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North East Cassia Hazardous Fuels Reduction Project

ENVIRONMENTAL ASSESSMENT

MINIDOKA RANGER DISTRICT

To comply with the National Environmental Policy Act, the North East Cassia Hazardous Fuels Reduction Project Environmental Assessment has been prepared. This Environmental Assessment tiers to the decision for the 2003 Revised Land and Resource Management Plan for the Sawtooth National Forest and complies with the standards and guidelines of that plan. To avoid bulk and duplication these documents are incorporated by reference. These documents, as well as information from the project record are available from the Minidoka Ranger District, Burley, Idaho.

This Environmental Assessment is not a decision document. Instead, it presents the evidence and analysis necessary to determine whether the consequences of the Proposed Action are "significant" and therefore whether an Environmental Impact Statement is necessary. The Responsible Official (Scott Nannenga, District Ranger, Minidoka Ranger District) will determine whether an Environmental Impact Statement is necessary and whether or not to implement one of the alternatives considered in the Environmental Assessment.

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ABSTRACT

The Minidoka Ranger District of the Sawtooth National Forest proposes a variety of management activities to address resource concerns on National Forest System lands in the North East Cassia Project Area. The purposes of this project are to modify vegetation structure and fuel loads in order to lower the intensity and slow the rate of spread of wildfire on National Forest System lands and to return the Project Area to a less departed Fire Regime Condition Class.

This Environmental Assessment documents the analysis completed by the project Planning Team to estimate the site specific effects of implementing proposed project Alternatives.

The Environmental Assessment tiers to the decision for the 2003 Revised Land and Resource Management Plan for the Sawtooth National Forest and complies with the standards and guidelines of that plan.

Proposed fuel treatments are intended to reduce the number of live juniper trees that have encroached outside of their historical range, thereby eliminating the chance of severe crown fire, while at the same time favoring the sagebrush-steppe ecosystem. A combination of mechanical and prescribed fire treatment methods are proposed in 3 actions alternatives. Treatments are proposed to treat approximately 4,710 acres of National Forest System lands and would vary in methodologies depending on the alternative selected.

Natural conditions in the North East Cassia Project Area support frequent wildfires that generally burn moderate to large sized areas of the landscape with mixed and/or stand replacement severity. Under such conditions, only large scale vegetation treatments would significantly alter fire behavior across the project area. Treatments proposed in this project are not expected to stop large wildfires but will affect fire behavior by allowing a natural fire regime to exist in the sagebrush steppe, independent of additional intensities/impacts caused by juniper trees burning.

Issues that resulted from scoping and collaboration were incorporated into the development and design of the (Modified) Agency Proposed Action – Alternative C and Mechanical Only Proposed Action-Alternative D. The analysis discloses the direct, indirect and cumulative effects that may occur as a result of the implementation of the Proposed Action and the No-Action Alternatives.

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Chapter 1 - Introduction

The USDA Forest Service proposes to reduce the amount of potential wildfire fuel through vegetation management in the North East Cassia Project Area on the Minidoka Ranger District of the Sawtooth National Forest.

The Forest Service has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) of 1969, and other relevant federal and state laws and regulations. This EA discloses the direct, indirect and cumulative environmental impacts that may result from the implementation of the Proposed Action. It is prepared according to the format established by the Council of Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500-1508.)

Activities proposed on National Forest System lands as part of the North East Cassia Fuels Reduction Project must conform to the 2003 Revised Sawtooth National Forest LRMP (Forest Plan) Standards and Guidelines.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Minidoka Ranger District Office (US Forest Service) in Burley, Idaho. These records are available for public review.

North East Cassia Project Location

The project is located approximately 6 miles west of Oakley, Idaho on the Cassia Division of the Minidoka District of the Sawtooth National Forest. The area can be accessed by Forest Road 500 (Bostetter Road) to the south and Forest Road 676 (Old North Road) to the north, off of Highway 27.

The project generally runs from east of Big Cottonwood Canyon at the north end of Cottonwood Ridge, around the upper elevations of the Big Hollow rim, dropping below in elevation and east of Cottonwood Ridge at Pickett Hollow, south past Little Cottonwood Canyon and south of Forest Road 500 to the Big Pipe Spring area, again remaining east of Cottonwood Ridge. The legal locations are described as the following: T14S, R21E, Sections 3, 4, 5, 7, 8, 9, 10, 15, 16, 17, 18, 21, 22; T13S, R21E Sections 20, 28, 29, 30, 31, 32, 33. Please see the map located in chapter 2.

Background

The goals of this project are to reduce the threat of severe wildfire, enable Appropriate Management Response to be utilized, and to restore the natural Fire Regime and Condition Class within the Project Area. This will be accomplished by reducing the number of live juniper trees that have encroached into the adjacent sagebrush-grass ecosystem. The project size is approximately 4,710 acres.

Purpose and Need for Action

The Purpose of this project is to reduce the amount of live juniper that has expanded out of its historical location on the landscape and increased its numbers in the adjacent sagebrush-steppe ecosystem. The result will be an area more consistent with Forest Plan guidelines for Active Restoration and Maintenance of Aquatic, Terrestrial, and Hydrologic Resources as well as Restoration and Maintenance Emphasis within Shrublands and Grassland Landscapes.

The Need for this project comes as a result of the fire threat associated with increased areas of encroached juniper. Evidence shows that the natural Fire Regime Condition Class of the project area has been altered by the amount of juniper that has encroached into the adjacent sagebrush-grass ecosystem. The result of fire suppression, historical overuse of livestock grazing, and other environmental factors has created a shift in the fire regime of these areas from short interval moderate intensity fires to long interval, high intensity crown fires (Brooks, 2006). The effect climate change has on juniper invasion is still being verified. Livestock grazing alone will not cause the expansion of juniper into the sagebrush steppe. "Livestock grazing reduces abundance of fine fuels and therefore fire potential. Livestock grazing may affect the rate of invasion, but the eventual outcome for both grazed and ungrazed sites will be the same in the absence of fire" (Bunting, 1992). The "eventual outcome" is an increase and eventual takeover of a sagebrush ecosystem by juniper trees.

This process is described in Miller, et al (2005). Juniper expansion is characterized as having three "phases" of encroachment and is determined by such attributes as Percentage of Maximum Potential Tree Canopy, Tree Recruitment, Shrub Layer, and others. These phases are described as being Phase I – Early; Phase II – Mid, and Phase III – Late; and correlate to how dominant (or encroached) a stand of juniper is on the landscape. Generally, a Phase I stand is just beginning to encroach into the sage-steppe. Shrubs and grass are still the dominant vegetation on site. In a Phase II stand, trees, shrubs and the herbaceous vegetation are co-dominant and all affect the ecological processes. In a Phase III stand, trees are the dominant driver of ecological processes (Miller, et al, 2005).

All three phases of juniper transition are encountered in the Project Area, with the largest percentages in Phase I and II. These are the areas that can be most easily converted 'back' to the shrub-herb dominated phase.

The concept of "threshold" is also discussed in the Miller, et al (2005) paper. Although the exact point of a threshold is difficult to interpret, what it basically refers to is the point at which the phase transition affects succession in a non-predictable manner. The paper states that most thresholds are probably reached as juniper transitions from phase II to phase III. After this point, if juniper were to be removed from the ecosystem, the successional pathway would be very difficult to predict. The pathway could range from a new steady-state situation (such as invasive annual weeds) to the site's natural vegetation, typically sagebrush/grass.

The North East Cassia project design is centered on preventing any more conversion of juniper past this Phase II/Phase III threshold, and to bring as much of the area to a Phase I or pre-encroachment phase condition as possible. This would also correspond to a Fire Regime Condition Class I. Since the majority of the Project Area is in a Transition Phase I or II, the efficacy of the project is high. The ability to achieve the Objectives of the project and Forest Plan is attainable.

It has been documented that fires starting in closed canopy, dense stands of juniper have little lateral spread and low intensities (Bunting, 1987). Some papers have even called these phase III stands "fire proof" (Yanish, 2002). As Brooks (2006) states: "many federal fire managers have reported that fire does not propagate easily [in the dense juniper fuel type] except under extreme weather conditions, which typically results in intense crown fires that endanger rural communities and may have undesirable effects on soils and plants." Another concern outlined in this paper is that "high intensity crown fire may lead to slow recovery of native plants and increased dominance of invasive non-native plants." This scenario could play out in the North East Cassia Project Area if a wildfire extended from lower elevations (where species such as cheatgrass currently flourish) up to the project area. Miller and Tausch (2001) point out that "areas of rapid and thickening post-settlement woodlands are creating conditions that produce high intensity crown fire." "These high intensity fires are capable of causing shifts from woodlands to introduced annual communities" (Tausch, 1999).

Fires burning in an ecosystem dominated by sagebrush but interspersed with juniper are more easily contained and controlled than fires burning in a dense juniper dominated overstory. Sagebrush dominated fuel types are able to be controlled by direct attack with fire retardant, helicopter water drops, engine crews, and bulldozers much more easily than in dense juniper stands. Because juniper is expanding into these same areas of sagebrush, the cost and risk of fire suppression increases on the same piece of ground if allowed to be converted to a juniper overstory.

This action will result in the treated area being in conformance with the direction found in the 2003 Sawtooth National Forest Land and Resource Management Plan (Forest Plan; Chapter III; Management Prescription Category (MPC) 3.2, number 1202, MPC 6.1, numbers 1205, 1215, 1216, 1221, and 1225). This proposed project would move the project area to a less departed Fire Regime Condition Class than it is currently.

Existing Condition

Juniper trees are not unlike other conifer tree where by close crown proximity, fires burning in the canopy can be spread in what is know as the "third dimension," more commonly know as crown fire. Crown fire is rarer than "surface fire," where the fire burns only the fuels found on or near the surface of the earth and under any overstory vegetation. Active crown fire is characterized by a fire that travels in the crown of the trees in combination with fire that travels along the surface. The type of fuel situation that would allow this type of fire behavior exists within the North East Cassia Project Area. Independent crown fire is a type of fire behavior that does not require a surface fire to be present, and instead travels exclusively in the crowns of the trees. This type of fire behavior is found in Juniper when winds are very high. Juniper that has increased its density on the landscape to the point that there is no significant surface fuel loading can also be found within the North East Cassia Project Area.

As the extent of juniper expands, the amount of fuel in the overstory increases, and the amount of fine fuel in the understory decreases. The North East Cassia Project Area is historically a sagebrush steppe with smaller areas of mature old growth juniper trees. Fires burning in the sage steppe ecosystem under historic fire return intervals (~50 yrs in Mt Big Sage) are able to kill any juniper that had encroached since the last fire return (Yanish, 2002; Burkhardt and Tisdale, 1976). This fire cycle kept junipers from expanding, restored and maintained the sage steppe ecosystem, and allowed fire to burn a site under light to moderate intensities where no real long term damage could occur.

Given the current state of the fuels in the North East Cassia Project Area, if a wildfire starts, the fire management direction will likely be suppression. Except under the most extreme conditions, it is likely that fire crews of the Forest Service will successfully suppress the fire.

This "success" however only further delays the natural fire return interval, allows the fuel load to continue to increase, allows juniper encroachment to advance upon more sagebrush, and puts more potential energy into the system. Eventually, the combination of drought, extreme weather conditions, and an ignition source will coincide, as it has in the past. The Black Pine 2 fire that started on July 6th, 2007, on the Minidoka Ranger District is a good comparison of the type of fire that could be expected in the North East Cassia Project Area under extreme conditions. A full discussion of this fire can be found in the Fire/Fuels Specialist report in the project file. It was a fire that started in a similar fuel type under extreme fire weather/fuel conditions, was unable to be suppressed, and eventually burned over 70,000 acres at a cost of over $4,000,000. Although it cannot be accurately predicted when this will happen, the opportunity for it renews every year that the area does not burn or receive fuels treatment (Pyne, 1995).

The longer the fire return interval, the more extreme the fire will be, and the more damaging (severe) it will be to the ecosystem. High severity fires result in a longer time period for the sites natural vegetation and wildlife to recover. This fuels project is designed to mimic a fire return event without doing the damage that a non-characteristic severe crown fire would.

The discussion of where juniper would naturally be located on the landscape versus where it is now has been one of the main questions in researching juniper. Causes of the invasion are equally important, especially in the context of how it may be prevented in the future. Knowing where juniper should and shouldn't be is critical to know when planning proposed treatments. Evidence of juniper expansion into Mountain Big Sagebrush has been well documented in the literature across the Great Basin. Similar invasions have been documented of Mesquite and Juniper into the desert southwest and ponderosa pine into prairie grassland (Burkhardt and Tisdale, 1976). The photo series comparison presented in Appendix B clearly shows vast areas of juniper expansion across the North East Cassia Project Area.

The literature is consistent in stating that climax Juniper, under a free burning fire regime, tends to be limited to rocky ridges and rimrocks, where vegetation is interrupted by rock outcrops, and other areas of naturally sparse surface fuel, or in open savanna-like situations with occasional juniper trees (Burkhardt and Tisdale, 1976; Miller and Rose, 1995). However, junipers are now spreading down from these areas into sites historically occupied by sagebrush in deep well drained soils (Miller and Rose, 1999).

Desired Future Condition

The desired condition for forested stands in the project area includes those identified in the Forest Plan. The desired condition for the Little Cottonwood Management Area in which the North East Cassia Project Area is found, as defined in the Forest Plan, would exhibit the following characteristics or desired end results related to vegetation condition, roads, and wildfire as a result of the Project:

MPC 3.2 – Objective 1202: Vegetative restoration or maintenance treatments, including wildland fire use, mechanical, and prescribed fire, may only occur where they:
b) Maintain or restore habitat for native and desired non-native wildlife and plant species
c) Reduce risk of impacts from wildland fire to human life, structures and investments

MPC 6.1 – Objective 1205: The full range of vegetation treatment activities may be used to restore or maintain desired vegetation and fuel condition.

MPC 6.1 – Objective 1215: Restore shrub composition in the Low Sage, Basin Big Sage, and Mountain Big Sage cover types; with emphasis on improving wildlife winter ranges in areas degraded by increasing juniper cover.

MPC 6.1 – Objective 1216: Restore open grassland conditions with desired ranges of native grasses and forbs in Big and Little Cedar Canyon juniper stands by reducing mature juniper stands.

MPC 6.1 - Objective 1221: Contain and reduce infestations of cheatgrass in areas below 6,000 feet in elevation.

MPC 6.1 – Objective 1225: Management actions in sage grouse habitat should be designed to meet desired conditions for sagebrush.

Treatments in the North East Cassia Project Area are not aimed at old-growth juniper stands. These stands are valuable on the landscape. Old growth conifer communities "provide unique, and often irreplaceable biological/ecological values, such as animal and plant habitat, biodiversity and genetic pools, and long-term climatic records" (Kauffman et al, 1992 and Spies, 1988, in Waichler, et al 2001). Instead, this project will attempt to correct the encroachment of juniper into areas of sage steppe where juniper has not historically been a part of the ecosystem.

This fuels reduction project is proposed to change the fuels in the project area to a desired future condition that is similar to the potential natural Fire Regime Condition Class (FRCC). The Fire Regime for mixed sage/juniper steppe ecosystems is primarily II, 0-35 year return interval (high frequency, high severity). The project, if completed as proposed, would move the overall condition class of the site closer to Condition Class I, which is defined as "within the natural range of variability of vegetation characteristics; fuel composition; fire frequency; severity and pattern" (Interagency FRCC guidebook, v1.3.0, 2008).

This project proposes both prescribed fire and mechanical manipulation treatments to mimic the natural process of wildland fire. Specifically, the treatments are designed to remove juniper from areas where it would not be found persistently growing under its natural fire regime. As a result of these treatments, it is expected that sagebrush-bunchgrass will re-colonize sites that have been displaced by juniper encroachment.

The proposed treatments meet the objectives of a fuels treatment because of three issues. First, by converting sites from unnatural juniper overstory, the condition class is being changed from FRCC 2 or FRCC 3 to FRCC 1. Second, wildland fires will be able to be more easily controlled. Juniper overstory fires produce a large amount of radiant heat and have a high resistance to control. Sagebrush steppe produces wildfires that exhibit high rates of spread and moderate intensities, however they are much more responsive to control with commonly available suppression techniques.

Third, by performing this fuels reduction treatment, it will allow fire managers in the future to allow wildland fires to burn in a more natural fashion. As is discussed, fires are often suppressed because fire managers know that the fire is burning unnaturally and will probably damage the system. If the NE Cassia fuels treatment is completed, the opportunity to let fires burn naturally will become available, especially as the knowledge of the fire regime of sagebrush-steppe is becoming more known.

Performing fuel reductions activities will require expenditure of public funds. The cost-per-acre rate for individual treatment units will vary from under 100 dollars per acre to as much as 450 per acre depending on the treatment. The Fire/Fuels Specialist report details the cost of treatments in a comparative fashion, and cost is included in the Comparison of Alternatives section.

A mosaic of treated and non-treated juniper stands will be created with emphasis on retaining large older trees in singles or clumps that may have been retained through natural processes.
Stringers will be retained and serve as wildlife travel corridors. Stringers will be from 30 to 130 feet wide, located primarily along ridges and along canyon rims. Patches will be from 1-5 acres in size and will be located within the main body of the mechanical treatment areas. The total amount of untreated juniper in the mechanical treatments will be a minimum of 15% of the original, in the form of patches and stringers, as is consistent with the Forest Plan guidelines. Within Prescribed Fire units, burned patches of no more than 30 acres will be implemented, equaling no more than 60 percent of a prescribed burning treatment unit.

Proposed actions are expected to require up to seven years to fully complete, depending on the Alternative chosen. Portions of the project may occur in any month of the year in areas not requiring

avoidance mitigation for wildlife. The primary seasons for implementation will be early spring, summer and fall.

Public Involvement

The public was involved in many facets of this project's development. Responses were made from the scoping efforts, from the public comment effort, as well as on the ground field visits and personal communications. This interaction was extended to cooperating agencies as well, such as the Idaho Department of Fish and Game and the Idaho Department of Parks and Recreation.

The North East Cassia Project Area is tiered to an earlier proposed project that was named the Big Cedar Wildlife/Fuels Management Project. The Big Cedar project was smaller in size and sought slightly different end-state objectives than the North East Cassia Project Area, however, scoping and public comment periods were both completed for the Big Cedar project. These original comments and concerns were carried forward into the development of the North East Cassia project.

A chronology of public involvement is as follows:

August 6th, 2007. (Big Cedar) Combined Scoping and Public Comment Period documents mailed to interested parties.
August 6th, 2007. (Big Cedar) Legal Notice published in the Times-News Newspaper, Twin Falls, ID.
December 3rd, 2007. Field trip with representatives from local interest groups, members of the public, and cooperating state agencies.
March 4th, 2008. North East Cassia Scoping document mailed to interested parties.

Issues

For purposes of NEPA analysis, an "issue" arises from the relationship between actions (proposed, connected, similar, and cumulative) and environmental consequences (physical, biological, cultural, and socioeconomic).

The Interdisciplinary Team (IDT) reviewed comments from the public and other agencies, and identified key issues in a content analysis process. These key issues as well as several issues identified by resource specialists during IDT meetings were used in this EA to design the Proposed Action, prescribe mitigation measures, and describe environmental effects. Other issues were determined to be relevant but differ from key issues in that they were not used to formulate alternative approaches. They often describe minor or consistent consequences among alternatives considered in detail and are covered by mitigation measures or monitoring. Issues not addressed in this EA are those that have already been decided by law, regulation, or existing plans, were outside the scope of the decision being made, or were conjectural (not supported by scientific or factual evidence). See the project record for notes from the content analysis process.

Key Issues

1. **Risk associated with the Proposed Action and Alternatives.**
   a) **Potential that the fuels reduction treatments will not be successful in achieving meaningful objectives**
   b) **Potential for prescribed fire to escape and cause unacceptable resource damage**

   Input from the public and other agencies has expressed concern that the proposed treatments will fail to achieve the Purpose and Need. Failure to achieve the P&N is described as one of the following indicators: escaped prescribed fire, prohibitively high cost, or low efficacy of treatment methods. These three components are analyzed and compared across alternatives in this document.

2. **Potential loss of sagebrush habitat could be detrimental to sage grouse, an MIS and FS Region 4 Sensitive species.**

   The proposed action stands to impact sagebrush on a limited scale, although specific mitigation measures are proposed. Sagebrush could be impacted on a small scale where it exists in proximity to slash piles. Sagebrush that existed under and proximal to slash piles could be injured or killed during the piling/and or burning of slash. Also, although not targeted, sagebrush could be impacted in proposed aerial ignition treatments due to fire being inadvertently dropped on it.

3. **Invasive plants such as cheatgrass may be expanded as a result of fuels reduction treatments.**

   Cheatgrass and other exotic weed species are present within the North East Cassia Project Area. Forest data shows that cheatgrass is commonly found along travel corridors, and decreases in prevalence with increasing distance from these corridors. Mitigations are centered on preventing the expansion of exotics by washing machinery and by not burning within a set distance from these travel corridors, and avoiding areas of high densities of weed populations. Also, large scale continuous surface burning that would allow cheatgrass to expand is not being proposed for this project.

Issues Considered But Not Analyzed in Detail

The Council on Environmental Quality (CEQ) NEPA regulations explain 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)…" Issues not analyzed in detail were identified as those that (a.) are treated the same in all alternatives, (b) outside the scope of the proposed action, (c) already decided by law or regulation or (d) not supported by scientific evidence. A brief list of these issues eliminated from detailed study are found below, however additional information on these issues may be found in the Project Record.

Heritage

Field survey and site monitoring found that there are currently no known sites being affected by treatment activities. No new facilities are being proposed as part of any alternative. If significant cultural resources are located during the Section 106 field review, avoidance and or mitigation of potential impacts would be developed in consultation with appropriate Tribes and the Idaho State Historic Preservation Office.

Relationship to the Forest Plan

The 2003 Revision of the Forest Plan for the Sawtooth National Forest includes provisions of the National Forest Management Act, its implementing regulations, and other guiding documents. The Forest Plan details the direction for managing the land and resources of the Sawtooth National Forest.

Current Laws

The Environmental Assessment for the North East Cassia Hazardous Fuels Reduction Project has been prepared pursuant to the requirements of the National Environmental Policy Act (NEPA, 40 CFR 1500-1508), the National Forest Management Act (NFMA implementing regulations of 2008 including 36 CFR 219.2, and the transition provisions of 36 CFR 219.14), and the 2003 Sawtooth National Forest land and Resource Management Plan. Federal laws, including the Endangered Species Act, Clean Air Act, and Clean Water Act, also apply.

Decision Framework

The Responsible Official for this proposal is the Minidoka District Ranger. After reviewing the Proposed Actions, the No Action Alternative, and the environmental consequences of implementation, the Responsible Official will determine through a Decision Notice what activities, if any, will be implemented, and what management requirements and mitigation measures will accompany the activities.

Chapter 2 - Alternatives Including the Proposed Action

Alternatives are presented in accordance with the direction found in the CFR Title 40, Part 1502.14. Alternatives will be analyzed in accordance with FSH 1900.15, Chapter 10, Sections 15 and 16. Please refer to the included map for locations of the treatment unit numbers. The Minidoka Ranger District has developed four alternatives for the North East Cassia Fuels Reduction Project. Alternatives have been developed with the help of public, collaborating agency, and interest group input via public contact and the previously completed Scoping and Public Comment Periods. This collaboration helped refine the proposed treatment alternatives.

Proposed treatment alternatives include the use of mechanical fuels reduction methods, prescribed fire, or a combination of both. All alternatives except for the No Action Alternative – Alternative A would result in juniper trees being a lesser component on the landscape than is currently witnessed, thereby reducing the threat of severe crown fire. A brief description of these treatments is outlined below.

Alternatives Analyzed in Detail

Alternative A -No Action Alternative

No activities would be implemented under this alternative. This alternative is represented by the existing condition of the project area and is used as a baseline against which to compare the Proposed Action. This alternative complies with 40 CFR 1502.14(d), which requires that a No Action Alternative be included in the analysis.

Alternative A would have no vegetation treatments, would not reduce fuels, and would not move the project area toward the desired condition identified in the Forest Plan. Since activities would not be proposed, additional mitigation measures or management requirements would not be needed or applied to this alternative.

Alternative B – (Original) Agency Proposed Action

Under Alternative B, treatment units 1, 2, 3, 4 and 5 would be treated with mechanical methods. Treatment units 6, 7, 8, 9, 10 and 11 are proposed to be treated with prescribed fire and/or mechanical methods.

Mechanical methods could be any of the methods described in the Treatment Description section, including a combination of any of them. Slash disposal could be any of those described in the Slash Treatment section.

Broadcast prescribed fire is proposed for use in this alternative. A helitorch would be utilized in units 6, 7, 8, 9 and 11. This aerial fire would be directed at stands of dense juniper overstory where ignition would be efficient. Treatment unit 10 is proposed to be hand lit on an individual tree basis.

Alternative C – (Modified) Agency Proposed Action

Under Alternative C, treatment units 1, 2, 3, 4, 5, 8, 9, and 11 would be treated with mechanical methods. Treatment units 6, 7 and 10 are proposed to be treated with prescribed fire and/or mechanical methods.

Mechanical methods could be any of the methods described in the Treatment Description section, including a combination of any of them. Slash disposal could be any of those described in the Slash Treatment Description section.

Broadcast prescribed fire is proposed for use in this alternative, although on a more limited scale than Alternative B. A helitorch would be utilized in units 6 and 7. This aerial fire would be directed at stands of dense juniper overstory where ignition would be efficient Treatment unit 10 is proposed to be hand lit on an individual tree basis.

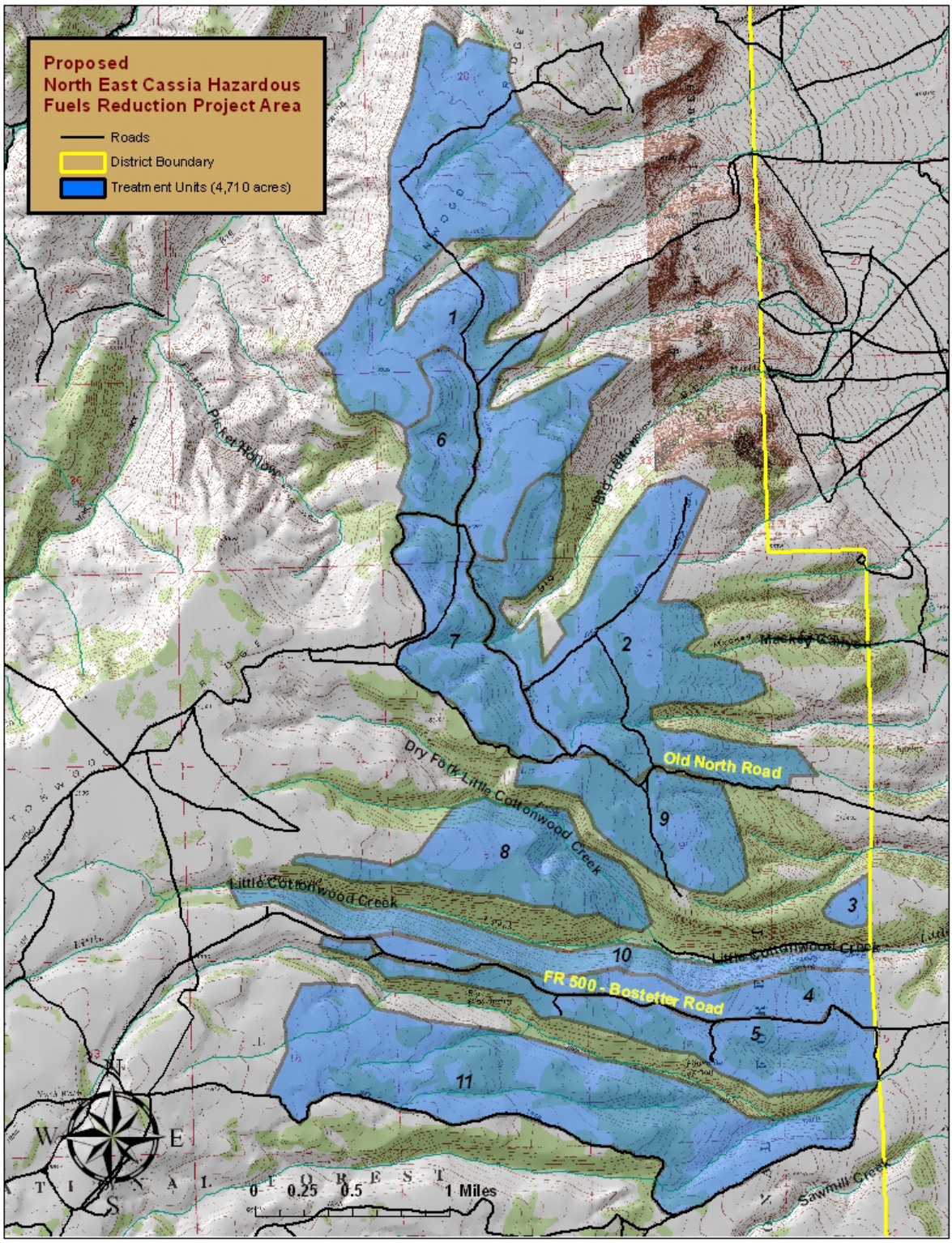
Alternative D – Mechanical Only with Pile Burning

Under Alternative C, all 11 proposed treatments units would be treated with mechanical methods only, with the distinction that pile burning (a form of prescribed fire) would be allowed in order to facilitate slash disposal. Pile burning is an efficient method to dispose of slash resulting from mechanical fuels reduction treatments because the slash does not have to be transported off site, or usually very far from where it was cut from.

Table 1 Proposed Units and Treatments

Unit	Acres	Alternative B	Alternative C	Alternative D
1	1,061	Mechanical Treatment	Mechanical Treatment	Mechanical Treatment
2	811	Mechanical Treatment	Mechanical Treatment	Mechanical Treatment
3	28	Mechanical Treatment	Mechanical Treatment	Mechanical Treatment
4	229	Mechanical Treatment	Mechanical Treatment	Mechanical Treatment
5	353	Mechanical Treatment	Mechanical Treatment	Mechanical Treatment
6	165	Broadcast Prescribed Fire	Broadcast Prescribed Fire	Mechanical Treatment
7	307	Broadcast Prescribed Fire	Broadcast Prescribed Fire	Mechanical Treatment
8	343	Broadcast Prescribed Fire	Mechanical Treatment	Mechanical Treatment
9	281	Broadcast Prescribed Fire	Mechanical Treatment	Mechanical Treatment
10	268	Hand Prescribed Fire	Hand Prescribed Fire	Mechanical Treatment
11	864	Broadcast Prescribed Fire	Mechanical Treatment	Mechanical Treatment

Figure 1 Map of the North East Cassia Fuels Reduction Project Area



Treatment Description

Mechanical Treatments

Mechanical treatments are defined in this document as a manipulation of the fuel completed by either manual (hand) methods or machine-based methods. This fuels project is targeted exclusively at reducing the extent of juniper on the landscape. No manipulation of any other plant species is proposed. The overarching goal of the mechanical fuel treatment is to break up the continuity of the juniper overstory, allowing fire suppression to be more effective, or change the fuel structure so that when fire burns through it will do so in a non-damaging fashion.

Hand treatment refers to the use of chainsaws or other hand tools to mechanically sever the juniper from its stump. All mechanical methods will be prescribed to cut the juniper below the lowest living branch in order to minimize the risk of the tree recovering from a remaining branch that is attached to the stump. Resprouting from a retained live branch is a potential obstacle with the Utah Juniper (*Juniperus osteosperma*) that is the primary species located in the Project Area. (Wright, et al, 1979). Hand treatment could be among the slowest methods in terms of time to complete an acre of ground (depending on crew size). However, chainsaws can be more thorough in terms of cutting below the lowest living branch.

Machine based mechanical treatments could be a variety of specific methods, all of which do approximately the same thing to the juniper tree. These machines either remove the tree from the stump (felling), or they grind, chip, hammer, or shred the tree (mastication) into many small pieces that go on the ground. Once severed from the stump, material can be transported off site (usually in chip form to a market) or piled and prepared for future burning.
Commonly used machines for fuels reduction in juniper include a hydro-ax, feller buncher, harvester, vertical or horizontal shaft masticators (mounted on a machine platform), gyro-tracks, and others.

Any mechanical treatment method or combination of methods that achieved the desired fuels objectives of the NE Cassia fuels project would be considered for use.

Prescribed Fire Treatments

Prescribed fire is proposed to be used in three forms in the project. The first would be burning piles that were created as a result of any mechanical fuels treatments. These piles would be ignited with hand ignition methods, such as a driptorch or other similar device.

The second proposed use of prescribed fire is the use of broadcast fire. Broadcast prescribed fire is defined as fire that is ignited and allowed to burn in natural (unmodified) fuel conditions. The traditional way to prescribe-burn juniper is to ignite it when the results will be a free-burning fire that consumes both the understory and overstory fuels. These fires are typically ignited when surface fuel moistures are low, air temperatures are relatively high, and winds are strong. These conditions allow the fire to spread in the surface fuel, which cause the juniper overstory to be consumed at the same time. These fires, when started, are very difficult to control and frequently challenge the holding resources. Prescribed fire ‘escapes’ can be common. The reason for this is that fire managers must ignite these fires at the very extreme margins of safe burning conditions. This allows unexpected factors to have a higher degree of influence than in burning other fuel types. For example, the wind may be stronger or

come from a different direction than is forecast. The relative humidity may drop lower than predicted. It may get hotter than predicted. All of these factors are exacerbated at the margins of the prescription parameters, meaning that there is little room for error.

No prescribed fire proposed for the NE Cassia project will be attempted in these traditional prescription parameters. This project is being designed with the thought of trying to favor sagebrush retention and recruitment. Therefore, prescribed fire techniques that target only the juniper overstory are being proposed.

The Alternatives that propose aerial ignition of some treatment units are designed to minimize impact to sagebrush. The project proposal is to utilize a heli-torch (with spreader) during times of the year that are cooler and will not allow sage and grass to burn, but that will allow the juniper overstory to be killed by applying fire from aerial ignition. It would be impractical to use a heli-torch in this fashion on the entire landscape. Instead, patches would be strategically located for burning. These patches would be 25-30 acres in size and would be deliberately located on the landscape. With enough passes of the heli-torch, specific polygons of juniper will be able to be ignited and achieve the objectives of overstory juniper mortality. It is not expected that prescribed fire ignited in this fashion would be able to propagate itself outside of the ignition zone. This would allow for a high degree of control where the fire is located on the landscape. Prescription parameters would call for light winds, full sun skies, and cool temperatures. Low fuel temperatures will be the most limiting factor. This will be partially overcome by burning under full sun after the fuel has warmed up.

The objective of the broadcast prescribed fire treatments would be to completely kill juniper trees within the 25-30 acre patches. This is consistent with the parameters set forth by the District Biologist to mitigate impact to cover and thermal hiding needs for wild ungulates. This would also serve to limit the spread of crown fire in the juniper stands and allow firefighters access.

The third way prescribed fire is proposed to be utilized in the North East Cassia Project Area is in Unit 10 (north facing slope of Little Cottonwood Canyon) under Alternatives B and C. This proposal is a modified “single tree burning” method of prescribed fire (Jameson, 1966 (b)). Juniper trees will be lit by hand and used on an individual tree or small clump basis. Patches of juniper with more than 5 crowns touching will be excluded from the treatment. This treatment was developed on-site with interested members of the public.

Slash Treatment Description

Slash resulting from mechanical fuels reduction methods will be dealt with in a manner that efficiently removes the material from a hazardous arrangement. This could potentially be several different methods, depending on the fuels scenario. They include the following:

Landing Piles

Landing piles would be the primary slash treatment used in mechanical units that require large amounts of biomass to be removed and where this biomass cannot be retained on site due to conflicts with other treatment objectives or other resources. They would generally be used for all un-merchantable juniper biomass. The creation of piled debris at landings would reduce the amount of slash that is retained on site and would have a low net gain of surface fuels. Some branches and tops may be retained in the area from where they originated with this type of slash treatment as they break off during the cutting and moving stages.

Landing piles would vary in size and distribution according to the amount of material that is removed, and the proximity of adjacent fuels. Most landing piles would need a year to dry before they could be burned.

Machine Piles

Machine piles would be the slash removal treatment for areas where pieces of machinery are used to process felled trees and where space allows for piles to be created and maintained on-site with no adverse interactions with the public or other resources. Machine piles would be smaller than landing piles but larger in general than hand piles. The size and distribution of machine piles will be dictated by proximity to adjacent fuels and availability of suitable locations.

Hand Piles

Hand piling of activity fuels will be used in areas needing slash disposal in areas that cannot have large piles due to proximity of adjacent fuels, high visitor use, or has a risk for invasive weed infestation. Piling will be completed in accordance with the piling specifications developed on the Minidoka Ranger District. These pile specifications dictate that: Piling is avoided in highly visible areas; materials in piles are no greater than 6" in diameter and 6 feet in length, hand piles are no larger than 8 feet in diameter and 6 feet in height, piles are created no less than 15 feet apart from one another, and piles are covered at 2/3 depth where necessary.

Mitigation Measures

Mitigation measures are analysis actions added to the project during project development to reduce impacts and are incorporated in the effects analysis for this project.

Issue 1 Mitigation

1) Prescribed burning will be implemented when live fuel moisture of the grass/herbaceous/shrub fuel is not receptive to fire; therefore the risk of escaped prescribed fire will be very low.

Issue 2 Mitigation

1) Juniper removal is targeted, not sagebrush. Mitigation is in the project design and timing of the treatments. Timing restrictions are: no treatments will occur within 0.6 miles of an established, active lek between March 25 and May 15.
2) No treatments will occur between May 1 and July 15 to avoid the migratory bird nesting season.
3) If it is determined by the project leader that treatments need to occur between May 1 and July 15, the District Biologist will identify avoidance areas.

Issues 3 Mitigation

1) Timing of broadcast prescribed fire treatments in late fall or early winter with higher soil moistures will reduce the potential for scorching the soil and creating sites for establishment of noxious weeds.
2) All equipment intended to be used in any stage of the project development or implementation needs to be cleaned before entering or exiting the project area.
3) Equipment storage and loading/unloading activities should be located in areas that are free from invasive species. When possible use staging areas and helibases that are maintained in a weed-free condition.
4) Fire line construction (if required) should be limited to areas that are free from any existing noxious/invasive plant species when possible. Fire lines should be rehabilitated as soon as possible

and reseeded with an approved seed mix. Use appropriate preparation tactics to reduce disturbances to soil and vegetation.

5) Pile burning or prescribed fire should be conducted when minimal impacts to the soil resource will occur, such as times of high soil moisture.
6) Piles should not exceed the current district pile standard, except where allowed in the project design.
7) Pile burning or overstory broadcast burning should not take place over existing invasive plant populations.
8) Spot or broadcast burning should not take place within 15 feet of any travel route. 'No-burn' areas will be identified prior to implementation by the district weed coordinator and communicated to the District fire staff.

Comparison of Alternatives

Information in this section is presented as a summary comparison of Action Alternatives. This information has been summarized from the Affected Environment and Environmental Consequences (AEEC) section of this EA. For a more detailed description of how these summaries were developed, please refer to the appropriate AEEC section.

Table 2 Fire/Fuels Comparison of Alternatives

Indicators	Alternative B	Alternative C	Alternative D
Estimated Cost	$933,600	$1,250,400	$1,413,000
Potential-Likelihood Measure/Nearness to Purpose and Need Measure Factor Rating	Moderate	High	High
Inherent Risk of Escaped Prescribed Fire	Yes	Yes	No
Number of Burning Days – Aerial Ignition	14	3	0
Number of Burning Days – Hand Ignition	3	3	0
Escaped Fire Risk Rating	Highest	Moderate	Lowest

Table 3 Invasive Plants Comparison of Alternatives

	Risk Rating Units (total acres)			
Alternative	Low	Moderate	High	Summary
B	1 (1061 acres)	6 (1937 acres)	4 (1714 acres)	Moderate Risk Level
C	1 (1061 acres)	5 (1656 acres)	5 (1995 aces)	Moderate-High Risk Level
D	1 (1061 acres)	3 (1183 acres)	7 (2468 acres)	High Risk Level

Table 4 Wildlife Comparison of Alternatives

Alternative	Acres of Improved Sage-grouse Brood Rearing Habitat (due to removal of Juniper)		Potential Loss of Sagebrush Habitat due to treatments (acres)
	Prescribed Fire	Mechanical	
A	0	0	N/A
B	1,337	2,110	<65
C	444	3,375	<16
D	0	4,710	<0.5

Alternatives B, C, and D will result in beneficial effects to sage-grouse habitat and to other species of sagebrush dependent wildlife. The potential loss of acres of sagebrush in Alternatives B, C, and D,

while varying slightly by alternative, is considered to be insignificant (in all three alternatives) in relation to the amount of sagebrush that exists in the analysis area and at the landscape scale.

Monitoring

Monitoring activities can be divided into Forest Plan monitoring and project-specific monitoring. The National Forest Management Act requires that National Forests monitor and evaluate their forest plans (36 CFR 219.11). Chapter 4 of the Forest Plan includes the monitoring and evaluation activities to be conducted as part of Forest Plan implementation. There are three categories of Forest Plan monitoring: implementation monitoring, effectiveness monitoring, and validation monitoring. Implementation monitoring and any additional project-specific monitoring is an important aspect of complying with the standards and guidelines established in the Forest Plan for all projects.

Effectiveness and validation monitoring are typically done as part of Forest scale monitoring. Items to be monitored with associated information are found in the Sawtooth LRMP, Chapter IV.

Table 5 Project Implementation Monitoring for the North East Cassia Project Area

Item to be Monitored	Responsibility	Timing of Monitoring	Objectives for Monitoring
Wildlife Nesting/Use of the Site	Wildlife Biologist	Prior to, concurrent with, and following implementation	To ensure compliance with Forest Plan standards and guidelines
Project Operations Restrictions for Wildlife	Wildlife Biologist	Prior to and current with implementation	To ensure compliance with mitigation requirements.
Weed Infestation and Spread	Range Staff Officer or Designee	Post implementation	To ensure compliance with mitigation requirements.
Air Quality Impact	District Fuels Technician	Concurrent with and post implementation	To ensure compliance with mitigation requirements.
Soil and Vegetation Recovery in Burn Pile Locations	District Fuels Technician, District Hydrologist, Range Staff Officer	Post implementation	To evaluate soil and vegetation recovery in burn pile locations.
Heritage Resources	Project Archeologist	Post implementation	To examine locations of known and previously undiscovered heritage resources.

Alternatives Considered But Eliminated

There are no Alternatives that were considered but eliminated.

Chapter 3 - Affected Environment and Environmental Consequences

This section describes the environmental impacts of the alternatives. Specialist reports, which include assessments of the affected environment and more detailed analysis of direct, indirect, and cumulative effects of the alternatives, can be found in the project file at the Minidoka Ranger District.

Wildfire and Fuels

Affected Environment

Existing Fire Environment
Fire behavior depends on numerous factors (i.e., the location of ignition, weather conditions, and fuel loads at the site of ignition) and cannot be predicted exactly. In dense juniper sites such as can be found within this project area, fires usually tend to be small and relatively easy to control. However, under extreme weather conditions, such as drought (or early snow melt), combined with moderate or high winds, fire behavior may be more intense and fires more difficult to control in this fuel type.

Direct, Indirect, and Cumulative Effects of Alternative A – No Action
This alternative would not treat any portion of the fuel profile. It would not directly increase surface fuel loads and the arrangement of fuels would not change. Over time, however, juniper canopy would continue to expand across the project area. This alternative would exacerbate the potential for an extreme fire to occur since recruitment of more junipers would continue. Effects of the extreme fire would be severe, fire management would be difficult to implement, and values (i.e., natural resources, improvements, and communities) would continue to be threatened. Under this alternative, emergency response personnel would find it difficult to implement fire management directions for direct control and perimeter control strategies during extreme weather conditions. This alternative would not alter the fuel beds or fire behavior. Therefore, it would not slow rates of spread or lower fireline intensity to provide fire personnel with the advantage during initial attack. In the long term, emergency fire responders would be faced with an even greater challenge in implementing Forest Plan direction for direct attack due to the increased recruitment of fuels.

Direct and Indirect Effects of Alternatives B, C, and D
The prescribed fire effects of treatments proposed under Alternatives B, C, and D would vary depending on weather conditions, fire behavior, and the resulting mortality of juniper in the stand. Prescribed fire would be used to lower the overall crown cover percent across the project area. The amount of reduction would be variable and correspond to the factors listed above. Ideally, the crown cover would be reduced by 100 % of the existing overstory canopy cover in targeted treatment areas. These pockets of burned juniper would serve to slow or even stop an advancing crown fire. The direct effect would be safer and more efficient fire management. Depending upon burning conditions managers could choose to suppress the fire, or if moderate enough, allow the fire to burn under appropriate management response scenario.

Mechanical treatments proposed under Alternatives B, C and D would have the same direct and indirect effects. Stands of juniper trees that have encroached out of their natural location on the landscape would be removed mechanically. The direct effect would be the elimination of the threat of severe crown fire. The sagebrush ecosystem would not be impacted by an increasing juniper overstory. Old-growth stands of juniper would be left alone and continue to be resistant to wildfire due to low surface fuel loadings. Indirect effects would be a change from FRCC 3 or 2 to FRCC 1, those covered under the Wildlife

section such as improved habitat for sage-grouse, and also potential increases in ground and surface water flows due to lowered transpiration from the vegetation on site.

Slash treatments proposed in Alternatives B, C, and D contribute only indirectly to the elimination of severe fire threat in juniper stands. The direct effect of the slash treatments would be the elimination of biomass resulting from mechanical treatments. Machine and hand-built slash piles, once burned, would reduce the amount of slash that is retained in stands and reduce the amount of surface fuels that would be present after mechanical treatment if the slash was not otherwise piled.

During extreme weather conditions, these alternatives would yield localized reduced fire behavior effects within treated units.

Cumulative Effects of Alternative A

The cumulative effects of the no action alternative are based upon a continuation of the current process of juniper cover expansion. With no action, juniper will continue to increase at the expense of the sagebrush-grass ecosystem, until disturbance occurs. This disturbance will likely be severe wildfire. The damage to the ecosystem will be a loss of the juniper overstory and any remaining understory. Soil structure degradation, seed bank destruction, multi-species habitat loss, and invasion of exotic annual weeds are likely results of this eventual disturbance.

Other cumulative effects include increased suppression costs for future severe wildfires, and increased risk to firefighters. As the juniper fuel increases, fighting the fire will require more resources and will have more extreme fire behavior. Both of these factors increase the cost and risk of fire suppression.

Additionally, under the no action alternative, the cost of future fuels reduction activities will be increased. If the No Action alternative is selected now, fuels will continue to increase. If a fuels reduction project is proposed later, the financial cost will be greater in proportion to the additional fuel that will exist then as compared to now. Also, the FRCC will be even further departed towards FRCC3 than it is currently.

Cumulative Effects of Alternatives B, C, and D

The cumulative effects of Alternatives B and C contribute to making the landscape more resistant to intense wildfire. Wildfire suppression activities for the past 100 years have had a moderate to high impact on overstory fuel accumulations within the project area. It is unknown if past vegetation management treatments have contributed to a higher than normal juniper stand density. The continued suppression of wildfires would not prevent the continued expansion of juniper, which would again exacerbate wildfire behavior by increasing fire severity and intensity. Areas proposed to be treated will require continued human intervention to prevent a reoccurrence of the current fuels problem. This could be either allowing wildfire to burn naturally, or continuing fuels reduction treatments to prevent juniper from expanding. Vegetation treatments that resulted in decreases in canopy fuels without increasing surface fuels would reduce crown fire behavior.

Comparison of Alternatives – Fire/Fuels

The cost of implementation methodologies proposed in a fuel reduction project is one of the factors used to choose one alternative over another. It has generally been held that the use of prescribed fire is a less expensive alternative in terms of cost-per-acre. This is true especially where aerial ignition is used on large acreages in a single burning period. Costs that are usually not captured in prescribed fire are the costs to prepare the site, and the costs to monitor and hold the burn after the main ignition period is completed, and the travel costs of outside resources that assist the burn.

The costs of mechanically treating an area are typically greater than prescribed fire, however capturing the true cost of mechanical treatment tends to be simpler and more accurate because costs are commonly those in a contract or Forest Service payroll, which is a known quantity.

Capturing true costs of a project can be challenging. Hidden costs, cost-pooling, unknown charges to the charge code, per-diem rates for traveling resources, and technician time are all difficult to quantify exactly. Also, before a contract is awarded, the government can only estimate what the costs will be. The actual contract cost can come in higher or lower than the government estimate. The tables below are derived from expertise and experience with past costs of implementation.

Another issue that has been raised is the fear of a prescribed fire escaping. The chance of a fire escaping as a result of this project is considered very low due to the project design. This project is specifically designed so that if the live fuel moisture of the grass/herbaceous/shrub fuel is receptive to fire, the project will be out of prescription. However, there is always an inherent risk of a prescribed fire escaping, so Alternatives B and C will show an *inherent* risk of prescribed fire escaping.

Risk of a Prescribed Fire Escaping			
	Alternative B	Alternative C	Alternative D
Inherent Risk of Escaped Fire?	Yes	Yes	No
Acres at Risk of Escape	2,482	740	None
# of Burning Days – Aerial Ignition	14	3	0
# of Burning Days – Hand Ignition	3	3	0
Risk Rating	Highest	Moderate	Lowest

Aerial Ignition Cost for 1 day – Estimated to Complete Approximately 100 Acres Per Day			
	Base Resource Cost	**Misc. Resource Cost**	**Total**
Engines –T4 x 2	2000	2000	4000
Overhead (6)	2500	1500	4000
Fuel	400		400
Helicopter (all)	6000		6000
			14,400

Mechanical Treatment Costs		
	Cost Per Acre	**Acres Per Day**
Force Account Hand Based Mechanical	70-400 (ave. 235)	2-10 (ave 6)
Machine Based Mechanical	200-400 (ave 300)	8-25 (ave 16.5)
Contracted Hand Based Mechanical	300-450 (ave 375)	2-10 (ave 6)
Average of machine and hand mechanical	**Approximately $300**	**9.5**

Estimate of Days Required to Complete the NE Cassia Project, By Alternative			
	Alternative B	**Alternative C**	**Alternative D**
Aerial Prescribed Fire (up to 60% of a burn unit)	14	3	-
Hand Ignition Prescribed Fire	3	3	-
Machine Mechanical	150	241	285
Hand Based Mechanical	414	662	785
Totals Days (averaged) required to complete	**581**	**909**	**1070**
Field Seasons (150 days) required to complete	**3.8**	**6.1**	**7.1**

Estimated Total Cost to Complete the Project by Alternative			
	Alternative B	**Alternative C**	**Alternative D**
Aerial Prescribed Fire	$172,800	$43,200	-
Hand Ignition Prescribed Fire	$16,500	$16,500	-
(Average) Mechanical	$744,300	$1,190,700	$1,413,000
Totals	**$933,600**	**$1,250,400**	**$1,413,000**

Potential-Likelihood/Nearness to Purpose and Need Factor (PLM/NPNM Factor)

The PLM/NPNM Factor is defined below. The Factor is used to obtain a relative weighted score that can be used to compare Alternatives in terms of the ease of implementing a treatment with how close the result of that treatment is to the Purpose and Need of the project.

1. **Potential/Likelihood Measure (PLM)**
   The first measure is the Potential of the first encounter with a tree to cause mortality. The second measure is the Likehood of this actually happening, based upon technical expertise of the rater. An 'encounter' is defined as each time a treatment is applied to a tree. For instance, every single pass with a helitorch on one tree is a single encounter; another example would be: using a masticator on a tree is one encounter and coming back with a chainsaw to remove a missed lower limb is another encounter.
   The PLM Sum will be a number from 2-6. A PLM of 2 requires the most encounters to cause mortality, a 6 requires the least.

   The numbers are defined as:
   1 – More than 50% of trees will require more than one encounter to cause mortality
   2 – Fewer than 50% of trees will require more than one encounter to cause mortality
   3 – Trees will be killed on the first encounter.

2. **Nearness to Purpose and Need Measure (NPNM)**
   The NPNM is defined as how near the treatments result meets the Purpose and Need (P&N) of the project. Although all treatments move the project area towards the P&N, the end result of some treatments will be closer to the measure of 100% removal of encroached junipers on the landscape.

   NPNM numbers are defined as follows:
   1– Moves the site towards the P&N, however the end result will be the furthest from the P&N
   2- Is closer to the P&N than a 1, however does not entirely meet it
   3- Is the closest to meeting the P&N of 100% removal of encroached junipers.

3. **The PLM/NPNM Sum**
   The PLM/NPNM Sum combines the PLM and NPNM into one number. This Sum number balances the ease of attaining the full P&N with the nearness to attaining the Desired End Result of the project. This will be a number from 3-9. A Sum of 3 would be a treatment difficult to implement and difficult to achieve the P&N. A Sum of 9 would be a treatment both easy to implement and easy to achieve the P&N.

PLM-NPNM Summary				
	PLM	PLM Sum	NPNM	**PLM/NPNM Sum**
Aerial Prescribed Fire	2-1	3	2	**5**
Hand Ignition Prescribed Fire	2-2	4	2	**6**
Hand Based Mechanical	3-3	6	3	**9**
Machine Based Mechanical	2-2	5	3	**8**

PLM/NPNM Factor

The PLM/NPNM Factor is derived from the PLM/NPNM Sum and a Weighted Percentage that is multiplied together (thus creating a mathematical factor). This Factor is weighted across the entire project area, and allows the Decision Maker to comparatively see both how challenging an Alternative will be to implement, and how close the implementation result will match the Purpose and Need. This is a relative measure between alternatives.

The 'Percentage of Treatment' line is derived from the percentage that a treatment type is part of an Alternative, by acre, in the following order: Aerial Prescribed Fire/Hand Prescribed Fire/Mechanical. For example, in Alternative B, 42% of the acres are in Aerial Prescribed Fire, 6% is in Hand Prescribed Fire, and 52% is in Mechanical. The 'PLM/NPNM Sum' line is derived from the previous table. Mechanical is averaged together as an 8.5 PLM/NPNM Sum. The 'Result' line is the individual multiplication factor result, by treatment type.

The 'PLM/NPNM Factor Sum' line is the final comparative score, and will be a number from 300 to 900. A Factor close to 300 indicates an Alternative that would be difficult to implement and difficult to achieve the P&N. A Factor of 600 would be in the middle. A Factor close to 900 would be an Alternative both easy to implement and easy to achieve the P&N. Factor sums from 300-500 are rated as a "low." Sums from 500-700 are rated as a "Moderate." Sums from 700 to 900 are rated as a "High."

PLM-NPNM Factor, by Alternative			
	Alt B	**Alt C**	**Alt D**
Percentages of Treatment in an Alternative	42/6/52	10/6/84	0/0/100
PLM/NPNM Sum	5/6/8.5	5/6/8.5	5/6/8.5
Result	210 / 36 / 442	50 / 36 / 714	0 / 0 / 850
PLM/NPNM Factor Sum	**688**	**800**	**850**
Factor Sum Rating	**Moderate**	**High**	**High**

Invasive Plants

Affected Environment

Noxious weed inventories have been completed on the travel routes throughout the project area. A site specific inventory has been completed for the North East Cassia Fuels Reduction project. Invasive species found within or adjacent to the project area are Cheatgrass (*Bromus tectorum*) and Diffuse Knapweed (*Centaurea diffusa*). See Table 6 for acres infested. These species probably colonized the area after road construction activities such as grading, and hauling material from infested sites. Both Cheatgrass and Knapweed are commonly known to invade highly disturbed areas such as burned areas, road sides, trail heads, and along livestock driveways. Firewood gathering, recreational travel, road maintenance, wildfires, and livestock grazing have likely contributed to the persistence of these species within the project area.

Known responses of the identified weed species are to colonize disturbed areas. Cheatgrass is adapted to both survive fire on site, and to colonize recently burned sites with exposed bare soil. Fire facilitates cheatgrass dominance on some sites by interrupting successional trajectories of post-fire plant communities, and cheatgrass facilitates fire and can thus shorten the interval between fires. Diffuse knapweed has a large, perennial taproot that may survive fire if the root crown is not killed. It also produces large quantities of seed that may survive fire. Diffuse knapweed may have the potential to establish and spread following fire. Fire provides an ideal seedbed by removing shade and exposing mineral soil. Therefore, if diffuse knapweed was present on or near the site prior to the fire, there is potential for its establishment.

Table 6 Site Inventory Summary

SPECIES NAME	AREA INFESTED
Cheatgrass (*Bromus tectorum*)	Approx. 20 acres
Diffuse Knapweed (*Centaurea diffusa*)	>0.1 acre

Direct and Indirect Effects of Alternatives A – No Action and B, C and D – Proposed Actions

Alternative A- Under this Alternative there would no new direct, indirect or cumulative effects as there would be no actions being implemented. Current vegetative conditions would continue along the current path with noxious weeds being present on site, they may expand or decrease in density and area over time through natural cycles.

Implementation of Alternatives B, C or D has the potential to increase both the total acres infested with noxious weeds and the density at which they occur.

The proximity to all of the treatment areas to known weed infestations; Treatment units 1, 2, 4, 5, 6, 7, 9, 10, and 11 are directly adjoining the largest know infestations of cheatgrass. Units 2 and 8 have cheatgrass scatted throughout. Units 4, 5, 10 and 11 have the potential for diffuse knapweed populations within them. However, at this time there are not any existing diffuse knapweed plants within the project units. The ways in which these species of weeds spread means that these treatment areas are at risk either through direct or indirect contact with the existing weed populations.

The proposed prescribed burning in the late fall or early winter with helitorch or by hand ignition will help reduce the potential for increased invasive populations within the project area. The timing of this burning with higher soil moistures will help prevent soil scorching from occurring. The treatment

activities in the mechanical units need to avoid the larger concentrations areas along the travel corridors and avoid piling slash within these areas as well.

All of the units in the project area need to follow all of the mitigation measures to insure we are meeting the Forest Plan objectives for this resource area to prevent new invaders from establishing and to contain and control existing populations.

Spur roads within the project area should not be opened for public access beyond the existing management levels prior to the implementation of this project to protect from continuing the spread of invasive plant species.

Risk Assessment

Under Alternative A there is no change in the risk assessment as there would be no actions implemented. Negative impacts from recreational motorized cross country travel will no longer occur as a result of the implementation of the new Sawtooth National Forest Travel Management Plan. Noxious weed spread would continue to be affected by existing, on-going actions unrelated to this proposal.

The following risk assessment was used to determine the likelihood of increasing both the total acres infested with noxious weeds and the density at which they will occur within each treatment unit within the project area.

Alternative B

Unit #	Acres	Treatment Type	Risk Rating	Species of Concern
1	1,061	Mechanical	Low	Cheatgrass
2	812	Mechanical	Moderate	Cheatgrass
3	28	Mechanical	Moderate	Cheatgrass
4	229	Mechanical	High	Cheatgrass, Diffuse Knapweed
5	353	Mechanical	High	Cheatgrass, Diffuse Knapweed
6	165	Prescribed Fire	Moderate	Cheatgrass
7	308	Prescribed Fire	Moderate	Cheatgrass
8	343	Prescribed Fire	Moderate	Cheatgrass
9	281	Prescribed Fire	Moderate	Cheatgrass
10	268	Prescribed Fire	High	Cheatgrass, Diffuse Knapweed
11	864	Prescribed Fire	High	Cheatgrass, Diffuse Knapweed

Alternative C

Unit #	Acres	Treatment Type	Risk Rating	Species of Concern
1	1,061	Mechanical	Low	Cheatgrass
2	812	Mechanical	Moderate	Cheatgrass
3	28	Mechanical	Moderate	Cheatgrass
4	229	Mechanical	High	Cheatgrass, Diffuse Knapweed
5	353	Mechanical	High	Cheatgrass, Diffuse Knapweed
6	165	Prescribed Fire	Moderate	Cheatgrass
7	308	Prescribed Fire	Moderate	Cheatgrass
8	343	Mechanical	Moderate	Cheatgrass
9	281	Mechanical	High	Cheatgrass
10	268	Prescribed Fire	High	Cheatgrass, Diffuse Knapweed
11	864	Mechanical	High	Cheatgrass, Diffuse Knapweed

Alternative D

Unit #	Acres	Treatment Type	Risk Rating	Species of Concern
1	1,061	Mechanical	Low	Cheatgrass
2	812	Mechanical	Moderate	Cheatgrass
3	28	Mechanical	Moderate	Cheatgrass
4	229	Mechanical	High	Cheatgrass, Diffuse Knapweed
5	353	Mechanical	High	Cheatgrass, Diffuse Knapweed
6	165	Mechanical	High	Cheatgrass
7	308	Mechanical	High	Cheatgrass
8	343	Mechanical	Moderate	Cheatgrass
9	281	Mechanical	High	Cheatgrass
10	268	Mechanical	High	Cheatgrass, Diffuse Knapweed
11	864	Mechanical	High	Cheatgrass, Diffuse Knapweed

INVASIVE PLANTS- SUMMARY RATING

	Risk Rating Units (total acres)			
Alternative	**Low**	**Moderate**	**High**	**Summary**
A	-----	-----	-----	NA
B	1 (1,061 acres)	6 (1,937 acres)	4 (1,714 acres)	Moderate Risk Level
C	1 (1,061 acres)	5 (1,656 acres)	5 (1,995 aces)	Moderate-High Risk Level
D	1 (1,061 acres)	3 (1,183 acres)	7 (2,468 acres)	High Risk Level

Summary rating is based upon number of units that fall within each risk rating category. The risk is the relative likelihood of causing ground disturbing activities that will cause an increase of noxious/ invasive plants within the project area.

Cumulative Effects of Alternative B, C, and D – Proposed Action

The weed infestations in the project area are a result from previous management activities such as road construction, fuel wood gathering, multiple recreational uses, etc... Currently activities such as; hunting, fire wood cutting, and livestock grazing are occurring across the entire project area and are currently making control and eradication of the noxious weeds on site difficult. Additional disturbances within the area will add to the challenge of managing the noxious weed populations in this area.

Wildlife and Botanical Resources

The Forest Service is required by law, regulation, and policy to address impacts to wildlife species of special designations. Proposal of the North East Cassia Fuels Reduction Project as requires analysis of the effects of the alternative on wildlife habitat for:

- Management Indicator Species (MIS)
- Threatened, Endangered, Proposed, and Candidate species (TEPC)
- Forest Service Region 4 Sensitive wildlife species
- Migratory bird species.

Direct and indirect effects to these species will be analyzed at the geographic scale of the North East Cassia Proposed Fuels Reduction Project (4,710 acres). Cumulative effects will be analyzed at the geographic scale of the Cassia Division, Minidoka District, of the Sawtooth National Forest.

Species Considered and Evaluated

MIS are used to assess effects of management activities on groups of species with similar habitat requirements. The following wildlife species are Sawtooth National Forest MIS species (2003 Revised Forest Plan): Pileated Woodpecker (Dryocopus pileatus), Greater Sage-grouse (Centrocercus urophasianus), Columbia River Bull Trout (Salvelinus confluentus). The Greater sage-grouse is the only MIS species known to occur on the Minidoka Ranger District, Cassia Division and will be addressed in relation to the NE Cassia Fuels Reduction Project.

Greater Sage-grouse – Sage grouse are highly dependant on sagebrush for food and cover throughout the year (Connelly 2000). Habitat on the Cassia Division and within the North East Cassia Fuels Reduction Project is used by sage-grouse primarily for early and late brood rearing habitat and limited wintering habitat.

Management Indicator Species (MIS) Habitat

Affected Environment – MIS

Greater Sage- grouse – Sage-grouse are known to use sagebrush/forb-dominated communities adjacent to the North East Cassia Fuels Reduction Project. Sage grouse are highly dependant on sagebrush for food and cover throughout the year. They feed almost exclusively on sagebrush throughout winter. During late brood rearing, sage-grouse can be found in grasslands, agricultural fields, and along alpine ridges, but are generally within a mile of sagebrush habitat. Sage-grouse can be migratory or non-migratory (Connelly 2000). Despite management and research efforts that date to the 1930's, breeding populations of this species have declined 17-47% throughout much of its range (Connelly and Braun, 1997). Causes are frequently attributed to habitat fragmentation, land conversion, overgrazing, introduction of exotic weeds and altered fire regimes (Miller, R F., and L.L. Eddleman 2001).

Sage-grouse habitat on the Cassia Division within or adjacent to the North East Cassia Fuels Reduction Project is used by Greater sage-grouse for breeding (Mid- March to May), nesting (May-June), early to late brood rearing in the summer and early fall (July –October), and possible wintering on the low sagebrush ridges. Both Mountain Big sagebrush (*Artemisia tridentata vaseyana*) and Low sagebrush (*Artemisia arbuscula*) are found within the project area and both species of sagebrush are highly valued by sage-grouse. In early summer, as the lower sagelands dry out, sage-grouse gradually meander up the sagebrush ridges in search of more succulent forbs. They use wet meadows and riparian areas in search of insects that are an important source of protein for their young (Connelly 2000). They are known to use the lower portions of the project area during milder winters to access forage on sagebrush above the snow level. The majority of the sagebrush stands within or adjacent to the North East Cassia Fuels Reduction Project are in mid to late successional stages with a variety of grasses and forbs within the understory that appear to be providing quality habitat (Rust, SK, & J.J.Miller 2005-07). Since the 1950's, junipers have invaded many of the moderately sloped sage-grasslands that ascend upward to Cottonwood Ridge (Fuels specialist report). Several sage-grouse leks are known to exist on Cottonwood Ridge and it is presumed that sage-grouse nest within the vicinity of the leks. None of the known currently active or historically active leks are located within the proposed project boundary (IDFG Lek data, 2008).

Environmental Effects – MIS

Direct/Indirect Effects of the No Action Alternative – Alternative A versus Alternatives B, C, and D on Greater Sage-grouse

Under the **No Action Alternative – Alternative A**, there would be little change to sage-grouse or their

habitat. As junipers continue to invade and become more dense within pure sagebrush stands, sage-grouse habitat will become less desirable. Dense stands of juniper in sage-grouse habitat provide perches for raptors that can prey on grouse (Sage-grouse Advisory Committee 2006). Additionally, over time, juniper invasion into sagebrush can diminish forbs and shrubs that grouse use for foraging. In the event of wild fire, junipers are succeptible to crown fires and once ignighted could burn large tracts of nesting and brood rearing habitat. When a large wildfire occurs, loss to sage-grouse habitat may be significant and will take from 15 to 25 years to become suitable habitat again.

Effects Similar to all action Alternatives B, C, and D
The total amount of juniper retained in the prescribed fire units will be approximatly 60% of each unit treated, while 15% of juniper will remain on the mechanically treated units.

Alternative B (Original) Agency Proposed Action – This alternative favors the use of prescribed fire (2,228 ac.), but additionally uses mechanical treatments (2,482 ac.), to remove encroaching juniper from existing sage-grouse habitat on approximately 4,710 ac. Treatment activities in units 1-5 (2,482 ac. of primarily brood rearing habitat) are aimed at selectively, mechanically, removing single juniper trees within sagebrush habitat. Mechanical treatment will be emphasized in the lower elevation units (1, 2, and 3). This will benefit sage-grouse habitat as it is more selective than fire and is more likely to retain potential wintering areas at lower elevations for sage-grouse. Units 6 through 11 (2,228 ac.of sage-grouse habitat) will be treated with prescribed fire. Since sagebrush is not targeted in either treatment type, neither winter or nesting/brood rearing habitat will be negatively affected by these treatments. No treatment is planned in wet meadows, or riparian conservation areas (Little Cottonwood Creek) where sage-grouse likly forage and access water while brood rearing.

In the short term (1-7 yrs.) in mechanically treated units, some individual sagebrush could be damaged by equipment use. This is expected to be an insignificant amount of sagebrush and these areas would recover quickly. Though not targeted, some sagebrush will be lost during prescribed fire activities due to heat kill. Junipers will be ignited in small groups to remove the overstory and some burning of individual sagebrush plants is expected. It is estimated that less than 65 acres or less than 1% of sage-grouse habitat within the analysis area will be removed by incidental burning under this Alternative. The largest burned opening is not expected to be greater than 30 acres in size. Openings this size or smaller would provide natural reseeding of sagebrush from adjacent shrubs. There is always the risk that prescribed fire could escape the planned perimeter and burn more sage-grouse habitat than predicted. Timing of prescribed fire to a period of high moisture content of the sagebrush greatly minimizes this risk.

Under this alternative, there will be an increase of vehicle activity and human disturbance within sage-grouse brood rearing and potential wintering habitat as Juniper stands are treated. This would be a short term, seasonal, increase (1-7 years) throughout the summer/fall/winter time period. Sage-grouse typically use sagebrush stands within the project for nesting or early brood rearing (April-June), which would be the time period when grouse would be most susceptible to human disturbance. Treatments are not proposed during this time period. Sage-grouse will likely avoid units where treatments are occuring and move to untreated areas within the project area. Not all units will be treated within the same year but will be spread over time and space. This will minimize the effect to sage-grouse as they will always have untreated areas of sagebrush to take refuge within the project area.

Overall this alternative is beneficial to sage-grouse by removing juniper from 4,710 acres of brood rearing and potential wintering areas, but may have slightly more risk to loss of some sage-grouse habitat as compared to either Aletnatives C or D. Sagebrush, other shrubs, and forbs will likely increase in the treated areas providing younger, more succulent forage and more areas of hiding cover that is free from raptor perches. Additionally it will open up corridors of travel from sage-grouse

wintering habitat to summering habitat . Conversely, if juniper stands are left untreated and the current dry weather patterns continue, there is potential for wildfire to spread from burning juniper into mid to late successional sagebrush stands. Fifteen to 25 years would be required to provide suitable nesting/brood rearing/wintering habitat should this occur. This alternative provides an opportunity to manage this threat to sage-grouse habitat.

Alternative C (Modified) Agency Proposed Action - This alternative favors more mechanical treatment (3,970 ac.) with less emphasis on precribed fire (740 ac.). This alternative presents the optimum opportunity to remove encroached juniper from existing sage-grouse habitat on approximately 4,710 ac. Treatment activities in units 1-5 plus units 8, 9, and 11 (3,971 ac. of primarily brood rearing habitat) are aimed at selectively, mechanically, removing single juniper trees within sagebrush habitat. The emphasis on mechanical treatment in this Alternative further reduces the risk of losing sagebrush to escaped fire as compared to that potential with Alternative B. However, there will be more vehicle/machine activity and disturbance to sage-grouse over a wider area (1,488 ac. more) than with the acres of prescribed fire activity in alternative B. Disturbance from a prescribed fire operation would likely be of much shorter duration than the time frame needed for mechanical treatment. In this alternative, Units 6, 7, and 10 (740 ac.of sage-grouse habitat) will be treated with prescribed fire. Since sagebrush is not targeted in either treatment type, winter and nesting/brood rearing habitat will be beneficially affected in the long term(15+ yrs.). No treatment is planned in wet meadows, or riparian conservation areas (Little Cottonwood Creek) where sage-grouse likly forage and access water while brood rearing (same as in Alternative B).

In this Alternative with more mechanically treated units, more individual sagebrush could be damaged by equipment use as compared to Alternative B. As in Alternative B, this is expected to be an insignificant amount of sagebrush and these areas would recover quickly. Likewise, as in Alternative B, though sagebrush is not targeted, some sagebrush will be lost during prescribed fire activities. Since fewer acres (740ac.) will be treated with prescribed fire, potentially less sagebrush would be lost to burning under this Alternative. Junipers will be ignited in small groups to remove the overstory and some burning of individual sagebrush plants is expected. Under Alternative C, it is estimated that less than 16 acres or less than .5% of sage-grouse habitat within the analysis area will be removed by incidental burning. The largest burned opening is not expected to be greater than 30 acres in size. Openings this size or smaller would provide natural reseeding of sagebrush from adjacent shrubs. There is always the risk that prescribed fire could escape the planned perimeter and burn more sage-grouse habitat than predicted. Timing of prescribed fire to a period of high moisture content of the sagebrush minimizes the risk of escaped fire.

Under this alternative, there will be an increase of vehicle activity and human disturbance within late brood rearing and potential wintering habitat as Juniper stands are treated. This would be a short term, seasonal, increase (1-7 years) throughout the summer/fall/winter time period. Sage-grouse typically use sagebrush stands adjacent to the project for nesting or early brood rearing (April-June), which would be the time period when grouse would be most susceptible to human disturbance. Treatments are not proposed during this time period. Sage-grouse will likely avoid units where treatments are occuring and move to untreated areas within the project area. Not all units will be treated within the same year but will be spread over time and space. This will minimize the effect to sage-grouse as they will always have untreated areas of sagebrush to take refuge within the project area.

Alternative C presents the best opportunity to remove the maximum amount of encroached juniper from 4,710 acres of sage-grouse brood rearing and potential wintering areas. This would provide immediate and long term benefits to sage-grouse brood rearing and wintering habitat. This alternative, by using prescribed fire on less acres than Alternative B, minimizes the risk of burning excessive amounts of sage-grouse habitat as a result of escaped fire. Similar to Alternative B, sagebrush, other shrubs, and

forbs will likely increase in the treated areas providing younger, more succulent forage and more areas of hiding cover that are free from raptor perches. Additionally it will open up corridors of travel from sage-grouse wintering habitat to summering habitat. Conversly, if juniper stands are left untreated and the current dry weather patterns continue, there is potential for wildfire to spread from burning juniper into mid to late successional sagebrush stands. Fifteen to 25 years would be required to provide suitable nesting/brood rearing/wintering habitat should this occur. Alternative C offers the best combination of prescribed fire and mechanical treatments to maximize the improvement of sage-grouse habitat while minimizing the establishment of invasive species.

Alternative D Mechanical Only with Pile Burning - This alternative proposes mechanical treatment on all 11 units (4,710 ac.). Fire would be used in a very limited way to dispose of piles of juniper (fuel) created by mechanical treatment. This alternative virtually eliminates the risk of escaped, prescribed fire while allowing the opportunity to remove encroached juniper from existing late brood rearing and wintering habitat. As in Alternatives B and C, treatment activities are aimed at selectively, mechanically, removing single juniper trees within sagebrush habitat. However, there will be more vehicle/machine activity and human caused disturbance to sage-grouse over a wider area (entire analysis area) than with the acres of prescribed fire activity in Alternatives B and C. Disturbance to sage-grouse from prescribed fire operations would likely be of much shorter duration than the time frame proposed by mechanical treatment. Similar to Alternatives B and C, treatments would be a short term, seasonal, increase in disturbance (1-7 years) throughout the summer/fall/winter time period. Sage-grouse typically use sagebrush stands adjacent to the project for nesting or early brood rearing (April-June), which would be the time period when grouse would be most susceptible to human disturbance. Treatments are not proposed during this time period. Sage-grouse will likely avoid units when treatments occur. In this alternative, sagebrush is not targeted, so winter and nesting/brood rearing habitat will be beneficially affected in the long term (15+ yrs.). No treatment is planned in wet meadows, or riparian conservation areas (Little Cottonwood Creek) where sage-grouse likely forage and access water while brood rearing (same as in Alternative B and C).

In this Alternative where all units will be treated mechanically, more individual sagebrush could be damaged by equipment use. As in Alternative B and C, this is expected to be an insignificant amount of sagebrush, less than .5%, and these areas would recover quickly. All the units will not all be treated during the same year but will be spread over time and space. Similar to Alternatives B and C, this will minimize the effect to sage-grouse as they will always have untreated areas for refuge within the project area.

Alternative D presents a similar opportunity as Alternative C to remove the maximum amount of encroached juniper from 4,710 acres of sage-grouse brood rearing and potential wintering areas without any of the risks of escaped prescribed fire.

Similar to Alternatives B and C, Alternative D would provide immediate and long term benefits to sage-grouse brood rearing and wintering habitat. Similar to alternative B and C, sagebrush, other shrubs, and forbs will likely increase in the treated areas providing younger, more succulent forage and more areas of hiding cover that are free from raptor perches. Additionally it will open up corridors of travel from sage-grouse wintering habitat to summering habitat. Conversely, if juniper stands are left untreated and the current dry weather patterns continue, there is potential for wildfire to spread from burning juniper into mid to late successional sagebrush stands. Fifteen to 25 years would be required to provide suitable nesting/brood rearing/wintering habitat should this occur.

Alternatives Comparison Table for MIS

Alternative	Acres of Improved Sage-grouse Brood Rearing Habitat (due to removal of Juniper)	Potential Loss of Sagebrush Habitat due to treatments (acres)
	Total	
A	0	N/A
B	3,447	Less than 65
C	3,819	Less than 16
D	4,004	Less than 0.5

Alternatives B, C, and D will result in beneficial effects to sage-grouse habitat and to other species of sagebrush dependent wildlife. The potential loss of acres of sagebrush in Alternatives B, C, and D, while varying slightly by alternative, is considered to be insignificant (in all three alternatives) in relation to the amount of sagebrush that exists in the analysis area and at the landscape scale.

Threatened, Endangered, and Sensitive Species (TEPC) Habitat

Only Threatened, Endangered, Proposed, or Candidate species with potential or occupied habitat within or adjacent to the North East Cassia Fuels Reduction Project area are evaluated in this environmental assessment. Only sensitive species that are known to occur or have a high probability of occurrence are evaluated in this assessment. Probability of occurrence is determined by the presence of suitable habitat in the area and /or confirmation of the presence of the species in the area. A biological assessment and biological evaluation (BA/BE) has been completed on the effects of the proposed action alternatives on TES wildlife and plant species. This analysis can be found in the project file located at the Minidoka RD.

Affected Environment – TEPC Species

Threatened or Endangered Species - No species listed as Threatened or Endangered by the U.S. Fish and Wildlife Service are known to exist within the project area (Species List: 14420-2009-SL-0039 dated December 1, 2008). No Canidate or Proposed species exist within the analysis area.

Affected Environment - Sensitive Species –Terrestrial Wildlife and Plants

Table 7 Region 4 Forest Service Sensitive Terrestrial Wildlife Species Probability of Occurrence within the Analysis Area

Species	Probability of Occurrence in the Project Area. (Species Analyzed in the Wildlife Specialist Report)
Spotted Bat (*Euderma maculatum*)	Moderate, potential habitat, analyzed
Townsend's Big-eared Bat (*Corynorhinus townsendii*)	High, potential habitat, analyzed
Wolverine (*Gulo gulo*)	Low, potential habitat, not analyzed
Fisher (*Martes pennanti*)	Low potential habitat, not analyzed
Northern Goshawk (*Accipter gentiles*)	Low potential habitat, analyzed
Boreal Owl (*Aegolius funereus*)	Low, potential habitat, not analyzed
Flammulated Owl (*Otus flammeolus*)	Low potential habitat, not analyzed

Three-toed Woodpecker (*Picoides tridactylus*)	Low, no potential habitat, no records, not analyzed
Spotted Frog (*Rana luteiventris*)	No potential habitat, not analyzed
White-headed Woodpecker (*Picoides albolarvatus*)	Low, no habitat, not analyzed
Mountain Quail (*Oreortyx pictus*)	Low, no occurrences, not analyzed
Greater Sage-Grouse (*Centrocercus urophasianus*)	High, known occurrences. Analyzed in the MIS Section
Pygmy Rabbit (*Brachylagus idahoensis*)	Low potential habitat, analyzed
Peregrine Falcon (*Falco peregrinus*)	Low, no habitat, no occurrences, not analyzed
Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*)	Moderate potential habitat, not known to use the project area, analyzed
Bald Eagle (*Haliaeetus leucocephalus*)	Low potential habitat, analyzed

Table 8 Region 4 Forest Service Sensitive Botanical Species Probability of Occurrence within the Analysis Area

Present/Potential impact within Project area	Plant Species	Habitat and Known Populations
Not present	Goose Creek Milkvetch (*Astragalus anserinus*)	Barren slopes of white tuffaceous sand, known populations on Cassia Div. - Goose Creek drainage
Not present	Christ's Indian paintbrush (*Castilleja christii*)	Subalpine meadows > 9,000 ft .- endemic species found only on Mt. Harrison on, Albion Division
Not present	Davis' wavewing (*Cymopterus davissii*)	Subalpine rock outcrops and gravel areas> 9,000 ft. - known populations on Independence Mt., Graham Pk., and Mt. Harrison on Albion Division
Not present	Desert buckwheat (*Eriogonum desertorum*)	Dry, lower slopes - Black Pine and Cassia Division
Not present	Idaho penstemon (*Penstemon idahoensis*)	Lacustrine ash deposits, clay soils known populations on Cassia Division - Goose Creek drainage
Not present	Cottam's cinquefoil (*Potentilla cottamii*)	Cracks in quartzite outcrops 7,500 - 10,400 ft. - populations on the Raft River Division

Environmental Effects – Sensitive Terrestrial Wildlife and Botanical Species

The Wildlife and Botanical Resources Specialist Report indicates that all three Alternatives B, C, or D will likely impact some terrestrial wildlife individuals, but will not cause a trend toward federal listing or a loss of viability. As there are no sensitive botanical species present within the proposed treatment areas, none of the three Alternatives B, C, or D will impact any sensitive botanical species (Wildlife and Botanical Resources Specialist Report 2009).

Cumulative effects to Forest Service MIS and Sensitive Species

Past and present timber harvest, firewood gathering, and associated road building, wildfire and prescribed burning, livestock grazing, noxious weeds and invasive species, and substantial increases in motorized recreation, and recreational activities, in general, have affected MIS and Sensitive species habitat within the analysis area and on the Cassia Division. These activities are likely to continue over time. While not all of these activities have occurred within the boundaries of the project area, most of

these activities have likely removed or altered nesting, roosting and foraging habitat to some degree or another across the Cassia Division and adjacent to the project area. All the activities have likely added to cumulative effects to MIS and Sensitive species habitat.

In the foreseeable future, there may be timber sales proposed in areas adjacent to the project area. Firewood gathering is like to remain the same or increase as more people seek alternatives to high heating costs.

There have been several large wildfires on the Cassia Division in the past 10 years affecting MIS and Sensitive species habitats. Wildfire removes both foraging and nesting habitat until these areas recover. While some cheatgrass and noxious weeds have developed in these areas, likely affecting avian and bat foraging, most of the occurrences are along roads and forest access points (Noxious weed and invasive species infestations likely come from a variety of sources including recreation activities and livestock grazing). As drier weather conditions prevail, wildfires are likely to continue in MIS and Sensitive species habitat and add to the cumulative effects of all other authorized activities such as timber harvest, recreation and associated roads.

Prescribed fire activities may take place but the majority of these will be proposed to enhance wildlife habitat and are usually implemented out side of the breeding season. Typically, no road construction occurs with prescribed fire. Some incidental loss of snags (burn up) would likely occur along with creation of new snags as well. Overall, long term habitat improvements from prescribed fire projects are expected, but short term changes in distribution and use of this habitat by MIS and Sensitive species will likely add to cumulative effects in the short term.

Livestock grazing has affected riparian areas, springs, and seeps in MIS and Sensitive species habitat over time. When livestock grazing is managed appropriately, impacts to MIS and sensitive species is minimized, however it is likely that impacts to riparian areas , springs and seeps will continue to to occur over time and add to the cumulative effect of all activities.

Over the past two decades, increasing motorized recreation and creation of user developed routes on the Minidoka RD, has likely added to the disturbance and disruption of MIS and Sensitive species nesting, cover and foraging habitat. With the implementation of the recently signed Sawtooth MVUM (2008) and elimination of cross country travel, it is believed these impacts will be greatly reduced over time. There may be proposals to re- construct or move a limited number of recreational trails to address resource issues. This would involve ‘no net gain’ in trail miles, as an existing trail would likely be removed permanently to provide a new trail elsewhere. Additionally, spur roads and redundant roads have been identified for review and possible closure. These closures, if executed, will be an improvement to MIS and Sensitive species habitat

Migratory Bird Species Habitat

Executive Order (EO) 13186, signed January 10, 2001, lists several responsibilities of federal agencies to protect migratory birds, among them:

- Support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.

- Identify where unintentional take reasonably attributable to agency actions is having, or is likely to have a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. With respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the Service. These principles, standards, and practices shall be regularly evaluated and revised to ensure that they are effective in lessening the detrimental effect of agency actions on migratory bird populations. The agency also shall inventory and monitor bird habitat and populations within the agency's capabilities and authorities to the extent feasible to facilitate decisions about the need for, and effectiveness of, conservation efforts;

Additional direction comes from the Memorandum of Understanding (MOU) between USDA Forest Service and USDI Fish and Wildlife Service, signed January 17, 2001. The purpose of this MOU is to strengthen migratory bird conservation through enhanced collaboration between the Forest Service and Fish and Wildlife Service, in coordination with state, tribal and local governments. The MOU identifies specific activities for bird conservation, pursuant to EO 13186 including: 2) Strive to protect. Restore, enhance, and manage habitat of migratory birds, and prevent the further loss or degradation of remaining habitats on National Forest System lands. This includes: a) Identifying management practices that impact populations of high priority migratory bird species, including nesting, migration, or over-wintering habitats on National Forest System lands, and developing management objectives or recommendations that avoid or minimize these impacts. This will help form future specific protocols called for in a MOU implementing the Executive Order.

High Priority Migratory Bird Species Habitat

This section analyzes the current condition and the effects of the alternatives upon high priority migratory bird species habitat that occurs within the analysis area. The high priority habitats within the analysis area are riparian annd sagebrush habitats (Idaho Partners in Flight, Idaho Bird Conservation Plan, January 2000). For Minidoka, direct and indirect effects will be analyzed at the scale of the analysis area, and cumulative effects will be analyzed at the scale of the Cassia Division. This analysis complies with Executive Order 13186 and the subsequent January 17, 2001, Memorandum of Understanding between the Forest Service and Fish and Wildlife Service.

Priority habitats have been chosen to monitor conditions in primary breeding habitat of high priority migratory bird species that occur in the project area. Once high priority bird species have been identified, those species and their habitat can be monitored for trend; allowing conservation efforts to be focused in the area of greatest need (Idaho Bird Conservation Plan, 2000).

Migratory Bird Habitat Affected Environment

Riparian Migratory Bird Habitat

Riparian areas are biologically diverse and are very productive systems compared to adjacent uplands. Nearly half the migratory bird species that breed in Idaho use riparian areas as nesting habitat (Idaho Partners in Flight 2000). Little Cottonwood Creek riparian area and three spring sources are the only perennial water sources available to migratory birds within the analysis area. Livestock grazing, recreational activity and fire suppression have all had an affect on the current condition of migratory bird habitat within this habitat type in this drainage. Warblers and Flycatchers are high priority species (Idaho Partners in Flight 2000) that likely rely on the Little Cottonwood Creek riparian habitat.

Sagebrush Migratory Bird Habitat

Of the two types of migratory bird habitat analyzed in this section, sagebrush migratory bird habitat covers the most acreage within the N.E. Cassia Fuels Reduction Project. The most dominant brush species across the analysis area is mountain big sagebrush (Artemisia tridentata vaseyana). Canopy cover of sagebrush in the analysis area varies by site and aspect with some areas as thick as greater than 25% to areas previously burned with very low canopy coverage (wildfire burn area). Past burns tend to take 15-25 years to reach pre-burn canopy coverage depending on the intensity of the fire.

Cheatgrass invasion and subsequent increased fire frequency is a very serious threat to sagebrush migratory bird habitat since sagebrush can be eliminated by frequent fires. Some south-facing slopes and locations along the Bostetter road within the analysis area could potentially be affected by this threat. Areas on Forest land within the project boundary, in higher elevation sagebrush areas with greater precipitation levels, generally are less susceptible to cheatgrass invasion and subsequent altering of fire frequency.

Livestock grazing in sagebrush migratory bird habitat has altered species composition and abundance of some species of native grasses and forbs in some areas of the Analysis Areas. Residual grass heights may be insufficient for some species of nesting migratory birds on some years to provide adequate hiding cover.

Use of motorized roads and trails within sagebrush migratory bird habitat can potentially increase the likelihood of human-caused wildfire and noxious weed spread into this sagebrush habitat within the analysis area. Additionally, use of roads and trails in sagebrush habitat during the nesting season can also create disturbance effects to nesting migratory birds.

Environmental Effects – Migratory Bird Habitat

Direct / Indirect Effects of the No-Action versus the Action Alternatives
Under the no action alternative, current conditions for migratory birds in riparian, sagebrush, and pinyon-juniper habitats, as related to the North East Cassia Fuels Reduction Project Project, would remain the same.

Alternative B, C, and D- No treatments are proposed within 150 ft. of Riparian Conservation Areas under any of the 3 Alternatives so there would be minimal effect on riparian dependent avian species or their habitat. As sagebrush is not targeted for removal in any of the 3 Alternatives, there would be little negative impact, but likely a long term beneficial (due to juniper removal) to migratory birds dependent upon sagebrush. Juniper stands that have invaded sagebrush/grasslands are targeted for treatment and this would effect those species dependent upon juniper for nesting and foraging. Timing restrictions (May 1 through July 15) will be included in all 3 Alternatives to minimize the impact to nesting of migratory birds. Generally speaking, aerial, ground, and bark insectivores will likely benefit in the short term (1-5 yrs.), in burned habitats produced by Alternatives A and B. Whereas foliage gleaners will likely benefit from unburned habitats (Saab and Powell 2005) provided by mechanical treatments in all 3 Alternatives, but specifically in Alternative D. Sagebrush nesting habitat could be reduced in all prescribed fire units in all 3 Alternatives in the short term (1-5 yrs.), however, it has been determined that this would be an insignificant amount in relation to the nesting habitat found in the analysis area. Likewise, juniper nesting and foraging habitat will be reduced in the long term (15+ yrs) for those species dependent upon juniper for any of their life cycle. Treatments in each of the three alternatives are designed to protect older growth junipers along ridges, up the drainages and along

canyon rims where juniper was historically found in pinyon-juniper ecosystems.

Many migratory bird species will move to adjacent habitat to forage while treatments are implemented. Under any of the Alternatives, not all units will be treated within the same year but will be spread over time and space. This will minimize the effect to sagebrush dependent species as they will always have untreated areas of sagebrush to take refuge within the project area.

Cumulative Effects to Migratory Bird Habitat

Past and current livestock grazing, past timber harvest and associated road building, noxious weeds and invasive species, and substantial increases in motorized recreation, and recreational activities, in general, have affected riparian and sagebrush migratory bird habitat within the analysis area and on the Cassia Division. All of these activities have likely removed or altered riparian vegetation to some degree or another and have added to cumulative effects to migratory bird habitat.

There have been several wildfires on the Cassia Division in the past 10 years affecting riparian, sagebrush, and pinyon-juniper habitats. Wildfire removes nesting, cover, and foraging habitat until these areas recover. While some cheatgrass and noxious weeds have developed in these areas, likely affecting avian foraging, most of the occurrences are along roads and forest access points (Noxious weed and invasive species infestations likely come from a variety of sources including recreation activities and livestock grazing). If drier weather conditions prevail, wildfires are likely to continue to occur in riparian, sagebrush, and pinyon-juniper migratory bird habitat and add to the cumulative effects of all other authorized activities such as timber harvest, recreation and associated roads.

Past timber harvest, fuel wood cutting, and attending road building have likely affected nesting and cover/perching opportunities for migratory birds.

Over the past two decades, increased motorized recreation and creation of user developed routes on the Minidoka RD, has likely added to the disturbance and disruption of migratory bird nesting, cover and foraging habitat. With the implementation of the recently signed Sawtooth MVUM Travel Plan (2008), it is believed these impacts will be greatly reduced over time. However, recreational use will likely continue to increase on the currently permitted roads and trails over time and will likely be a large impact on migratory birds.

There may be proposals to re- construct or move a limited number of recreational trails to address resource issues. This would likely involve ‘no net gain’ in trail miles, as a trail would likely be removed permanently to provide a new trail elsewhere. A portion of these trails could potentially be constructed within within migratory bird habitat. Redundant roads have been identified for review and possible closure. These closures, if executed, will be an improvement to migratory bird habitat.

Prescribed fire activities may take place but the majority of these will be proposed to enhance wildlife habitat and are usually implemented outside of the breeding season. Typically, no road construction occurs with prescribed fire. Overall, long term habitat improvements from prescribed fire projects are expected, but short term changes in distribution and use of this habitat by migratory birds will likely add to cumulative effects in the short term.

Chapter 4 - Consultation and Coordination

The Forest Service contacted, consulted, or collaborated with the following organizations, Federal, State, and local agencies, and tribes during the development of this environmental assessment.

Project Team Members

The following individuals served as interdisciplinary team members who conducted the environmental analysis and prepared reports that support this Environmental Assessment.

Name	Title	Responsibility
Scott Nannenga	District Ranger	Responsible Official
Stephen Fillmore	District Fuels Specialist	IDT Leader
Dena Santini	District Biologist	Wildlife and Plant Biology Analysis
Lucas Phillips	District Range Specialist	Range Evaluation, Invasive Weeds Analysis
Mark Dallon	Zone Hydrologist	Hydrology and Soils Analysis
Mark O'Brien	District Archeologist	Cultural Resource Analysis, SHPO Consultation
Karl Fuelling	Forest Silviculturalist	Silvicultural Prescription
Dave Bassler	Forest Fire Ecologist	Ecological Prescription Development

FEDERAL, STATE, AND LOCAL AGENCIES:

Idaho Department of Fish and game
Idaho Department of Parks and Recreation
US Fish and Wildlife Service
Cassia County Commissioners
Idaho State Historic Preservation Officer

TRIBES:

Shoshone-Bannock Tribes
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Appendix A – Design Criteria

Wildlife

1. Juniper removal is targeted, not sagebrush. No treatments will occur within 0.6 miles of an established, active lek between March 25 and May 15 (ID Sage-Grouse Advisory committee 2006).
2. No treatments will occur between May 1-July 15 to avoid the migratory bird nesting season.
3. If it is determined by the project leader that treatments need to occur between May 1 and July 15, the District Biologist will do nest searches identify avoidance areas.

Cultural Heritage

1. If previously undiscovered cultural sites are encountered during the course of treatment, the operator or hand crew would stop treatment and contact the Contract Administrator, who would then contact the Archaeologist to review the site. The Archaeologist would consult with the SHPO to determine the course of action to be taken. If affected properties are discovered after treatment, the Forest Service would document any damage and consult the appropriate SHPO and Council pursuant to 800.13(b).

Fuels/Fire

1. Utilize District slash piles standards where possible and most efficient. Follow invasive weed location distance mitigations when placing burn piles on the landscape and when creating piles greater than the District pile size standard.
2. Do not negatively impact sagebrush when performing aerial ignition. Create burn prescription parameters consist with the objectives and mitigations of the Environmental Assessment.

Soils/Hydrology

1. Prescribed fire treatment will not be done within 150 feet of Fourmile Spring in Unit 11.
2. Treatment on slopes over 25% in mechanical treatment units will be done by hand (no machinery or large equipment).
3. Machinery will be worked cross slope as much as possible to avoid soil disturbance down the fall line.
4. Locate slash piles on gentle slopes (<15%) and cross slope from one another to avoid long runs of disturbed soil.
5. Machinery with rubber tires or low ground pressure tracks is preferred for treatment implementation.
6. Conduct piling to leave topsoil in place and to avoid displacement of topsoil. Machinery that lifts and places material into burn piles is preferred to machinery that pushes or drags material into burn piles. This helps achieve objectives stated in watershed conservation practices 11.1 (5), 11.2 (6), 13.1 (9), 14.1 (13) and 14.2 (14) of the Watershed Conservation Practices Handbook (FSH 2509-25).
7. Operate heavy equipment only when soil moisture in the upper 6 inches is below the plastic limit (a ball can be formed in the fist that holds together on gentle tossing or shaking) or protected by at least one foot of packed snow or two inches of frozen soil.

Invasive Plants

1. Comply with the Mitigations found in the Weeds Specialist Report and the Environmental Assessment.
2. Require contractor, cooperator, and Forest Service equipment (not including service trucks that remain on roadways) to be clean, i.e. free of mud, dirt, and plant parts, prior to entering National Forest System lands.
3. The weed crew will treat occurrences of priority weeds, if necessary, prior to implementation. They will treat as many occurrences as possible of lower priority weeds inside and outside treatment units. The Weeds function will flag weed occurrences to be avoided during project implementation.
4. Coordinate with District Weed Coordinator to locate landings, staging areas, and other areas of severe soil disturbance to best reduce the risk of the spread of invasive plants.

5. As soon as possible after slash treatments are complete, reclaim disturbance by a combination of covering them with slash, raking in dirt and duff from adjacent areas, and reseeding as needed.

Range

1. Pre-treat within 25 feet of water troughs and spring exclosures in prescribed fire units.
2. Pre-treat within 15 feet of fence lines in prescribed fire units.
3. Pre-treat around fences, water troughs, spring exclosure by hand cutting juniper within 5 feet of the improvements in prescribed fire units.
4. Spot burning or pile burning should not take place within 25 feet of any structural improvement.
5. The prescribed burning should not take place while livestock are present on the Allotment(s).
6. Multiple treatment units should not be burned in different grazing units on one allotment in the same year.
7. Monitor vegetation prior to and after project implementation to determine vegetative response to the treatments to determine the need for holding livestock off of a grazing unit.
8. Burned treatments on different grazing units on one allotment should not occur within two years of each other

Appendix B - Aerial Photography Comparison of Juniper Expansion in the North East Cassia Project Area

The Minidoka Ranger District has on file aerial photographs of the District from 6 different years starting in 1952 and ending in 1999. After 1956, new photographs were taken approximately every ten years. For the purposes of this report, two surface reference points were chosen and then compared for differences in apparent vegetation from 1952 to 1999, a 47 year interval.

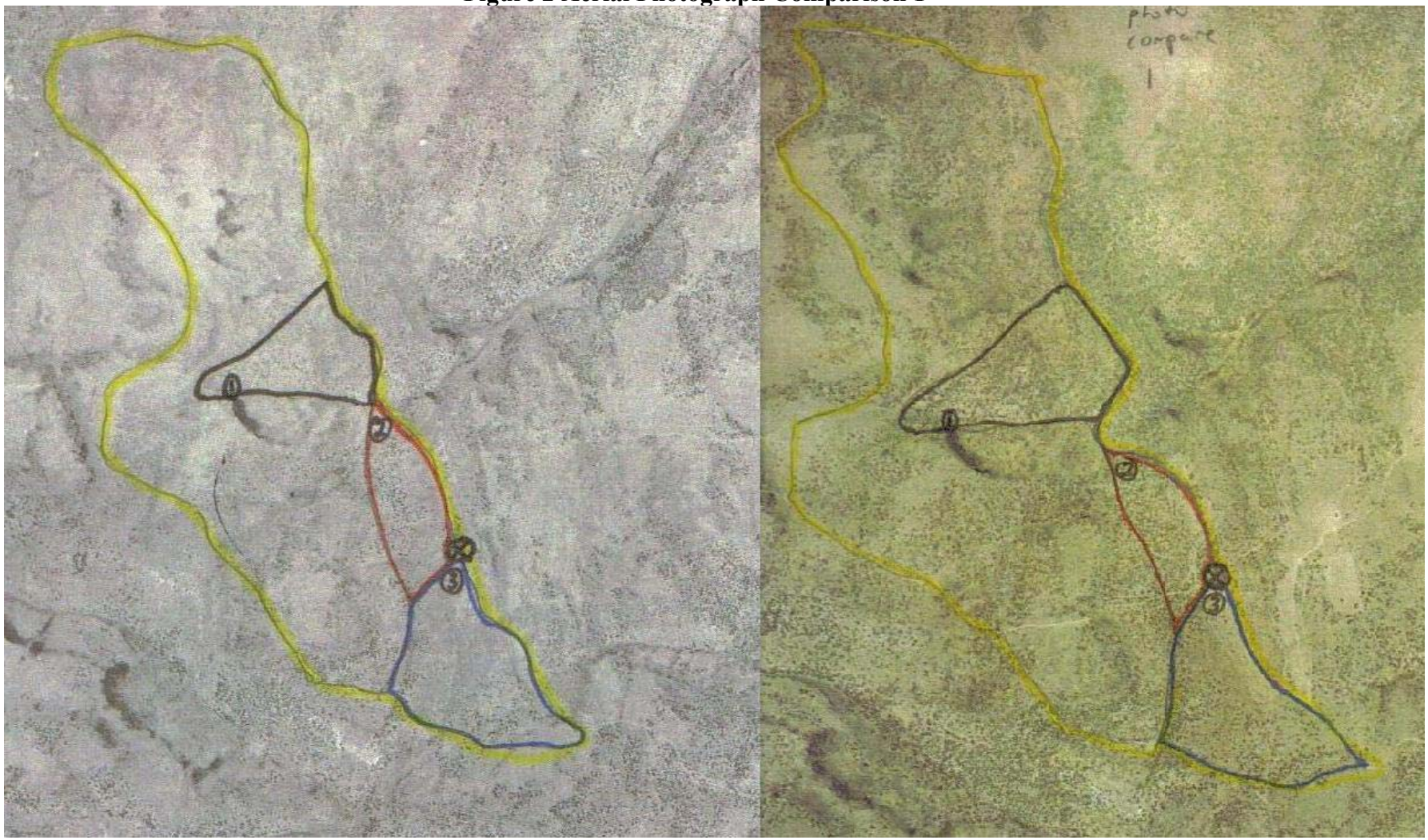
Comparison One has a surface reference point at approximately (WGS 84) N 42° 13' 59.72" by W 114° 00' 51.86". This comparison is located towards the north end of the project area and is entirely contained within proposed treatment unit 7. Three polygons were drawn within this comparison to narrow the focus. Within each of these polygons, ocular estimation suggests a 30-50% increase in juniper canopy cover.

Comparison Two has a surface reference point at approximately (WGS 84) N 42° 12' 35.30" by W 113° 59' 07.14". This comparison is located towards the middle of the project area along the Oakley-Rogerson road (Forest Road 500). Four polygons were drawn within this comparison to narrow the focus. These four polygons suggest a similar 30-50% increase in juniper canopy cover.

These photo comparisons show evidence of an upward trend in juniper crown cover across the North East Cassia Project Area, and that juniper is encroaching into the sagebrush steppe. Throughout the 1952 aerial photographs, dark bands of juniper vegetation can be seen. These are most commonly found along the rocky cliffs and ridges, and south facing slopes where juniper historically occurs (Burkhardt and Tisdale, 1976). Even though this photo series is from 47 years prior to the 1999 series, it should be remembered that grazing had occurred since before the turn of the century. Organized fire suppression started some time later, in 1905 when the Minidoka National Forest (and later Minidoka Ranger District of the Sawtooth National Forest) was chartered by Congress. By the 1952 photo series, juniper encroachment had already had over a 50 year foothold on the landscape. This can be seen in the loose arrangement of juniper seedlings/saplings radiating out from the denser stands in the 1952 photos.

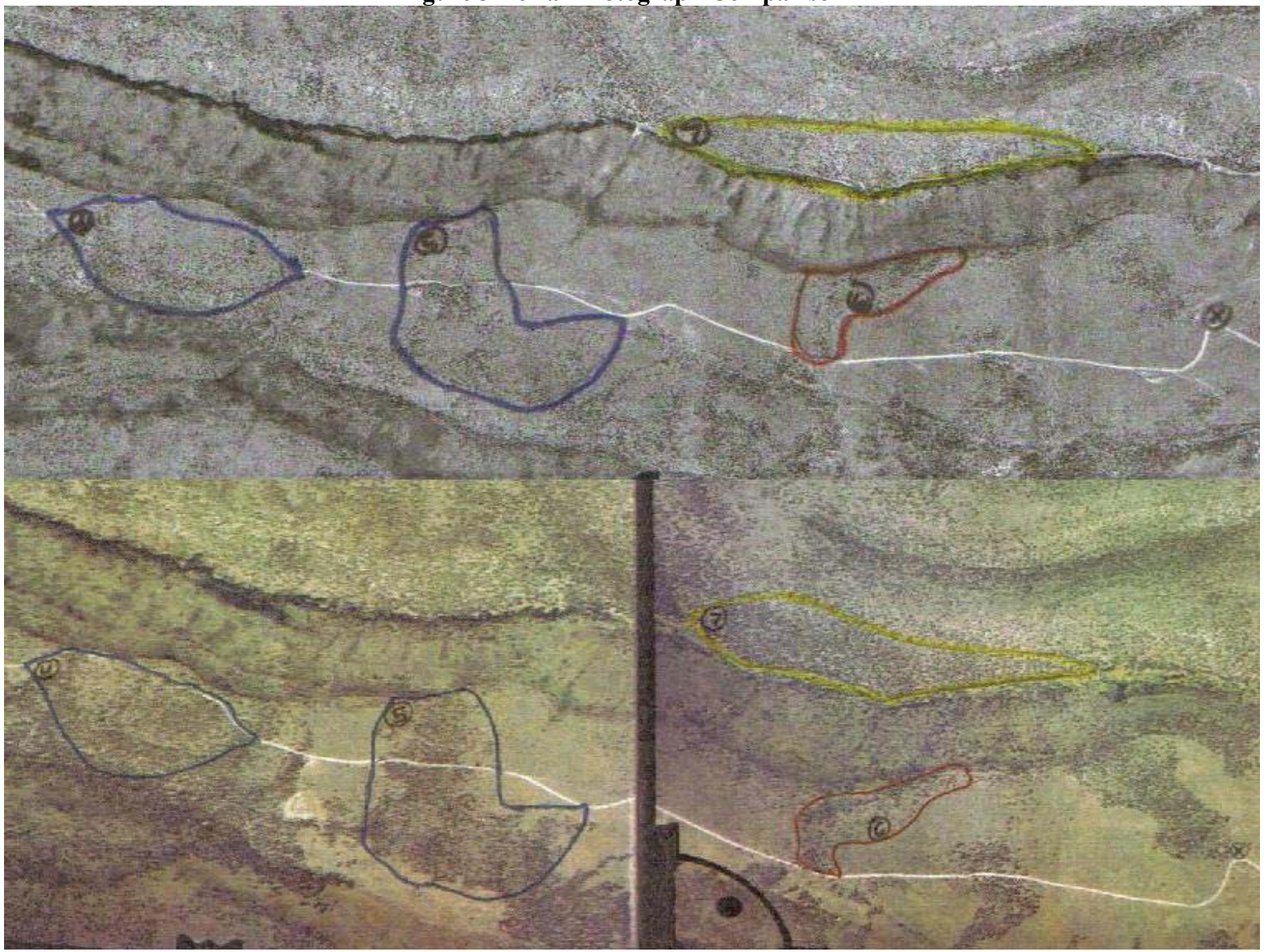
By the 1999 photo series, the site had experienced over 100 years of grazing, including heavy overgrazing before the Forest Service took over stewardship and started the process of reducing livestock numbers. The site had also experienced at least 94 years of fire suppression. The 1999 photos show a site that is thoroughly encroached with juniper.

Figure 2 Aerial Photograph Comparison 1



Left side photo is from 1952. Right side photo is from 1999. Yellow overlay roughly corresponds to proposed treatment unit 7. Note the three (numbered 1, 2, 3) comparison polygons. The X is the surface reference point at the given lat/long.

Figure 3 Aerial Photograph Comparison 2



Left side photo is from 1952. Right side photo is from 1999. The prominent white line is the Oakley-Rogerson Road (Forest Road 500). Note the four (numbered 4, 5, 6, 7) comparison polygons. The X is the given surface reference point lat/long. Polygons 4, 5, and 6 are located in proposed treatment units 4 and 5. Polygon 7 is not in a proposed treatment unit.

Appendix C – Acronyms, Abbreviations and Initialisms

AEEC	Affected Environment/Environmental Consequences
Alt	Alternative
BA	Biological Assessment
BE	Biological Evaluation
BLM	Bureau of Land Management
BTU	British Thermal Units
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	Environmental Assessment
EO	Executive Order
ESA	Endangered Species Act
ERC	Energy Release Component
FLI	Fire Line Intensity
FR	Federal Register
FR	Forest Service
FRCC	Fire Regime Condition Class
FSH	Forest Service Handbook
GIS	Geographical Information System
HU	Hydrologic Unit
IC	Ignition Component
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDT	Inter Disciplinary team
IRA	Inventoried Roadless Area
LRMP	Land and Resource Management Plan (Forest Management Plan)
MOU	Memorandum of Understanding
MPC	Management Prescription Category
MIS	Management Indicator Species
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NFS	National Forest System
NPNM	Nearness to Purpose and Need Measure
PLM	Potential/Likelihood Measure
PVG	Potential Vegetation Group
RCA	Riparian Conservation Area
SAC	Sage-grouse Advisory Committee
SHPA	State Historic Preservation Officer
SNF	Sawtooth National Forest
TEPC	Threatened, Endangered, Protected, Candidate
TES	Threatened and Endangered Species
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service