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# Environmental Assessment

## Stansbury Vegetation

## Research and Treatment

**Salt Lake Ranger District, Wasatch-Cache National Forest**
**Tooele County, UT**

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# Table of Contents

# SUMMARY

The Wasatch-Cache National Forest (WCNF) proposes to establish four study plots to research the effects of various treatments on juniper-dominated sites. In addition, the Forest proposes to mechanically treat 500 acres of juniper and chemically treat 1 to 2 acre research plots of cheatgrass-dominated sites within a 40-acre portion of the 2000 Box Canyon Fire. This will help determine the best restoration treatments to move toward more desirable species composition, vegetation structure, and more natural hydrologic and ecological functions. This 40-acre area is within a larger 200-acre portion of the Box Canyon fire that would receive additional treatments to replace cheatgrass with more desirable perennial species. The project area is located on the northwestern portion of the WCNF portion of the Stansbury Mountains of northern Utah, within the Salt Lake Ranger District. This action supports a multi-university research project looking at factors associated with the loss of sagebrush to juniper and cheatgrass across the entire Great Basin. In addition, this action is designed to move vegetation toward historical conditions on this landscape.

The proposed action is expected to increase our knowledge of the effects of past management and both natural and human-caused changes in the vegetation across the Great Basin. It would likely result in small increases in non-native vegetation on experimentally burned plots (approximately 35 acres). It would likely increase the herbaceous and native brush component on mechanically treated areas, while decreasing the juniper overstory.

In addition to this proposed action, the Forest Service also evaluated the no action alternative in which the current management would continue to guide management of the project area. Under this alternative, there would be no vegetation treatment within either the juniper plant communities or those communities currently dominated by invasive, non-native species.

The proposed action was modified from how it was presented in the initial scoping document for several reasons. First, the large 1,000 acre prescribed burn was eliminated because it was no longer needed for research purposes. In addition, the Forest Service felt that the outcome of this prescribed burn would likely be similar to the consequences of the 2000 Box Canyon fire, which resulted in a dominance of cheatgrass and prickly lettuce. Second, the treatment of three to five, 25 to 50 acre sites using various research techniques was eliminated because the acreage necessary to meet requirements for research purposes were not present. Finally, because of topography and existing structural complexities (juniper skeletons remaining in place from the 2000 Box Canyon fire), the 300 acres of chemical treatment was reduced to 200 acres and includes smaller 1-2 acre research plots within a 40-acre portion of this area.

Based upon the effects of the alternatives, the responsible official will decide whether to apply prescribed fire, mechanical treatments, and chemical treatments to the juniper and non-native ecosystems in the project area, and if so:

- how many acres should be treated;
- which areas should be treated;
- what types of treatments should occur;
- when the treatments should take place;
- what mitigation measures are necessary; and
- what types of monitoring should occur.

# CHAPTER 1- INTRODUCTION

## Introduction

This chapter introduces the proposed action and the purpose and need it addresses, specifies the decisions to be made regarding the proposal, describes the scoping process, and any issues associated with this proposed action that were identified.

The Forest Service has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. This EA analyzes the effects of prescribed burning, mechanical, and chemical treatments in the juniper and non-native communities on the Salt Lake Ranger District within Tooele County. The project area is approximately 900 acres in size. This analysis will address restoring composition, structure, and function of plant communities and wildlife habitats, processes (such as seasonal and spatial patterns of historical natural fires), and other landscape dynamic to these communities. The return of native vegetation communities (primarily sagebrush) and the creation of a mosaic of varying age classes, along with the integration of the organisms that rely upon them, need to be addressed and planned for long periods of time and on a landscape level.

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

## Background

Sagebrush (*Artemisia* spp.) ecosystems occupy 100 million acres in the West and are the largest ecological community in North America. Home to more than 300 wildlife species, this ecological community is the primary forage base for the western livestock industry, provides valuable recreation opportunities, and provides precious water in a semi-arid region that has one of the fastest growing human populations in North America.

These ecosystems are considered one of the most endangered in the United States. While only about 10% of the sagebrush steppe of the Intermountain West has been converted to other cover types, more than 99% of the sagebrush steppe has been affected by livestock, and about 30% has been heavily grazed, resulting in dominance by a few woody plants (Noss and others 1995). Expansion of exotic weeds such as cheatgrass (*Bromus tectorum*) and the encroachment of juniper (*Juniperus* sp.) are two factors that have contributed most to the decline of sagebrush communities in the Intermountain Region. This encroachment has significantly altered fire regimes across the region (Ferry and others 1995).

Juniper invasion of the more moderately moist portion of this ecological community has shifted fire regimes from relatively frequent, low to mixed severity fires (10-50 year

mean fire return interval) to more infrequent (>50 year mean fire return interval) high severity fires. The observed shift from shrub steppe to juniper woodland has resulted in nearly a 6-fold increase in fuel loads (7 to 40 tons/ha; McIver and others 2004). On more arid portions of the sagebrush ecological community, exotic annual grasses have become dominant and mean fire return intervals have shifted from >50 years to <10 years. Currently, in the Stansbury Mountains as well as throughout the Intermountain West, junipers, which have increased because of fire suppression, are now being replaced by exotic grasses following fire. As a result, fire regimes have changed from relatively frequent, to infrequent (greater than 100 years in many areas, and now to a very frequent return interval. Under current climatic conditions, both exotic weeds and juniper have the potential to occupy far more area than they currently do (McIver and others 2004).

## Purpose and Need for Action

The primary purpose is to provide a research opportunity to explore various techniques to restore native species within the sagebrush ecosystem. There is an opportunity to work with several universities (Brigham Young University; Utah State University; University of Nevada, Reno; Oregon State University; and University of Idaho) to research the conditions under which native perennial understory vegetation may return following disturbance. In addition, there are opportunities to research various restoration techniques that would allow native species to replace and effectively compete with undesirable non-native invasive species.

The additional purpose of proposed vegetation treatments is to restore sagebrush ecosystems to a properly functioning condition in the Stansbury Mountains. Based on historic and current observation, approximately 80% of the historic sagebrush communities on the west side of the Stansbury Mountains have been replaced by juniper because of fire suppression within the past 50 to 100 years. With the loss of the sagebrush, there has been an associated loss of wildlife habitat and a need to improve habitat conditions in this area.

Also, recently burned areas in this landscape have been invaded by undesirable non-native species that have greatly altered the fire regime. There is a need to restore these areas to native species composition and structure in order to restore ecological functions, as well as return this area to a more natural fire regime.

## Proposed Action

The action proposed by the Forest Service, to meet the purpose and need, will include the following:

Research Treatments:

1. Prescribed burn on approximately 35 acres of existing juniper (12½ acres to be included in a research exclosure);
2. Mechanically treat one 12½-acre experimental study site by hand clear-cutting juniper to ½ meter in height;
3. Mechanically treat one 12½-acre experimental study site with a bullhog wood shredder, which converts standing juniper into compost materials on site;
4. Establish exclosures in each 12½-acre treatment area to keep livestock use from research plots.

Vegetation Treatments outside of research:

5. Mechanically treat up to 500 acres outside the experimental sites with a bullhog wood shredder;
6. Chemically treat up to 200 acres within the 2000 Box Canyon Fire. Treatments would include a combination of Plateau to treat the cheatgrass, and Dicamba or other broadleaf herbicides to treat prickly lettuce;
    a. Small 1-2 acre plots would be established in a 40-acre portion of the Box Canyon Fire that would require hand removal of burned junipers before chemical treatments can be applied.
    b. Large plots would be included within the 200-acre area that would require using a bullhog for removal of burned junipers before chemical treatments can be applied.

If a decision is made to mechanically treat the juniper in the Stansbury Mountains, the Wasatch-Cache Forest Plan (USDA Forest Service, 2003) will need to be amended. The amendment would change Management Prescription Category (MP) 2.6, Undeveloped Areas that currently does not allow for vegetation/fuel treatments. MP 2.6 would be rewritten to allow mechanical vegetation/fuels treatments (no road construction) for the low elevation juniper communities in the Stansbury Mountains. This would help maintain and/or move these sites toward a dominance of native perennial species within the historic range of variability and maintain the unique qualities of these undeveloped areas on the Stansbury Mountains.

## Forest Service Guidance

Some pertinent guidance for the management of the project area is described below, but detailed descriptions can be found in the Wasatch-Cache National Forest Plan (USDA Forest Service 2003). Forest-wide direction occurs in Chapter 4 (pp. 4-1 through 4-117) of the Forest Plan, while specific direction for the Stansbury Management Area is on pages 4-166 through 4-175. The management direction, standards, and guidelines from

the Forest Plan have been incorporated into the proposed action and alternatives for this proposal. A copy of the Forest Plan is available on the WCNF's website:

http://www.fs.fed.us/r4/wcnf/projects/feis/revised_forest_plan.pdf

## Desired Future Conditions

**Soil, Water, Riparian, and Aquatic Resources**
In general, watersheds are in properly functioning condition with adequate ground cover that prevents soil erosion and compaction. In addition, there is adequate infiltration and moisture holding capabilities provide for storage and release of water to streams and aquifers similar to historical rates.

**Wildlife Resources**
The amount, distribution, and characteristics of vegetation (live and dead) are present at levels necessary to maintain habitat for viable populations of native and desired non-native wildlife species. Big game winter ranges in the Stansbury Mountains (generally below 7,000 feet) which include the entire perimeter of the Area, will be maintained and enhanced with the goal of holding big game on the Forest longer to help decrease impacts on private lands below. In addition, sagebrush and other mountain brush species age classes will be maintained in a higher proportion of older age classes than in other locations to provide browse above the snow.

**Vegetation**
Historical Range of Variability (HRV) and Properly Functioning Condition (PFC) represent desired ranges, and management activities result in resource conditions that remain within or more toward these desired ranges. A variety of management activities and natural processes combine to help maintain a diverse vegetative environment. Vegetation cover types in the Stansbury Mountains form a mosaic of habitat diverse in species composition, plant communities, and size/age/structural classes within communities.

**Roadless Area Values**
Roadless areas mapped with Management Prescription 2.6 as well as other unroaded prescriptions (see 2003 Forest Plan) are maintained for values including:

- ✓ soil, water, diversity of plant and animal communities;
- ✓ habitat for TES and species dependant on large undisturbed land;
- ✓ primitive and semi-primitive non-motorized and motorized (open in current travel plan) recreation; and
- ✓ reference landscapes for research, study and interpretation, landscape character and scenic integrity, traditional cultural properties and sacred sites and other identified unique conditions.

Roadless areas function as biological strongholds and refuges for many species and competition by nonnative invasive species is minimized. These areas support healthy and diverse ecosystems and there is no long-term loss of roadless characteristics and values.

## Forest Goals and Subgoals

### Watershed Health Goals

A primary goal is to maintain and/or restore overall watershed health (proper functioning of physical, biological and chemical conditions) and to provide for long-term soil productivity. The 2003 Forest Plan identified the following subgoals among others:

- ✓ Identify **areas that are not in properly functioning condition**. Improve plant species composition, ground cover and age class diversity in these areas.
- ✓ Maintain and/or restore **soil productivity** to improve watershed functioning through managing groundcover, soil compaction, and vegetation.
- ✓ Maintain and/or restore **habitat to sustain populations** of well distributed native and desired non-native plant, vertebrate, and invertebrate populations that contribute to viability of riparian dependent communities.

### Biodiversity and Viability Goals

A primary goal for biodiversity and viability is to provide for sustained diversity of species at the genetic, populations, community and ecosystem scales. In addition, the forest identified the goals of maintaining communities within their historic range of variation (which sustains habitats for viable populations of species) and of reducing the potential for uncharacteristic high-intensity wildfires, and insect epidemics.

The 2003 Forest Plan identified the following biodiversity and viability subgoals, among others:

- ✓ Restore or maintain **fire-adapted ecosystems** (consistent with land uses, historic fire regimes, and other Forest Plan direction) through wildland fire use, prescribed fire, timber harvest or mechanical treatments.
- ✓ Maintain or restore **species composition**, such that the species that occupy any given site are predominantly native species in the kind and amount that were historically distributed across the landscapes.
- ✓ Provide adequate habitat components for **sustainable big game populations** coordinated with State wildlife management agencies, private lands and other resource needs and priorities.
- ✓ In revegetation projects, **establish a variety** of native species (avoiding monocultures).
- ✓ Greatly reduce known infestations of **noxious weeds** and rigorously prevent their introduction and/or spread.

## Management Prescriptions

The following direction for the management prescriptions that occur in the study area is found in the 2003 revised Forest Plan. This project area includes both management prescription 2.6 (Undeveloped Areas) and 6.2 (Livestock Forage Production). The directions for these prescriptions are defined as:

> **2.6 – Undeveloped Areas:** Manage to protect undeveloped landscapes in a manner other than formal recommended wilderness. Although other uses and activities may occur, the primary emphasis is protection to assure the values and unique qualities associated with undeveloped areas are recognized and preserved. No new developments or activity that would alter the landscape or character are allowed, however use of motorized equipment (such as chainsaws for trail clearing) is allowed.
>
> **6.2 – Emphasis on managing for livestock forage production while maintaining or restoring non-forested ecosystem integrity:** Emphasis is on managing vegetation composition and structure to produce forage for livestock. Livestock use is managed to ensure that rangelands are in satisfactory condition and/or with an upward trend. Goods and services are provided within the productive capacity of the land, and ecological functions are maintained. Non-forested landscapes range in appearance from near natural to altered where management activities are evident.

## Applicable Forest Plan Direction

The following Forest-wide Standards and Guidelines (LRMP 4-36 – 4-38) are applicable to Stansbury research and treatment project:

- (G1) Minimize the amount and impact of smoke from "fire use" activities by identifying smoke-sensitive areas, using "best available control measures," monitoring smoke impacts, and following guidance in State smoke management plans.
- (S1) Allow no ground-based skidding on slopes greater than 40 percent.
- (S2) Apply runoff controls during project implementation to prevent pollutants including fuels, sediment, and oils from reaching surface water and ground water.
- (S4) Place new sources of chemical and pathogenic pollutants (for example, portable toilets, chemicals for noxious weed treatments) where such pollutants will not reach surface water or ground water.
- (S7) Allow management activities to result in no less than 85% of potential ground cover for each vegetation cover type. (See Appendix VII for potential ground cover values by cover type.)

- (G4) At the end of an activity, allow no more than 15% of an activity area (defined in Glossary) to have detrimental soil displacement, puddling, compaction and/or to be severely burned.

- (G5) Do not allow activities that could result in water yield increases that would degrade water quality and impact beneficial uses.

- (G9) Avoid soil disturbing activities (those that remove surface organic matter exposing mineral soil*)* on steep, erosive, and unstable slopes, and in riparian, wetlands, floodplains, wet meadows, and alpine areas.

- (G11) Use Best Management Practices and Soil and Water Conservation Practices during project level assessment and implementation to ensure maintenance of soil productivity, minimization of sediment discharge into streams, lakes and wetlands to protect of designated beneficial uses.

- (G59) Manage Forest landscapes according to Landscape Character Themes, and Scenic Integrity Objectives as mapped. (See Chapter 4, A.7. Scenery Management for definitions).

- (G60) Resource management activities should not be permitted to reduce Scenic Integrity below Objectives stated for Management Prescription Categories.

- (S32) Review undertakings that may affect cultural resources to identify potential impacts. Compliance with Sections 106 and 110 of the National Historic Preservation Act shall be completed before the responsible agency official signs the project decision document.

- (G88) Design any mitigation measures necessary to resolve adverse affects to sites in such a way that they provide the maximum public benefit that the sites (or the information derived from them) can offer.

## Forest Plan Consistency

All uses of the National Forest must be consistent with the Forest Plan. The proposed action is inconsistent with the forest plan as related to mechanical treatments in Management Prescription (MP) 2.6. Three options were considered: 1) modify the proposal to make it consistent; 2) reject the proposal; or 3) amend the plan to permit the proposal. We have chosen to amend the forest plan to allow mechanical treatments within MP 2.6 only in the Stansbury Mountains (see Chapter 2).

**Significance of Forest Plan Amendments**

If the option chosen is to amend the plan, the "significance" of the amendment must be determined. It is important to note that there is a difference between "significance" of the change to a forest plan and "significance" of the environmental impacts of the Proposed

Action as defined by the Council on Environmental Quality (CEQ). Determination of "significance" for a forest plan amendment is based on the following National Forest Management Act planning requirements and criteria (FS Handbook 1909.12, Section 5.32).

**1. Timing** – Identify when the change is to take place. Determine whether the change is necessary during or after the plan period (the first decade) or whether the change is to take place after the next scheduled revision of the forest plan. In most cases, the later the change, the less likely it is to be significant for the current forest plan. If the change is to take place outside the plan period, the forest plan amendment is not required.

**2. Location and Size** – Determine the location and size of the area involved in the change. Define the relationship of the affected area to the overall planning area. In most cases, the smaller the area affected, the less likely the change is to be a significant change in the forest plan.

**3. Goals, Objectives, and Outputs** – Determine whether the change alters long-term relationships between the levels of goods and services projected by the forest plan. Consider whether an increase in one type of output would trigger an increase or decrease in another. Determine whether there is a demand for goods and services not discussed in the forest plan. In most cases, changes in outputs are not likely to be a significant change in the forest plan unless the change would forego the opportunity to achieve an output in later years.

**4. Management Prescription** – Determine whether the change in a management prescription is only for a specific situation or whether it would apply to future decisions throughout the planning area. Determine whether or not the change alters the desired future condition of the land and resources or the anticipated goods and services to be produced.

All alternatives analyzed in detail will be evaluated for forest plan consistency. The proposed forest plan amendment and evaluation of its significance are shown in Chapters 2 and 3.

## Decision Framework

The Wasatch-Cache Forest Supervisor is the official responsible for making this decision. The decision to be made is, whether to apply prescribed fire, mechanical treatments, and chemical treatments to the juniper and sagebrush ecosystems in a portion of the Stansbury Mountain Range, and if so,

- how many acres should be treated;
- which areas should be treated;
- what type of treatments should occur;

- when the treatment should take place;
- what mitigation measures are necessary; and
- what types of monitoring should occur.

In addition, the decision to be made is shall we amend the Forest Plan management prescription direction to allow the mechanical treatment of vegetation in Management Prescription 2.6 in the lower elevations of the Stansbury Mountains in order to improve and/or maintain roadless qualities. This would only be conducted without the establishment of temporary and/or permanent roads.

## Public Involvement

An important aspect of the environmental analysis process is the participation of the public and other agencies in identifying issues and concerns regarding the potential impacts of a proposal. The issues and concerns are then considered in developing alternative ways of meeting the proposal's purpose and need.

In June 2005, a scoping document listing the proposal and soliciting comments was sent to a number of individuals, organizations, and agencies on the Districts mailing list. A total of three letters were received in response to the scoping effort.

## Issues

The Forest Service separated the issues into two groups: significant and non-significant issues. Significant issues provide a framework for the effects analysis and mitigation needed for the project. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made. The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…"

Significant issues, the Forest Service identified the following topics raised during scoping:

1. Invasion of low elevation, burned juniper sites in the Stansbury Mountains by undesirable non-native plant species and associated alteration of fire regime, watershed health, and wildlife habitat;
2. Loss of desirable woody browse (deer winter range) as a result of burning**;**
3. Effects of chemicals on humans, livestock, wildlife, and rare plants;
4. Effects of treatments on current grazing;
5. Effects of grazing on experimental treatment;
6. Increase intrusion of ATV and off road vehicles use in areas opened by the fire;

7. Potential for fire to burn adjacent lands, both privately owned and managed by the Bureau of Land Management;
8. Effects of the treatments on Threatened, Endangered, Forest Service Sensitive Species, other rare plant species, migratory birds, and pollinators;
9. Effects of the treatments on archaeological sites;
10. Effects of treatment on roadless character and on potential wilderness values;
11. Effects of the treatments on wetlands and riparian areas;

The following issues were determined to be non-significant and will not be addressed in detail in this analysis. The rational for not addressing these issues further is in the project file.

1. **Which NFMA planning regulations (1982 or 2005) will be used in the planning and implementation of the project?** We will be implementing this project under the provisions of the 2005 Planning Rule.
2. **The forest should demonstrate that an MOU to promote the conservation of migratory bird populations exists and should be included in this document.** It is not considered a significant issue because it is outside the scope of this action.
3. **Recommended use of native seed for revegetation purposes.** It is not considered a significant issue because direction to use native seed for revegetation occurs in the revised Forest Plan.
4. **Adjacent historical treatments need to be accounted for in the experimental design.** It is not considered a significant issue because it is outside the scope of this action.
5. **Several comments were made related to conducting proper NEPA (EA vs. CE) analysis for this project.** Because this analysis follows standard and legal practices, direct, indirect, and cumulative effects analyses within the framework of an Environmental Assessment (EA) have been completed.
6. **The Range of Alternatives in the EA is inadequate and should include an action alternative that only involves research treatments.** Because the no action alternative addresses the effects of not implementing any vegetation treatments in the project area, this was not considered to be a significant issue. A more in-depth analysis was completed that addressed effects to potential wilderness values as noted in Significant Issues (no. 10) above.

# CHAPTER 2- ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered for the Stansbury Vegetation Treatment. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social and economic effects of implementing each alternative.

## Alternatives

**Alternatives Considered and Eliminated from Detailed Analysis**
The alternative described in the initial scoping document was considered but eliminated from detailed analysis. This alternative was eliminated for several reasons. First, the large 1,000 acre prescribed burn was eliminated because the reasons for including this large treatment (watershed scale effects) were no longer included in the research proposal. In addition, the Forest felt that the outcome of this prescribed burn would likely be similar to the consequences of the 2000 Box Canyon fire, which resulted in a dominance of cheatgrass (*Bromus tectorum*) and prickly lettuce (*Lactuca* spp.). Second, the treatment of three to five 25 to 50 acre sites using various research techniques was eliminated because the acreage and vegetation gradient requirements necessary to meet requirements for research purposes were not present. Finally, because of topography and existing structural complexities (juniper skeletons remaining in place from the 2000 Box Canyon fire), the 300 acres of chemical treatment was reduced to 200 acres and includes smaller one to two acre research plots within a 40-acre portion of this area.

**Alternatives Studied in Detail**
Each alternative has specific impacts associated with how it achieves the purpose and need for the project. The conditions and impacts are described in Chapter 3, Affected Environment and Environmental Consequences. Management Requirements and Monitoring included in each alternative are included below.

**Alternative 1, No Action**
Under the No Action alternative, current management plans would continue to guide management of the project area. Under this alternative, there would be no vegetation treatments (mechanical, prescribed fire, or chemical) within the juniper and invasive, non-native vegetation communities. Under this alternative, environmental consequences would continue to occur because the existing environment is not static.

**Alternative 2, Proposed Action**

Figure 2-1 shows the location of the treatments in Alternative 2 within the project area on the west side of the Stansbury Mountains. Figure 2-2 illustrates the locations of each specific type of treatment within the research units.

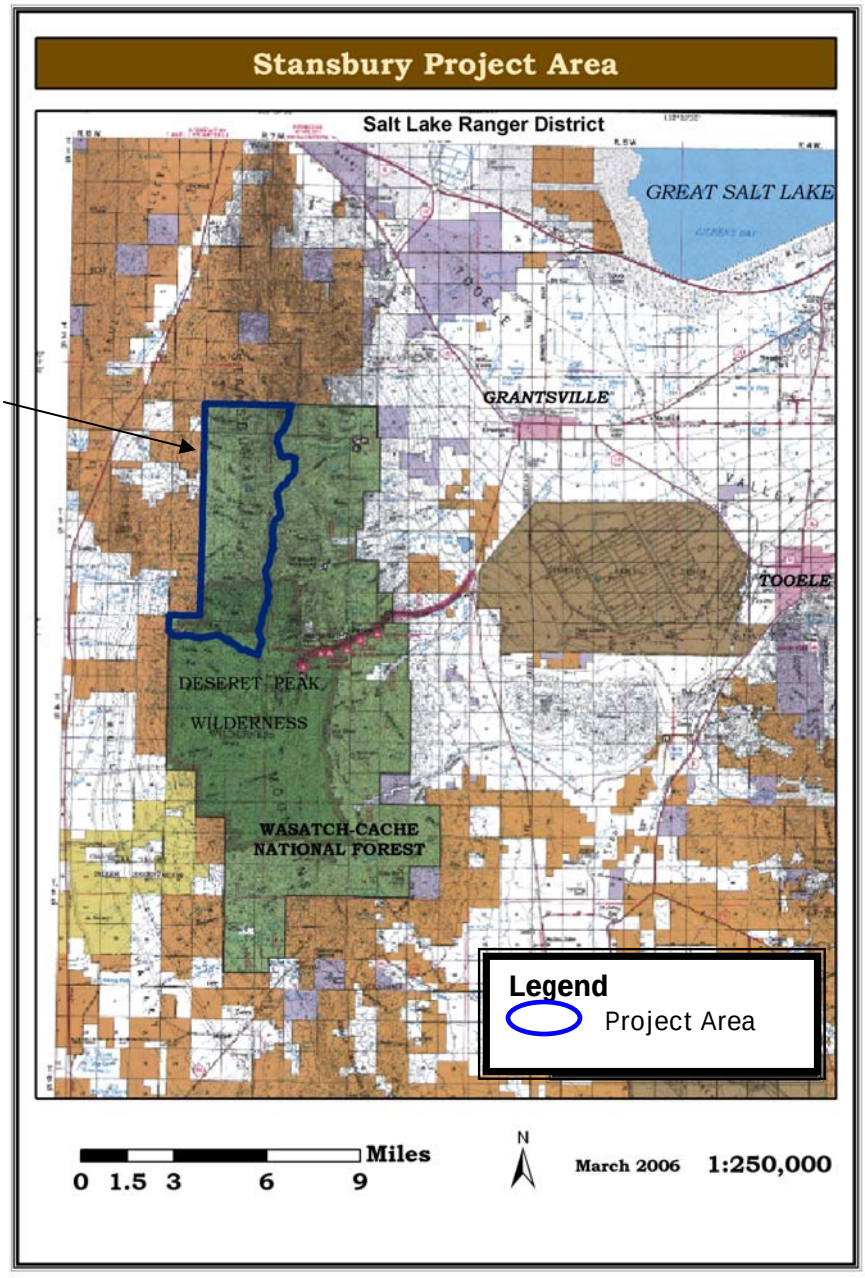



**Figure 2-1.** General location of the project area on the west side of the Stansbury Mountains.

This alternative includes the following:

1. On Experimental Plots:
    a. Prescribed burn approximately 35 acres of existing juniper;
    b. Mechanically treat one 12½-acre experimental study site by hand cutting juniper to ½ meter in height;
    c. Mechanically treat one 12½-acre experimental study site with a bullhog wood shredder, which converts standing juniper into compost materials on site;
2. Mechanically treat up to 500 acres of juniper outside the experimental sites with a bullhog wood shredder;
3. Chemically treat up to 200 acres on invasive, non-native herbaceous species within the 2000 Box Canyon Fire. Treatments will include a combination of Plateau to treat the cheatgrass, and Dicamba or other broadleaf herbicides to treat prickly lettuce;
    a. Small 1-2 acre plots would be established in a 40-acre portion of the Box Canyon Fire that would require hand removal of burned junipers before chemical treatments can be applied.
    b. Large plots would be included within the 200 acre area that would require using a bullhog for removal of burned junipers before chemical treatments can be applied.
4. Establish exclosures for each 12 ½ acre treatment area to keep livestock use from research plots.
5. Require the modification of Forest Plan Standard (S2.6) for the low elevation juniper communities in the Stansbury Mountains alone to allow for vegetation/fuel treatments (no road construction), which would help maintain and/or move these sites toward a dominance of native perennial species within the historic range of variability.

### *Ground Disturbance Associated with Research Plots*

One weather station would be installed on site. In addition, soil moisture and temperature probes would also be installed in each phase of juniper encroachment within each of the 4, 12.5 acre treatment plots (control, bullhog, slash, burn; 3 phases times 4 treatments equal 12 stations). Each station would have one centrally located data logger attached to a t-post. Four sets of wires approximately 30m in length would be buried between 2 and 6 inches deep in 4 different trenches. Probes attached to the wire would be buried in holes less than 18 inches deep and 2 inches in diameter.

Within each 12.5 acre treatment plot, vegetation and fuels would be characterized in 15, 30 x 33m subplots. Soil sampling would be done in 9 of the 15 subplots (3 subplots in each phase of juniper encroachment). To characterize the soils, one soil pit (<1m diameter x <1m deep) would be dug in each phase of juniper encroachment per treatment (3 pits per treatment x 4 treatments = 12 soil pits). Fifteen soil surface samples (10cm x

10cm x 5 cm deep) would be collected in each of the 9 subplots each year. Fifteen soil surface samples would also be taken from underneath juniper trees within the subplot.

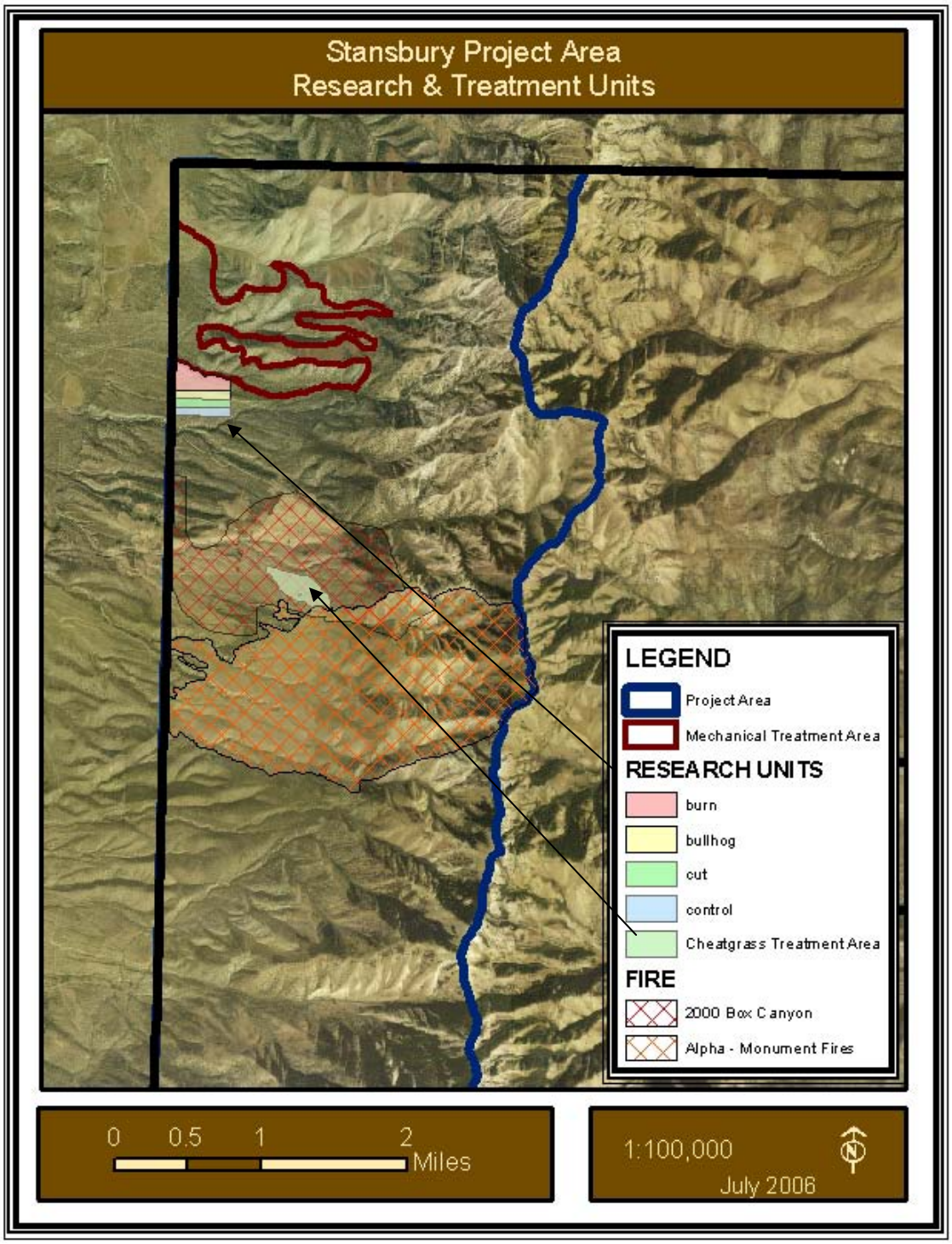



**Figure 2-2.** Location of mechanical treatment and research plots within the project area.

# Mitigation Measures

In response to public comments on the proposal, mitigation measures were developed to reduce some of the potential soil compaction impacts the action alternative may cause.

1. Use of the bullhog would:
    a. Only be allowed in dry periods to avoid soil compaction.
    b. Would be confined to the normal dry season. At the relatively low elevation of this project, and with the dominant western exposure, the normal dry season should extend from approximately April 1 through October 15. The operating season can be extended on either side of these dates when the ground is not snow covered and soil moisture content is below 15- 20% by volume.
2. When creating fire line, follow the natural contour of the land.
3. Leave overstory clumps near fencing to reduce the linear effect of fencing in the landscape.
4. High burn severity conditions would be limited to less than 15% of the treatment area.
5. For chemical treatments, do not spray chemical within 100 feet of an ephemeral or perennial stream channel.
6. The three archaeological sites that were determined to be significant will be flagged by the Forest archaeologists, and physically avoided during the implementation of this project.
7. No ground disturbing treatments would be done within 25 feet of the permanently flowing or intermittently flowing stream channels.
8. Follow the guidance in the Noxious Weed EIS adjacent to streams.

# Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in Table 2.1 is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 2.1- Comparison of Alternative 1 (No Action) with Alternative 2 (Proposed Action).

| Treatment | Alternative 1 | Alternative 2 |
|---|---|---|
| Prescribed Burn acres | None | 35 acres (12 ½ - acres with exclosure) |
| Mechanical Treatments and acres | None | 12 ½ - acres of clearcut with exclosure, 12 ½-acres of bull hog with exclosure, and 500 acres additional bull hog treatment with no exclosure |
| Chemical treatment | None | 200 acres in the 2000 Box Canyon fire permieter |
| Forest Plan Prescription change (Forest Plan Amendment) | No Change | Modify the 2.6 prescription in this area to allow mechanical treatmnet, while not allowing temporary or permanent roads to be constructed. |

## Forest Plan Consistency

A decision to mechanically treat the juniper in Management Prescription (MP) 2.6 in the Stansbury Mountains would require a Forest Plan amendment. The MP 2.6, Undeveloped Areas, currently does not allow for vegetation/fuel treatments. The primary emphasis of the MP 2.6, however, is to assure the values and unique qualities associated with undeveloped areas are recognized and preserved. The mechanical treatment of juniper at these lower elevations, without new road construction, would move these areas toward desired conditions more effectively than by using prescribed fire alone. Fires in nearby portions of this landscape have resulted in an increase in non-native, invasive species, such as cheatgrass and prickly lettuce that alter the fire regimes as described above. Allowing mechanical vegetation/fuels treatments in the juniper would maintain the values and unique qualities of these undeveloped areas by bringing them back to a properly function condition and restoring natural processes. No roads or trail construction would be permitted to conduct the treatments, and roadless qualities would be maintained or enhanced.

Current wording for the standard associated with MP 2.6 is:

> *(S2.6) Timber harvest, vegetation/fuel treatment, road construction, new recreation development, and new trail construction are not allowed.*

Amended wording for the standard associated with MP 2.6 would be:

> *(S2.6) Timber harvest, vegetation/fuel treatment, road construction, new recreation development, and new trail construction are not allowed. **

> **Mechanical vegetation/fuels treatments are allowed in the juniper stands of the Stansbury Management Area, as these activities can be used to meet the intent for which these Undeveloped Areas were established.*

# CHAPTER 3- EXISTING CONDITIONS AND ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, social and economic environments of the project area and the potential direct and indirect impacts to those resources that could occur due to implementation of the alternatives. Direct effects are defined as those impacts that occur at the same time and place as the proposed action; while indirect effects are those impacts that` occur later in time, or at another location, than the action itself. In addition, this section describes the cumulative effects or the incremental impact of past, present, and reasonably foreseeable future actions for the project area. Finally, this section also presents the scientific basis for comparison of alternatives as presented in Table 2.1 and later in this section.

For all resources, unless defined as different, the project area and treatment areas are defined as the following. All areas are also identified on the following map.

**Project area:** For analysis purposes the area covers from the north Forest Service boundary between North and South Broons Canyons to Spring Canyon, then from the ridgeline on the east to the west Forest Service boundary.

**Mechanical Treatment area:** This area is located with in the larger project area. It covers an area from South Broons Canyon to Round canyon.

**Research Treatment areas:** This area is located with in the larger project area. It covers an area from Round Canyon south to the next canyon (unnamed). With two other more isolated treatments within the unnamed canyon south of Round Canyon. All treatments are the 12.5 acres, except the 35 acre burn.

**Chemical Treatment area:** This area is located with in the large project area. This treatment is located within the Box Canyon Burn. It is in Little Granite Canyon, south of Box Canyon.

## Fuels

The analysis method is to describe the desired conditions for fuels, and present existing fuels conditions in terms of fuel models, photo series for fuel loadings, and the related expected fire behavior. The effects of the alternatives are also discussed in terms of fuel models and expected fire behavior. Determination of the fuel model, photo series, and post-treatment assumptions are based on visual observations of the area (particularly during the Fire Regime Condition Class assessment on 5/4/05) and reviewing bullhog operations near Clovis, UT on 11/29/05.

Desired conditions for fuels in the Stansbury area would be mature juniper trees widely enough spaced (or absent) so that crown fires are not likely under any wind conditions.

In addition, return to a more natural fuelbed condition would be desirable. Specifically, this would include a reduction of annual grasses that tend to create flashy fuels producing a potentially very short fire return interval. Instead, native bunchgrasses whose clumped distribution allows a less frequent, cooler fire in a mosaic pattern every few decades would be predominate. This would eliminate most juniper reproduction while keeping the perennial grasses and mountain big sagebrush healthy. If soil is not irretrievably lost and non-native annuals are not dominant, these fuel conditions would allow fire to play a more natural role in this ecosystem, maintaining a healthy balance between grasses and woody shrubs and trees, and reducing the risk of hazardous crown fires.

**EXISTING CONDITIONS**

Fuels in most of the Stansbury Vegetation Research and Treatment project area consist of relatively dense Utah juniper, with limited shrub (mostly mountain big sagebrush) and grass (non-native cheatgrass, and some native perennials such as bluebunch wheatgrass, squirreltail, and Sandberg's bluegrass) understory. Standing fuels are much more predominant than dead and down fuels. Within the chemical treatment portion of the project area (the 2000 Box Canyon Fire area), the vegetation consists primarily of cheatgrass and prickly lettuce, with remnant dead/burned standing junipers. These fuels are much flashier and continuous than the unburned part of the project area. No formal fuels monitoring has occurred (BYU would be doing this as part of their research design); the following is based on visual observations of the area.

The current fuel model for the juniper portion is probably best categorized as Rothermel's Fire Behavior Fuel Model 6 (Anderson 1982), which is generally described as dormant brush or hardwood slash. Total fuel loads for this model are typically about 6.0 tons/acre (of <3" diameter dead and live fuels), with dead fuels < ¼" diameter about 1.5 tons/acre. Fuel bed depth is about 2.5 feet. Fires will carry through flammable foliage under moderate winds.

A new set of fuel models was introduced in 2005 (Scott and Burgan 2005) to expand the previously available models. In this set, the Stansbury project area may best fit into Fuel Model SH2 (142) – moderate load dry climate shrub. This model describes a fine fuel (<1/4" dead and all live woody) loading as about 5.2 tons/acre and a fuel bed depth of about 1 foot.

Using the National Wildfire Coordinating Group's Stereo Photo Series for Quantifying Natural Fuels (Ottmar and others 2000), this general area probably best fits in PJ 07, with about 3.1 tons/acre of litter, about 1.72 tons/acre of woody material, and total aboveground biomass at about 21.55 tons/acre, predominantly of Utah juniper. The photo series is more specific than the fuel models, and most closely matches this particular site.

Expected fire behavior under current juniper conditions is that fire would not carry readily with the juniper stand (due to the low amount of surface fuels) except under moderate to high wind conditions (which are of course very common in the Great Basin), in which case it would spread very rapidly between the juniper crowns, with high flame

lengths, and be very difficult to control. Besides people who happen to be in the fire's path (such as firefighters, hunters, scattered recreationists), the primary resources at risk from wildfire include any adjacent developments (which are few in the west Stansbury area, consisting of a few scattered ranch buildings and the BLM Muskrat Fire Station several miles west) and probably some range fences and perhaps spring developments. Of greater risk is the ecological impact of wildfire in this highly altered system (see the vegetation discussion). In the Great Basin, areas dominated by juniper and burned by wildfires are generally replaced by cheatgrass, prickly lettuce, and other undesirable non-natives. This is attributable to the native perennial grasses that have been highly reduced by a combination of grazing, juniper encroachment, and subsequent soil loss. Natives perennials are often very slow to recover under current conditions.

The current fuel model for the chemical treatment area would be Fuel Model 1 – short annual grasses (Anderson 1982). For the expanded fuel models, this area would correspond to Fuel Model GR4 (104) – Moderate load, dry climate grass (Scott and Burgan 2005). Both types describe fire spread governed by fine, very porous, continuous, cured herbaceous fuels. Fuel loads are relatively light (about 1-2 tons/acre), but the continuous nature and low packing ratio create conditions for rapid fire spread on an annual basis.

A grassland photo series has not been developed. The closest photo series for the cheatgrass type might be SWSB 08 for Southwest US Sagebrush (Ottmar and others 2000), which shows scattered sagebrush and rabbitbrush over cheatgrass, with about 0.17 tons/acre biomass from shrubs, 0.27 tons/acre from grass and forbs, and 0.17 tons/acre from (mostly) litter. The area probably has a lower fuel loading figure for shrubs and a higher figure for grass and litter.

A Fire Regime Condition Class Assessment was completed in the field in May 2005 for the Horseshoe Springs subwatershed, which contains the Stansbury Vegetation Research and Treatment project. This subwatershed is highly departed from the natural fire regime (FRCC 3). This departure was due primarily to the predominance of uncharacteristic stands within the sagebrush stratum (stands dominated by either cheatgrass, seeded non-native grass, or junipers), which makes up the majority of the subwatershed.
Fire behavior in the cheatgrass system is expected to be a fast moving surface fire, with little residual heat, and moderate flame lengths. Subsequent vegetation establishment would be primarily cheatgrass and other weedy annuals.

The desired conditions for the Fire Regime Condition Class would be to restore a more natural fire regime, or at least reduce the departure from the natural fire regime, primarily by replacing juniper and/or cheatgrass areas with sagebrush and native grasses characteristic of the natural fire regime.

## EFFECTS OF ALTERNATIVES

### *Alternative 1, No Action*

Under the No Action Alternative, juniper would continue to grow, becoming more dense and eliminating what is left of the residual native understory. Fuel conditions would continue to become more hazardous. Continued no action ensures that when the wildfires come, they would likely be hot, crown fires, and there would be little or no desirable native understory to regenerate, without considerable expense and work. In the cheatgrass-dominated areas, continuous fine fuels would continue to create conditions conducive for frequent fast-moving fires, further reducing the ability of native shrubs and perennial grasses and forbs to become established.

### *Alternative 2, Proposed Action*

The proposed juniper treatments (burn, clearcut, and bullhog) would reduce hazardous fuels by eliminating or greatly reducing the standing live juniper fuel load and thus the potential for crown fires. Dead fuels would increase, particularly in the short term, more so for the clearcut and burn units than the bullhog units. Chipped juniper from the bullhog treatments would break down relatively fast (due to smaller particle size and greater soil contact) compared to clearcut and burn treatments. However, both clearcut and burn treatments would show reduced fuels over time, unlike the No Action alternative where woody fuels continue to increase as the juniper grow. After treatment, the clearcut unit would likely be Fuel Model 11 (Anderson 1982) for the short term, with relatively light logging slash (up to 11.5 tons/acre of fuels <3" diameter). In the short term, this could produce fairly active fire behavior, depending on the continuity of the fuels. The bullhog and burn units, as well as the clearcut unit over time, would probably be a Fuel Model 8, with total fuel loads about 5.0 tons/acre (<3" diameter), in a much less flammable arrangement (either chips on the ground or standing dead trunks). Fire behavior in this fuel type would likely be slow burning, with low flame lengths.

Fire behavior in any of the treatment units would also be affected by how much cheatgrass dominates after treatment. It is expected that the burn unit would probably have the highest incidence of cheatgrass (due to removal of soil cover), with lesser amounts in the clearcut and particularly bullhog (because of the increased soil cover provided by chipped material; however, this could be partially offset by increase soil disturbance from the bullhog equipment) units. An increase in cheatgrass would provide for fuel continuity and flashy flammability. Another consideration would be the increase in native perennial grasses as a result of juniper removal. An increase in native perennial grasses could reduce the dominance of cheatgrass, creating less flashy fuels and a more natural, patchy fuelbed (and soil covering).

The chemical treatment of areas currently dominated by cheatgrass would produce a reduction of the flashy, cheatgrass fuels, and an increase in the desired conditions of more patchy, less flashy perennial bunchgrass and scattered sagebrush fuels. Large-scale treatment (particularly if arranged in an overlapping, gridded pattern as suggested by Mark Finney's research) could alter the fuels across the landscape enough to slow the spread of large fires.

The proposed actions (both juniper removal and cheatgrass reduction) would improve the Fire Regime Condition Class of the individual stands by converting them from uncharacteristic stands to seral stage/vegetative conditions (early seral) under-represented on the landscape. This would contribute toward reducing departure from the natural fire regime at the landscape scale.

**CUMULATIVE EFFECTS**

Cumulative effects of this project on fuels, considered with past, present, and reasonably foreseeable future projects, would be a continued trend of reducing large, standing, woody fuels (juniper) at the landscape scale. Relevant past events and activities include the Box Canyon wildfire (755 acres in 2000) and the Alpha and Monument wildfires (1525 acres total). The Monument Fire, which occurred in the mid-1980s, was totally within the earlier Alpha Fire. Addition relevant activities include the recent BLM vegetation treatment at Round Canyon (juniper thinning) in 2005. The BLM has current and additional planned treatments in the area for the Iosepa Wildland Urban Interface (WUI) project (7,500 acres between the years 2005-2009), which includes juniper thinning and grass/forb seeding. Collectively, these fires and vegetation treatments have reduced or will reduce or eliminate woody fuels in localized areas, which contribute to restoring fuels conditions and juniper density to reference/desirable conditions across the landscape.

The increase in continuous, flashy fuels (cheatgrass) over the last hundred years or so as a result of non-native invasive weed introduction (augmented by livestock grazing, fire suppression, and other factors) is likely to cumulatively continue. Past actions include seeding intermediate wheatgrass and other non-native perennial grasses, particularly in the Alpha/Monument fires area, in order to compete with and replace cheatgrass. This project is the first in this area to use chemical treatment to try to reduce cheatgrass (and its associated fuels/fire regime effects).

## Heritage Resources

The analysis method is to present the desired conditions for heritage resources; describe heritage resource features and conditions within the project area; present information on potential effects of the treatments; and then present recommended mitigation measures.

**EXISTING CONDITIONS**

***Heritage Resource Inventory:*** Approximately 640 acres were subjected to a Class III intensive pedestrian survey. This resulted in the identification of six archaeological sites: 42 TO 2694-2699. Four of these newly identified sites are prehistoric lithic scatters, and two of the sites are historic era trash scatters. Of the six newly identified sites, three of them are determined to be eligible to the National Register of Historic Places by the USFS. Table 3.1 describes the newly identified sites and their relationship to the project area.

Table 3.1. Descriptions of newly identified archaeological sites.

| Site Number | Site Description / NRHP Eligibility | Distance to Project Area / Potential Effect. APE=Area of Potential Effect |
|---|---|---|
| 42 TO 2694 WS-456 | This site is a lithic scatter located on a ridgeline on the north side of Round Canyon. Due to the small size of the site, and the lack of significant subsurface cultural deposits, this site is determined ***not eligible to the National Register of Historic Places***. | This site is located within the APE, and ***has the potential to be affected by this undertaking.*** However, due to the topographic location of the site it is likely that this proposed undertaking would not affect it. The majority of this undertaking would take place on the alluvial fan to the west and southwest of this ridge. |
| 42 TO 2695 WS-457 | This site is a historic trash scatter located on the alluvial fan descending from the west side of the Stansbury Range into Skull Valley. Due to the small size of the site, its lack of buried deposits, and its lack of known association with significant people or events, this site is determined ***not eligible to the National Register of Historic Places***. | This site is located within the APE. ***This site has the potential to be affected by this undertaking.*** |
| 42 TO 2696 WS-458 | This site is a lithic scatter located on the alluvial fan that descends from the Stansbury Range into Skull Valley. Due to the number of different lithic raw material types and the potential for subsurface cultural deposits, this site is determined ***eligible to the National Register of Historic Places under Criterion (D): Scientific Information Potential.*** | This site is located within the APE. ***This site has the potential to be affected by this undertaking.*** To mitigate a possible adverse effect to this site it will be flagged, so that it can be avoided during project implementation. |
| 42 TO 2697 WS-459 | This site is a lithic scatter located on the alluvial fan that descends from the Stansbury Range into Skull Valley. Due to the number of different lithic raw material types and the potential for subsurface cultural deposits, this site is determined ***eligible to the National Register of Historic Places under Criterion (D): Scientific Information Potential.*** | This site is located within the APE. ***This site has the potential to be affected by this undertaking.*** To mitigate a possible adverse effect to this site it will be flagged, so that it can be avoided during project implementation. |
| 42 TO 2698 WS-460 | This site is a historic trash scatter located on the alluvial fan descending from the west side of the Stansbury Range into Skull Valley. Due to the small size of the site, its lack of buried deposits, and its lack of known association with significant people or events, this site is determined ***not eligible to the National Register of Historic Places***. | This site is located approximately 1200 feet south of the north part of the APE for this project, and approximately 1000 feet north of the south part of the APE of this proposed undertaking. Therefore, ***this site lies outside the APE and will not be affected by this undertaking.*** |
| 42 TO 2699 WS-460 | This site is a lithic scatter located on the alluvial fan that descends from the Stansbury Range into Skull Valley. Due to the number of different lithic raw material types and the potential for subsurface cultural deposits, this site is determined ***eligible to the National Register of Historic Places under Criterion (D): Scientific Information Potential.*** | This site lies within the APE of the Box Canyon Fire of 2000. ***This site has the potential to be affected by this undertaking.*** To mitigate potential adverse effects to this site, it will be flagged and avoided during the implementation of this project. |

Because of the low physical impact associated with chemical treatment, most of this survey was conducted in the northern APE where the Forest proposes a number of different treatments. The main treatment strategy would be to use a bullhog to mechanically thin approximately 500 acres in this area. The survey also avoided the steep slopes of the canyons in the northern APE; however, we did survey the majority of the ridgelines.

The result of this survey was that all of the areas considered to have high probability to contain cultural resources (in this case areas with a slope of less than 30 degrees) were subjected to a Class III archaeological survey, utilizing 15-20 meter spaced, north/south trending, pedestrian transects.

Due to the findings of *An Archaeological Survey of the Stansbury Mountains Vegetation Treatment: Report #U-05-FS-944f / #WS-05-737*, the Forest made the following recommendations:

The three archaeological sites that have been determined by the Forest to be eligible to the National Register of Historic Places under Criterion (D) fall within the APE of this proposed undertaking. The Forest will physically avoid these cultural resources during the implementation of this proposed project. This will be accomplished by flagging a 50-meter buffer zone around the cultural resources and consulting with the personnel who are implementing the project on the ground to ensure that the sites will be avoided. In light of the fact that the significant archaeological sites will be avoided by this undertaking, the Forest believes that this project will have no adverse effect on historic properties eligible to the National Register of Historic Places.

## EFFECTS OF ALTERNATIVES

### *Alternative 1, No Action*

Heritage resources would remain unchanged from existing conditions.

### *Alternative 2, Proposed Action*

Because the Forest physically avoid the archaeological sites that are potentially eligible to the National Register of Historic Places (NRHP) within the Area of Potential Effect (APE), Heritage resources would remain unchanged from existing conditions.

## CUMULATIVE EFFECTS

There is a moderate to high density of cultural resources within the general project area. Past, present and future actions that involve ground disturbing activities, or that have the potential to increase erosion, may adversely affect significant cultural resources.

## Scenery Management

The social aspect of a landscape is part of an ecosystem. Understanding how people view the landscape helps direct management activities in design and implementation. Because "people are concerned about their environment, including aesthetic values of landscapes, particularly scenery…" (SMS) the Scenery Management System (USDA Forest Service 1996) provides a framework to communicate the values of scenery in concert with other resources.

The base line for the analysis is the Natural Appearing Landscape Character Theme (LCT) and a High Scenic Integrity Objective (SIO) in the Revised Forest Plan. The purpose of this management action is to research the effects of various treatments on a juniper-dominated site(s) and cheatgrass-dominated sites.

- ✓ Prescribed burning – It is assumed that the fire would create a mosaic within the research parcel and the skeleton of the juniper would remain.
- ✓ Mechanical Treatment hand clearing – It is assumed that the density of the juniper canopy would be altered and woody material would either be chipped of burned in slash piles and scattered.
- ✓ Mechanical Treatment bullhog wood shedder– It is assumed that the density of the juniper canopy would be altered and woody material would be chipped and scattered.
- ✓ Chemical Treatment of Cheatgrass – It is assumed that the effect would be a change in surface texture and color only.

The visibility analysis is based on the casual visitor and their understanding and sense of place in the landscape. The GIS analysis is of landform only.

That fire and the use of fire in the landscape is part of the character of the landscape being viewed by the visitor to the Forest in a natural appearing landscape. The proposed actions are designed to mimic the characteristics of the landscape by creating naturally appearing mosaic patterns in the vegetation canopy.

The integrity of the viewed landscape is based on the casual visitors to the Forest. The major views into the project area would occur from travelways that are seldom used because of the difficulty of access to the site. These views would be of minimal concern to the casual visitor because the characteristic landscape is somewhat monochromatic with little diversity of color, form, texture and line.

**EXISTING CONDITIONS**
**General Landscape Character:**

1. **Landform:** Sparsely dissected main ridge slopes.
2. **Surface Water Characteristic:** Intermittent streams
3. **Vegetation Pattern:** Sagebrush and Juniper

4. **Land use Pattern:** Ranching and associated buildings, barbwire fencing dividing land ownerships or pastures mainly in valley floor with remnants of log and wood framed structures from early settlers.

**Area of Analysis:**
The analysis area lies east of State Route 196 to Dugway, and is on the western slope of the of the Stansbury Mountain range running north and south from approximately Round Canyon on the North and Little Pole Canyon on the South. The proposed actions would occur in the Northern portion of the analysis area between Round Canyon and Big Granite Canyon within a Wasatch-Cache National Forest Natural Appearing Landscape Character Theme (LCT) with a High SIO. The Ecological Unit is Subsection Stansbury Range 341A-16 within the Bonneville Basin Section 341A.

**Landscape Character Theme:**
Natural Appearing LCT is where the existing landscape character has been influenced by both direct and indirect human activities, but appears natural to a majority of viewers. The southern end of the project area is Natural Evolving Landscape Character (LCT) (Deseret Peak Wilderness) where the natural landscape character originates primarily from natural disturbances and succession of plants, with subtle change due to indirect human activities.

**Scenic Integrity Objective:** High
The northern and southwest corner end of the analysis area and the southern end is managed as "Very High". About 67% of the analysis area is managed as "High" scenic integrity objective, where the valued landscape character "appears" intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely, and at such scale, that they are not evident. The southern end of the analysis area is managed as a "Very High" scenic integrity objective about 33%, where the valued landscape character "appears" intact. Less than 1% of the rest of the analysis area is being manages as private land or as a "Moderate" scenic integrity objective. Table 3.2 summarizes the Scenic Integrity Objective by management prescription within the project area.

Table 3.2 – Acres of Landscape Character Theme – Scenic Integrity Objective (SIO) and Management Prescription (MP)

| Landscape Character | SIO | MP | Acres |
|---|---|---|---|
| Natural Appearing | High | 2.6 | 12,118 |
| | | 3.2u | 90 |
| | | 6.2 | 1,602 |
| | Moderate | 3.2d | 4 |
| Natural Evolving | Very High | 1.2 | 6,764 |
| Private | Private | Private | 33 |
| | | **total acres** | **20,610** |

**Scenic Attractiveness:** Class C – Indistinctive low scenic quality. The landscape is monochromatic offering little change in color except for the deep green of the juniper stands, which have minimal texture and variety as viewed form the middleground.

**Concern Level for travelways and viewpoints:** State route 196 to Dugway is a Level 2 concern level travelway, where the travelway is of local importance with all types of use including recreation and tourism.

The proposed project area is seen from one concern level 2 road (State Route 196, where it is an secondary travelways with local importance and interest in scenery) all other travelways have either a low concern or interest in scenery or have a minimal number of people that frequent the travelways.

**EFFECTS OF ALTERNATIVES**

### *Alternative 1, No Action*

Because this alternative is allowing nature to take its course, and minimizing human interference with natural processes the image or character of the landscape may have little change to the casual visitor overtime if no management occurs. However with no management in the juniper stand, the canopy would close, reduce diversity, and would have less of an appeal for casual visitor who prefers landscapes with a high to moderate amount of diversity in the texture of landscape. The closed canopy landscape also has a higher probability that if a natural fire ignited it would reduce the possibility of creating a mosaic in the vegetation. A denuded juniper middle ground could dominate the casual visitors view and reduce the integrity of the seen landscape.

### *Alternative 2, Proposed Action*

There would be minimal if any effect to the casual visitor for views from more primitive roads near the project site or from State Route 196, which has the highest concern for change to the integrity of the landscape. The proposed action would increase diversity by opening the canopy in the juniper of the seen landscape and help maintain or extend the visual time frame of a mosaic scene of a natural appearing landscape.

Fencing around research areas could have potentially the greatest effect to people driving within the foreground of project area. Their concern would probably be reduced because of the fencing that is found in the adjacent public and private lands and would appear to be part of the character.

The proposed project would modify densities of overstory and repeat many of the elements found in adjacent landscapes that result from wildfire. The juniper skeletons left by the prescribed burn could last for a number of years. Yet as the understory returns to its native function the juniper skeleton would represent some natural event in time that changed the overstory. By comparing photos in years past to current photos it is evident that the viewed landscape is dynamic and has changed. This does not affect the intactness of the landscape so therefore the proposed actions would be compliant with Forest Plan direction for a natural appearing LCT with a high SIO.

**CUMULATIVE EFFECTS**
The cumulative effected area is within the viewshed of people driving along State Route 196 from Marshall Spring on the North to Big Creek Canyon on the South and within about 35 years time frame based on the approximate time it takes for a juniper to reach maturity. Because the lands viewed within this viewshed are owned or managed by different agencies, individuals or organizations, it is anticipated that these lands would continue to be managed as farming, ranching and by public agency actions and that any actions would have little to no effect on the viewed landscape.

Box Canyon and the Alpha/Monument fires are within the viewshed and outside of the analysis area where the effects of past action may be apparent. These fires burned nearly 2300 acres and the fires effects may be seen from State Route 196. Although these fires covered a large area, much of the area is a mosaic of clumps to large stands of juniper creating some diversity in the landscape. The proposed actions would leave natural breaks between these existing fires and would create additional diversity in the landscape.

The BLM Vegetation treatments Round Canyon projects in the past and Iosepa WUI Project in the present and near future have and will continue to create openings in the canopy of the juniper increasing the diversity in the landscape and mimic and create the desired landscape consistent with Forest Plan direction for this area.

The cumulative effects of the proposed action and addition of past, present and reasonably foreseeable actions would result in a landscape that is more varied, diverse and appear more natural.

## Roadless Values

The Stansbury Mountains Roadless Area #0419011 includes a portion of the project area where the proposed 500-acre bullhog treatment would occur. Figure 3.1 illustrates the location of the roadless area and the project area within it.

**EXISTING CONDITIONS**
Appendices C1 and C2 of the Wasatch-Cache National Forest revised forest plan (USDA Forest Service 2003), describe in detail the characteristics of the entire roadless area. The area was not recommended as wilderness in the revised forest plan, but was provided the needed protection "…for the ecological benefits and the undeveloped landscapes" it provided. As noted in Vegetation below, there has been an estimated 600 percent increase in juniper in portions of Utah. These conditions represent, therefore, a great variation from historical and properly functioning conditions. Figures 3-4a and 3-4b illustrate how this landscape looked historically and how it looks today. These unnatural conditions in the West have been caused by a combination of factors. First, historic

overgrazing reduced fuels that helped spread fire and controlled juniper encroachment and second, by fire suppression activities, which reduced fire occurrence in these ecosystems.

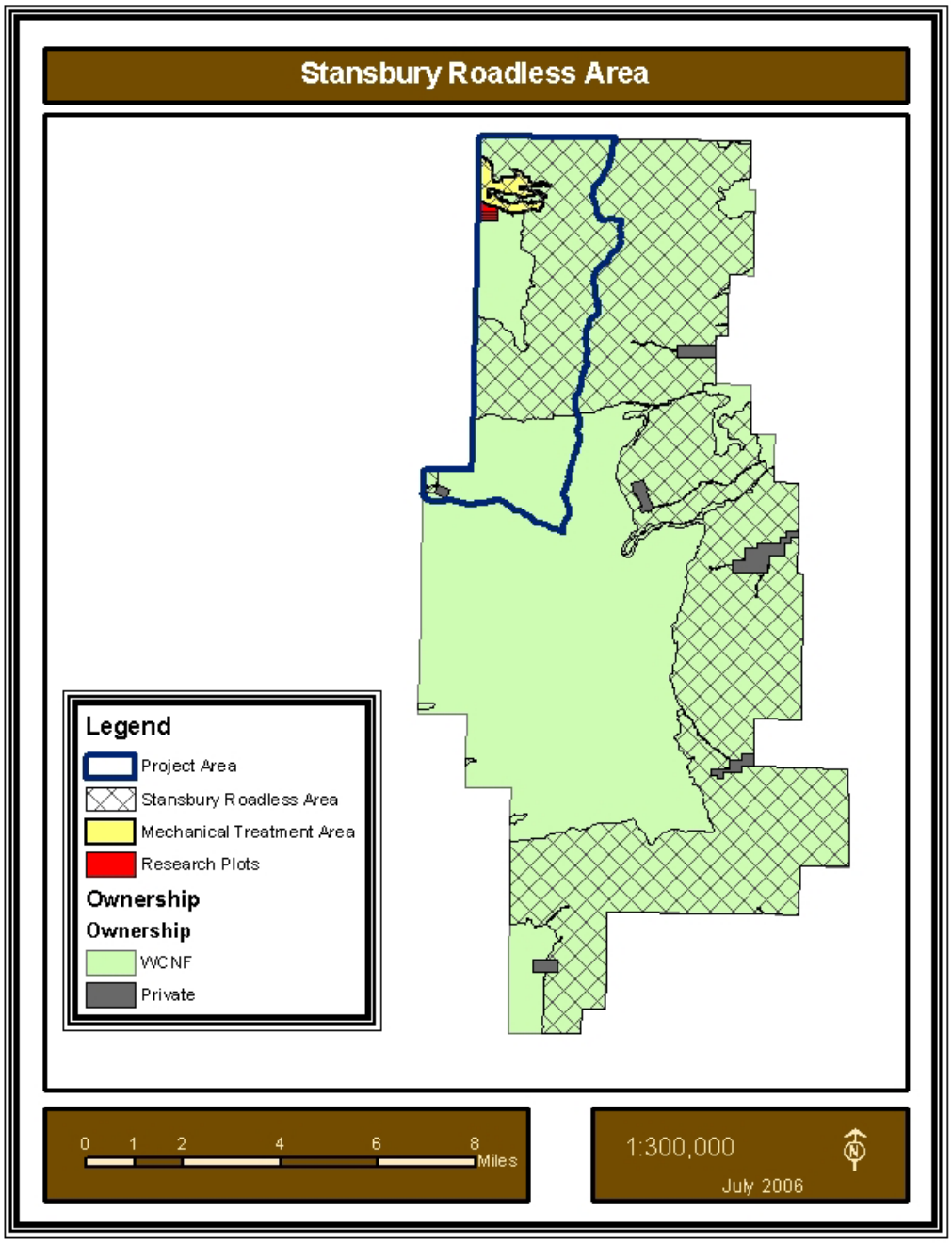



**Figure 3-1.** Location of project and mechanical treatment area within the Stansbury Roadless Area.

## EFFECTS OF ALTERNATIVES

### *Alternative 1, No Action*

The No Action alternative would have no effect on the existing character of this portion of the Stansbury Mountains Roadless Area. As noted in Vegetation Resources below, the current unnatural dominance of Utah juniper would continue to occur and natural functions would continue to be altered by this juniper dominance.

### *Alternative 2, Proposed Action*

The proposed action does not adversely affect natural integrity and apparent naturalness[1]. Natural integrity and apparent naturalness have been affected by historic management, including livestock grazing and fire suppression. In the long term, this alternative improves these wilderness characteristics because it would restore this portion of the Stansbury Roadless Area to its historic range of variation.

The roadless rule allows for fuels treatment projects in inventoried roadless areas. The area would maintain its roadless character because no roads or trails would be constructed. The human imprint would be unnoticeable, except during mechanical treatment and, perhaps, immediately after treatment until the remaining mulch forms a more naturally-appearing surface. In the short term, there may be some temporary reduction in these values (e.g. visuals and noise during treatment). Other wilderness attributes like remoteness, solitude, opportunities for primitive recreation would only be temporarily affected during project implementation.

Roadless area characteristics include soil-water-air resources, sources of public drinking water, diversity of plant and animal communities, habitat for TES and species dependent on large undisturbed areas of land, primitive recreation, reference landscapes for research study or interpretation, landscape character and integrity, traditional cultural properties and locally unique characteristics. These would not be adversely affected. Some would be improved in the long-term like diversity, habitat, and landscape character.

Figure 3.2 below illustrates how the area would look following the bullhog treatment. This site immediately west of the proposed project area was treated in 2004. In 2005, when the photo was taken, the area had a more or less natural appearance. The ecological characteristics and values of the site would move toward the pre-settlement and desired future conditions.

[1] Natural integrity is a measure of whether long-term ecological processes of the area are intact and operating and describes the extent to which human influences have altered natural processes. Apparent naturalness is a measure of past and proposed activities on the appearance of naturalness of the area to the casual observer.

**Figure 3-2.** Area just west of the proposed 500-acre treatment area that has been treated by a bullhog to reduce juniper cover.

## CUMULATIVE EFFECTS

Roadless character has, for the most part, been affected by changes in vegetation conditions from those that historically occurred to an invasion of juniper and of cheatgrass into landscapes once dominated by sagebrush (Figures 3-4a and 3-4b). The Forest Service portion of the Stansbury Mountains is approximately 69,400 acres. Of this, about 64,900 acres, or about 93.5 percent, is included in the Stansbury Roadless Area and the Deseret Peak Wilderness. In general, these exclusions are because of historic conversions of vegetation through fire[2] to non-native species such as cheatgrass, and through seeding of crested wheatgrass in sagebrush stands on the eastern portion of the mountain range. Vegetation on adjacent lands below the forest boundary have generally been altered through agricultural development and through rangeland modifications, which may have included the use of herbicides and rangeland disking and seeding of introduced species. Approximately 400 acres of lands adjacent to the forest have been similarly treated with the bullhog and have produced a much more naturally appearing landscape as shown in Figure 3-2 above.

[2] Alpha-Monument and Box Canyon fires in the project area and one in the Barlow-Deadman area of the southwestern portion of the mountain range.

# Soil Resources

The analysis method is to present the desired conditions for soil resources; describe soil resource features and conditions within the project area; present information on potential effects of the treatments; and then present recommended mitigation measures. Several sources of information are used to analyze the effects of the proposed project and alternatives. Information on the soil resource was obtained from the 2005 soil survey of the Tooele Area (USDA-NRCS, 2005). A review of bull hog operations was conducted near Clover, Utah on November 29, 2005.

**EXISTING CONDITIONS**

**Mechanical Treatment Area.** The treatment is proposed to occur on alluvial terrace and lower mountain sideslope landforms. The gently sloping western portion of the treatment area is located on a calcareous upper terrace landtype. The dominant soil type in this landtype is the Abela very gravelly loam on 5 to 15 percent slopes. The Abela soils are very deep (greater than 60 inches) to quartzite bedrock. The steeper eastern portion of the treatment area is located on a lower mountain slope landtypes. The dominant soil types in this landtype are the Reywat very cobbly loam and the Broad gravelly loam on 30 to 60 percent slopes. The Reywat soils are on southerly aspects and are shallow (less than 20 inches) to quartzite bedrock. The Broad soils are on northerly aspects and are moderately deep (20 to 40 inches) to quartzite bedrock. About 10 % of this area is in quartzite rock outcroppings.

**Chemical Treatment Area.** The treatment is proposed to occur on an upper alluvial terrace landtype within the Box Canyon Fire area that burned in August of 2000. The dominant soil within this landtype is the Kapod very cobbly loam on 5 to 30 percent slopes. The Kapod soils are very deep (greater than 60 inches) to quartzite bedrock.

**Research Treatment Area.** These treatment sites would occur on a calcareous upper terrace landtype. The dominant soil type in this landtype is the Abela very gravelly loam on 5 to 15 percent slopes. The Abela soils are very deep (greater than 60 inches) to quartzite bedrock. Farther upslope and to the east are a pair of additional mechanical research treatments that are proposed to occur on an upper alluvial terrace landtype. The dominant soil within this landtype is the Kapod very cobbly loam on 5 to 30 percent slopes. The Kapod soils are very deep (greater than 60 inches) to quartzite bedrock.

**EFFECTS OF ALTERNATIVES**

***Alternative 1, No Action***

Soil quality would generally remain unchanged from existing conditions. Wildfire would remain a disturbance agent for this area under this alternative and the potential for severe soil burning to occur as a result of wildfire must be considered. In some situations, intense heat could create hydrophobic conditions, resulting in decreased infiltration and increases runoff.

As part of this analysis, an assessment of previous wildfire activity along the Wasatch Front was made to determine the amount and distribution of high severity burn conditions within the component wildfires. The recent history of these wildfires covers the range in variation of size (from small to large) and season of occurrence (early, mid, and late season). For all fires assessed, from the time period 1964 through 2003, high severity conditions were noted on 16% of the area burned. Moderate severity was observed on 36%, and 48% of the areas were either low severity or unburned. Soil hydrophobicity data was incomplete for all fires, but averaged less than 5% of the fires where observed.

Based upon this analysis, no direct or indirect adverse effects to soil quality would occur, and soil condition following the types of wildfires that commonly occur in this area should meet Forest Plan guideline G4 for soil quality.

### *Alternative 2, Proposed Action*

Field reviews of bull hog treatments indicate that the chipper left many chips on the ground that provides erosion protection for the soil and very little ground disturbance is caused by the bull hog tracks. It is expected that bull hog treatment of the 12½ -acre experimental unit and the 500-acre bull hog mechanical treatment area would disturb the soil surface slightly but would leave adequate amounts of wood chips that would provide erosion protection. With the implementation of recommended mitigation to prevent detrimental soil compaction and rutting by mechanical equipment operating on wet soils, no direct or indirect adverse effects to soil quality would occur, and soil condition following the treatment would meet Forest Plan Guideline G4 for soil quality. Any similar treatments implemented under the Forest Plan amendment proposed for MP 2.6 prescriptions would have similar (no direct or indirect) adverse effects to soil quality.

The 12½ -acre hand-cut clearcut experimental treatment area is expected to have very little ground disturbance caused by operators operating chainsaws in the area. The cut trees would be left in place and the trees would not be hauled off site. It is expected that no increase in erosion would result from this activity and no adverse direct or indirect effects to soil quality would occur.

The installation of fences around the experimental units would have very little ground disturbance since the activity involves driving metal posts into the ground and stringing wire on the posts. No increase in erosion is expected from this activity and no direct or indirect adverse effects to soil quality would occur.

Fulton and West (2002) reviewed the effects of prescribed fire on soil quality and several conclusions were reached. They found that:

> [P]rescribed fire can impact soil quality by burning/heating the soil and killing soil organisms, thereby altering nutrient transformation rates and bioavailability. These impacts depend upon the severity and intensity of the fire. Prescribed burning of slash can increase erosion by eliminating protective cover and altering soil properties. …the degree of

> erosion after a prescribed burn depends on soil erodibility; slope; precipitation timing, volume, and intensity; fire severity; cover remaining on the soil; and speed of revegetation."

They also stated "the following management measures were identified as ways to reduce the magnitude of the effects of fire on soil quality: (1) limit fire severity, (2) avoid burning on steep slopes, and (3) limit burning on sandy or water repellent soils."

Although several adverse effects can occur from using prescribed fire, the land conditions within and around the 35 acre experimental burn treatment unit make it very unlikely likely that prescribed fire activities would affect soil quality. This is because the treatment area is not very steep (13% gradient) and the soil textures in the proposed unit are loamy (not sandy), and the time period for vegetation to reoccupy the unit should be short, being about two years. Finally, the prescription for the controlled burn activity would be designed to minimize severe soil heating and burning by limiting the occurrence of high severity fire activity to less than 15% of the project area.

As part of this analysis, an assessment of previous wildfire activity along the Wasatch Front was made to determine the amount and distribution of high severity burn conditions within the component wildfires. The recent history of these wildfires covers the range in variation of size (from small to large) and season of occurrence (early, mid, and late season). For all fires assessed, from the time period 1964 through 2003, high severity conditions were noted on 16% of the area burned. Moderate severity was observed on 36%, and 48% of the areas were either low severity or unburned. Soil hydrophobicity data was incomplete for all fires, but averaged less than 5% of the fires where observed.

Long-term soil productivity is not expected to be adversely affected by the application of chemicals to control cheatgrass in 40-acres treatment unit. The herbicide Imazapic has been found to have a moderate persistence in the soil, with a half life of about 120 days (Tu, 2001). Consequently, concentrations of the herbicide are unlikely to persist in the soil long enough to reduce the ability of the treated areas to support native plant species.

**CUMULATIVE EFFECTS**

The area of analysis for the soils related cumulative effects of the proposed action and its alternative are the actual treatment units of the proposed action.

Both of the alternatives meet Forest Plan direction for preserving soil quality and long-term soil productivity. With the implementation of recommended mitigations, the proposed treatments under the action alternative would result very little, if any, detrimental soil disturbance. Therefore, the proposed action would not have cumulative effects on soil quality.

The potential for detrimental soil burning to occur from wildfire may be higher for the no action alternative. If it does, past wildfire assessments indicate that the amount of severe soil burning could range from 0 to 100%, with an average value of 16% of the fire area.

With the exception of the project area contained within the 2000 Box Canyon Fire, the proposed treatment units have very little existing soil quality problems or detrimental soil disturbances resulting from past or present management activities. The Box Canyon Fire area has existing soil quality problems from poor post fire ground cover conditions. Removal of cheatgrass in favor of perennial species under the proposed action would certainly not make these conditions cumulatively worse. Because the Box Canyon fire removed most of the large Juniper related fuels, the likelihood of additional (cumulative) severe soil burning from future wildfire is very low.

## Vegetation Resources

The analysis method is to present the desired conditions for vegetation resources; describe vegetation features and conditions within the project area; present information on potential effects of the treatments; and then present recommended mitigation measures. Several sources of information were used to analyze the effects of the proposed project and alternatives including a map of the existing vegetation and assumed historical conditions. The assumed historical conditions were based on photography from the turn of the $19^{th}/20^{th}$ century. An interdisciplinary field trip was taken to the project area in July 2005 to review conditions in the project area and conditions after a bull hog treatment was completed earlier in the year. Additional fieldwork was completed in order to develop a representative map of existing vegetation conditions. A review of bull hog operations was conducted near Clover, Utah in November 2005 to determine the effects of such treatment on juniper in the landscape.

**EXISTING CONDITIONS**

The project area is dominated by Utah juniper (*Juniperus osteosperma*) with scattered, sparse understory vegetation of Sandberg's bluegrass (*Poa secunda*), bluebunch wheatgrass (*Pseudoroegneria spicata*), and junegrass (*Koelaria nitida*). Rocky mountain juniper (*J. scopulorum*) occurs near streams and on more mesic slopes in the Stansbury Mountains (Taye 1983). Figure 3-3a and 3-3b shows the current and estimated historic distribution of cover types within this landscape, which are summarized in Table 3.3.

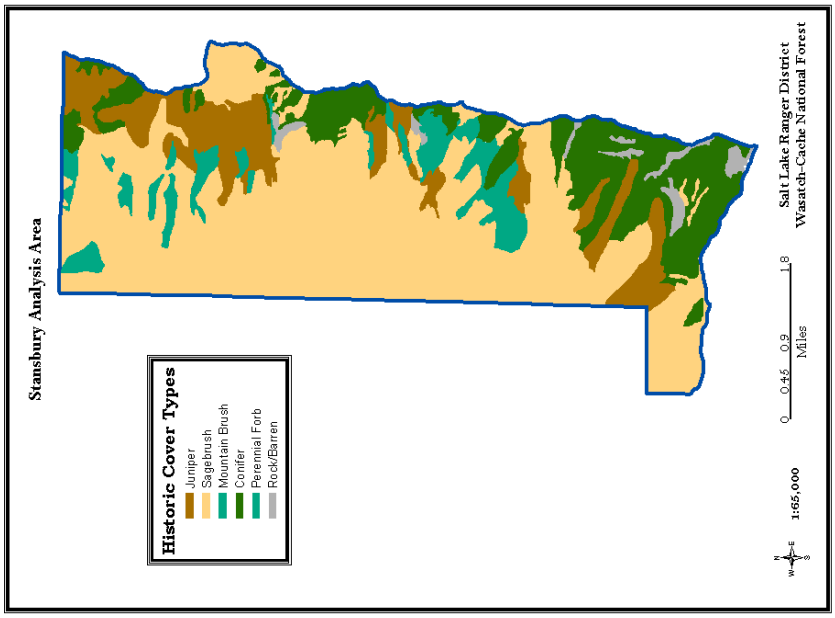



Figure 3-3b. Likely historic distribution of cover types in the Stansbury Study Area.

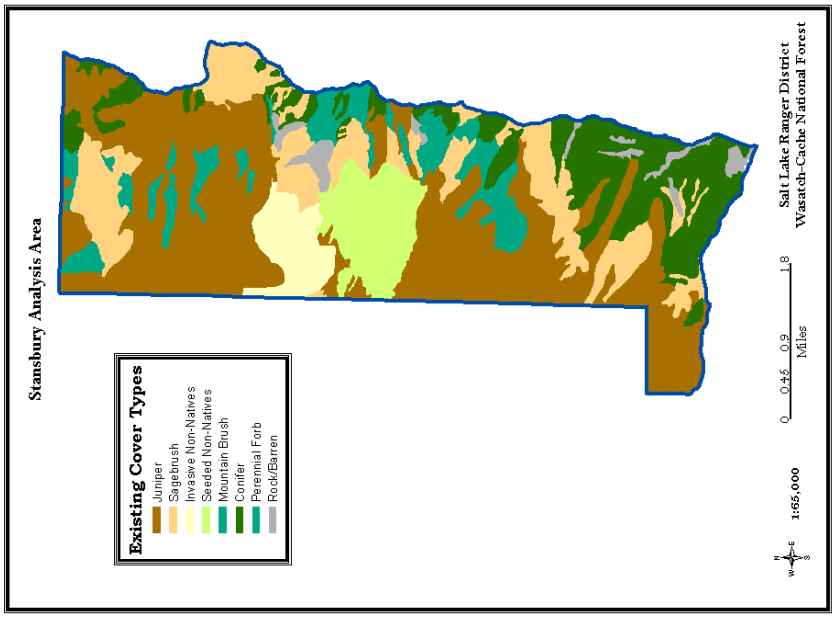


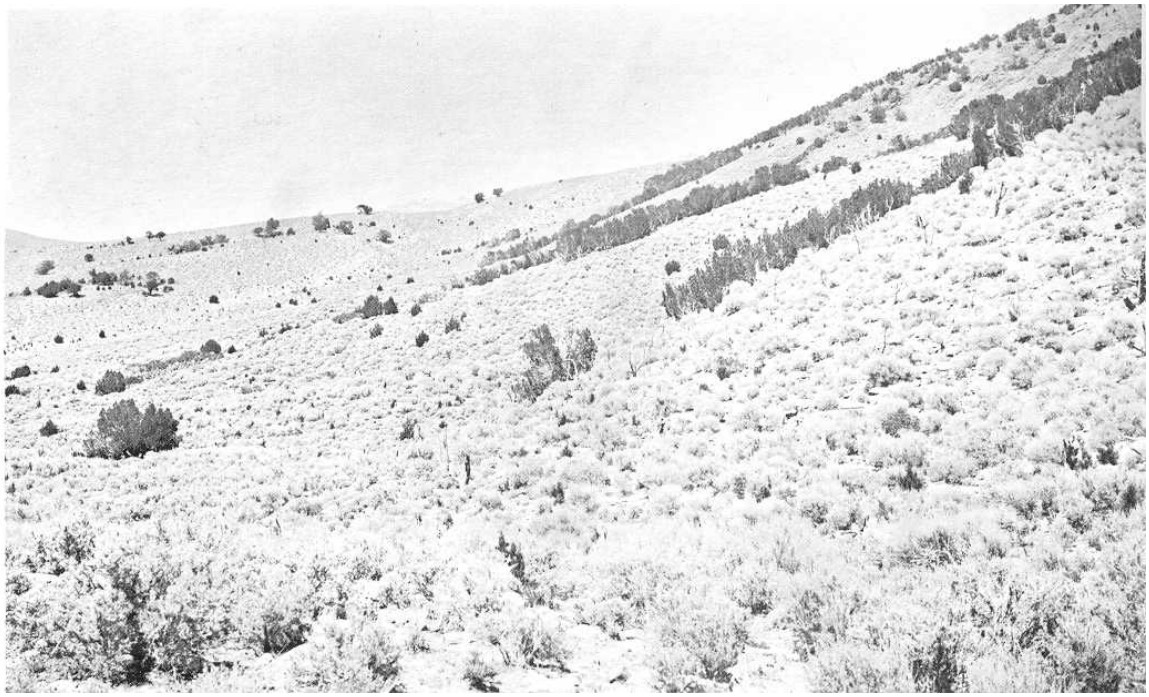

Figure 3-3a. Distribution of existing cover types in the Stansbury Study Area.

Historically, while Utah juniper did occur on rockier sites within the landscape, much of the area was dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) in the early 1900's.

Table 3.3 Existing and estimated historic acres by cover type within the project area.

| Cover Type | Existing Acres | Estimated Historic Acres |
|---|---|---|
| Juniper | 5,255 | 1,875 |
| Sagebrush | 2,095 | 6,875 |
| Seeded Non-natives | 865 | 0 |
| Invasive Non-natives | 535 | 0 |
| Mt. Brush | 730 | 930 |
| Tall Forb | 395 | 395 |
| Conifer | 1,980 | 1,980 |
| Barren | 300 | 300 |
| **Total** | **12,155** | **12,155** |

Figures 3-4a and 3-4b illustrate the changes that have occurred over approximately 100 years since settlement. In that period, livestock grazing and fire suppression have resulted in a transition from sagebrush-dominated hillsides, to those dominated by Utah juniper.



3-4a. Near the mouth of Big Creek Canyon on the southern end of the project area, showing a nearly complete dominance of mountain big sagebrush. G.K. Gilbert, a geologist in the Bonneville Basin, took the historic photo in 1901.

Figure 3-4b. The same view of Big Creek Canyon in 2005 showing a nearly complete dominance of juniper as a result of fire suppression and livestock grazing.

## EFFECTS OF ALTERNATIVES

### *Alternative 1, No Action*

Areas currently dominated by Utah juniper would continue to be dominated by this species until unplanned fires occur. With unplanned fire, species composition would likely be similar to the Box Canyon fire of 2000, which resulted in the dominance of cheatgrass and prickly lettuce. These species tend to remain dominant over extended periods of time because they result in increased fire return interval.

Cottam and Stewart (1940) reported a post-settlement expansion of Utah juniper in the Mountain Meadows portion of southwestern Utah by about 500 percent between 1864 and 1934. The current unnatural dominance of Utah juniper would continue to occur and natural functions would continue to be influenced by this juniper dominance. In addition, a conversion to cheatgrass and other non-native invasive species would likely occur following fire, similar to conditions that followed the adjacent Box Canyon fire of 2000. This increase in cheatgrass would likely result in a significantly shorter fire return interval. Miller and Tausch (2002) found that pre-settlement fire return intervals were sufficient to keep western juniper from encroaching mountain big sagebrush-Idaho fescue plant associations. Mean fire return intervals were generally between 15 and 20-25 years in mountain big sagebrush ecosystems, which once occupied this landscape. Paysen and others (2000) found that after 2-3 burns, sagebrush sites can be converted to cheatgrass dominance and fire return interval can be shortened and 5½ year fire cycles will maintain cheatgrass.

### *Alternative 2, Proposed Action*

There would be an increase in forage production, shrub cover, and plant diversity. Figure 3.4 illustrates the difference between an area treated with a Bullhog on lands immediately to the west of the proposed 500-acre juniper treatment. This figure not only illustrates the increase in understory production, but also shows how the landscape more closely resembles the historic conditions shown in Figure 3.3a. Bates and others (2005) studied the recovery of sagebrush grasslands for thirteen years after a western juniper-cutting project was initiated. They found that herbaceous production increased from 40 lb/acre to 1,000 lbs/acre in the first five years of the study. In the subsequent 8 years, production was 8 to 10 times greater in the cut areas when compared to the uncut areas. These authors also found that plant diversity doubled, understory cover increased 5 fold, and bunchgrass density increased 4 fold in the cut areas. There is much less likelihood of non-natives invading these areas following fire because intensity would be lower. Existing native herbaceous species would be more likely to recover following lower intensity fires, and more rapidly reoccupy these sites, thus competing with the invasives more effectively.

**Rare Plant Species**

Surveys have resulted in no occurrences of rare plants within the project area. Utah Department of Natural Resources, Natural Heritage Program rare plant inventories identify only a few species that occur within the general vicinity of the project area. These are small spring parsley (*Cymopterus acaulis* var. *parvus*), Cottam's cinquefoil

(*Potentilla cottamii*), and Broadleaf penstemon (*Penstemon platyphyllus*). Small spring parsley occurs at lower elevations southwest of the forest in dry salt desert shrub and on other sandy sites (typically sand dunes and stabilized sand dunes), often with Indian ricegrass (*Achnatherum hymenoides*). These sites do not occur in the project area. Cottam's cinquefoil occurs above 9,000 ft. elevation east of the project area in habitats that do not occur in the treatment areas. Broadleaf penstemon, a Wasatch-Cache National Forest Watch plant species, occurs on the eastern side of the Stansbury Mountains, but was not found when surveys were conducted in the area.

**CUMULATIVE EFFECTS**

Two areas within this landscape have burned within the past 20 years. The Box Canyon Fire of 2000 resulted in the dominance of cheatgrass (*Bromus tectorum*) and prickly lettuce (*Lactuca serriola*), both non-native invaders following disturbance. This area had been seeded, following the fire, to the native bluebunch wheatgrass, but it was relatively unsuccessful. It is mapped as "Invasive Non-natives" in Figure 3.2a. Just south of the Box Canyon fire were the Alpha and the Monument fires; the Monument fire burned entirely within the perimeter of the Alpha fire. This area was seeded to non-native perennial grasses, including intermediate wheatgrass (*Thinopyrum intermedium)* and is mapped as "Seeded Non-natives" in Figure 3-2a. These seeded grasses were able to compete with the less desirable invasive species and currently dominate this area.

It is estimated that, on National Forest System and adjacent lands to the west, there are approximately 18,000 acres of juniper within the landscape in which this project area occurs. Within the past two years, the BLM has treated an estimated 500 to 1,000 acres of juniper with a bullhog in the area west of the Forest boundary. This has resulted in thinning the juniper to open the canopy and an increase in herbaceous production. In addition, within the Box Canyon and Alpha-Monument fire perimeters, there has been a reduction of juniper in this landscape by over 2,000 acres.

The BLM plans to treat an additional 7,500 acres of juniper within the watershed and nearby lands by 2009. This total of 8,000 to 8,500 acres of juniper treated by the BLM, in addition to the nearly 500 acres of juniper treated in this project, would result in approximately 8,500 to 9,000 acres of juniper in the landscape that would be moved toward the historical range of variation. There would remain between 9,000 and 9,500 acres of juniper on a landscape that once had an estimated 1,875 acres under pre-settlement conditions.

## Water Resources

The analysis method is to present the desired conditions for water resources; describe water resource features and conditions within the project area; present information on potential effects of the treatments; and then present recommended mitigation measures. Several sources of information are used to analyze the effects of the proposed project and alternatives. An interdisciplinary field trip was taken to the project area on July 28, 2005 to review conditions in the project area and conditions after a bull hog treatment was

completed earlier in the year. A review of bull hog operations was conducted near Clover, Utah on November 29, 2005.

## EXISTING CONDITIONS

**Water Features –** The project area is located on the west side of the Stansbury Mountains and the waters of this area drain into the mud flats of Skull Valley. The project is on foothills that are dissected by ephemeral channels. No floodplains, wetlands, or municipal watersheds occur in the project area. The upland area is dry and no water features are present except the uppermost 800 feet of an ephemeral channel located on the west side of the proposed bull hog treatment unit and three ephemeral channels located in the proposed 500-acre mechanical-treated juniper unit whose lengths are 2,700 feet, 4,500 feet, and 1,200 feet. Another ephemeral channel is located along the south edge of the projects 500-acre mechanical-treated juniper unit whose length is 3,700 feet.

The ephemeral channels have pea-sized to cobble-sized beds that flow during spring runoff and infrequent summer storms. The channels are not very stable and do not have deep-rooted perennial vegetation because of the lack of perennial water.

**Water Quality -** The State of Utah has designated the streams draining the Bear River watersheds above the National Forest boundary as Antidegradation Segments. This indicates that the existing water quality is better than the established standards for the designated beneficial uses. Water quality is required by state regulation to be maintained at this level. The beneficial uses of streams within these watersheds, as designated by the Utah Department of Environmental Quality, Division of Water Quality, are:

- Class 2B – protected for recreation
- Class 3A – protected for cold water species of game fish and other cold water aquatic species
- Class 4 – protected for agricultural uses.

The numeric water quality standards can be found in Section R317-2, Utah Administrative Code, *Standards of Quality of Waters of the State* (Utah, State of. 2006).

Based on a review of the 2006 Utah 303(d) List of Impaired Waters, the waters draining the west side of the Stansbury Mountains have not been assessed.

## EFFECTS OF ALTERNATIVES

### *Alternative 1, No Action*

Water quality would remain unchanged from existing conditions. Because protective ground cover is lower under current conditions erosion and sedimentation would continue to occur at rates higher than those found under historic conditions. Except for the spring-fed portions of the stream such as below Box Canyon Spring, the streams are naturally high sediment yielding streams that flow for a short period of time.

### *Alternative 2, Proposed Action*

This section describes the effects to water resources from the proposed treatments. The field reviews of bull hog treatments indicate that many chips were left on the ground that provide erosion protection for the soil and very little ground disturbance is caused by the bull hog tracks. It is expected that bull hog treatment of the 12.5-acre experimental unit and the 500-acre bull hog mechanical treatment area would disturb the soil surface slightly but would leave adequate amounts of wood chips that would provide erosion protection, sediment is not expected to be delivered to the ephemeral channels, and no direct or indirect adverse effects to water quality would occur.

The 12.5-acre hand-cut clearcut experimental treatment area is expected to have very little ground disturbance caused by operators operating chainsaws in the area. The cut trees would be left in place and the trees would not be hauled off site. It is expected that no increase in erosion or sediment movement would result from this activity and no adverse direct or indirect effects to water quality would occur.

The installation of fences around the experimental units would have very little ground disturbance since the activity involves driving metal posts into the ground and stringing wire on the posts. No increase in erosion is expected from this activity and no direct or indirect adverse effects to water quality would occur.

Researchers (Fulton and West 2002) reviewed the effects of prescribed fire on water quality and several conclusions were reached. They found that "prescribed fire can impact water quality by heating the soil and killing soil organisms, thereby altering nutrient transformation rates and bioavailability. These impacts depend upon the severity and intensity of the fire. Prescribed burning of slash can increase erosion and sediment delivery to streams by eliminating protective cover and altering soil properties. …The degree of erosion after a prescribed burn depends on soil erodibility; slope; precipitation timing, volume, and intensity; fire severity; cover remaining on the soil; and speed of revegetation." They also stated "the following management measures were identified as ways to reduce the magnitude of the effects of fire on water quality: (1) limit fire severity, (2) avoid burning on steep slopes, and (3) limit burning on sandy or water repellent soils."

Although several adverse effects can occur from using prescribed fire, the land conditions within and around the 35 acre experimental burn treatment unit make it likely that very little sediment would leave the unit and indirectly adversely affect water quality. This is because the treatment area is not very steep (13% gradient), the distance sediment would need to travel to reach a stream is over 2000 feet, and burning under controlled circumstances should not harm the soil and the time period for vegetation to reoccupy the unit should be short, being about two years.

Water quality is not expected to be directly or indirectly adversely affected by the application of chemicals to control cheatgrass in 40-acres treatment unit. The ecological risk assessment for the Imazapic, the active ingredient for the chemical that would be

used to treat the area, indicates that no adverse effects to water quality should occur under the applications that would be used for this project. The risk assessment states that no risks to non-target aquatic plants is likely from a direct spray; no risk to aquatic plants were predicted at typical application rates from off-site drift; no risks were predicted for non-target terrestrial plants and non-target aquatic plants in the stream, fish, aquatic invertebrates from surface runoff, and although risk to non-target plants may occur if herbicide is spilled directly into a pond, no direct risk was predicted for fish or aquatic invertebrates from accidental spill to a pond. No direct and indirect adverse effects are expected to water quality from use of this herbicide because of the risk assessment presented above and because contamination of water is unlikely due to the lack of ponds or live water in the area; the treatment would occur during the dry period of the year; the precipitation in the area is very low (about 8 inches per year); application of the herbicide would be from the ground and not by an airplane or helicopter; and application would not occur within the ephemeral channels.

**CUMULATIVE EFFECTS**

Several activities have occurred, are occurring, and are planned to occur in the project area as listed in the Cumulative Effects Analysis Worksheet. These include motorized ATV use, non-motorized use (horseback), livestock grazing, the Box Canyon Fire, Alpha and Monument Fires, BLM vegetation treatment in Round Canyon in 2005, and BLM future vegetation treatments. The effects of these activities on water quality is low because most of the drainages are ephemeral and flow only in the spring season or during intense thunderstorms which is typical of these types of drainages. The water quality during these types of events would be expected to have high sediment loads and then the channel becomes dry. Box Canyon Spring flows year-round and supports a small riparian area and although portions of the riparian area were burned in the Box Canyon Wildfire, riparian vegetation is growing back and the riparian area is improving. The BLM Treatments have and continue to increase the ground cover by leaving shredded-woody material and lowers the runoff potential in the areas treated. Since the proposed treatments have had very little effect on water quality and the past, present and future activities are not expected to change water quality conditions in the drainage area, the cumulative effects of the project is expected to have very little change to the water quality.

## Wildlife Resources

The analysis method is to present the desired conditions for wildlife resources; describe features and conditions within the project area for wildlife resources; Present information on potential effects of the treatments; and then present recommended mitigation measures.

**EXISTING CONDITIONS**

In the early 1900's, much of the area was dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), however, Utah juniper did occur on rockier sites within the landscape. Through fire suppression and livestock grazing this area succeeded to a landscape dominated by juniper and current composition, structure, patterns, and functions have been altered as a result.

**Threatened and Endangered Species**

There are four federally listed wildlife species for the Wasatch-Cache National Forest: bald eagle, black-footed ferret, Canada lynx, and yellow-billed cuckoo. Of these four species the USDI Fish and Wildlife Services list only the bald eagle and yellow-billed cuckoo in Tooele County.

**Bald eagle**

Bald eagles (*Haliaeetus leucocephalus*) nest in large trees or snags with sturdy branches in areas that provide adequate food and close proximity to open water. Bald eagles generally utilize cottonwoods and snags near open bodies of water as winter roosting sites, and feed opportunistically on fish, waterfowl, and mammals. They also winter on more upland areas feeding on small mammals and carrion. In wintering areas, bald eagles commonly roost in large groups. There are several hundred bald eagles wintering in Utah.

On the Wasatch-Cache National Forest, bald eagles use lower elevation areas on south and west facing slopes for roosting in areas where there is open water and other abundant food sources. The heaviest concentrations are along the Wasatch Front and the Vernon area, with individuals and smaller groups around Cache Valley, Ogden Valley, and Kamas.

**Yellow-billed cuckoo**

The yellow-billed cuckoo (*Coccyzus americanus*) preferentially selects moderately dense thickets and deciduous trees near water at lower elevations. They use low, dense, shrubby vegetation to a very high degree. They generally require relatively large riparian tracts below 7,000 feet for breeding and typically nest 4 to 8 feet off of the ground. Their diet consists mainly of insects although they will feed on some fruit and an occasional frog or lizard.

It is rare in Utah but sightings do occur on a fairly consistent basis. The best habitats on the Wasatch-Cache National Forest are in the lower ends of the major canyons in Salt Lake County, along the Ogden River, around Pine View Reservoir, and along the lower Blacksmith's Fork and Logan Rivers.

**Sensitive Species**

Sensitive species are identified as "those for which population viability is a concern, as evident by… significant current or predicted downward trends in population numbers or density… or in habitat capability that would reduce a species existing distribution". Table 3.4 includes the wildlife species on the current sensitive species list for the Forest Service Intermountain Region that are listed as occurring or having habitat on the Wasatch-Cache National Forest. Also included is a brief description of habitat requirements for these species, the presence of suitable habitat and expected occurrence

of these species in the project area, and the documented occurrence of these species in the project area or on the Wasatch-Cache National Forest.

On the Wasatch-Cache NF there are 13 terrestrial wildlife species sensitive species. Of those species for the Wasatch-Cache NF, only the following occur or have habitat within the project area: pygmy rabbit, greater sage-grouse, spotted bat, Townsend's big-eared bat, northern goshawks, three-toed woodpecker, and peregrine falcon. The Townsend's big-eared bat, northern goshawk, three-toed woodpecker, and the peregrine falcon have habitat in the project area but implementation would not target the habitat for these species. These species have been analyzed and are included in the terrestrial wildlife report and the Biological Assessment and Biological Evaluation (BA/BE) written for this project. The pygmy rabbit and the greater sage-grouse will be discussed further in this document. Forest Service sensitive species surveys have been conducted in appropriate habitat types in the Stansbury Mountains.

Table 3.4 - Forest Service Region 4 sensitive species: probability of occurrence in project area.

| Species | Status[1] | Habitat Requirements | Presence of Suitable Habitat | Documented Occurrence | Probability of Occurrence |
|---|---|---|---|---|---|
| Northern goshawk *Accipiter gentilis* | R4 MIS | Coniferous, mixed coniferous, and riparian (aspen stringers) forests. | Yes. | Yes, on the WCNF but not in project area. | Low. |
| Peregrine falcon *Falco peregrinus* | R4 | Prefer nesting cliffs in mountainous areas or in river canyons and gorges. Forage in riparian areas or in open meadows. | Yes. | On the east side of the Stansbury Mountains. | Low. |
| Boreal owl *Aefolius funereus* | R4 | High-elevation spruce-fir forests. Snags with cavities required for nesting. | No. | No. | None. |
| Flammulated owl *Otus flammeolus* | R4 | Mixed pine forests and aspen. Snags with cavities required for nesting. | No. | Yes, on the WCNF but not in project area. | None. |
| Great gray owl *Strix nevulosa* | R4 | Mixed coniferous and hardwood forests. Snags required for nesting. | No. | Irregular winter vagrant in Utah. | None. |
| Three-toed woodpecker *Picoides ridactytus* | R4, | Coniferous and mixed forest types at elevations up to 9,000 feet. Requires snags for nesting and foraging. | Yes. | Yes, on the WCNF but not in project area. | Low. |

| Species | Status[1] | Habitat Requirements | Presence of Suitable Habitat | Documented Occurrence | Probability of Occurrence |
|---|---|---|---|---|---|
| Columbian sharp-tailed grouse *Tympauchus phasianellus columbianus* | R4 | Grasslands, sagebrush, mountain shrub, and edges of riparian woodlands. | Yes. | No, range restricted to Box Elder, Weber, and Cache counties. Not found in the project area. | None. |
| Greater sage-grouse *Centrocercus urophasianus* | R4 | Sagebrush communities used during all life cycle stages. Riparian meadows, springs, and streams are also used during late brood-rearing. | Yes. | Yes, on the WCNF but not in project area. | Moderate. |
| Wolverine *Gulo gulo* | R4 | From low-elevation, forested drainage bottoms to high-elevation, sparsely timbered cirque basins. | No | No reports verified on WCNF. | None. |
| Pygmy rabbit *Brachylagus idahoensis* | R4 | Areas with tall, dense sagebrush. Require deep soils to excavate burrows. | Yes. | Not on WCNF. | Low. |
| Spotted bat *Euderma maculatum* | R4 | Roosts in crevices of rocky cliffs at elevations up to 10,600 feet. Forages in ponderosa pine, pinyon-juniper woodlands, and shrub desert. | Yes. | Not on WCNF. | Low. |
| Townsend's big-eared bat *Corynorhinus townsendii* | R4 | Roosts in caves and abandoned mines at elevations up to 9,500 feet. Forages in shrublands, woodlands, and open montane forests. | Yes. | Yes, on the WCNF but not in project area. | Low. |

[1] R4 = Forest Service Region 4 sensitive; MIS = management indicator species for the Wasatch-Cache National Forests.

### Pygmy rabbit

The range of the pygmy rabbit includes eight western states (California, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming). Pygmy rabbits are reported through must of the Great Basin in isolated patches. Fragmentation and degradation of mature sagebrush habitat are principal causes of the decline of pygmy rabbit populations. Some reasons for the habitat loss include fire

frequency, conversion to agriculture, suburban encroachment, overgrazing, and large-scale chemical treatments to remove sagebrush (UDWR 2003).

Pygmy rabbits are found primarily in big sagebrush and rabbit brush dominated communities. Within these vegetation communities, pygmy rabbits are limited to areas on deep soils with tall, dense sagebrush. These areas are used for food, cover, travel routes, and escape routes (Tesky 1994). Sagebrush species dominate winter diets. In the summer there is a shift to more grasses and forbs, while still heavily favoring sagebrush (UDWR 2003).

Pygmy rabbits are the only rabbit that digs burrows. With this unique habit of digging burrows, deep loose soils have been shown to be an important factor in pygmy rabbit habitat (UDWR 2003). Burrows are usually located on slopes at the base of sagebrush plants, and face north to east (Tesky 1994). Burrows are used more in winter for thermal cover than at other times of the year (Tesky 1994).

In Utah, the pygmy rabbit's range is limited to the western half of the state with additional occurrences in Cache, Rich, and Wayne Counties (UDWR 2003). This is only a small proportion of its historical range in Utah. The distribution is determined by the presence of deep soils and tall, dense sagebrush (UDWR 2003). No pygmy rabbits were found during field reviews of the project area. There have been no pygmy rabbits found on the Wasatch-Cache National Forest.

**Greater sage-grouse**

Sage-grouse, historically occurred from British Columbia east to Saskatchewan and south to New Mexico and California. Today, they are found in only 11 states and 2 provinces (McWilliams 2002). Extensive habitat loss and habitat modifications are possible reasons for decline in populations. Some reasons for habitat loss include juniper expansion, urban expansion, agriculture conversion, herbicide treatments, rangeland seeding, and livestock grazing management (UDWR 2003).

The great sage-grouse are dependent on sagebrush dominated habitats. They inhabit sagebrush- grasslands or juniper sagebrush- grassland communities. Meadow surrounded by sagebrush may by used as feeding grounds (McWilliams 2002). For optimal habitat, a good understory of grasses and forbs, and wet meadow areas are essential. Sagebrush provides one of the only means of protection for birds from weather and predators.

In winter, sage-grouse require tall stands of sagebrush where they can feed above snow cover (Adams et.al. 2004). Leks or mating areas usually consist of open areas with low, sparse sagebrush cover (McWilliams 2002). Ideally, these will have adjoining areas of dense cover and taller sagebrush plants for daytime feeding and loafing sites (Adams et.al. 2004). Greater sage-grouse are ground

nests and are susceptible to a variety of native and non-native predators (UDWR 2003). Nests are almost always located under sagebrush plants.

Sage-grouse are highly selective grazers. They lack a muscular gizzard, which prevents them from grinding and digesting seeds. They must consume soft-tissue foods (McWilliams 2002). The primary food for sage-grouse is sagebrush. In springtime, and in the bird's juvenile stage, diets are supplemented by insects and forbs, which include herbaceous leaves and some perennial bunchgrasses (Adams et.al. 2004).

In Utah, it is estimated that greater sage-grouse occupy 50% less habitat. The largest populations in Utah are found in western Box Elder County, Uintah County, Rich County and Wayne County, with smaller populations scattered in the central and southern portions of the state (UDWR 2003). No sage-grouse were found during field reviews of the project area. Populations are low on the Forest and there are no known leks on the Wasatch-Cache National Forest.

#### Biological Assessment/Evaluation

A BA/BE has been completed for this project and is located within the project files. Information on the bald eagle, yellow-billed cuckoo, wolverine, boreal owl, flammulated owl, great gray owl, and Columbian sharp-tailed grouse are located within the BA/BE but not within this EA, since they either occur outside the project area, have not been observed within the study area, and/or are likely to not be affected by the project. A project finding of no effect/impact has been given to the above species.

### Management Indicator Species

The WCNF has identified five management indicator species (MIS); the snowshoe hare (*Lepus americanus*), beaver (*Castor canadensis*), goshawk (*Accipiter gentiles*), Bonneville and Colorado cutthroat trout (*Oncorhynchus clarki utah* and *Oncorhynchus clarki pleuriticus*). MIS are monitored on a Forest wide scale. Goshawks were selected as a representative species in aspen, conifer, and mixed conifer. Snowshoe hare was selected as a representative species in pole/sapling aspen, conifer, and mixed conifer. Beavers were selected as a representative species in riparian systems. Bonneville and Colorado River cutthroat trout were selected as representative species in aquatic systems. Life history, survey information, and trend data for all MIS can be found in the 2006 MIS report (Wasatch-Cache National Forest 2006).

#### Beaver

The beaver is a MIS for the Wasatch-Cache National Forest, having been selected as an indicator of riparian system health. While populations fluctuate yearly in response to biological elements, the presence of beaver within a watershed indicates a level of functionality of that system.

Beavers are fairly common in Utah and are found in permanent, slow-moving streams, ponds, small lakes, and reservoirs. Foraging habitat for beaver is present in riparian habitats, where willow and other suitable browse species are present. Beaver populations on the Wasatch-Cache National Forest have been divided into two separate sub-populations, the Wasatch/Bear River Range and the Uinta Mountain (North Slope Range). This division between the two populations is due to the low likelihood of movement between these two geographic areas.

While Forest Service population data monitoring for beaver has not been in place long enough to indicate a trend, Utah Division of Wildlife Resources (UDWR) efforts have. Three UDWR documents for the Wasatch/Bear River Range, show a static trend on all the units on the Wasatch-Cache National Forest, except for the Southern quarter of Summit County and Southeast Salt Lake County that show a increasing trend.

With the exception of a few specific locations, Forest Service management of suitable beaver habitat within National Forest boundaries has not changed significantly from 1980 to the present. Therefore, until Forest Service monitoring yields data for population trends, it is assumed that the determinations made in the State of Utah Survey Report remain valid (Wasatch-Cache National Forest 2006).

**Goshawk**

The northern goshawk uses a wide variety of forest ages, structural conditions, and successional stages. The Forest Service selected it as a MIS in part because it has a strong affinity for aspen, conifer, and mixed conifer habitat types and is somewhat representative of all species using these habitats, including their prey. On the Wasatch-Cache National Forest vegetation types that are considered suitable habitat include lodgepole pine, fir, Douglas fir, spruce and aspen.

The Forest Management Indicator Species Report looked at goshawk populations for both territory occupancy and from fledgling success. Population trends were developed base on a subset of the known population; consisting of 25 known nesting territories. Both territory occupancy and fledgling success data shows that there is a static population trend in the goshawk population Forest wide (Wasatch-Cache National Forest 2006).

**Snowshoe hare**

Snowshoe hare is the representative species in pole/sapling aspen, conifer, and mixed conifer. They are predominately associated with forests that have a well-developed understory that provides protection from predators and supplies them with food. Snowshoe hares utilize areas of new disturbance where regeneration provides adequate horizontal cover and available forage. This is typically in 15-25 year range depending on site condition and growing periods.

For snowshoe hares, the Wasatch-Cache National Forest has been divided into two separate sub-populations (the Wasatch/Bear River Range and the Uinta Mountain "North Slope Range"), since the likelihood of individuals moving from one area to the other is low. The pellet count data between 2004 and 2005 from the Wasatch/Bear River Ranges suggests an increase of 25 % (3.73 vs 4.65 pellets per plot) in snowshoe hare numbers (Wasatch-Cache National Forest 2006).

**Bonneville Cutthroat Trout**

Bonneville and Colorado River cutthroat trout are the two aquatic species identified as management indicator species. The range of Bonneville cutthroat trout (BCT) is defined by the Snake River Drainage on the north, the Colorado River on the east and south and the Nevada desert lands and drainages on the west. Historically, BCT occupied 6,258 miles of stream in the Bonneville Basin.

Currently occupied habitat is found spread across ten drainages ($4^{th}$ level hydrologic units). Only a few areas do not support any cutthroat trout on the Wasatch-Cache National Forest lands. These are the Wellsville Mountains, the Stansbury Mountains and the Duchesne River Country. The Wellsville Mountains supports no fish populations. The Stansbury Mountains have two rainbow and one brown trout populations while the Duchesne River contains both brook and rainbow trout populations. (Wasatch-Cache National Forest 2006)

**Migratory Bird Treaty Act**

The Migratory Bird Treaty Act of 1918 (MBTA) as amended was established to protect migratory birds. This act makes it illegal to pursue, hunt, take, capture, kill, or possess migratory birds or any part, nest, or egg of any such bird (16 U.S.C. 703-7012). In January of 2001, an Executive Order 13186 was issued on the Responsibility of Federal Agencies to Protect Migratory Birds. It specifies the need to avoid or minimize any adverse impacts on migratory birds. The order addressed the need to restore and enhance the habitat of migratory birds. One hundred ninety two migratory birds were identified off the 2002 Partner's in Flight Priority Species (PIF) and the US Fish and Wildlife's Birds of Conservation Concern List (BCC) Forest wide. There are 22 species that have been identified from Forest Service migratory bird surveys in the project area. The closest Breeding Bird Survey route (Timpie Springs) shows a total of 63 bird species with the potential to have habitat within the project area.

**Species at Risk for Viability**

The revised (February 2004) Species at Risk for Viability list for the Wasatch-Cache NF identifies species by analysis groupings. Only the following species are addressed due to their presence within the project area and potential effects to the species habitat type they occupy: Brewer's sparrow, Sage sparrow, Virginia's warbler. Note: Some species within this list have been addressed elsewhere within this document.

**Brewer's sparrow**

In Utah, Brewer's sparrows (*Spizella breweri*) are common to very common summer residents, breeding throughout the state in appropriate habitats. Densities in Utah are high in the northern and western parts of the state and highest in Rich and Summit Counties. Brewer's sparrows breed primarily in shrub steppe habitats in Utah and are considered to be shrub steppe obligates. However, Brewer's sparrows may also be found in high desert scrub (greasewood) habitats, particularly where these habitats are adjacent to shrub steppe. They may also breed in large sagebrush openings in pinyon-juniper habitat or coniferous forests (Parrish et. al. 2002).

**Sage sparrow**

The sage sparrow (*Amphispiza belli*) occurs locally throughout Utah during the spring and summer; it occurs primarily in the southwestern portion of the State during the winter. The sage sparrow prefers shrubland, grassland, and desert habitats. The nest of twigs and grasses is built either low in a shrub or on the ground. It prefer semi-open habitats with evenly spaced shrubs 1-2 meters high. Vertical structure, habitat patchiness, and vegetation density may be more important in habitat selection than specific shrub species. Sage sparrows prefer big sagebrush whether pure stands or interspersed with other shrubs, but rarely in mixed sagebrush-juniper (Parrish et. al. 2002).

**Virginia's warbler**

The Virginia's warbler (*Vermivora virginiae*) occurs statewide in Utah as a common summer resident. Historical nesting records for Utah include Salt Lake and Summit County (1869), San Juan County (1936), Utah County (1937), Kane County (1946 and 1947), Garfield County (1952), Daggett County (1959), Beaver County (1965), Weber County (1973-1974), and the Uinta Basin (1977). Elevation for nesting in Utah ranges from 4,000 feet (1220 m) in the Salt Lake Valley to approximately 10,000 feet (3050) in San Juan County. The Virginia's warbler typically requires scrubby hillsides where a herbaceous or woody under story is well developed. Lower mountain habitats with dense stands of Gambel's oak and relatively high slope are preferred for breeding, although mountain mahogany, riparian areas, ponderosa pine forests, and pinyon-juniper woodlands, all with shrubby under stories, are also used for breeding. Breeding occasionally occurs in Douglas-fir and aspen habitats that have the required shrub understory. (Parrish et. al. 2002)

## EFFECTS OF ALTERNATIVES

### *Alternative 1, No Action*

Habitat would remain unchanged from existing condition. The area would continue to favor species adapted to this unnatural climax habitat. There would be a decrease in suitable habitat for those species that are dependent on the decreasing sagebrush communities. The continued juniper encroachment and periodic intense wildfires similar

to those in the past there would be a further increase in non-native and invasive species and a continued decrease in big game winter range.

### *Alternative 2, Proposed Action*

**Threatened and Endangered Species**
Neither the Bald Eagle nor the yellow-billed cuckoo have potential habitat within the project area. Bald Eagles have the potential to fly over the project area, but no potential foraging or roosting habitat exists within the project area. There would be no effect to these listed species by the project.

**Sensitive Species**

**Pygmy rabbit**
There is low quality habitat for the pygmy rabbit in the project area. There are a few remnant stands of sagebrush in the project area. These stands do not contain the large (over six feet tall) sagebrush plants or the deep soft soils required for pygmy rabbit habitat. The project has the potential of increasing the amount of sagebrush in the project area. This increase of sagebrush, over a long time period, could increase the quality of pygmy rabbit habitat. There have been no pygmy rabbits found on the Wasatch-Cache National Forest. With the poor quality of habitat in the project area there is a low potential for effects on pygmy rabbits. The project finding is *may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species*.

**Greater sage-grouse**
Habitat is of low abundance and quality for the greater sage-grouse in the project area. With the heavy cover of juniper woodlands and decreasing stands of suitable sagebrush habitat, there is a low chance of sage-grouse in the project area. Populations are low on the Forest and there are no known leks on the Wasatch-Cache National Forest. The project has the potential of opening up areas and increasing the amount of sagebrush in the landscape. The long-term effect of this project could be beneficial effect if sage-grouse were found in the area, or moved into it. The project finding is *may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species*.

**Management Indicator Species**

**Beaver**
The project area does not contain suitable riparian area to sustain beavers. No riparian habitat would be altered with any of the alternatives. None of the alternatives would have an effect of beaver populations or habitat trends Forest wide.

**Goshawk**
The aspen, conifer, and mixed conifer vegetation types, which the goshawk is representative of, is not targeted for treatment and will not be affected by the project. There is no known nest within the project area. Some habitat is present within the higher portions of the project area, which is not targeted for treatment. The proposed action alternative would open up the lower juniper woodlands, which may increase possible winter foraging for goshawks. These openings could be beneficial for individual goshawks, but would not affect the overall population or habitat trend Forest wide.

**Snowshoe hare**
The pole/sapling aspen, conifer, and mixed conifer vegetation types, which the snowshoe hare is representative of, are not targeted for treatment and will not be affected by this project. Some habitat is present within the higher portions of the project area and is not targeted for treatment. Neither of the alternatives would have an effect on snowshoe hare populations or habitat trends Forest wide.

**Cutthroat Trout**
Within the project is Box Canyon, a permanently flowing non-fish-bearing stream are a number of seasonally flowing or intermittent streams. Box Canyon would therefore be classified as a Category 2 stream, which the seasonally flowing streams would be classified as Category 4 stream. There are no known populations of Bonneville cutthroat trout populations in or downstream of any streams draining from the Stansbury Mountain Range. This project would have no impact on aquatic sensitive species.

**Migratory Bird Treaty Act**
The project would be conducted in the fall, outside of the breading season for migratory birds. The habitat would change favoring bird species that bird in open sagebrush and grasslands. Not all juniper woodlands in the area would be affected and would still provide suitable habitat for migratory birds that favor older juniper woodlands. The project would provide a more diverse habitat in the area and increase species diversity.

**Species at Risk for Viability**
The Brewer's sparrow has been known to breed in sagebrush openings in juniper stands. Project would target the juniper woodlands and open up areas for sagebrush growth. Project may have a beneficial long-term effect on breeding habitat by opening up some sagebrush stands. Sage sparrow has limited quality habitat present in the project area. The project may increase shrub species over a longer period of time and increase the quality of habitat in the area. Virginia's warbler has limited habitat present in the upper portions of the area. The conifer habitat is not targeted for treatment and there should be no long-term effect on the Virginia's warbler. The implementation would be conducted in the fall outside of breading season. There should be no long-term effects to any of the species at risk.

**Big Game**

The project area is located within an area designated by Utah Division of Wildlife Resources as crucial mule deer winter range. Bitterbrush and sagebrush are two native preferred browse species that exist within the project area. Within the project area these preferred browses species still exist in patches surrounded by juniper. These browse species are considered fire intolerant species and could be lost if fire occurred in this area.

In the Box Canyon fire area, preferred browse species are found in very low numbers, resulting in poor winter range in that area. Vegetation monitoring was conducted to monitor vegetation succession after the Box Canyon fire. Transects were read in 2001 and 2002. The data showed that two of the four transects were approaching acceptable ground cover values, but that the plants that established were non-native plant species and noxious weeds (Rone 2002). Both the lack of browse species and the increase in non-native and noxious weeds contribute to the decline of winter range in this area. The small plots that would be established for the chemical treatment would not positively or negatively impact winter range. However, they would provide information that could be used to plan future treatments to improve winter range. Using the results from the Box Canyon fire and the known intolerance to fire by these browse species, there could be a loss of these browse species for big game within the 35-acre prescribed fire treatment area.

The mechanical treatments in the large areas would improve the winter range for mule deer and other big game species found in the area. The mechanical treatments would help to promote recolonization of these browse species and other native vegetation into these juniper dominated sites, by removing the juniper and opening up the area.

**CUMULATIVE EFFECTS**

Cumulative effects are past, present, and reasonably foreseeable future actions in or around the analysis area that may affect wildlife resources. Past activity around the project area include three fires, the Box Canyon fire, Alpha fire, and Monument Fire. These fires were all south of the treatment areas and ranged in size from ~755 acres in the Box Canyon Fire to ~1525 acres in the Alpha Fire. These fires have lead to an increase in non-native and invasive species in the area and have decreased the quality of wildlife habitat, especially deer winter range. These areas that burned have little browse species available for winter forage for wildlife. If the treatments were not done, the reasonably foreseeable future could consist of larger fires similar to those in the past with a further increase in non-native and invasive species and a continued decrease in deer winter range.

Currently, there is still some livestock grazing in the project area. Most of the grazing is conducted to the south of the research area in Box Canyon. Grazing in this area is limited by the availability and location of water sources. The grazing would continue, but fencing would exclude it from the research areas. At its present rate of grazing, wildlife should not be adversely affected and would not add cumulatively to wildlife impacts.

Currently and for the next several years, the Bureau of Land Management is conducting mechanical vegetation treatments on adjacent lands to reduce juniper and provide fuel breaks for fires. These treatments would have similar effects for wildlife species found in the area as the proposed project. These treatments, when combined with Forest Service treatments, would help to bring a larger area back into a desired future condition.

## Forest Plan Amendment Significance Evaluation

The proposed action, if selected, would result in ecological conditions that more-closely mimic those found in the historic range of variability. Management Prescription 2.6 as it currently applies across the forest limits the treatment options in this area. This could result in greater impacts to the values and unique qualities associated with undeveloped areas in the Stansbury Mountains, than by use of mechanical treatments to reduce juniper.

**TIMING**
This change would take place immediately. This amendment would continue to reflect the original intent of the MP 2.6 and is considered to be a non-significant amendment.

**LOCATION AND SIZE**
This amendment would apply only to juniper stands in the Stansbury Mountains managed by the Forest Service. Approximately 17,000 acres has the potential to be effected, which is approximately 1.3% of the Forest Plan Planning Area.

**GOALS, OBJECTIVES, AND OUTPUTS**
This change is consistent with the management objectives for Undeveloped Areas in maintaining the values and unique qualities associated with undeveloped areas. This change would meet the vegetation objective 3d in the Forest Plan page 4-30. This objective states “Increase grass and forb production and plant species and age class diversity in sagebrush and pinyon/juniper by treating approximately 2,000 acres annually for a 10-year total of 20,000 acres.” This amendment would not alter long-term relationships between the levels of goods and services projected by the forest plan.

**MANAGEMENT PRESCRIPTION**
The proposed change would apply only to the juniper stands on the lands described in the Forest Plan for the Stansbury Management Area on pages 4-166 through 4-175, and would apply to future decisions during the planning period.

# CHAPTER 4- CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

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Wayne Padgett - Interdisciplinary Team Co-Leader, Ecologist
Diane Probasco - Interdisciplinary Team Co-Leader, Biologist
Charles Condrat - Hydrologist
Beth Corbin- Fire - Ecologist / Botanist
Thomas Flanigan - Archeologist
Paul Flood - Soil Scientist
David Hatch - Landscape Architect
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### *FEDERAL AND STATE AGENCIES:*

United States Department of the Interior

U.S. Fish and Wildlife Services

Bureau of Land Management- Salt Lake Field Office

State of Utah

Division of Wildlife Resources

American Indians

Goshute Tribe

### *OTHERS:*

Brigham Young University

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