BLM

Environmental Assessment

for

Mesa Sagebrush Fertilization Project

Prepared by

Bureau of Land Management

Pinedale Field Office

Pinedale, Wyoming

WY-100-EA11-186

NATIONAL SYSTEM OF PUBLIC LANDS

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1.0 INTRODUCTION

The Mesa Sagebrush Fertilization Project, WY-100-EA11-186, is a sagebrush habitat improvement project located on the Mesa within the Pinedale Field Office. The project area is located in Sublette County approximately 6.5 miles south-southwest of Pinedale, WY. The legal location of the project is: T32N R110W within Sections 1, 2, 11, 12, 13, 14, 24, 25 and 36; and T32N R109W within Sections 30 and 31. This Environmental Assessment (EA) was prepared by the Bureau of Land Management (BLM) Pinedale Field Office (PFO), Pinedale, Wyoming.

1.1 Background

The September, 2008 Record of Decision (ROD) for the Pinedale Anticline Oil and Gas Exploration and Development Project set the stage for an increased development scenario on an area of approximately 198,037 acres. The Wildlife Monitoring and Mitigation Plan with the accompanying Wildlife Monitoring and Mitigation Matrix (WMMM) established in the ROD provides direction for development-phase wildlife monitoring for various wildlife species. For mule deer, the matrix identifies monitoring parameters that allow changes in mule deer abundance to be quantitatively assessed. The matrix also defines a threshold for this change in abundance that requires Mitigation Responses listed in the ROD (Appendix B) to be implemented when the threshold is exceeded. For mule deer, the threshold is a 15% decline in the population of mule deer that use the Mesa in any year or cumulatively over all years compared to the Sublette mule deer herd unit or a mutually agreeable reference area. In 2010, the mule deer monitoring data indicated the mule deer numbers on the Mesa decreased more than 15% triggering a mitigation response as outlined in the ROD.

This project was developed as a mitigation response to exceeding the threshold in change of mule deer abundance as outlined in the WMMM. Habitat enhancement is one of the first options available in the Mitigation Responses to population decline. The project is designed to enhance available winter forage for mule deer by increasing sagebrush production, and potentially increasing palatability and nutrient quality on identified mule deer crucial winter range. A pilot fertilization project was implemented in 2010 with limited scope and has had positive preliminary results. Monitoring for the 2010 project will be conducted for five years post-treatment. An expanded trial area is needed to evaluate the practicality of fertilization treatment and to capture variability in conditions. If proven successful, this project may pave the way for future treatments on a larger scale.

1.2 Purpose and Need for the Proposed Action

Purpose of Proposed Action

The purpose of this project is to enhance mule deer crucial winter range habitat by increasing sagebrush productivity and potentially increasing palatability and nutrient quality of sagebrush with the least amount of disturbance to crucial winter range habitats.

Need for Proposed Action
As outlined in the Wildlife Monitoring and Mitigation Matrix, a specific threshold has been exceeded and there is a need to implement a mitigation response for mule deer.

1.3 Relationship to Statutes, Regulations, Plans or Other Environmental Analyses

Name of Plan/s: Pinedale Resource Management Plan (RMP)
Date Approved: November 26, 2008
Regulations at 1610.5-3 require actions to be in conformance with the approved land use plan. The Proposed Action is in conformance with the Pinedale RMP. RMP decisions pertaining to this proposal include:

Livestock Grazing Management Pages 2-17 and 2-18
The objectives of livestock grazing management include: maintain and/or enhance livestock grazing opportunities and rangeland health, maintain, restore, or enhance livestock grazing to meet the Wyoming Standards for Rangeland Health and achieve allotment objectives, and livestock grazing in areas of crucial big game winter ranges will be managed to maintain or enhance vegetation condition and forage availability for wildlife, as appropriate.

Vegetation Management Pages 2-37 and 2-38
The objectives of vegetation management include: manage permitted actions to control the spread of and/or eradicate noxious weed infestations, ensure Special Status Plant Species habitats are maintained at a level sufficient for long-term species sustainability, and conduct vegetation treatments to maintain important vegetation types and meet vegetation management goals.

Wildlife and Fish Habitat Management Page 2-45 to 2-52
The objectives of wildlife fish habitat and management include: maintain sufficient undisturbed or minimally disturbed habitats to maintain persistent, well-distributed, self-sustaining, and productive populations of all native and desirable non-native fish (e.g., brook, brown, and rainbow trout) and wildlife species within the planning area, maintain and enhance big game habitats to support big game populations at Wyoming Game and Fish Department (WGFD) planning objective levels, maintain raptor habitats and territories within the planning area to ensure long-term species sustainability and widely distributed functioning habitats in accordance with the Migratory Bird Treaty Act (MBTA), maintain sufficient undisturbed or minimally disturbed greater sage-grouse source habitats to maintain persistent, well-distributed, self-sustaining, productive populations of sage-grouse within the planning area, and maintain sufficient, undisturbed, or minimally disturbed sensitive species habitats to ensure persistent, well-distributed, self-sustaining, and productive populations of sensitive species within the planning area.

Other Authorities

This EA fulfills the National Environmental Policy Act (NEPA) of 1969 requirement for site-specific analysis. The Proposed Action is in accordance with 43 Code of Federal Regulations (CFR) 1610.5-3(a); 43 CFR Part 4100 et al – Grazing Administration; Federal Land Policy and Management Act (FLPMA) of 1976, as amended; Taylor Grazing Act of 1934; Endangered Species Act (ESA) of 1983, as amended; The Clean Air Act as amended; Clean Water Act of 1977; National Historic Preservation Act (NHPA), as amended; MBTA of 1918, as amended; and the Wyoming Standards for Healthy Rangelands and Guidelines for Livestock Grazing, August 12, 1997.

Other Plans and Environmental Analyses

Final Supplemental Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project, June 2008.

Final Supplemental Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project, Record of Decision, September 12, 2008.

Mesa Mule Deer Winter Habitat Improvement Project, Environmental Assessment WY-100-EA10-303, June 2010.

The proposed project has been reviewed and is in conformance with BLM IM. No. WY-2010-012 and is consistent with guidelines provided in the Governor's Sage-grouse Implementation Team's Core Population Area strategy and the Governor's Executive Order 2011-5.

1.4 Scoping, Public Involvement and Issues

The BLM decision-making process is conducted in accordance with the requirements of the Council on Environmental Quality (CEQ) regulations implementing NEPA and the United States Department of Interior (USDI) and BLM policies and procedures implementing NEPA. NEPA and the associated regulatory and policy framework require federal agencies to involve the interested public in their decision-making.

On June 21, 2011 a scoping package describing the proposed action was mailed to 38 individuals and organizations. Nine individuals/organizations provided comments. Three issues were identified through the scoping process: change in plant species composition, spread of noxious weeds and invasive species, and fertilizer burn.

This EA has been developed in consultation and coordination with the allotment's grazing permittees, state and local agency personnel, other affected parties, and interested members of the public-at-large.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Alternative 1 – Proposed Action

The proposed action is to fertilize a total of 3090 acres of sagebrush habitat in two separate treatments in two different areas in the fall of two different years. The first treatment could involve treating approximately 1000 acres of sagebrush with liquid or granular fertilizer in the late fall of the first year. The second treatment could involve treating approximately 2090 acres of sagebrush habitat with fertilizer in the late fall of a different year. The objective of the proposed action is to improve sagebrush productivity for wintering mule deer by increasing sagebrush production. No rest from grazing is proposed for this treatment. Map 1 depicts the general project location for this alternative.

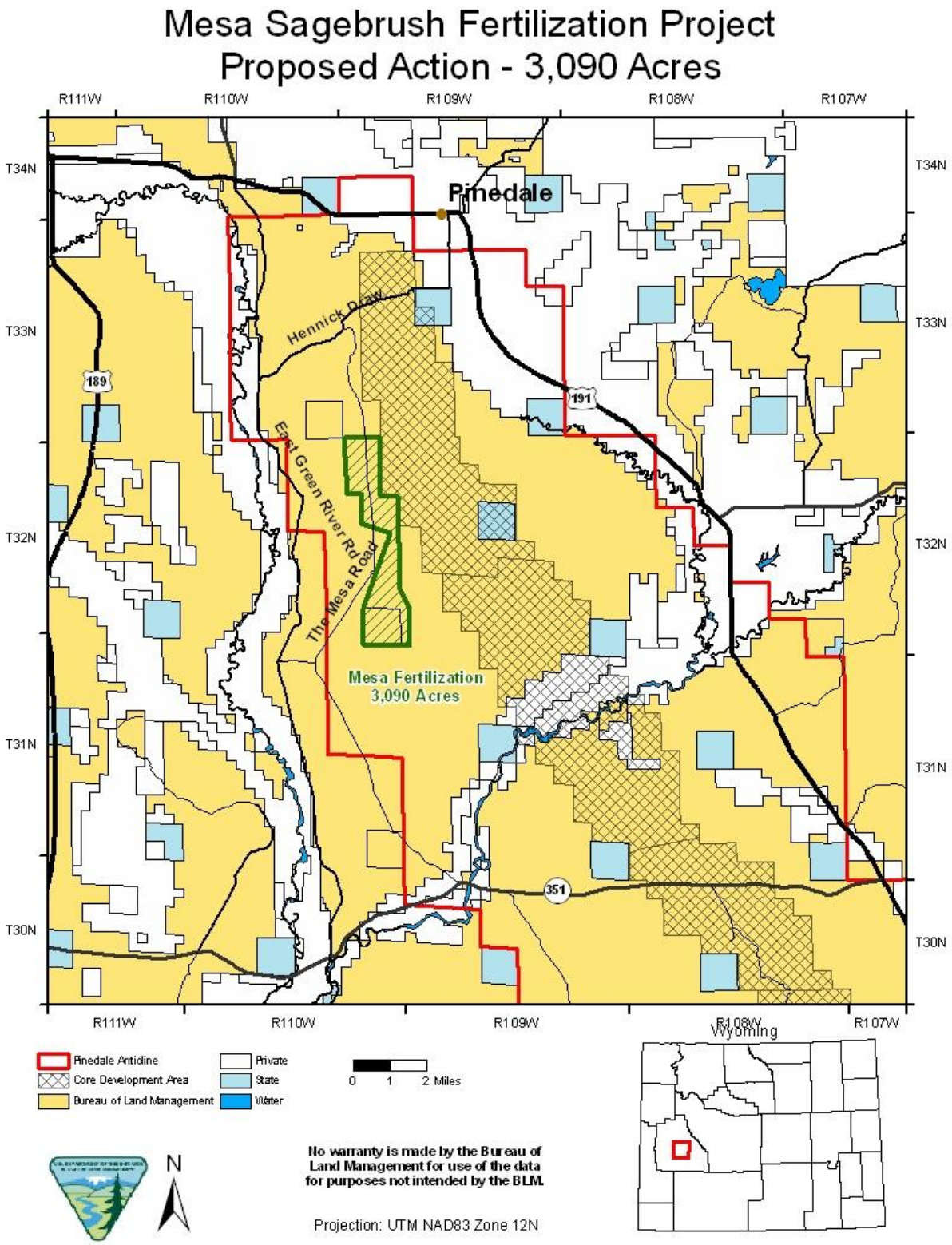
Full implementation of proposed action includes:

- Late Fall Soil N application up to 80 lbs N/acre
- Soil N product is Urea (46-0-0) or Can 27 (27-0-0)

Project design features would include the following to reduce or avoid negative environmental effects of the proposed action on resources:

- Pre and post-treatment monitoring would be conducted within the treatment area and in a control site adjacent to the project area. Monitoring could include photo points, line-point intercept, sagebrush production and utilization, herbaceous production, nutrient analysis of sagebrush, and weed monitoring.
- All slopes greater than 15% would be avoided.
- Aquatic and riparian systems would be avoided.
- Areas with known locations of noxious and invasive weeds would be avoided. If noxious and invasive weeds are found in the project area following the fertilizer treatment, necessary actions would be taken.
- Loamy 10-14” Foothills and Basins West Ecological Site inhabited with Wyoming big sage (*Artemesia tridentata var. Wyomingensis*) would be the targeted Ecological Site to fertilize.
- Fertilizer would be applied aerially.
- Surface disturbing or disruptive activities would not occur in big game crucial winter ranges from November 15 to April 30.

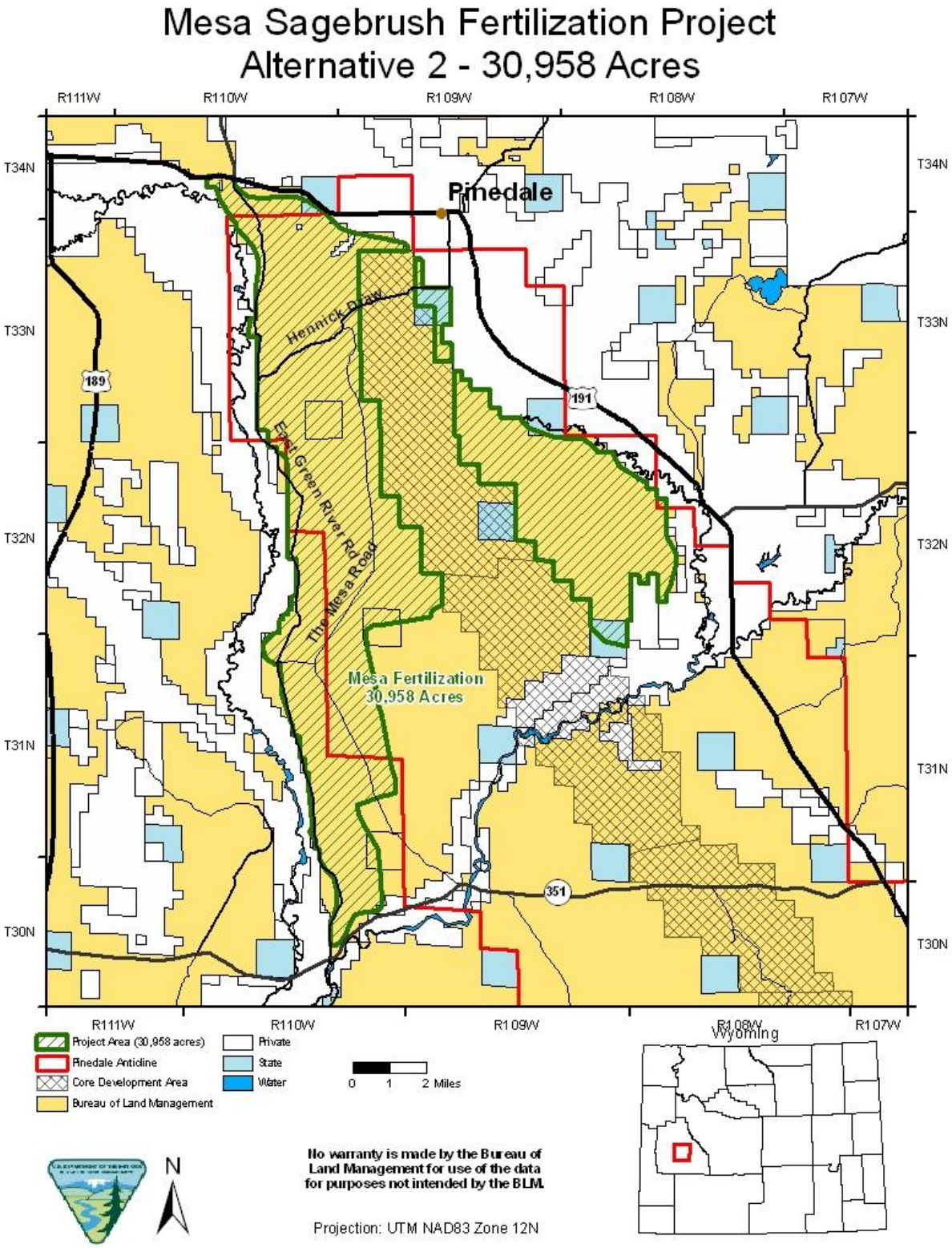
Map 1. Alternative 1 – Proposed Action



2.2 Alternative 2

As a result of scoping a second alternative was suggested. Alternative 2 includes the same fertilization treatment and design features as the proposed action but at a much larger scale at 30,958 acres. With this alternative 30,958 acres of sagebrush habitat would be treated over a ten-year period in the late fall of various years. No rest from grazing is proposed for this treatment. With this alternative, oil and gas Operators have offered an additional 2,100 acres of lease suspension within the proposed project area in addition to the already designated 49,903 acres of lease suspension areas within the flanks. Map 2 depicts the general project area for Alternative 2.

Map 2. Alternative 2



2.3 No Action Alternative

Section 1502.14(d) of the NEPA requires that the alternative analysis in the EA include the alternative of No Action. No Action would imply the proposed action would not be approved, and the current management practices and activities would continue on public lands. Under the "no action" alternative, the fertilization treatment would not be authorized.

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

The Mesa Sagebrush Fertilization project is located in the Mesa area of Sublette County, Wyoming. The project area consists entirely of sagebrush steppe habitat. Elevation ranges of the project area range from approximately 7400 feet up to 7500 feet.

The following elements of the human environment have been reviewed and it has been determined that these elements are either not present or would not be affected by the proposed action and alternatives, and will not be discussed further in this document:

- Air Quality
- Areas of Critical Environmental Concern (ACEC)
- Environmental Justice
- Fish Habitat
- Flood Plains
- Forests
- Global Climate Change
- Hazardous or Solid Wastes
- Prime or Unique Farmlands
- Water Quality: Drinking/Ground
- Wetlands and Riparian Zones
- Wild and Scenic Rivers
- Wilderness Study Areas
- Wilderness Values and Lands with Wilderness Characteristics

3.2 Wildlife (including Threatened, Endangered, Proposed, Candidate and Sensitive Species)

<u>Big Game</u>

The proposed project area provides crucial winter range for mule deer in the Sublette Herd Unit. Depending on snow conditions, mule deer arrive on winter ranges in late October during more severe winters and later in the year during mild winters. Migration back to summer ranges typically begins in late March or early April, depending on weather conditions (BLM 2008a). The project area also provides migration routes and spring, summer and fall ranges for pronghorn antelope.

Federally-listed Threatened, Endangered, Proposed, and Candidate Species

Greater Sage-grouse

The proposed action is located within 4-miles of 29 occupied sage-grouse leks. Nesting and brood rearing habitat is also present in the project area. The majority of the project area is located within sage-grouse winter concentration areas and within the Daniel Sage-grouse Core Area.

Other TEPC Species

The project area is not known to contain habitat for black-footed ferret, grizzly bear, Canada lynx, gray wolf, Colorado River fish, Kendall Warm Spring's dace, wolverine or yellow-billed Cuckoo and these species will not be discussed further.

BLM Sensitive Species - Animals

The following species were identified as possibly occurring within 4-miles of the proposed action: raptors, pygmy rabbit, Idaho pocket gopher, white-tailed prairie dog, migratory birds including sagebrush obligate song birds.

3.3 Watershed and Rangelands (including Threatened, Endangered, Proposed, Candidate and BLM Sensitive Plants)

There are several potential ecological sites in the project area: Clayey (Cy) 10-14" Foothills and Basins West, Loamy (Ly) 10-14" Foothills and Basins West, Loamy (Ly) 7-9" Green River and Great Divide Basin, Shallow Loamy (SwLy) 10-14" Foothills and Basins West, Shallow Loamy (SwLy) 7-9" Green River and Great Divide Basin, Gravelly (Gr) 7-9" Green River and Great Divide Basin, Saline Upland (SU) 7-9" Green River and Great Divide Basin, Very Shallow (Vs) 7-9" Green River and Great Divide Basin, Shallow Loamy Calcareous (SwLyCa) 7-9" Green River and Great Divide Basin, Lowland (LL) 10-14" Foothills and Basins West, Saline Lowland (SL) 7-9" Green River and Great Divide Basin, Saline Lowland Drained (SLdr) 7-9" Green River and Great Divide Basin, Sandy (Sy) 7-9" Green River and Great Divide Basin, and Clayey (Cy) 7-9" Green River and Great Divide Basin. The dominant site for the project area is the Loamy (Ly) 10-14" Foothills and Basins West site and interpretations will be based on this ecological site. The dominant shrub species is Wyoming big sagebrush and dominant grass species in the area include thickspike wheatgrass, Letterman's needlegrass, and Sandberg's bluegrass. From this data the plant community for the site is assumed to be in the big sage/rhizomatous wheatgrass community.

Federally-listed TEPC and BLM Sensitive Species - Plants

There are no known occurrences of TEPC and Sensitive Species of plants within the project area.

Soils

National Cooperative Soil Survey (NCSS) mapping was recently completed by Natural Resources Conservation Service (NRCS). The only soil group found in the project area is upland soils. The dominant soil mapped in the project area is Jemdilon gravelly loam, 1 to 4

percent slopes (approximately 10,400 acres). Jemdilon soils are found on intermontane basins and paleoterraces formed from alluvium of metamorphic and sedimentary rock. These are well drained soils with low organic matter content. This soil has a sodic horizon within 30 inches of the soil surface. Jemdilon soils are correlated to the Loamy (Ly) 10-14" Foothills and Basins West ecological site. Other soils found in the project area include Foursees, Badland, Golphco, Chinatown, Broback, Fonce, Twocabin, Taffom, Conpeak, Scooby and Sandbranch.

3.4 Invasive, Non-native Species, and Noxious Weeds

Noxious weeds are defined in EO 13112 as those "species whose introduction does or is likely to cause economic or environmental harm or harm to human health." Noxious weed species, when introduced to an area, are aggressive and often dominate natural communities. They are often able to establish in areas following disturbance. The State of Wyoming has designated 23 weeds as noxious, few of which are known to be a problem within the planning area. Current management includes annual monitoring and treatment of identified infestations.

Other weed species present within the project area, although not officially designated noxious, can be disruptive to native plant communities. These include cheatgrass, halogeton, and Russian thistle. Of these, cheatgrass is the most problematic in the project area. Weeds are present primarily in areas of disturbance, including along roads, in areas of oil and gas development, and in heavily grazed areas. Cheatgrass has been found in nearby oil and gas reclamation efforts. Survey efforts have not located weed species or cheat grass within the proposed project area.

3.5 Livestock Grazing

The majority of the project area lies within the Mesa Common Allotment. The Mesa Common Allotment is 57,649 acres (55,789 Federal, 120 State, 640 Private) with 5003 AUMs (4701 Federal, 197 State, 105 Private). There are 14 permittees that use the Mesa Common Allotment for different set dates from May 1st to November 15th with the heaviest use in May and June. Other allotments within the proposed project area include Clark Bloom Common, Mount Airy Common, Luman Individual and Marincic Mesa Individual.

The Mesa Common Allotment and Trapper's Point just to the north of the allotment, is a crucial area for "The Green River Stock Drift," a century-old seasonal stock driveway considered part of a potential Sublette County Rural Ranching Traditional Cultural Property and a potential Rural Historic Landscape. Livestock following the "Green River Stock Drift" travel through the proposed project area on their way to and from grazing allotments to the north of the project area.

3.6 Cultural Resources

The proposed project area is located within a cultural sub region designed in the 2008 BLM RMP FEIS for the PFO as "The Mesa" (2008 BLMc). This area is known to contain sparse concentrations of cultural resources primarily associated with prehistoric use of the wildlife migration corridor for big game procurement and is known to contain a high number of stone

circle sites. Lithic resource procurement is known to be widespread throughout the Mesa, primarily the quartzite cobbles that cap the Mesa, and is expressed as the Mesa Lithic Landscape (48SU2928). Multiple National Register of Historic Places significant cultural resource locations (i. e. Mesa Stone Circle Site-48SU368, Trapper's Point-48SU350, Ruby Hill-48SU2019) are located within the proposed project Area of Potential Effect (APE). This type of proposed project (fertilizer treatment with no proposed surface disturbance) is limited in its potential to adversely affect cultural resources.

4.0 ENVIRONMENTAL EFFECTS

4.1 Wildlife

Alternative 1 – Proposed Action

Alternative 1 includes treating 3091 acres of sagebrush with aerial applications of fertilizer in the fall. For wildlife in general, the proposed aerial applications would cause some localized disturbance to wildlife in the area during the application including dispersal and/or avoidance. Wildlife could be exposed to low levels of fertilizer during and following the application. The effects of nitrogen fertilizer on wildlife could not be found during literature searches. However, the methods of fertilizer application coupled with the modes of ingestion would keep the chance of accidental ingestion to a minimum. Wildlife losses would not be anticipated with the proposed treatment.

The shift in plant community dynamics that would be expected to occur with the fertilizer treatments would result in a boost in sagebrush growth, a potential increase in sagebrush palatability and nutrient quality, and higher production of grasses. This shift in plant community dynamics could increase the amount of forage available for wildlife on the Mesa. In particular, an increase in production of sagebrush could increase the amount of forage available on crucial winter range for mule deer.

It is unknown what the response of forbs would be to the fertilizer treatment. An increase in forbs would benefit wildlife, in particular sage-grouse. Forbs are an important food source for sage-grouse, especially for chicks that eat forbs until early fall (Connelly et al 2000). A decrease in forbs would reduce the quality and functionality of the habitat for sage-grouse and other species of wildlife. A potential invasion of cheat grass and other invasive species in the treatment areas would decrease the quality and functionality of the sagebrush steppe habitat for virtually all species of wildlife. The likelihood for the introduction of weeds and invasive species in areas that are presently weed-free is low. Decreases in forb species are not anticipated and has not been observed in the 2010 Pilot Project area; nor would an increase in cheatgrass or weed occurrence be expected.

The majority of the project area is within a WGFD designated winter concentration area for sage-grouse. Winter habitat is generally defined as sagebrush stands with 10-30% canopy cover and heights of 10-14 inches above the snow cover (Connelly et al 2000). The project would maintain and/or potentially increase the current sagebrush canopy cover and should

therefore maintain the functionality and quality of the habitat for sage-grouse in winter. The shift in plant community dynamics that would be expected to occur with the fertilizer treatments could increase the amount of cover and forage available for sage-grouse on the Mesa year round. The potential increase in the amount of cover and forage available could also benefit sensitive species including raptors, pygmy rabbit, Idaho pocket gopher, white-tailed prairie dog, and migratory birds including sagebrush obligate songbirds.

The conservative size of the project is small compared to the acres of sagebrush habitat occurring across the landscape that are available to wildlife. Since fertilizer treatments have not been a common type of treatment used in this area in the past, the outcome of the treatment is less certain and annual precipitation variability could produce varying results. A smaller treatment area would allow land managers to monitor the effects of the fertilizer treatment without taking the risk of altering a large amount of sagebrush habitat and without expending a large amount of funds with no result.

Alternative 2

The effects of Alternative 2 would be the same as expected for Alternative 1 but at a greater scale with the larger treatment area. The larger treatment area could yield more acres of higher sagebrush production which would be beneficial to several species of wildlife. The additional 2,100 acres of lease suspension would also be beneficial to wildlife. A decrease in the composition and/or abundance of forbs on the scale of this Alternative would not be beneficial to many species of wildlife, in particular sage-grouse. There is a greater risk involved with the larger treatment and a neutral outcome could result. An increased amount of funds would be expended with the larger treatment which would decrease the capacity for doing other mitigation projects as required by the matrix.

Alternative 3

The No Action Alternative would allow wildlife to utilize the project area as they currently are without changes.

4.2 Watershed and Rangeland Resources

Alternatives 1 and 2 – All Action Alternatives

Fertilizers have been used for many years to increase crop production on agricultural lands. There is limited research on the effects of fertilizing sagebrush rangeland. Goetz (1969) asserts that “nitrogen fertilizer may be a valuable tool for range improvement when factors of plant and soil response to the applied nitrogen are known and applied on a range site basis.” It is believed that the most limiting nutrient on semiarid and arid lands is nitrogen (Miller et al, 1991). However, water is the most limiting growth factor in the west (Miller et al, 1991). It has been shown that if there is not adequate plant available water, fertilizing with nitrogen could not increase production (Havlin et al, 1999). In a 1979 synthesis of rangeland fertilization studies, Schmisseur and Miller recommended to not fertilize sites that receive less than ten to twelve inches of precipitation per year. In many studies, the greatest increases in rangeland production were related to the greatest years of precipitation (Barrett, 1979; Schmisseur and Miller, 1979;

Pumphrey and Hart, 1973). Schmisseur and Miller (1979) contend that increases in production are greatest on sites with adequate soil moisture, low soil fertility, and deep medium-textured soils with good structure.

Fertilization can increase plant water use efficiency by increasing root growth and water intake efficiency (Havlin et al, 1999; Schmisseur and Miller, 1979). Sneva (1963) found in wet years that fertilization improved sagebrush establishment but caused high mortality of young plants in dry years. Schmisseur and Miller (1979) found that plant vigor was decreased in below average precipitation years. Even with adequate soil moisture, Goetz (1970) found leaf drying was delayed early in the season but happens rapidly late in the growing season. During times of drought, soil surface application of fertilizer results in less effective water recovery in plants (Havlin et al, 1999). This is in part due to stimulation of root development at the zone of fertilization (Havlin et al, 1999). Top-dressing, or fertilizing the soil surface, is the standard method for fertilization of rangelands. This application method results in stimulated root growth at the soil surface. During times of high soil moisture, this is not a concern. When the soil moisture is low, plants must obtain water from lower in the soil profile. With increased root growth at the soil surface, there are not as many roots deeper in the profile.

Another concern for low precipitation areas is “fertilizer burn.” Fertilizer burn is the desiccation of plants similar to drought due to excessive salt concentration in the soil (Havlin et al, 1999). This effect is most common in coarse-textured soils. One tool to determine potential fertilizer burn is the Salt Index of the fertilizer. The Salt Index is determined by osmotic pressure with higher values showing higher potentials of fertilizer burn. The Salt Indices of the proposed treatments are shown in Table 1. Of all the references reviewed only one noted the occurrence of fertilizer burn. Baldwin et al (1974) found the effects of fertilizer burn when using an application of 1200 pounds nitrogen per acre.

Table 1. Salt Indices of the Proposed Chemicals

Brand	Nitrogen Type	Salt Index (per unit N)
Can-27	Ammonium Nitrate	2.99
NDemand	Urea	1.62

There is conflicting information about the best time for fertilizer application in cool semiarid climates. Havlin et al (1999) recommend applying in late fall when the soil temperature is below 50° F. Schmisseur and Miller (1979) recommend application of fertilizer in the spring when soil moisture can be predicted better. Pumphrey and Hart (1973) found that spring applications had more plant production than fall applications. No consistent recommendation for application timing was found.

Nitrogen efficiency can vary by fertilizer application method. Top-dressing typically results in reduced efficiency of nitrogen recovery (Havlin et al, 1999). Pumphrey and Hart (1973) found that efficiency of nitrogen recovery was greatest in applications less than 30 pounds per acre.

Nitrogen fertilization tends to have little to no residual effects after the year of application (Havlin et al, 1999; Pumphrey and Hart, 1973).

There is a large amount of conflicting evidence on the overall effect of nitrogen on rangeland productivity. Carpenter and West (1987) determined that nitrogen fertilization had little to no effect on perennial plant growth in unirrigated desert conditions. Other research has shown no effect and decreases in total forage on fertilized sites (Sneva, 1963; Pumphrey and Hart, 1973). Goetz (1969) found a decrease in basal cover coupled with an increase in total dry matter on a fertilized site. This is explained by a plant composition change shifting towards grasses. In 1979, Barrett found an increase in total production. Goetz (1969) argues that the probability of increasing the production of a site is closely related to the natural potential of the site.

Nitrogen fertilization effects on big sagebrush were more uniform. Increased leader growth, denser foliage, and increased reproductive stems were found in several studies (Sneva et al, 1983; Carpenter, 1975; Miller et al 1991; Armstrong, 2007). While most studies showed an increase in production, there were studies with dissenting results. Two studies found that increases in sagebrush growth were related to precipitation not fertilization (Bayoumi and Smith, 1976; Barrett, 1979). Carpenter and West (1987) saw no sagebrush response to fertilization. In 1963, Sneva found that there was an increase of mortality in young sagebrush plants.

Grass response to fertilization was very consistent. Grasses were found to increase in all studies reviewed (Miller et al, 1991; Barrett, 1979; Goetz, 1969, Goetz, 1970, Carpenter, 1975). However, forb response to fertilizer treatments was inconsistent. Forbs had limited responses to fertilizers and when a response was noted in the studies, forbs were seen to decrease (Baldwin et al, 1974; Goetz, 1969; Carpenter, 1975).

The plant community dynamics of the site would likely change temporarily with the addition of fertilizer up to 80 lbs/acre. Nitrogen fertilization tends to have little to no residual effects after the year of application (Havlin et al, 1999; Pumphrey and Hart, 1973). Sagebrush production should increase with longer leader growth. Grasses would likely see the highest increase in growth with the additional nitrogen. The response of forbs on the site is uncertain. Annuals would likely increase in growth on the site. The plants could increase root growth near the soil surface to optimize nitrogen recovery and may be more susceptible to drought damage as a result of plant physiological changes. In the event of a drought, this increase of surface root growth may result in higher plant damage due to the corresponding reduction of deep roots.

The conservative size of the project is small compared to the acres of sagebrush habitat occurring across the landscape. Since fertilizer treatments have not been a common type of treatment used in this area in the past, the outcome of the treatment is less certain and annual precipitation variability could produce varying results. A smaller treatment area would allow land managers to monitor the effects of the fertilizer treatment without taking the risk of altering a large amount of sagebrush habitat and without expending a large amount of funds with no result.

Alternative 2

The effects of Alternative 2 would be the same as expected for Alternative 1 but at a greater scale with the larger treatment area. The larger treatment area could yield more acres of higher sagebrush and herbaceous production. A decrease in the composition and/or abundance of forbs on the scale of this Alternative would not be a beneficial result. The additional 2,100 acres of lease suspension would insure additional disturbance would not occur within the proposed project area. There is a greater risk involved with the larger treatment and a neutral outcome could result. An increased amount of funds would be expended with the larger treatment which would decrease the capacity for doing other mitigation projects as required by the matrix.

Alternative 3 – No Action

The plant community would remain in the current state of big sage/rhizomatous wheatgrass. The community would continue to trend toward higher sagebrush dominance. The grass species would continue to be dominated by bluegrasses, needlegrass, and rhizomatous wheatgrasses. Forbs species would continue to trend towards mat-forming species such as buckwheats and pussytoes (USDA NRCS, 2009).

4.3 Invasive, Non-native species and Noxious Weeds

Alternative 1 – Proposed Action

Introduced species were able to capitalize on fertilizer additions better than native species in rangelands. In most studies reviewed, cheatgrass was seen as a principal increaser with nitrogen fertilizer (Sneva, 1963; Pumphrey and Hart, 1973; Baldwin et al, 1974; Rauzi et al, 1968; Armstrong, 2007; Schmisseur and Miller, 1979). Schmisseur and Miller (1979) recommend not fertilizing cheatgrass areas because fertilizer could encourage cheatgrass growth at the expense of perennial species.

Cheatgrass is currently found on the eastern edge of the project area in reclaimed pipeline rights-of-way, well pads and along access roads. An increase in cheatgrass or weed occurrence is not expected as there are currently no occurrences documented within the proposed project area. The likelihood for the introduction of weeds and invasive species in areas that are presently weed-free is low. Nitrogen fertilization tends to have little to no residual effects after the year of application (Havlin et al, 1999; Pumphrey and Hart, 1973) and any increases in non-desirable plants should be temporary. Post treatment monitoring will ensure early detection of any noxious and invasive species in the project area. Aggressive treatment of these species, should they occur, would ensure minimal chance of these plants spreading.

Alternative 2

The effects of Alternative 2 would be the same as expected for Alternative 1 but at a greater scale with the larger treatment area. The risk of spreading invasive species and noxious weeds, in particular cheatgrass, would be the same but a larger treatment area would be susceptible to non-desirable species. The additional 2,100 acres of lease suspension would insure additional

disturbance would not occur within the proposed project area which would be beneficial because many non-desirable species occur in conjunction with disturbance. There is a greater risk involved with the larger treatment overall and a neutral outcome could result. An increased amount of funds would be expended with the larger treatment which would decrease the capacity for doing other mitigation projects as required by the matrix.

Alternative 3 – No Action

Cheatgrass is currently found in the pipeline reclamation along the North Anticline Road located to the east of the project area, at well pads and along access roads. Current management is to annually monitor and treat when found. Even with on-going treatments, cheatgrass is expected to be found in the reclaimed areas.

4.4 Livestock Grazing

Alternative 1 – Proposed Action

Preferential selection of fertilized sites by wildlife and domestic livestock was noted in many studies. Barrett (1979) found increased use of fertilized sites by pronghorn. In 1975, Carpenter found mule deer showed partiality to fertilized locations. Elk winter range studies showed fertilized range received up to 50% more use by big game (Bayoumi and Smith, 1976; Skovlin et al, 1983). Domestic livestock showed up to five times higher use of fertilized rangelands than unfertilized rangelands (Baldwin et al 1974; Barrett, 1979; Skovlin et al, 1983).

An increase in grasses could be beneficial to livestock grazing in the Mesa Common Allotment. The fertilized areas could see increased use by livestock and wildlife. With increased use and no rest from grazing, the grass community may further shift towards the bluegrasses and rhizomatous wheatgrasses. Increases in grazing use would be temporary and would follow the short term productivity change and would not extend beyond this since there would be no change in allotment stocking rates. The conservative size of the project is small compared to the acres of rangelands occurring across the landscape. A smaller treatment area would allow land managers to monitor the effects of the fertilizer treatment without taking the risk of altering a large amount of rangeland. There is no change in permitted livestock use proposed.

Alternative 2

The effects of Alternative 2 would be the same as expected for Alternative 1 but at a greater scale with the larger treatment area. The larger treatment area could yield more acres of higher herbaceous production which could benefit grazing. If the treatments decrease the amount of forage available there could be a need to evaluate livestock grazing because of the larger scale of the treatment area and multiple permittees that use the allotments in the project area could be affected. There is no change in permitted livestock use with the project as proposed. The additional 2,100 acres of lease suspension would insure additional disturbance would not occur within the proposed project area. There is a greater risk involved with the larger treatment overall and a neutral outcome could result. An increased amount of funds would be expended with the larger treatment which would decrease the capacity for doing other mitigation projects as required by the matrix.

Alternative 3 – No Action

Domestic animal use of the area is expected to continue at current rates. The Green River Stock Drift moves through the allotment and would continue. The animal use distribution patterns would not change with this alternative.

4.5 Cultural Resources

Alternatives 1 and 2 – All Action Alternatives

This type of proposed project (fertilizer treatment) is limited in its potential to adversely affect cultural resources. The fertilizer treatment would be an aerial application and would not result in any surface disturbance. This project, as currently proposed, would result in no effects to known significant cultural resources.

Alternative 3 – No Action Alternative

Cultural resource sites would not be disturbed. There would be no direct or indirect effects to significant cultural resources in the proposed project area if the "No Action' alternative is chosen.

4.6 Cumulative Effects

The cumulative effects analysis area for the project is the Mesa Common Allotment.

The PAPA EIS shows well field disturbance for the allotment at 3288.5 acres of primarily sagebrush steppe vegetation, approximately 6% of the total allotment. The reclaimed vegetation on the disturbed sites is not predicted to return to current state for up to 20 years. The reclamation would have a vegetative community with a higher proportion of grasses compared to the current state. There could be an increase in non-native invasive and noxious weeds in the allotment due to the gas field development. The treatments proposed could add to the spread of these weeds.

The quality and functionality of wildlife habitats in the project area would continue to be impacted by oil and gas development for several years within the PAPA. Impacts associated with oil and gas development in the PAPA were discussed in the Final EIS (BLM 2008a).

5.0 TRIBES, INDIVIDUALS, ORGANIZATIONS, or AGENCIES CONSULTED

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

5.1 Federal, State, and Local Agencies

Jonah and PAPO Interagency Offices, US EPA Region 8, Wyoming Department of Agriculture, Wyoming Landscape Conservation Initiative, Sublette County Conservation District, US Fish and Wildlife Service, Wyoming DEQ, Wyoming Game and Fish, State of Wyoming- Governor's

Office, Wyoming Office of State Lands and Investments, Sublette County Commissioners, Sublette County Extension Office, Natural Resources Conservation Service, and Sublette County Weed and Pest.

5.2 Others

Neighboring landowners and affected and interested public.

6.0 LIST OF PREPARERS

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