10-YEAR SUBLETTE MULE DEER MITIGATION PLAN

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Pinedale Anticline Project Office

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Dan Stroud – Habitat Mitigation Biologist

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I. Executive Summary

From 2008 to 2010, mule deer (Odocoileus hemionus) abundance on the Mesa declined by 20% exceeding the 15% threshold which triggered mitigation efforts as identified in the 2008 Pinedale Anticline Record of Decision. The Pinedale Anticline Project Office (PAPO) introduced a plan to various energy companies, publics, and agencies to address mitigation efforts for mule deer. The goals of the effort were to inform the interested publics and to request added input on the plan. The result was the first of a series of habitat assessments covering several years, the first beginning on Bureau of Land Management (BLM) lands associated with the Mesa, Soapholes, and Ryegrass areas. As a result of the 2011 habitat assessment, areas were identified for various traditional and nontraditional habitat enhancements, which are discussed in this plan. This plan also identifies the need and locations for future assessments within this subpopulation of the Sublette Mule Deer Herd Unit, which migrate to winter on the Anticline. Areas selected for future assessments are based primarily on information collected through collared mule deer from studies related to the development and identified in the Record of Decision for development of the anticline and maps of these migrations are included in this plan for illustrative purposes.

II. Introduction

a. Background

The Pinedale Anticline Record of Decision (ROD) (BLM 2008), signed September 12, 2008, acknowledged "some impacts to resources from implementing this ROD (e.g., wildlife habitat and vegetation resources) are not likely to be adequately mitigated on site (BLM 2008, p. 30)." The gas operators (operators) made commitments to provide funding for on and off-site mitigation, because of this decision. As indicated in the ROD, "The mitigation process utilizes performance-based measures to proactively react to emerging and undesirable changes, specifically declines in populations, early enough to assure both effective mitigation responses and a fluid pace of development over the life of the project. In that regard, this process is designed to provide certainty to the affected agencies and the public that impacts to wildlife will be addressed before consequence become severe or irreversible by monitoring changes and responding early (BLM 2008, p. B-4)." A wildlife monitoring and mitigation matrix (WMMM) was established through the ROD to identify certain "thresholds" based on population monitoring. The thresholds are used to provide for identification of changes in population that trigger the need for a "mitigation response." The "specific change requiring mitigation" for the those mule deer that winter on the Mesa, was a "15% decline in any year, or cumulatively over all years, compared to the reference area (BLM 2008, p. B-1)"starting the date that the ROD was signed. This trigger was reached in 2010 and again in 2011 (Sawyer and Nielson, 2011). While the "mitigation response" is different for each species, the response for mule deer stated "Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring (BLM 2008, p. B-1)." Sequential responses are listed in the ROD on page B-5, and generally reflect a prioritization of "on-site" protection and habitat enhancement, followed by "on-site/off-site" efforts related to the purchase of conservation easements or property rights and habitat enhancements. Finally, the third response suggests a "modification of operations" to reduce disturbances associated with the mule deer response. As a result of reaching the mule deer trigger, the Pinedale Anticline Project Office (PAPO) initiated a habitat assessment to identify potential habitat improvements that could be implemented in the areas important to this segment of the Sublette Mule Deer Herd Unit that utilizes the Mesa as a winter range and future planning for added assessments related to this subpopulation.

b. Purpose and Goals

This 10-year plan is in response to the above mentioned -population decline, and is designed to identify and implement habitat enhancements for mitigating impacts to mule deer as a result of gas development on the Pinedale Anticline. To address this goal, habitat assessments will include determining condition of winter and transitional ranges, identifying areas where habitat could be improved, recommending various types of treatments to improve these habitats, and implementing those improvements. In addition, future assessment areas are identified.

c. General Ecosystem Description

The focus areas for this Plan includes lands associated with the Mesa, Soapholes, and Ryegrass (Refer to Maps, Appendices B and G and Figure 1), and other adjacent areas identified by mule deer collaring information as important for either deer transitional ranges or winter ranges. Generally, winter ranges are located at relatively lower elevations associated with the Mesa, Soapholes, and eastern portions of the Ryegrass. Transitional ranges, including migration corridors and stopover habitat areas, have been identified by Sawyer and Nielson (2011) through the collaring and tracking of mule deer that winter on the Mesa.

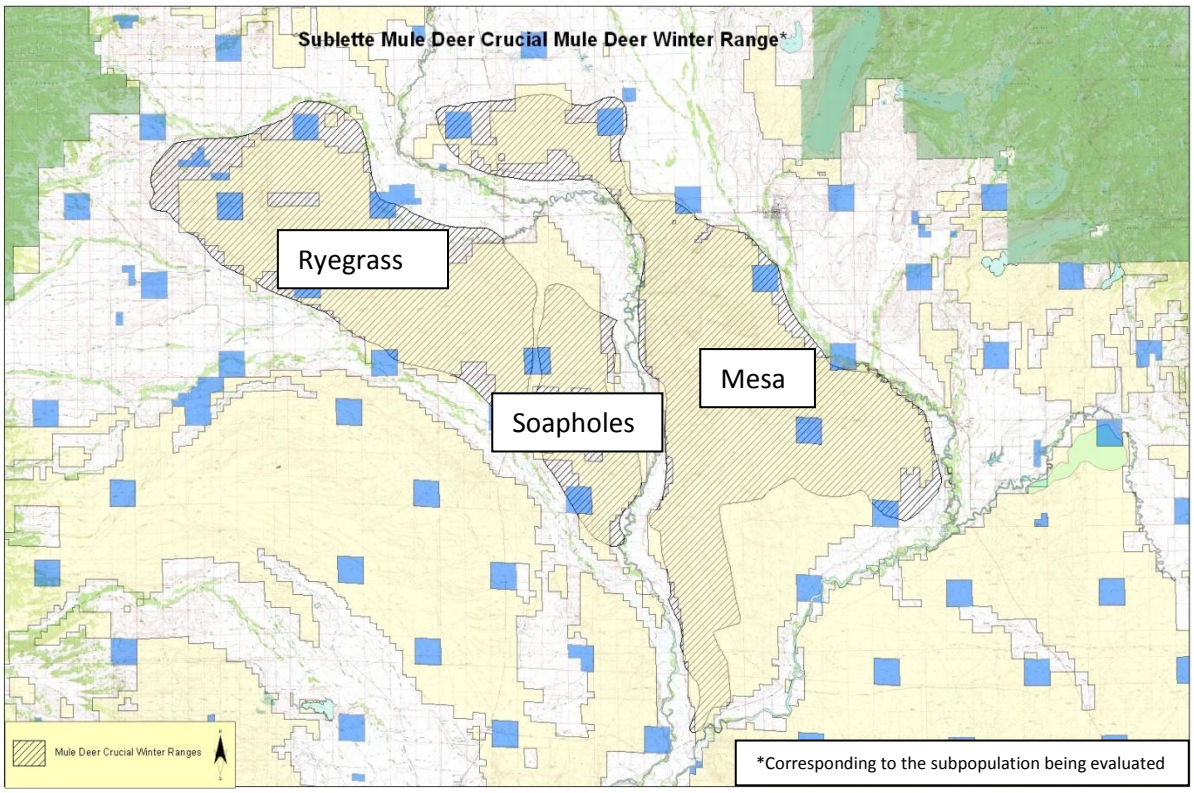


Figure 1 – Sublette Mule Deer Crucial Winter Ranges that correspond to subpopulation of herd unit being assessed.

The importance of the Ryegrass, Soapholes, and Mesa areas to mule deer, sage-grouse (Centrocercus urophasianus) and other sagebrush- related wildlife species cannot be overstated, in particular in the face of development and the loss of some of the traditional areas/ranges of importance. Figure 1 illustrates the importance to mule deer depicting the crucial winter ranges throughout the area and Appendix G depicts the efforts related to tracking of collared mule deer (Sawyer and Nielson, 2011) and illustrates the importance of this area to the Sublette mule deer herd unit. Most of these areas are not only important crucial winter range, but also have great importance from a mule deer transitional/migration standpoint. In addition, the majority of the areas evaluated in 2011 lay within the designated Sage-Grouse Core Habitat Area (State of Wyoming Executive Order 2011). The Executive

Order outlines important strategies, including a core area strategy for conserving sage-grouse on a statewide basis, in an attempt to avoid their "listing" as endangered by the U.S. Fish and Wildlife Service (USFWS). This strategy also outlines certain "disturbance thresholds" that relate to any sagebrush disturbances, including treatments designed to improve habitat for other species such as mule deer. Because of this, any treatments must be designed to meet and not exceed these "disturbance thresholds", outlined in the Executive Order. Preliminary results from this analysis, which is almost complete, indicate that we are within the 5% allowable disturbance with the existing project delineations. Total acreages to be treated will decrease due to many of the delineated polygons being treated to meet the criteria of the Executive Order. This criteria states that "Treatments that reduce canopy cover below 15% will be allowed, excluding northeast Wyoming …., if all such treated areas make up less than 20% of the suitable habitat within the DDCT (Density and Disturbance Calculation Tool), and any point within the treated area is within 60 meters of sagebrush habitat with 10% or greater canopy cover." A list of treatment areas that will be treated in this fashion will be provided along with the results of the DDCT analysis in an addendum to this plan at a later date.

The 2011 Habitat Assessment Area focused on Bureau of Land Management (BLM) lands in portions of the Mesa, the Soapholes, and the Ryegrass areas (Refer to Map, Appendix B). Topography generally consists of rolling hills, mesas and associated draws, and includes the Green River and associated flatter, riparian area. Elevations range from approximately 6,990 feet along the Green River up to almost 8,000 feet on Aspen Ridge, on the west side of the Ryegrass area. Annual precipitation varies from east to west ranging from 7-11 inches annually on portions of the Mesa and lower end of the Ryegrass, to 12-16 inches on the western end of the Ryegrass area (North Wind 2009).

Future assessment areas will be conducted on sites adjacent to the 2011 assessment, including private lands within the migration corridors, some smaller BLM properties, and on United States Forest Service lands (USFS). Sites for assessments will be determined from the previous mule deer studies associated with the WMMM and associated work from collaring mule deer (Sawyer and Nielson, 2010, 2011). Any future information from these ongoing studies will be utilized to modify assessment areas as needed.

The 2011 assessment area is comprised by a variety of sagebrush communities consisting of various sagebrush species. Species of sagebrush documented in the area include early sage (*Artemisia arbuscula ssp. longiloba*), low sage (*Artemisia arbuscula spp. arbuscula*), fringed sage (*Artemisia frigida*), bud sage (*Artemisia spinescens*), black sage (*Artemisia nova*), Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), mountain big sagebrush (*Artemisia tridentata vaseyana*), and basin big sagebrush (*Artemisia tridentata tridentata*). Other shrub communities are present, but to a lesser degree, including antelope bitterbrush (*Purshia tridentata*), chokecherry (*Prunus virginiana*), serviceberry (*Amelanchier alnifolia*), and snowberry (*Symphoricarpos occidentalis*) in the higher precipitation areas, to saltbush communities containing Gardner's saltbush (*Atriplex gardneri*) and winterfat (*Krascheninnikovia lanata*) in the lower precipitation areas.

Prior assessments of these communities were completed for the Ryegrass and Soapholes areas using an ecological site inventory approach (North Wind, Inc. 2008, 2009 and 2010, NRCS 2003, and BLM 2001).

Appendix A illustrates the data points and the polygons associated with this effort. These prior assessments were utilized to some degree in the delineation of treatment areas, and will also be used to determine the type of treatments that may be most appropriate for each site.

While not specific to all sites, site conditions throughout much of the Ryegrass have illustrated declines in condition, in particularly based in the lack of the taller stature bunchgrasses such as basin wildrye (*Leymus cinerius*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Indian ricegrass (*Achnatherum hymenoides*), and Needleandthread (*Hesperostipa comata).* These have been replaced mostly by rhizomatous species and lower stature bunchgrasses such as Thickspike wheatgrass (*Elymus lanceolatus*) and Sandberg bluegrass (*Poa secunda (*Northwind 2009*).* Also observed throughout the 2011 assessment area is a loss or decline of important shrub communities, in particularly mixed shrubs containing such species as serviceberry, chokecherry, and others. It is due primarily to these conditions that many recommended treatments in this report suggest either seeding or the planting of shrubs to increase overall diversity for mule deer, sage-grouse, and other wildlife species that rely on sagebrush systems for their survival.

In addition to the off-site treatments identified in this plan, on-site opportunities exist. Most of the opportunities, however, may not be "traditional" from a habitat enhancement perspective. Most traditional types of habitat enhancements require some reduction in sagebrush densities and cover, to allow for more herbaceous growth and to provide a mosaic of age classes among the shrub components. With the current amount of disturbance on the Mesa, this may not be a good option. One of the non-traditional types of treatments is described later and relates to potential fertilizer applications to increase productivity to sagebrush. The other, and perhaps the best option, is to pursue aggressive reclamation in the disturbed areas to provide for the vegetative needs of mule deer, sage-grouse, and other wildlife species. There are many opportunities for increasing vegetative diversity on the disturbed sites, as well as identifying potentially better reclamation practices not already being used. Some of these may include soil amendments, planting shrub and forb seedlings, growing plants that are currently hard or expensive to obtain, etc. Several reclamation practices have been used that might enhance the rate and reclamation success includes, but are not limited to: mulching, adding soil amendments, and irrigating areas in reclamation.

III. Sublette Mule Deer Herd Unit

In addition to annual job completion reports completed by the Wyoming Game and Fish Department (WGFD), ongoing population monitoring described in the ROD Wildlife Monitoring and Mitigation Matrix is also conducted and managed by PAPO. The following narrative and table was extracted from the 2011 Mule Deer Monitoring in the Pinedale Anticline Project Area – Annual Report (Sawyer and Nielson, 2011). This is provided here for added information relating to the "triggers," which were responsible for initiating this habitat assessment and future mitigation projects. Additional information may be obtained from the report.

The WMMM specifies that mitigation measures will be triggered if a 15% decline in mule deer abundance is detected in any year, or a cumulative change over all years since 2005, relative to a reference area. If we only look at numbers from the 2008-2009 winters, the Mesa declined by 45%, while the Ryegrass/Soapholes increased by 19% and the entire Sublette Herd Unit declined by 9%. However, as the independent review of WMMM (Bissonette et al. 2010) noted, the current methodology is unlikely to detect a change of 15% or less between annual abundance estimates of two populations. Their power analysis indicated that changes would need to be 35% or greater to have at least 80% confidence in detection. Given the magnitude of the observed changes between winters 2008 and 2009, the 15% threshold appears to have been exceeded, regardless of which reference area (Ryegrass/Soapholes or Sublette Herd Unit) is used.

Table 1. Mule deer abundance estimates and standard errors (SE) for the Mesa, Sublette Herd Unit, and Ryegrass-Soapholes, 2001- 2010.

Winter	Mesa		Sublette Herd Unit		Ryegrass - Soapholes	
	Estimate	SE	Estimate	SE	Estimate	SE
2001	5,228	820	34,700	n/a	--	--
2002	4,676	614	32,920	n/a	--	--
2003	3,564	395	34,020	n/a	--	--
2004	2,818	325	26,630	n/a	--	--
2005	2,894	311	27,254	n/a	--	--
2006	3,156	470	26,470	n/a	986	237
2007	3,638	424	31,200	n/a	1,106	260
2008	3,850	322	28,700	n/a	1,862	249
2009	2,088	325	26,060	n/a	2,223	201
2010	2,318	225	26,162	n/a	1,109	136

In addition to the trends illustrated here, WGFD has documented through their annual Job Completion Reports, the importance of the Mesa, Soapholes, and Ryegrass areas, both as crucial winter ranges for mule deer (Figure 1) as well as important migration corridors. These annual reports date back to 1975 and include trend counts, age structure by year, hunter harvest information, and estimated populations. More recent reports also include posthunt sex and age ratios, hunter success, and narratives that discuss habitats, and management.

Historical Habitat-related Assessments

Habitat improvement projects and assessments, mostly related to the Wyoming Range Mule Deer Herd, have been ongoing for numerous years, some actually dating back to 1958 (Scribner, 2006) and others that have been done within the past few years (Smith and Younkin 2010). In general, these assessments have illustrated a loss of shrub diversity and vigor over time relative to preferred browse species, including mountain mahogany, bitterbrush, and serviceberry.

Recent Habitat Treatment Trends

Numerous habitat enhancements have been performed along the east slope of the Wyoming Range that should be considered relevant to future enhancement projects for mule deer. Data collection efforts have been ongoing with most of these projects since they were implemented and data summaries

provided, primarily by Eric Maichak and Jill Randall (Brucellosis-Feedground-Habitat Biologist and Habitat Biologist, respectively – WGFD 2011a). Results from these data collection efforts have been discussed and the following summary is provided to depict the results of the various treatments:

8 February 2011
Eric J. Maichak, Big Piney Brucellosis-Feedground-Habitat Biologist
Jill Miller, Pinedale Terrestrial Habitat Biologist
2010 Annual Habitat Report - Short and long-term effects of fire, mechanical, and herbicide treatments in sagebrush ecotypes of western Wyoming

In the summer and autumn of 2008 through 2010, BFH and Terrestrial Habitat personnel were assisted by BLM and USGS staff in post-treatment vegetation monitoring on 10 sites throughout the east-central slope of the Wyoming Range front, western Wyoming. Treatments (prescribed fire, mechanical, 'Spike' herbicide) occurred from 1993 through 2008 in sagebrush (Wyoming big, low, mountain big) habitats and were paired with adjacent untreated control sites. With the use of nested frequency (1993-1997), line-point-intercept (1998-2010), shrub belts (1993-2010), and production clippings (1993-2010), the goals of this effort were to 1) document and compare vegetation characteristics among habitat and treatment types and 2) assess potential long-term effects of treatments. We found that relative to control sites, density and cover of sagebrush were and continue to be (15-yr post treatment) reduced substantially by fire, while most of these variables were reduced within mechanical (pitting, ripping, mowing) and Spike treatments, but to a lesser extent than fire. Basal cover of bare ground was increased with fire and reduced with Spike, but cover of bare ground on fire sites appears to return to control site levels within eight to 15 years. We found that all treatment types increased grass production, mechanical treatments increased forb production, yet Spike treatments reduced forb production. Species richness of grasses and forbs was unassociated with any treatment type. However, when we compiled line-point and respective grass production data from all sites and habitats (1998-2010), forb richness was low to modestly correlated with annual production of grasses (used as a surrogate measure of annual precipitation) suggesting that precipitation (i.e., annual or site specific) dictates recruitment of forbs. Our results support previous literature, and we suggest that mechanical and Spike rather than fire treatments can be implemented with greater control over sagebrush cover, density and age/height composition, and therefore may have fewer presumed negative effects on sagebrush obligate species (e.g., sage grouse) and fewer post-treatment livestock grazing stipulations. Furthermore, we suggest that until landscape-scale habitat treatments of varying mosaics (blob vs. patches) are implemented and assessed with respect to sage-grouse metapopulation impacts mechanical, and Spike treatments may have greater potential than fire for incorporation into recently delineated sage-grouse core areas.

Recent habitat efforts related to the Sublette Mule Deer wintering on the Anticline have primarily involved the use of nitrogen fertilization on the Mesa winter range. These efforts have involved the use of two rates of nitrogen fertilizer to increase shrub production. Application of nitrogen fertilization was implemented in both 2010 and 2011. In 2010, two rates were applied, a 40 pound/acre and an 80 pound/acre rate, and compared with a control area. Two control areas averaged 0.79 inches and 0.91 inches of leader growth, respectively, while the 40 pound and 80 pound per acre fertilizer rates resulted in 1.93 inches and 1.34 inches of leader growth, respectively. . While inconclusive due to the lack of a rigorous sampling design, fertilization appears to be increasing sagebrush production on the 40 and 80 pound application rates. Due to concerns from the public related to the lack of a statistically rigorous sampling design, a contract is being issued to collect a range of data and to compare it, statistically, to ensure that any differences are determined. Data that will be collected will include sagebrush leader growth and utilization, perennial grass cover, composition, and production; annual grass frequency, cover, composition and production, plant community attributes, and nutrient content of sagebrush and perennial and annual grasses. Data will be collected for 2 years, starting in 2012.

IV. Habitat Assessment Methods

The habitat assessment conducted during the 2011 field season utilized "qualitative" techniques described in the Wyoming Range Mule Deer Habitat Assessment: South LaBarge Study Area (Smith & Younkin 2010), and consisted primarily of photos with GPS locations, descriptions of site characteristics including dominant plant species on site, and treatment recommendations.

Polygons were drawn of sites that were determined to be best for potential treatment, as opposed to identifying characteristics of all sites within the area analyzed. For each assessment/photo point, the above characteristics were documented and included in a spreadsheet (Geodatabase) and in an assessments "notes" report for those specific points determined to have the best capabilities for a positive treatment response. While the assessment/photo points do not display everything examined, observations were made throughout the Ryegrass and Soapholes areas, and in one area on the Mesa flanks. Each assessment/photo point was recorded by allotment in the "assessment notes."

Treatment recommendations are based on professional judgment and past experience working with habitat manipulations throughout Sublette County since 1988. In addition, a literature search was conducted, and results of that search were used to aid in determining mule deer needs and possible treatment options, as well as consultation with others that have conducted various types of treatments for mule deer (e.g. Deseret Ranch – northerly slope cool burns; Idaho's Tex Creek Habitat Area – shrub and aspen planting, etc.). In many cases, treatment sites were selected to provide for optimal results, and one of the primary components related to this is moisture. Mesic sites, either because of snow drift or due to drainages, are a part of the emphasis in this selection process. Because of the added moisture many of these sites receive, they have increased potential for better vegetative response to seeding/planting and other treatments. Sites were, to some extent, selected based on their soil depth and texture, as well as their potential for a better treatment response, with loamy sites being preferred. Finally, aspect and topography were considerations on site selection, with northerly to westerly slopes being selected for transitional range projects. Many of these slopes are unavailable for winter use, lending them to use in transitional periods, while not impacting winter shrub availability. In addition, personal communications with Rick Danvir (Deseret Ranch) were also an added justification. Deseret Ranch has implemented cool north slope burns for mule deer on transitional ranges, apparently with some success.

Appendix B is a map of the potential treatment "polygons," coded by treatment year, Appendix C gives a list of treatment areas and treatment recommendations, and Appendix D is an example of one assessment point for illustrative purposes of the type of information and recommendations documented for each site. Approximately 80 data points (including efforts from the PAPO and BLM) were assessed and information gathered during the 2011 field season.

In addition, previous data collection/inventory efforts using the Ecological Site Description (ESD) framework during 2009-2010 resulted in the establishment of approximately 41 quantitative data points throughout the Ryegrass and Soapholes areas. The Jonah Interagency Office funded these data collection efforts to collect information in areas important for those species impacted in the Jonah Field.

Data collection included the identification of ecological sites, line-point intercept by species (modified – all "hits" are recorded, plus ground cover), shrub belts (density by age class), and documentation of age classes and condition of shrubs and "similarity indices" (which describe site condition relative to its potential on a dry weight production basis). Ecological site potential is based on climate and soil descriptions.

V. Treatment Assessment Methodology

Monitoring of future treatments will include a treated and control site and methodologies will be consistent with locally established methods. Monitoring will be done pre-treatment (either the year of the treatment or the previous year, depending upon whether it's a spring or fall treatment), immediate post-treatment, 3rd year and then every 5 years up to year 15 (e.g. 3rd, 8th and 13th years) post treatment. Monitoring will be done on a macroplot basis with 5 transects per macroplot for traditional treatments. At a minimum, monitoring will include line-point intercept (percent cover), shrub belts (density, age classes), and production/utilization (clipping or estimating). For non-traditional types of projects, monitoring may vary depending upon the type of treatment. For instance, for shrub plantings, monitoring should include survivability and utilization measurements. Data collection results will be compiled and included in annual reports

VI. Mule Deer Habitat Goals by Seasonal Range

The area assessed in 2011, and future areas to be assessed will focus primarily on winter and transitional ranges, and include sites identified by Sawyer and Nielson (2010, 2011) within migration corridors and within habitat "stopover" locations. Differing goals occur for the different habitat seasonal ranges, due to varying needs (primarily nutritional) by mule deer during those periods (Wasley 2004, Bishop et al. 2008, deVos et al. 2003). Generally, during the winter, mule deer rely primarily on existing body reserves and condition, while decreasing forage intake, decreasing metabolism and limiting movements. Spring and fall periods may, perhaps be most important from a nutritional perspective (assuming that summer ranges are abundant and high quality). During these transitional periods deer are either coming off of winter ranges and in need of high quality, nutritious forages for improving body condition, fawning and milk production. Fall periods are important from the standpoint of increasing body condition to as great a degree as is possible prior to winter, in order to have a better chance of winter survival (deVos et al. 2003).

<u>Seasonal Range Goals</u>

Transitional Ranges – Create early seral patches in stands of older-aged, dense stands of mountain big-sage, and mixed shrub communities to enhance spring/fall nutrition and variety/diversity of vegetation, including forbs and grasses, available to mule deer.

Winter Ranges – Increase leader growth (production) and/or palatability of sagebrush and other important browse species. Where possible, add or enhance second or third browse species to improve diversity (e.g. reclamation/shrub plantings) and enhance forb and grass productivity and diversity.

All seasonal ranges – Increase vegetative diversity through all methods including nontraditional enhancement methods (see below).

VII. Habitat Enhancement Tools/Treatment Methods

Various tools and treatment methods are available for enhancing habitat for mule deer, which primarily focus on changing vegetation. Most of these methods are induced to reinstate disturbance into various vegetative communities to create habitat mosaics with various age classes of plants including shrubs, improving nutrition by increasing productivity of herbaceous components important to mule deer and improving the palatability of shrubs by replacing older plants with younger plants (Wasley, 2004, deVos et al. 2003, Cox et al. 2009). Many of the more traditional tools have been utilized for centuries, mostly for increasing grass production for livestock, but with a focus of reducing or eliminating shrub cover and setting back succession. Other tools are being explored that are less traditional, and some which are to some extent experimental. The focus of the 2011 assessment and associated habitat enhancements has been to focus on tools that appear to be the best relative to the site being enhanced, and the associated needs of that site.

The following list contains various tools that are recommended or could be utilized to meet the goals of the enhancement efforts:

- <u>Traditional</u>
    - Mechanical (mowing, aerator, pitter, ripper) – reduce shrub densities
    - Chemical (SPIKE)– reduce shrub densities
    - Prescribed burns – reduce shrub densities
    - Prescribed burns – aspen regeneration
    - Grazing management *– including development of new water sources where needed to enhance existing management options for deferred rotational systems.
    - Interseeding – to increase vegetative diversity and/or replace some lost species that are adapted to the site/area
- <u>Nontraditional</u>
    - Biological techniques (livestock or other ungulate use to change vegetation or set it back successionally – some of these can actually reduce shrub densities and provide varying age classes similar to the more traditional techniques)
    - Seed blocks (mineral or protein blocks with seed mixed into block) – increasing vegetative diversity by planting seed using livestock
    - Prescribed burning with seeding - reduce shrub densities and add diversity
    - Prescribed burning with shrub plantings – reduce sagebrush densities and replace with mountain shrub species
    - Drainage restoration (check dams with seeding) – reduce erosion, add or retain water and increase vegetative diversity through seeding and use of the added water retained
    - Scatter seed and feed livestock on area to incorporate seed (private lands) - adding diversity through seeding using livestock as the tool

*Numerous research projects have identified potential grazing systems that could benefit mule deer along with other wildlife species (Leckenby et. al. 1982, Willms et. al. 1979, Yeo et.al. 1993, Gallizioli 1979)

VIII. 10-year Project Implementation Plan

The following narrative outlines specific needs by year for either implementing projects, or for conducting added habitat assessments in different areas. In general, for any project implementation work the following will be needed: 1) National Environmental Policy Act (NEPA) – including all specifics needed (e.g. cultural, recreation, visual, etc.), 2) Monitoring and reporting (identified under treatment assessment methodology), and 3) Actual implementation (discussions will need to be held on how best to do this). Future assessments will be done utilizing techniques similar to those used in 2011. Some of the assessments may be done as time permits and depending upon the time requirement for the other aspects leading to implementation of projects.

Year 1 – 2012

The initial focus will be to complete the NEPA process for all identified projects from the 2011 assessment. Additionally, cultural surveys will be completed on those projects identified for implementation in 2013 (refer to Appendices E and F), and possibly 2014 (Appendices H through M). A project proposal was prepared for the NEPA analysis for the 2013 and 2014 projects and approved by the PAPO Board of Directors in May 2012 (Board). It also included funding for the necessary cultural survey for the 2013 projects. The WGFD and PAPO will coordinate with BLM ID Team members to write a request for proposal (rfp) for the NEPA, to contract the cultural clearance, and for any added needs that are identified.

In addition to the treatments identified in the 2011 assessment, another effort is in progress on private lands to interseed forbs in areas adjacent to irrigation ditches. This effort is occurring on the Sommers and Grindstone ranches and is being led by the National Resource Conservation Service (NRCS) (Jennifer Hayward) and WGFD (Jill Randall). The effort will be monitored, and if data are favorable interseeding forbs on other private lands of willing landowners to enhance and diversify transitional range forage for mule deer and brood-rearing areas for sage-grouse could be pursued.

The Density and Disturbance Calculation Tool (DDCT) analysis for sage-grouse must be completed prior to implementing any treatments. This analysis is in progress and almost complete, and illustrates that we are slightly below the 5% allowable disturbance threshold. Final treatment acreages will be less than the total acreages previously calculated, primarily because many areas will now be treated in a mosaic fashion with treatment widths of no more than 120 meters (as per the Executive Order – 20% treatment areas allowable within DDCT if treatments are no more than 60 meters from sagebrush canopy of 10% or greater). Once completed, the DDCT analysis results will be included as an addendum, along with those areas that will be treated in this fashion, rather than a complete treatment of the entire delineated polygon.

A funding proposal to implement the2013 projects will be prepared in 2012 to take to the PAPO Board for approval based on cost estimates and implementation determined from consultation with the WGFD and the BLM. Project implementation for 2013 projects (refer to Appendices D and E) will focus on WGFD and BLM crews for both cost estimates and associated work on completing the projects. While some of the work may need to be contracted, in-house (WGFD and BLM) implementation is recommended as a first priority.

The PAPO, WGFD, BLM, and permittees will meet and coordinate annually. This coordination effort will include discussions about how permittees can assist with managing their livestock to benefit the project(s). The duration and when a treatment area will be rested from livestock grazing will be based on a number of variables including but not limited to: 1) type of treatment; 2) vegetative response as it relates to the treatment goals and objectives; and 3) existing science (Maichak et al 2011).

Follow-up planning and potential qualitative assessments will be needed with most project areas, which will be performed in 2012. This especially pertains to the Brodie Draw treatments (refer to Appendix E) and the preliminary polygons created in the James Ryegrass and Ryegrass Individual Areas (refer to Appendix H). In the case of Brodie Draw, little time was spent during the 2011 assessment in this allotment/area. After discussion with some of the ID Team members in an initial meeting, further consideration and added analysis on other types of treatments, this area was deemed a good candidate for some potential seeding/planting types of treatments to both bring back the shrub community quicker and to add both shrub and herbaceous diversity and productivity. Relative to the James Ryegrass and Ryegrass Individual area, preliminary treatment area delineations are completed. This area is an important transitional range and further assessments will be completed during the 2013 field season.

Added mule deer habitat assessments will commence during the 2012 field season, focusing on private and federal (BLM and USFS) lands. Priority for this effort will be given to areas within and immediately adjacent to those corridors identified by Sawyer, et.al (Appendix G). Specific areas related to these assessments and already identified projects include Webb Draw Aspen/Shrub Project, and the Monument Ridge Prescribed Burn on the Bridger-Teton National Forest.

Year 2 – 2013

Project implementation will begin in 2013 on the projects identified in Appendices D and E. Total area for potential treatment is approximately 1,800-2,000 acres. Prior to implementation, pre-treatment data will need to be collected, on both the proposed treatment area as well as an identified control site.

In addition to implementation of the above projects, planning will proceed for the projects identified for implementation during 2014 and as outlined in Appendices G through L. Included in this effort will be cultural surveys (based on treatment method), developing cost estimates for treatments, and submitting a project proposal for approval by the PAPO managers for approximately 5,500 acres of treatments. In

addition, other avenues of funding will also be explored, which may include: BLM's Budget Planning System (BPS), Wyoming Wildlife and Natural Resources Trust, WGFD Trust Fund, and Sage Grouse Working Group Funding.

Annual reports will be prepared identifying previous years' efforts and added project areas identified by additional habitat assessments. Since some of these may occur on private lands, if opportunities exist for earlier implementation, these will be included in the associated project proposals to the PAPO managers and other funding sources. Locations of 2012 and future habitat assessment work will be based on "opportunity" (on private lands), additional BLM lands within or adjacent to migration corridors and on USFS lands within or adjacent to migration corridors (refer to Appendix G). In addition, data collection on implemented projects or those that will be implemented in 2013 will be collected.

Years 3-4 – 2014-15

Project implementation will continue during 2014 and 2015 addressing the projects not implemented from the 2011-2013 Habitat Assessment work; and where necessary cultural work (on federal lands) has been completed. Projects identified for implementation in 2013 are identified in Appendices H through M.

In addition, follow-up from habitat assessment efforts conducted during the 2013 field season will be done, with the development of plans for each identified project site. A proposal will be submitted to the Managers for implementation of the identified projects, with necessary follow-up planning and NEPA (where required). Many of these sites may be on private lands. Treatments proposed on private lands will not require the added cost of NEPA, which would allow treatments to be undertaken as soon as funds are available.

Habitat assessment work will continue, based on previous years' coverage. Data collection will continue for projects already implemented or planned based on methodologies identified in this planPre- and post-treatment data collection will be done as per the methodologies set in the section on Habitat Assessment Methodologies. All treatments will have data collection both pre- and post-treatment, and the 3rd, 8th and 13th years, post-treatment.

Year 5-10 - 2016-2020

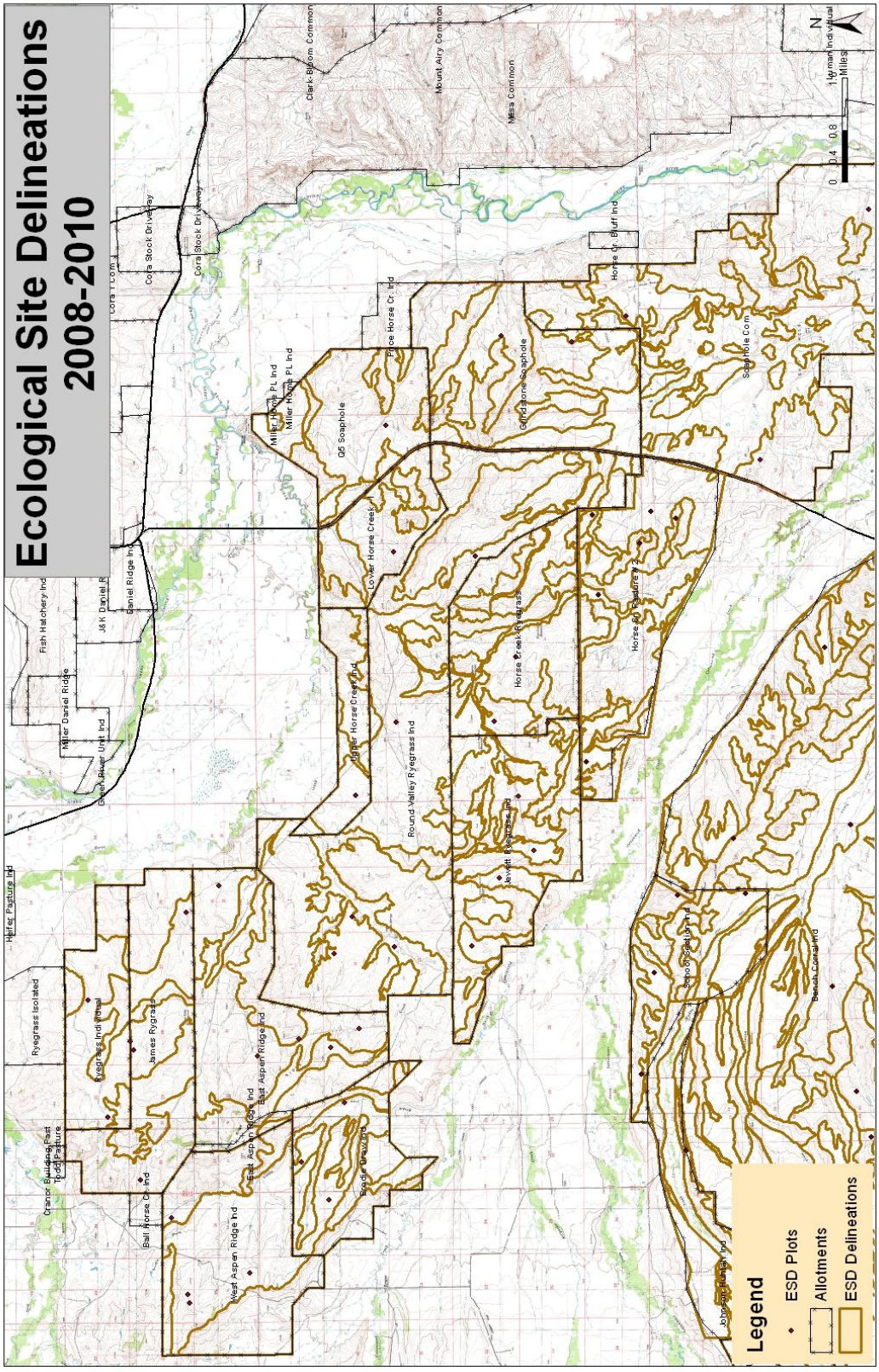
Efforts during this period should focus on any added habitat assessments/projects that may need to be addressed and that are certain to be identified as this mitigation project progresses. Previously identified projects that may not have been pursued, but have value should be revisited. As new ideas and technologies come available, additional projects will continue to be identified.

Data collection efforts associated with treatments will be continued for all previous projects and potential projects during this period. An adaptive management process should be explored to examine treatment success as they are implemented, and where possible, treatments having the greatest

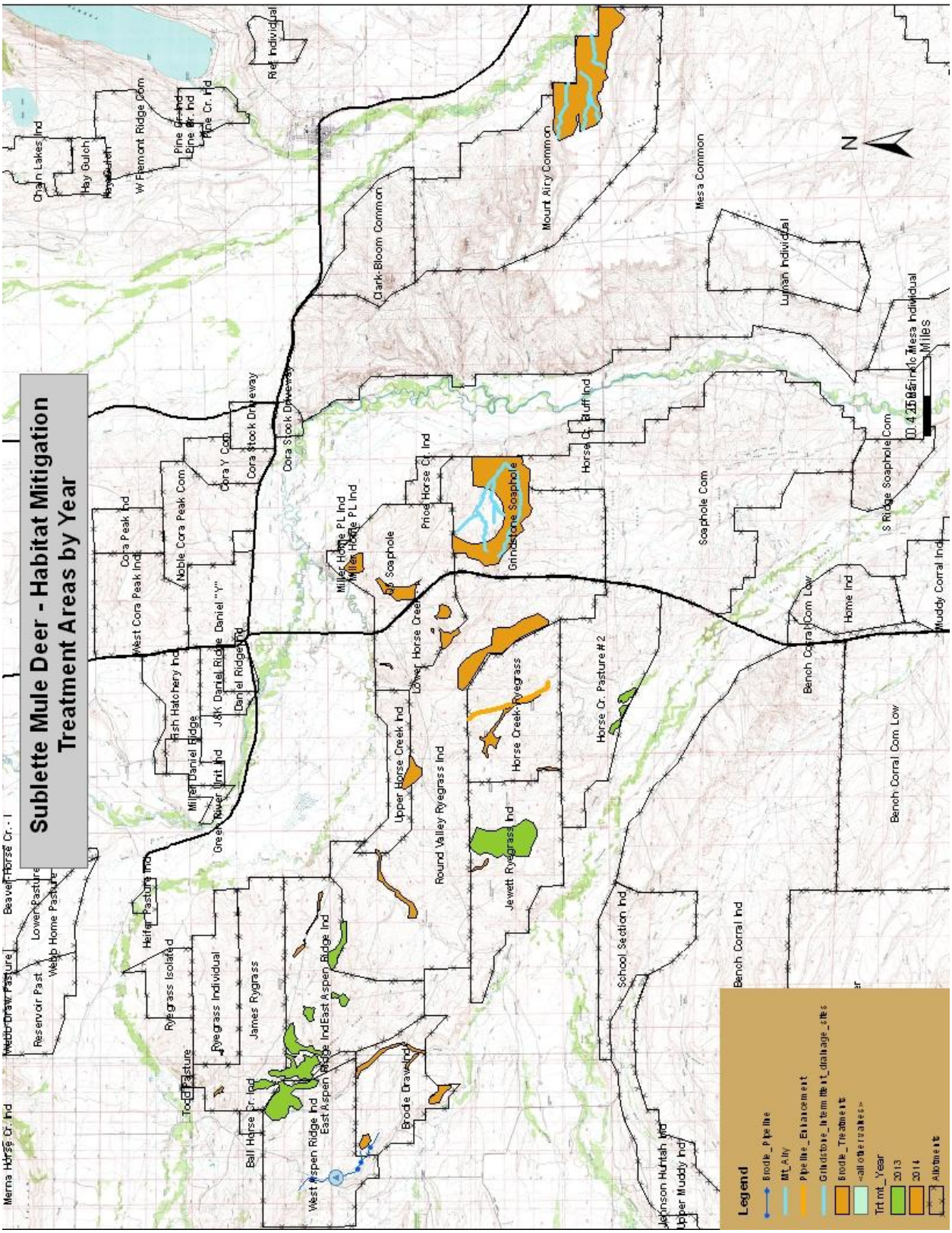
benefits be expanded either on site or in other similar areas. If new treatments are identified added NEPA will need to be considered.

Ongoing monitoring efforts should be used for assessing treatment potential to identify the best treatments in other areas, in particular the Ryegrass area. A follow up habitat assessment that takes into account the results of data collection efforts should be conducted to identify other areas that will benefit from further treatments. This is especially applicable to those areas assessed during the 2011 field season on BLM properties.

APPENDIX A – Ecological Site Descriptions – Delineations and Data Points



APPENDIX B– 2011 Mule Deer Habitat Treatment Areas



APPENDIX C – List of Treatments/Areas identified in 2011 Assessment

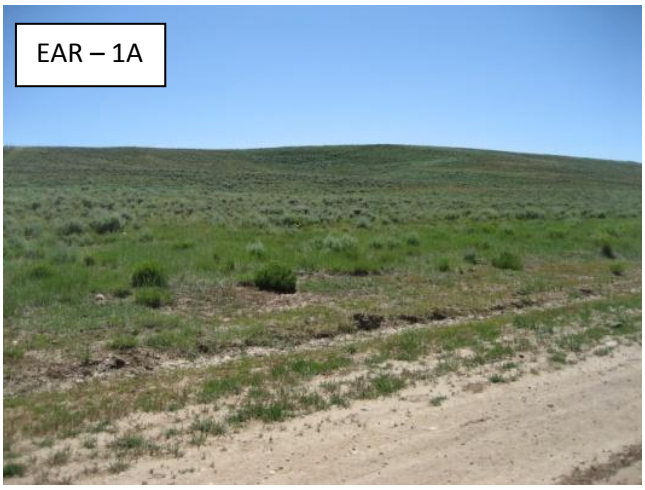
AREA	ALLLOTMENT	ACRES	PROPOSED METHODS
Aspen Ridge Appendix D	East & West Aspen Ridge	800-1000	Rx Burn, Ripping aspen edge, shrub plantings, mechanical or SPIKE
Brodie Draw Appendix D	Brodie Draw & West Aspen Ridge	400+	Seeding, shrub planting, Interseeding
Jewett-Ryegrass Appendix E – Area 1	Jewett-Ryegrass Ind.	517	Mechanical or SPIKE
Jewett-Ryegrass Appendix E – Area 2	Horse Creek-Ryegrass	2+ linear miles or approx. 16 acres	Interseeding pipeline reclamation
Jewett-Ryegrass Appendix E –Area 3	Horse Creek Pasture #2	80	Interseeding and/or planting
James Ryegrass & Ryegrass Ind. Appendix G – Area 1	James Ryegrass	12	Aspen – Rx burn, Ripping along edge, shrub plantings
James Ryegrass & Ryegrass Ind. Appendix G – Area 2	Ryegrass Ind.	3	Enhance diversity via seedings (protection?)
James Ryegrass & Ryegrass Ind. Appendix G – Other Areas	James Ryegrass & Ryegrass Ind.	Approx. 100	Further examination needed in 2012 to identify potential and associated treatment recommendations
Ryegrass Area Appendix H – Area 1	East Aspen Ridge	40	Wet meadow enhancement through seeding/planting
Ryegrass Area Appendix H – Area 2	East Aspen Ridge	100	Rx burning and shrub plantings or Mech. Thinning
Round Valley – Ryegrass Appendix I – Area 1	Jewett-Ryegrass Ind. & Horse Creek Ryegrass	40	Rx burning and shrub planting
Round Valley – Ryegrass Appendix I – Area 2	Round Valley Ryegrass Ind.	50	Mechanical or SPIKE
Round Valley – Ryegrass Appendix I – Area 3	Horse Creek Ryegrass	110	Fence repair/construction; drainage restoration
Lower Horse Creek Appendix J – Area 1	Lower Horse Cr. Ind.	6+	Rx Burn & shrub plantings
Lower Horse Creek Appendix J – Area 2	Lower Horse Cr. Ind.	60	Rx burn or SPIKE; possible shrub plantings
Lower Horse Creek Appendix J – Area 3	Round Valley – Ryegrass Ind.	496	Mechanical and/or Chemical; some interseeding
Soapholes Appendix K – Area 1	Q-5 Soaphole	500	Mechanical treatments with seeding
Soapholes Appendix K – Area 2	Grindstone Soaphole	1820	Basin restoration – Mechanical; SPIKE; seeding; drainage structures
Mount Airy Appendix L	Mount Airy Common	1260	Basin restoration – Mechanical; SPIKE; seeding; drainage structures

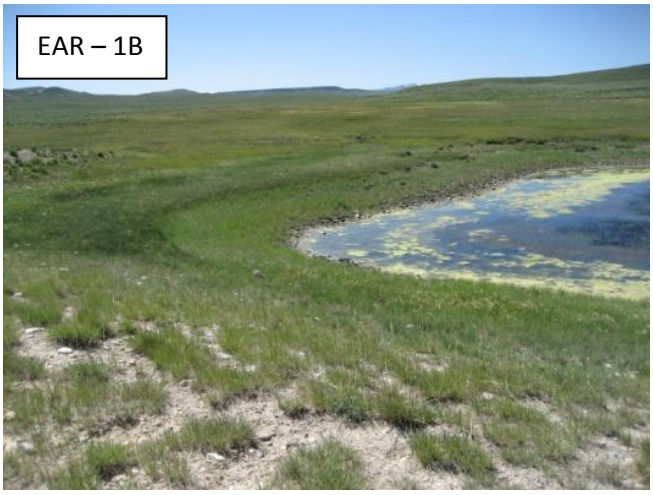
APPENDIX D – Example of an Assessment/Photo Point

East Aspen Ridge Allotment – July 20, 2011

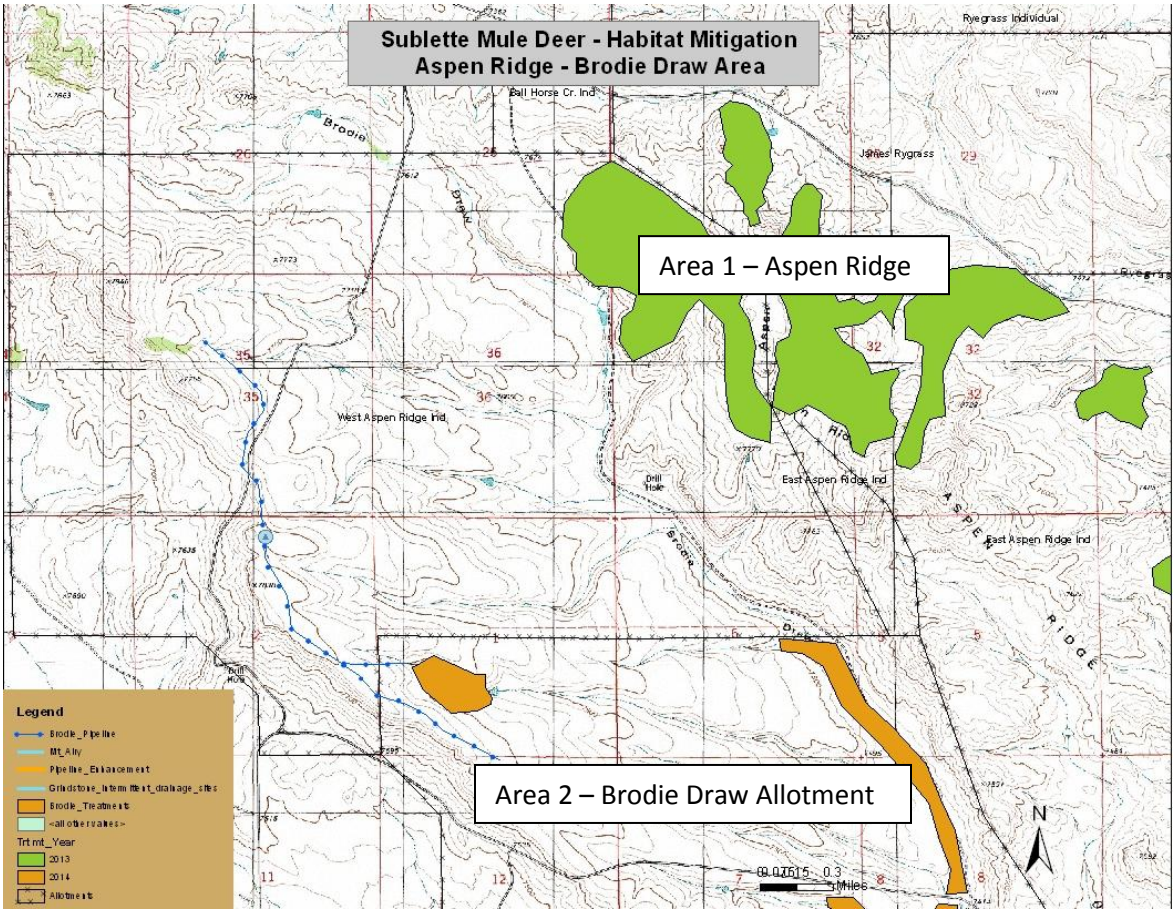
EAR-1

Evaluate for seeding and protection – possible forb seeding in meadow & Basin Wildrye on edges of this wet meadow. Sagebrush communities in area appear to be a combination of Wyoming and Mountain (Bonneville?).
UTM: 4746503.0N 566766.0E
Lupine prevalent in area.
Photos 39 and 40 of slope with potential for treatment – thinning of sagebrush w/potential seeding; slopes further south in photos could be included in treatments
Photos 41-47 of wet meadow area. Stockwater pond – provide off-site water?
Low browsing of sagebrush in this area.
Wet meadow extends to this UTM on north side of main road – 4746703.8N 565971.7E





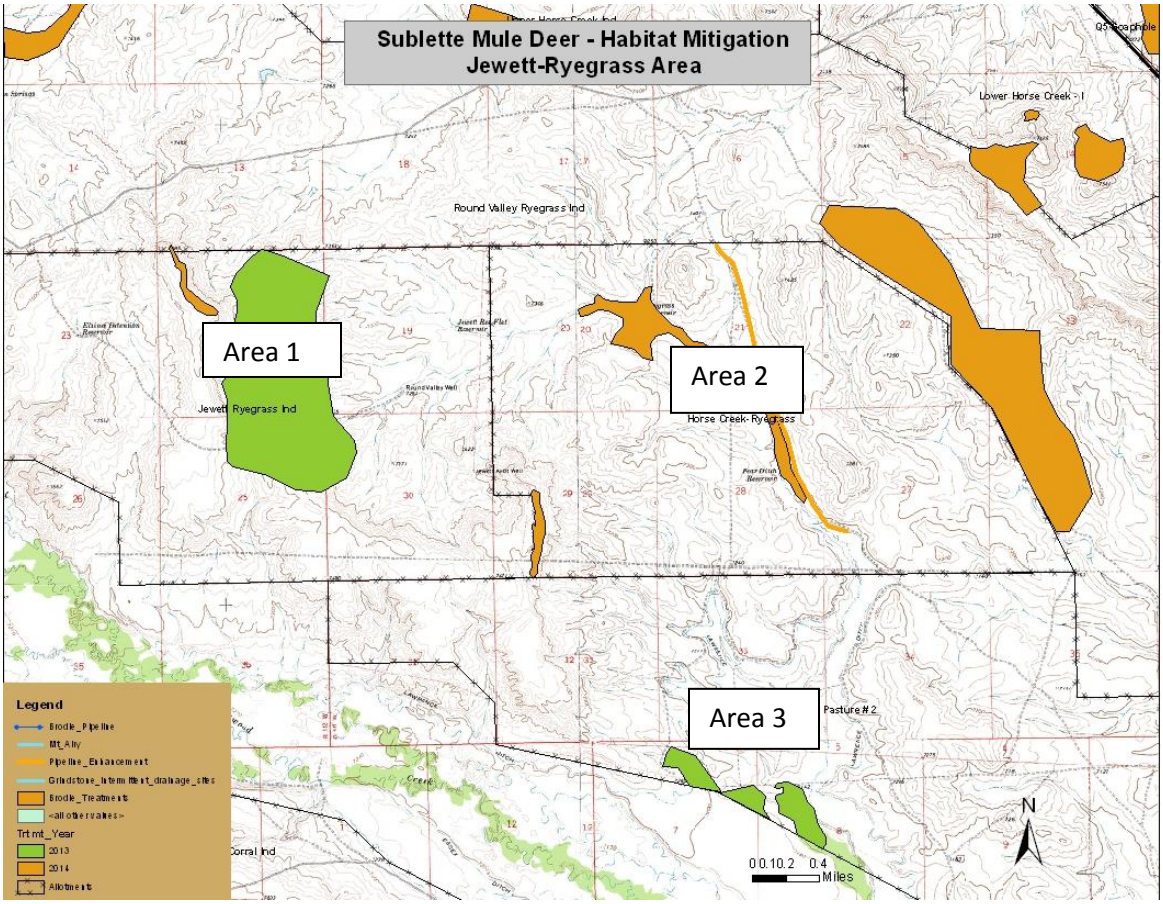
APPENDIX E – 2013 Mitigation Projects – Aspen Ridge-Brodie Draw



AREA 1 – Treatment polygons within this area comprise approximately 600-800 acres of aspen, mixed shrub and sagebrush stands. Treatment objectives for these sites include: Sagebrush thinning, shrub plantings, increasing vegetative diversity, and aspen stand expansion/rejuvenation. Specific tools recommended include 1) Rx Burning immediately adjacent to aspen on lower side, 2) Ripping along lower edge of aspen, 3) Planting shrubs in area that is burned, and 4) Thinning or small treatments of sagebrush with possible seeding in other polygons. Where bitterbrush is present, SPIKE or a mowing level conducive to reducing sagebrush densities while having minimal effects on bitterbrush would be recommended. Seeding will need to have some ground disturbance, and could be feasibly done with an aerator. Estimate approximately 500 acres for seeding.

AREA 2 – Brodie Draw and West Aspen Ridge Allotments – Estimate approximately 400 acres in previous Brodie Draw Rx Burn area for a combination of treatments to increase shrub and herbaceous diversity. Specific tools would include shrub planting (bare root stock) and interseeding (with aerator or Truax Drill) into existing vegetation. Another option could be to utilize livestock concentrations to plant seeds. In addition, develop an existing well to provide water in new locations in both allotments to better disperse livestock. In the case of Brodie Draw, this will reduce use on an existing wet meadow area which will benefit numerous wildlife including mule deer and sage-grouse. There may also be possibilities for using some water to increase plant diversity near existing reservoir.

APPENDIX F – 2013- Mitigation Projects – Jewett-Ryegrass Area

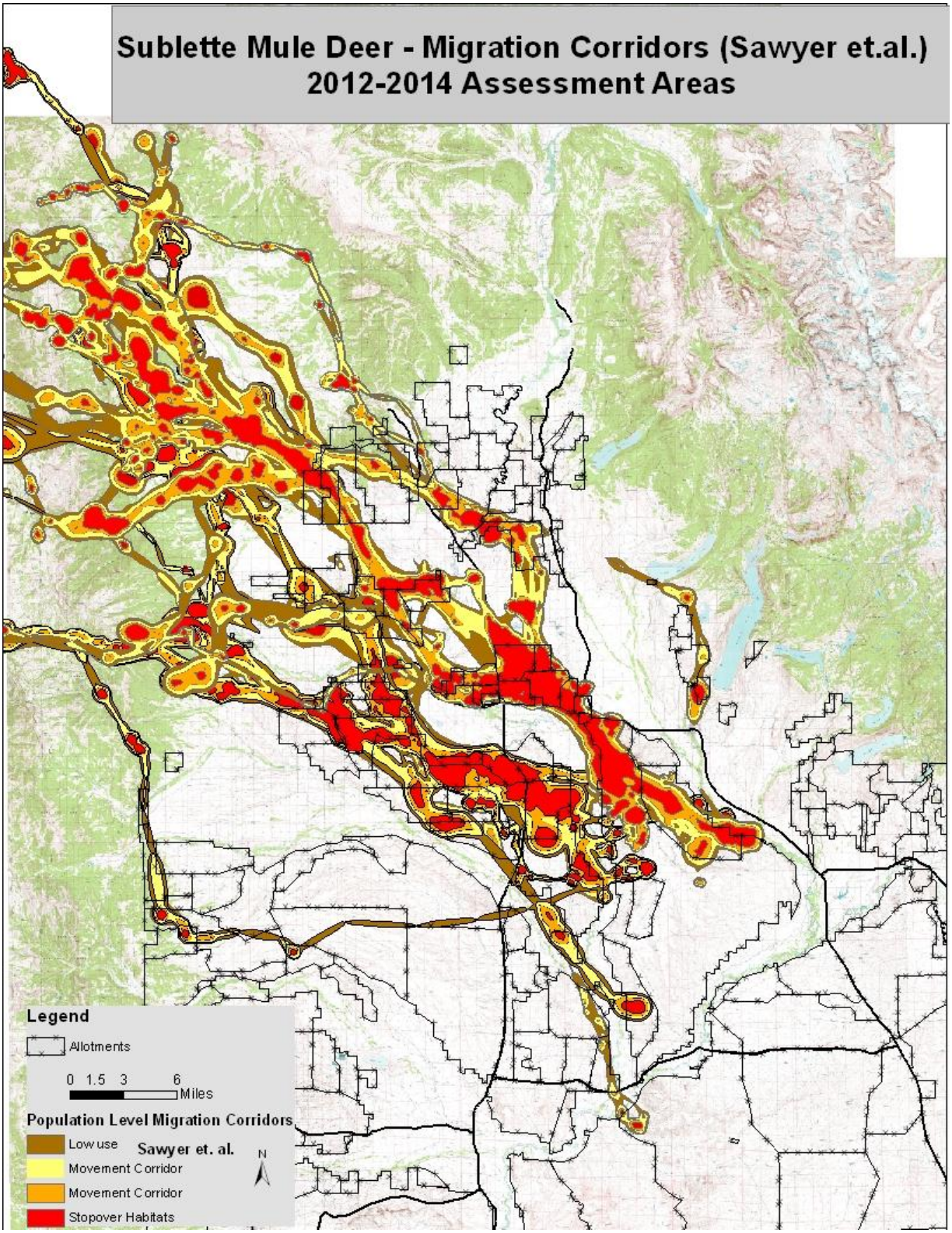


AREA 1 – This polygon represents approximately 517 acres of big sagebrush-bunchgrass and is in relatively good condition overall. Added delineation will be needed but treatments will focus on increasing sagebrush age class diversity and improve herbaceous productivity and to maintain/enhance existing diversity. Mowing or chemical treatments will be utilized within polygon in areas further specified for treatment to meet above objectives. These will primarily occur where sagebrush densities are highest and actual acres of treatment will be based on need to achieve best results. This is due primarily to the existing diversity within the polygon.

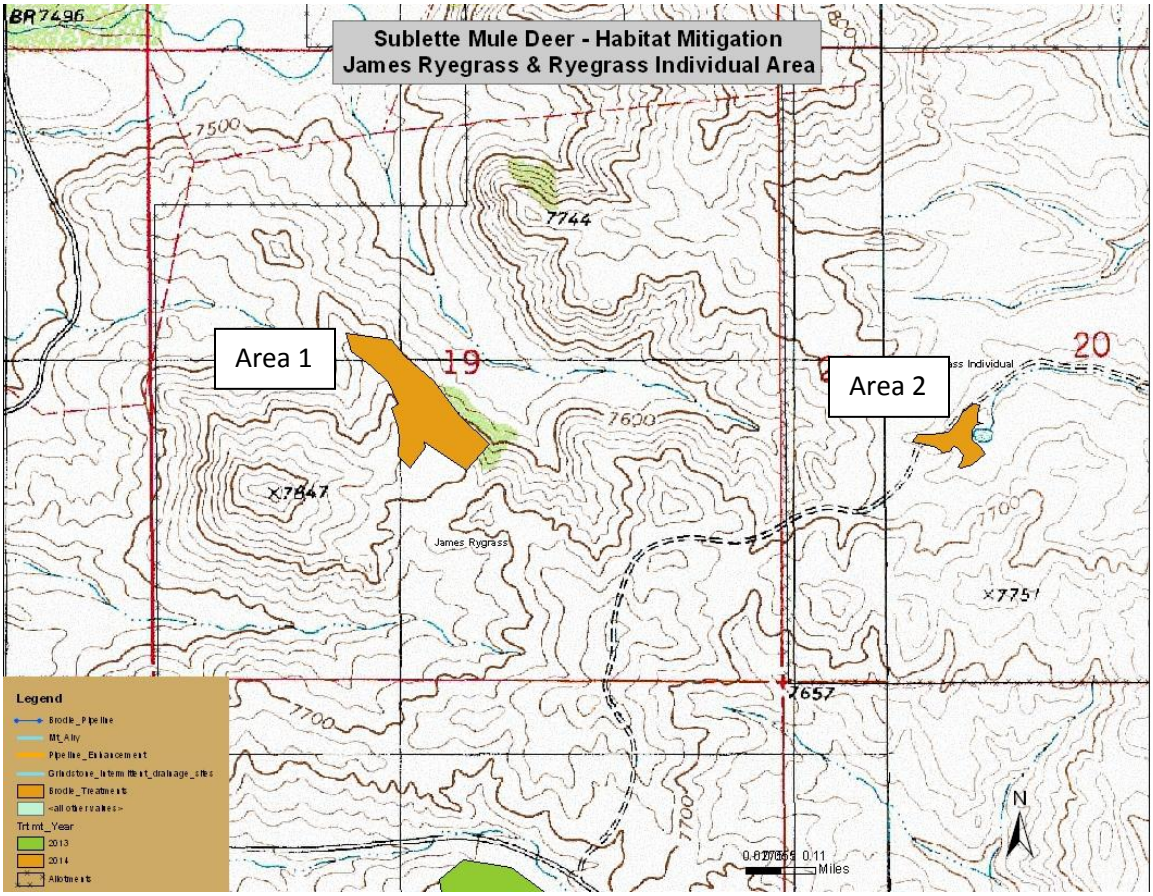
AREA 2 – This linear feature is an existing pipeline that could be enhanced through seeding/shrub plantings. Previous reclamation can be enhanced for mule deer through adding vegetative species preferred by mule deer. The length of the delineated pipeline is approximately 2.3 miles and width estimated at 56 feet (16 acres). Seed mix and/or shrub plantings will include species adapted to the site (Ecological Site Description) and include species important to mule deer and sage-grouse. If noxious weeds are present, control efforts should also be implemented.

AREA 3 – These polygons contain approximately 80 acres of wet meadow/riparian communities. Treatment objectives are to improve diversity of these mesic communities by seeding or planting methods or potentially fencing some of the wetter areas. Any species seeded will be adapted to site (from Ecological Site Descriptions) and address both mule deer and sage-grouse needs. Coordination with private landowner will be necessary on this project since the two easterly polygons are located on private lands.

APPENDIX G - 2012 through 2014 – Habitat Assessment Areas



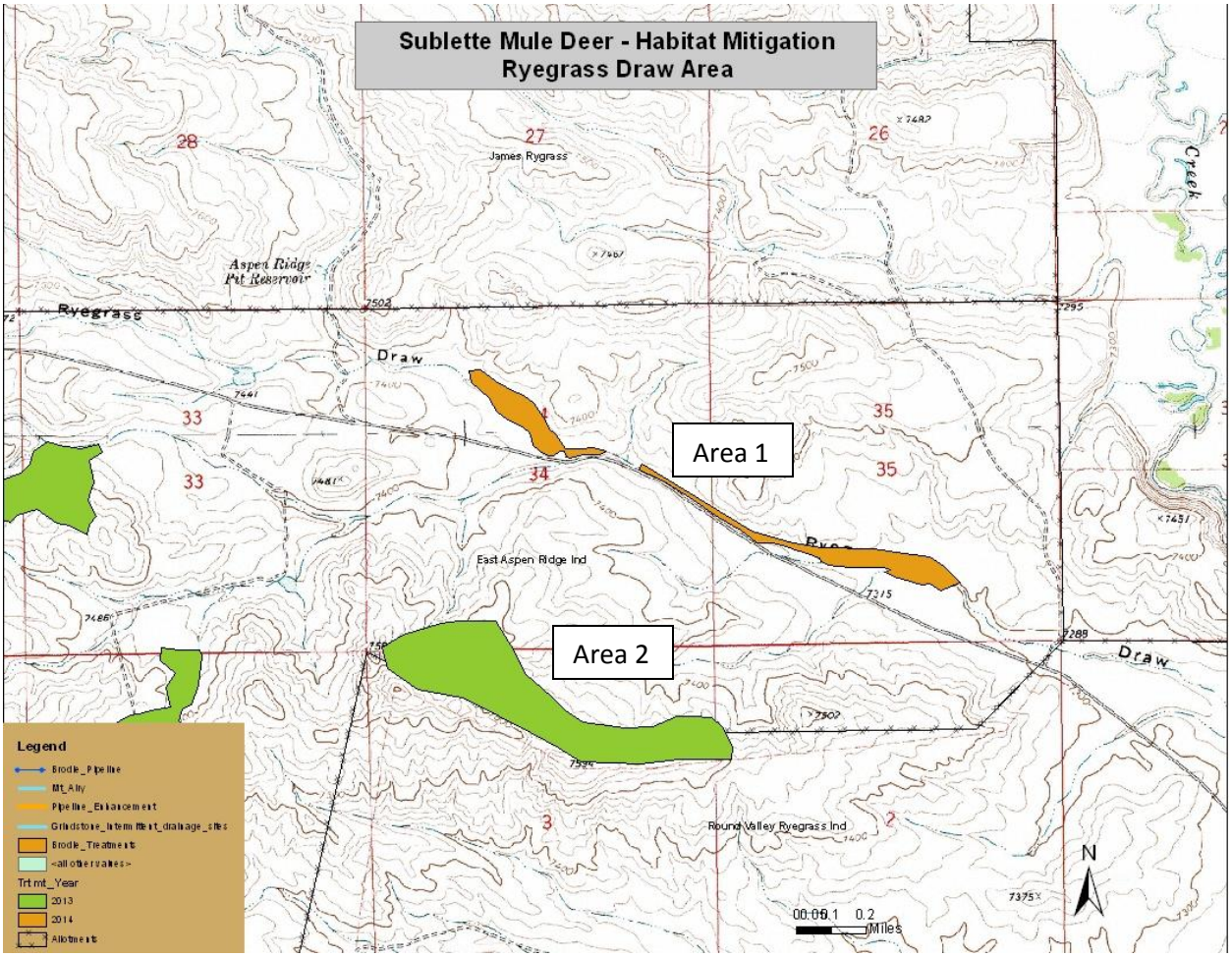
APPENDIX H – 2014 Mitigation Projects – James Ryegrass & Ryegrass Individual Area



AREA 1 – This polygon is a 12 acre aspen stand which needs rejuvenation and improvement. Potential exists for both rejuvenation as well as expansion; along with the mixed shrub community that coexists within and adjacent to the stand. Treatment recommendations include Rx burning, ripping along lower boundary of aspen stand, and potential shrub plantings to replace previous mixed shrub community.

AREA 2 – This area has potential, similar to other riparian/mesic areas for enhancement to increase diversity (potential) of the site. It is also in close proximity to previous mowing projects. Possible treatments may include seeding and/or exclosures.

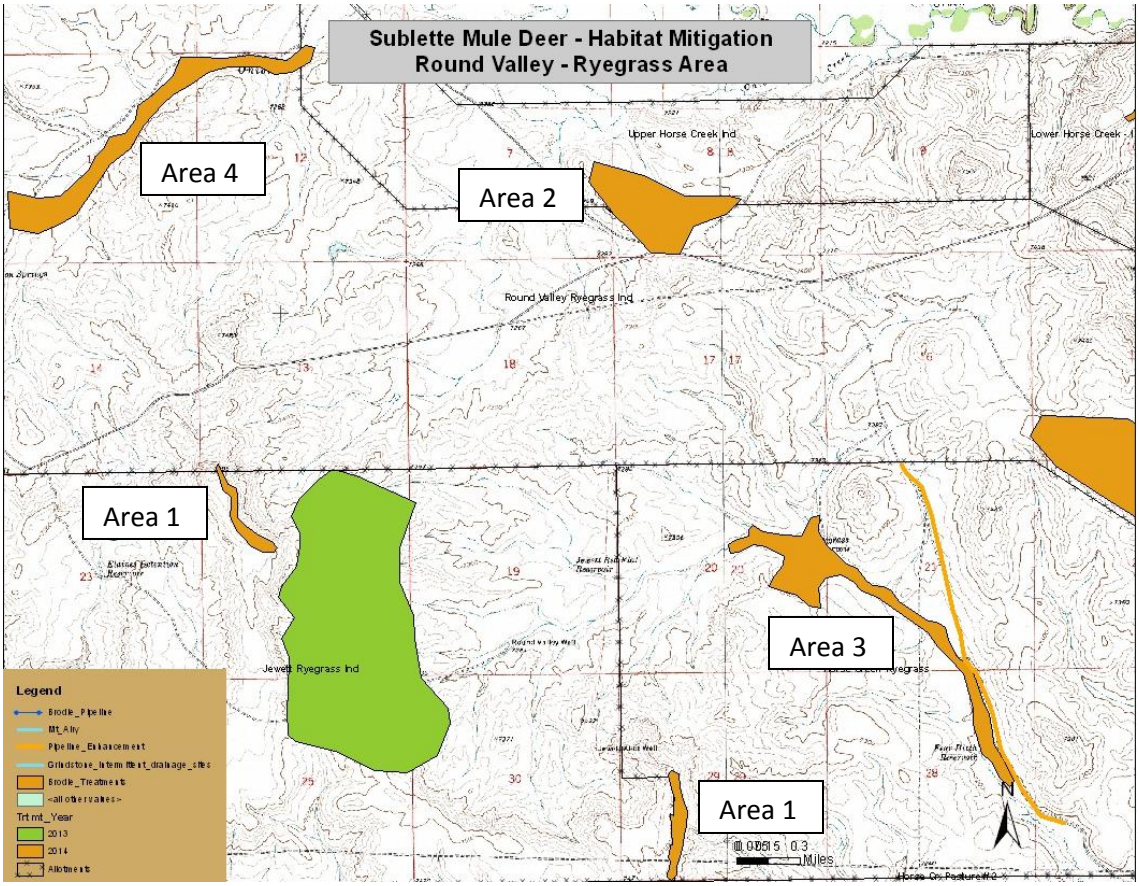
APPENDIX I – 2013 & 2014 Mitigation Projects – Ryegrass Draw Area



AREA 1 – This polygon represents approximately 40 acres of wet meadow/riparian community. Objectives for treatments include improving existing conditions through construction of several 1 to 10 acre exclosures in the spring or seep areas.

AREA 2 – This polygon is approximately 100 acres in size with objectives of adding diversity through prescribed burning coupled with shrub plantings and/or seeding. It is a sagebrush site with some mixed shrubs on a northerly slope.

APPENDIX J – 2014 Mitigation Projects – Round Valley – Ryegrass Area



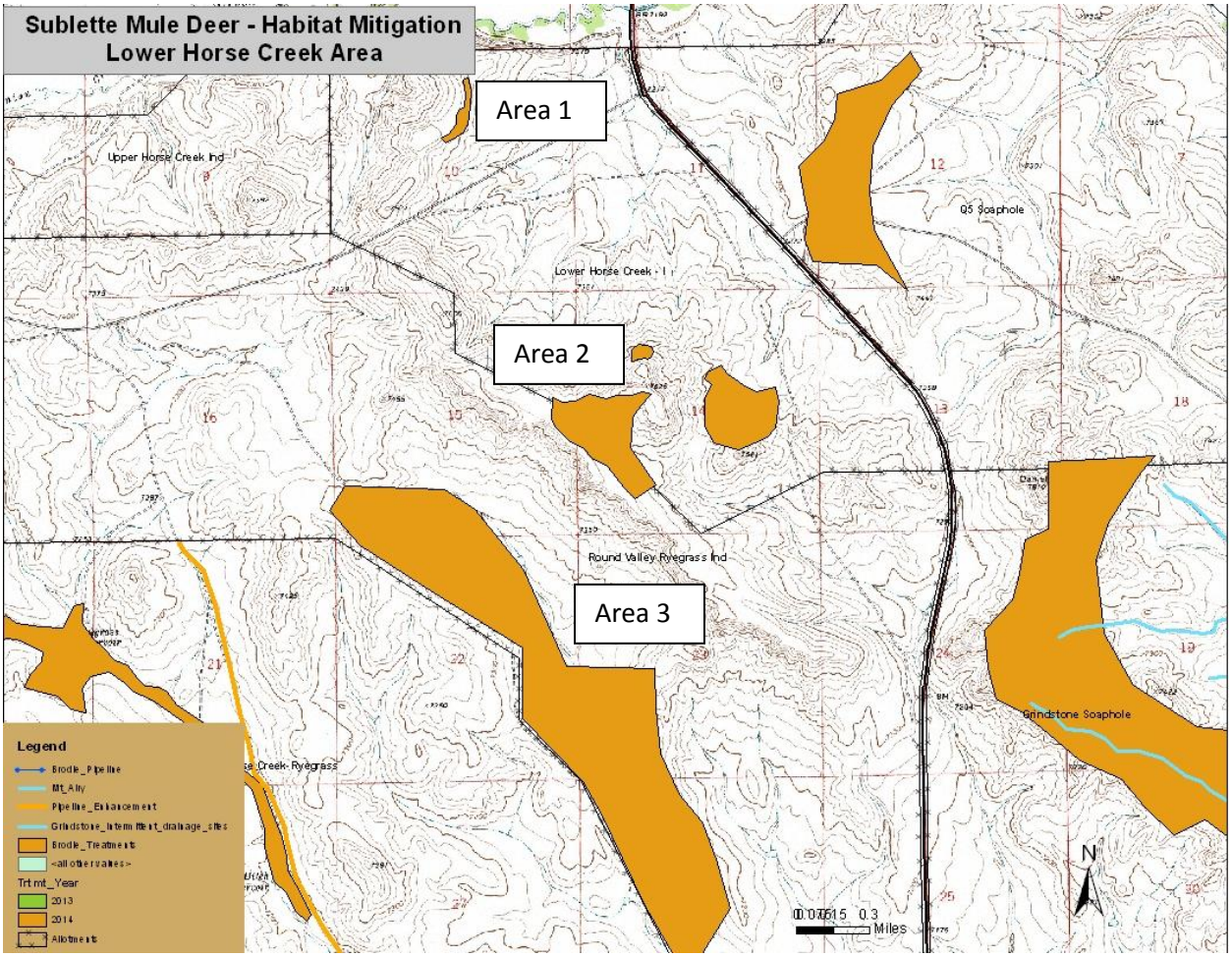
AREA 1 – These two small polygons (approximately 40 acres total) are on easterly and northeasterly slopes and contain remnant mixed shrub communities. The objective is to restore/expand these communities by reducing sagebrush cover and planting shrubs. Prescribed burning is recommended prior to the shrub plantings to eliminate sagebrush competition and provide a good site for the actual shrub planting.

AREA 2 – This area is a site previously treated, and a lower priority for treatments. Part of the site (on the south side of the fence) could be treated to thin sagebrush, and seeding could be added to increase diversity. The delineated polygon is approximately 96 acres in size.

AREA 3 – This 110 acre polygon includes the Ryegrass Reservoir and the associated drainage. Recommendations are to either repair or replace existing fence to protect quality mesic (riparian) areas and possibly restore the drainage below the reservoir over time, if adequate water is available. Also, within the protected area, the planting of desirable shrubs and other vegetation would be done to increase diversity.

AREA 4 – This site contains numerous springs and seeps. Recommendations are to fence those areas that are wetter and more prone to degradation.

APPENDIX K – 2014 Mitigation Projects – Lower Horse Creek Area

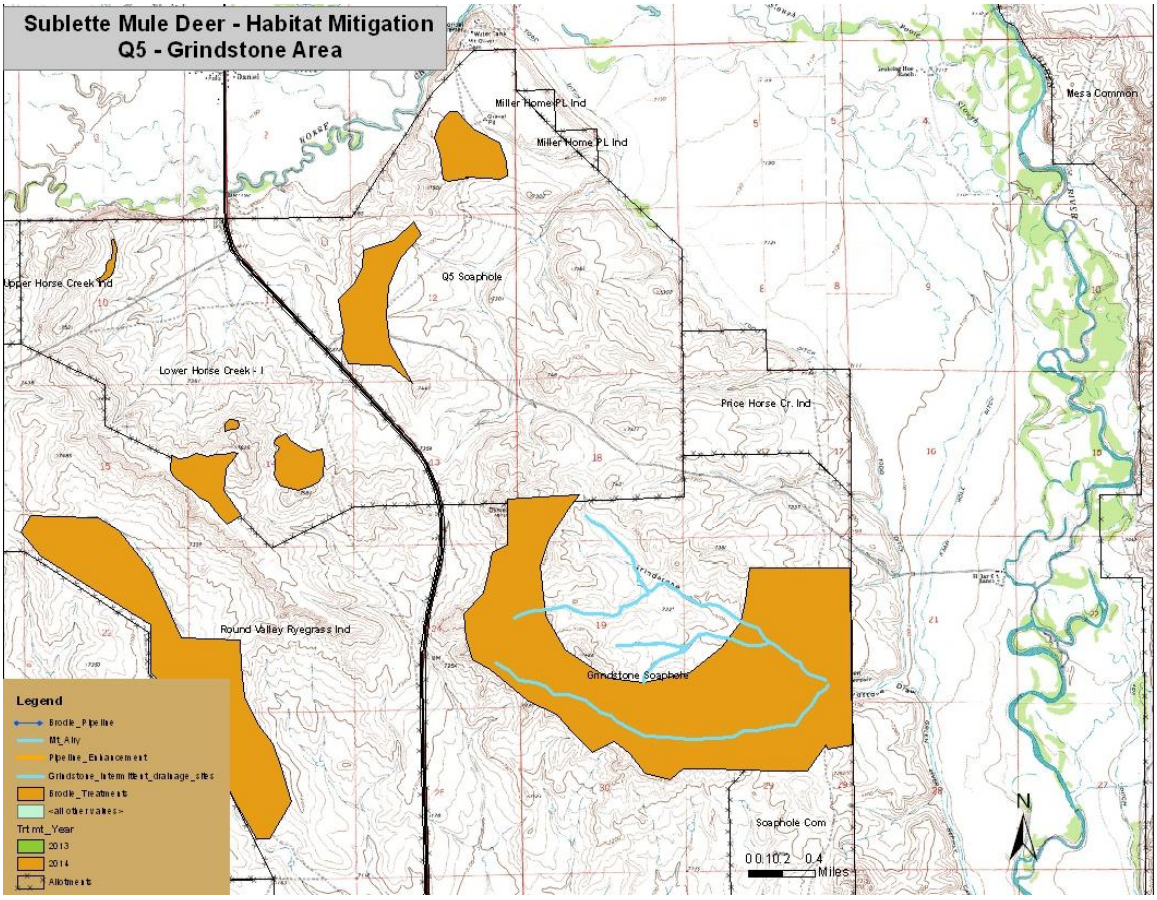


AREA 1 – This 6 acre polygon is on an easterly slope and contains remnant mixed shrubs. Objectives would include restoring/expanding mixed shrub community. The possibility exists that this treatment could be expanded to some extent. Recommendations would be prescribed burning followed by shrub plantings.

AREA 2 – These 3 polygons contain approximately 60 acres, some with remnant mixed shrub communities. Objectives would include reducing sagebrush canopy to increase diversity of other shrubs. Possible treatments may include prescribed burning or chemical, followed by possible shrub plantings on at least 2 of the sites.

AREA 3 – This polygon contains similar aged and relatively dense sagebrush cover. Objectives would be to add diversity to the community by reducing canopy cover, and possibly seeding. Seeding success would be greatly enhanced with soil surface disturbance. The potential exists for treating very small sites with an objective of increasing diversity while providing sagebrush cover for sage-grouse adjacent to the treated sites. The seed mix would be developed using the ecological site description which outlines potential vegetation species possible.

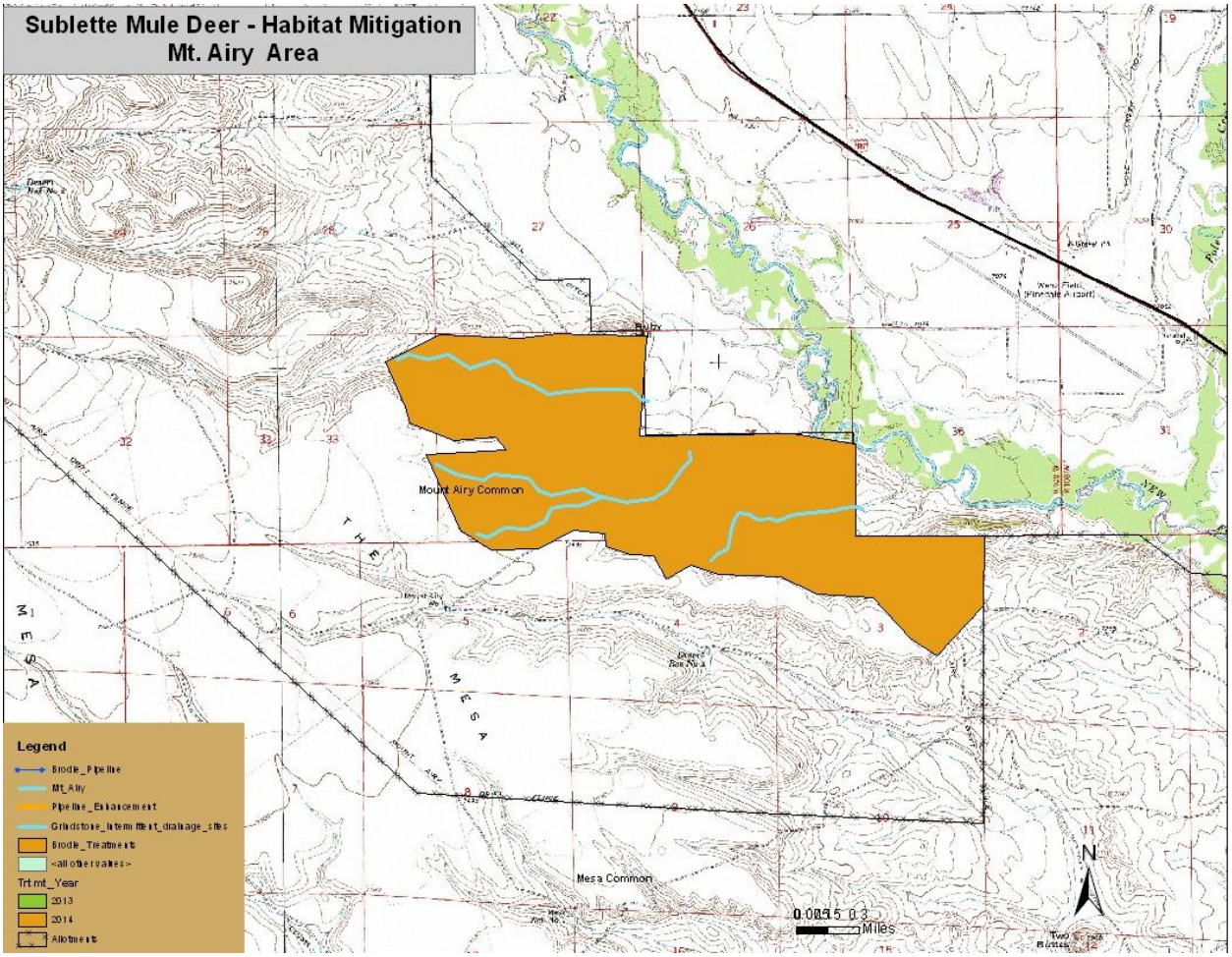
APPENDIX L – 2014 Mitigation Projects – Q5-Grindstone Area



AREA 1 –Area 1 comprise approximately 200-300 acres on two sites. Portions of these sites were previously treated prior to 1974 with herbicide. Sagebrush canopy has returned to cover greater than 25%, but herbaceous and ground cover is limited. Objectives should focus on increasing vegetative diversity, especially understory (herbaceous) diversity. Recommended treatments should focus mostly on mechanical treatments with seeding (e.g. Lawson Aerator), and adequate rest from livestock grazing to ensure optimal benefits from on-the-ground expenditures.

AREA 2 – This area contains opportunities for a basin-wide restoration/rejuvenation project, focusing on adding vegetative diversity, stabilizing the drainage, and expanding mixed shrub communities. Key to the potential basin-wide plan will be livestock grazing, and periodic seasonal deferments to aid existing vegetation and protect investments in on-the-ground projects. Recommend treatments could include aerator treatment and seeding throughout the area and especially along the drainage, construction of "check dams" or drop structures along the drainage with added seeding, and treatment of sagebrush in areas where remnant mixed shrubs communities are located along with shrub plantings. With the plan, added opportunities may also be realized for other types of projects.

APPENDIX M – 2014 Mitigation Projects – Mount Airy Area



This polygon, located on the eastern side of the Mesa comprises approximately 1260 acres. Objectives would be to work on this polygon to add vegetative diversity and enhance existing mixed shrub areas. There is also potential for drainage-related projects to stabilize and add diversity to existing drainage areas. Most of the work within this polygon would be through the use of mechanical treatments.

APPENDIX N - Sublette Mule Deer Implementation by Year – By Year

Year	NEPA/Cultural	Monitoring, Reporting and/or Project Proposals	Habitat Assessments	Projects
2012	EA for 2013 & 14 Projects/Cultural for 2013 Projects	Preparation of project proposal for 2013 projects	Continue in areas not assessed in 2011; focus on private and BLM lands & USFS lands	None
2013	Complete EA and cultural for 2013 projects. Initiate cultural for 2014 projects	Preparation of project proposal for 2014 projects, and any that may be identified on private lands	Continuation of above	Implementation of projects identified for 2013
2014-15	If added projects are identified for federal lands, this will require added NEPA and cultural work.	As needed for projects identified by added habitat assessments	Continuation of above	Implementation of projects identified for 2014, and any potential projects identified on private lands that can be done

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