIS personnel can provide timely information to hunters and other recreationists. (Many hunters need to know information a year ahead of time.)
4. At the conclusion of the project, BLM staff will monitor (for up to three years) the areas where they have a concern about increased motor-vehicle use. If it is determined that there is an increase of travel routes, an interdisciplinary team will meet to develop solutions. Potential solutions may include, but are not limited to, a fence, a permanent barrier system, a temporary OHV closure, and/or an Adopt-an-Area agreement with a partner.
5. Assess the amount of post-treatment monitoring that will be needed and the additional workload to deal with concerns. Include these tasks in annual work plans for Fuels, Law Enforcement, and Recreation staffs. Determine if additional staff positions are needed to handle the increased workload.

Impacts of Alternative 1 – No Action: Impacts would be similar to the proposed action.

VISUAL RESOURCES

The Bureau of Land Management is responsible for ensuring that the scenic values of their public lands are considered before allowing uses that may have negative visual impacts. BLM accomplishes this through its Visual Resource Management (VRM) system, a system that involves inventorying scenic values and establishing management objectives for those values through the resource management planning process, and then evaluating proposed activities to determine whether they conform to the management objectives. The Bureau's VRM system helps to ensure that the actions taken on the public lands today will benefit the landscape and adjacent communities. The VRM process looks to minimize visual contrast in the landscape from management activities by utilizing elements of form, line, color, and texture.

Affected Environment: Visual resources in the BLM San Juan Center include some of the most diverse and spectacular scenery in the state. Approximately 60,000 acres of land were found to be important landscape areas at the time the current RMP was written (1984), much of it located in the Silverton area and the Dolores River Canyon. General landscape types include broad to narrow river valleys, steep canyons, mesas, rolling parks, mountains, and ridges. Vegetation ranges from desert shrub, desert woodland, mountain shrub and conifer woodland, to alpine tundra.

Visual resources are assigned objectives:

Class I Objective: To preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.
Class II Objective: To retain the existing character of the landscape. The level of change to the characteristic landscape should be low.
Class III Objective: To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.
Class IV Objective: To provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

Class I Objective areas within the scope of this project include: BLM lands north of Mesa Verde National Park; the Goodman Point area; the Upper Dolores River area; BLM lands surrounding the city of Silverton, and the McKenna Peak area.

Impacts of the Proposed Action:

Mowing and thinning piñon–juniper and oakbrush woodlands: Thinning will remove the brown dead and dying trees and should result in improved health and vitality of the remaining piñon. This aids in their resistance to pine beetle infestation and resultant mortality, thereby making the stands more visually attractive than a dying forest stand. Oakbrush will re-sprout vigorously, providing a variety of vegetation sizes in the landscape. Juniper thinning should be done in a mosaic pattern, but mainly to thin thick groupings and individual dying trees. In areas where the trees will be heavily thinned due to mortality, the junipers should be thinned only lightly in order to provide some density of trees in the landscape.

Sagebrush mowing: Mowing of sagebrush in a mosaic pattern will allow for more variety in vegetation age and size classes, thereby providing increased visual diversity.

Ponderosa Pine Thinning: Grass and forb growth will increase with the increased penetration of sunlight to the forest floor resulting in a greater variety of vegetation and visual diversity. A less dense, more open forest stand will return the ponderosa pine forests to visually historic conditions. Thinning should result in improved health and vitality of the remaining ponderosa. This aids in their resistance to pine beetle infestation and resultant mortality, thereby making the stands more visually attractive than a dying forest stand.

Cumulative Impacts: Although thinning will reduce the amount of vegetation, the mosaic cutting pattern should mimic nature by providing clumps of trees and scattered openings, and reducing vegetation densities to a more natural condition. The result should be a more healthy and attractive forest. Recently thinned areas will be scattered around different parts of the BLM lands, thereby separating these areas and reducing the amount of acreage and visibility from any one viewpoint.

Impacts of Alternative 1 – No Action: The No Action alternative would result in similar impacts as the proposed action. If hazardous-fuels reductions did not occur, brown dead

and dying piñon and ponderosa will be visibly evident in the views, and will provide an enormous amount of fire fuel in the event of a wildfire. If a wildfire were to occur, the effect on the visual condition would be devastating. It would take approximately 100 years for visual restoration of burned areas. Depending on the severity of a wildfire, some areas may never recover.

Mitigation Measures:

1. During vegetation mowing cut the stumps as low as possible to reduce evidence of cutting activity.

2. Avoid piling of mulch; distribute mulch as uniformly as possible over soil surface to dry more quickly and reduce visual contrasts, as well as to hold down exposed soil and reduce erosion potential.

3. Cut vegetation in clumpy mosaic patterns, using feathered edges to avoid unnatural straight-line edges.

4. Pile and burn slash materials to avoid surface fuel buildup and unnatural accumulations of dead materials in areas of ponderosa pine thinning.

FIRE ECOLOGY AND MANAGEMENT

The activities of humans from aggressive fire suppression and past livestock grazing have influenced the natural fire regime within the project planning area. Past livestock grazing and fire suppression activities, along with the lack of vegetation treatments have directly influenced the fuels characteristics that exist today. Fire control has played a major role in the development of oakbrush and overcrowding of ponderosa pine stands throughout the western United States. Historically, low- to moderate- intensity fires maintained the natural savannah landscape of the pine woodland ecosystems.

A closed canopy predominates in forested areas today due to the reduction/elimination of natural ignition and fine fuels, along with the lack of vegetation manipulation. Ponderosa pine woodland has been invaded by old growth oakbrush, which is growing to heights equal to the bottom branches of the pine. Any crown fire through this vegetative type will likely eliminate most of the desirable ponderosa pine trees and threaten private lands. The current

Photo 6. *Drought, beetle kill, and overcrowded forest stands resulted in this devastating crown fire at Mesa Verde National Park during 2003.*

fuel loadings within the proposed project areas set the stage for a devastating, wind-driven, canopy fire event. As the maturation process continues, the potential for this type of wildland burning event will increase. The question is not will this type of burning event occur under current fuel loading conditions, but when and how far reaching will this fire event be?

Within the proposed treatment areas, as has been observed by West and Van Pell (1988) in their studies within piñon and juniper ecosystems, accelerated erosion is leading to site degradation because of increasing bare ground exposure where trees dominate. Site degradation has further added to the loss of understory development that is necessary for ground ignitions to occur. Any crown fire through this existing vegetative type will likely eliminate most of the desirable trees.

CUMULATIVE IMPACT SUMMARY:

Under the proposed action, long-term cumulative impacts to vegetation would be advantageous, as overall forest health will be improved, resulting in long-term benefits to all resources. See individual resource cumulative effects identified within this document.

PERSONS / AGENCIES CONSULTED

Colorado Division of Wildlife
U. S. Fish and Wildlife Service
Archuleta County
La Plata County
Montezuma County
Dolores County

INTERDISCIPLINARY REVIEW

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Dave Kinateder – Wildlife Biologist – Southwest Fuels Team, BLM, Gunnison, CO

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Chris Kloster – Habitat Biologist – Colorado Division of Wildlife, Durango, CO

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PUBLIC INVOLVEMENT AND COMMENTS

Complete upon 30-day comment period.

APPENDICES

Appendix A - Project Maps (The project maps can be accessed on the following Web site: ftp://ftp2.fs.fed.us/incoming/r2/sanjuan, open the prog-ea-maps folder.