Mule Deer Habitat Mitigation Projects 2020 Annual Update

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Overview

The 2008 Record of Decision (ROD) for the Supplemental Environmental Impact Statement (SEIS) for the Pinedale Anticline Oil and Gas Exploration and Development Project included a specific fund to be used for on-site and off-site mitigation for wildlife species impacted by energy development activities on the Pinedale Anticline Project Area (PAPA) (Bureau of Land Management [BLM] 2008). Pinedale Anticline Project Office (PAPO) awards funding for projects that include habitat improvements that enhance habitat functions and preserve essential migration routes on public and private lands. A portion of the Sublette mule deer herd (SMD) winters on the PAPA during some of the most critical periods of their annual life cycles. To promote SMD and mitigate the effects of energy development and infrastructure, mitigation projects have been focused on the designated Sublette Mule Deer Migration Corridor and crucial mule deer habitats. This is a description of 2020 mitigation project accomplishments for projects associated with PAPO.

2020 PAPO Project Activities and Accomplishments

Project Area

The portion of SMD that winters on the PAPA experiences challenging survival and nutritional conditions. Seasonal Mule deer health and body fat content going into and coming out



of winter is essential for individual survival and successful recruitment of healthy fawns in the spring, and therefore, the SMD population as a whole (Mule Deer Working Group 2015). During these transitionary periods and throughout the winter, mixed seral stages in vegetation communities are key habitat components for mule deer annual life cycles and survival (Mule Deer Working Group 2015). PAPO habitat mitigation and improvement projects are therefore focused on the composition and connectivity of the designated SMD migration corridor and crucial winter range (Figure 1).

Figure 1. Map of PAPA with SMD crucial ranges and migration corridor.

Habitat Treatments and Monitoring

Habitat composition and function enhancement project work in 2020 included pre- and post-treatment vegetation monitoring, mechanical treatments, herbicide treatments, and grazing rest on private and public lands (Figure 2). Partners included Partners for Fish and Wildlife, private landowners, the Bureau of Land Management (BLM), and the US Forest Service.



Figure 2. Map of 2020 PAPO project activities including habitat treatments, grazing rest, and wildlife friendly fencing.

1,480 acres of habitat treatments from 2018 and 2019 were rested from livestock grazing across different projects (Figure 2). 500 acres of late stage mountain big sagebrush were treated with Tebuthiuron (a Spike herbicide substitute) on private land belonging to Miller Land and Livestock and a State Section administered by the WY Office of State Lands and Investments in the Hoback Rim area as part of the Pape-Miller Mule Deer project. The applied herbicide targets decadent and mature sagebrush without diminishing other important browse species such as antelope bitterbrush while also opening overgrown canopies for ungulate access to increased grass and forb production. Also in the Rim area, 660 acres of late stage mountain big sagebrush habitat were mowed in a random mosaic pattern on private lands belonging to Roberts Cattle Co for the Roberts Phase of SMD Habitat Treatments. Treatment and control monitoring sites were

established to assess the vegetation community response over time (Figure 3). All 2020 treatments will be rested from livestock grazing for two growing seasons.



Figure 3. Pretreatment conditions in the Hoback Rim area prior to mowing in late summer/early fall 2020.

One and two-year post monitoring of 2019 and 2020 mechanical treatments was conducted on 18 survey points on public lands administered by the BLM as part of the Sublette Mule Deer Mitigation Project (BLM 2016). Monitoring included line point intercept surveys, shrub density belts, annual shrub production surveys, browse level surveys, and photopoints (Figure 4). 1,480 acres of treatments from 2018 and 2019 were rested in 2020. 2019 treawtments will be rested for a final growing season in 2021, after which, livestock rest will be complete for the project and monitoring will continue until project objectives are met. Objectives include reducing the proportion of unproductive age classes of Wyoming big sagebrush and increasing production of grasses and forbs to provide mule deer with a more diverse range of successional stages across critical seasonal ranges.



Figure 4. Example of 2018 mowing treatment in the Soapholes area; left image shows pretreatment conditions with homogenous mature sagebrush, low understory production, and patches of bare ground. Right image shows site conditions two years post-treatment with reduced sagebrush cover, increased grass production, and reduced bare ground.

The Monument Ridge project began its first phase of mechanical treatments summer 2020. Accomplishments included about 3,700 acres of slash and pile of encroaching conifers to promote age class distribution and ecological function of aspen stands in important summer and parturition SMD range in the Bondurant area (Figure 2). 2021 will involve additional slash/pile work; the prescribed burn phase of the project will likely not commence until 2023.

2021 monitoring included one-year and two-year post monitoring on Roberts and Miller habitat treatments. Aerator treatments are planned on additional areas of the Hoback Rim owned by Miller Land and Livestock, though total acreage has not yet been determined. The Mesa Mule Deer Shrub Planting project is also scheduled to commence in 2021 with pretreatment monitoring, sagebrush thinning, and seedling planting.

Wildlife Friendly Fencing

Livestock and boundary fences can not only impede wildlife movement and access to essential habitats, but can also cause stress, injury, and mortality (Wyoming Game and Fish Dept. 2004). PAPO has focused mitigation funding on updating fences in the SMD migration corridor to facilitate passage during essential movement periods and ensure mule deer wintering in the PAPA can access crucial nutrition while traveling to and from winter range. In 2020, about 12 miles of wildlife friendly fencing was installed by landowners and private contractors on public and private lands in the migration corridor (Figure 2).

Types installed included four-strand wire, top rail, and custom drill stem pipe modifications (Figures 5-7). Collaborators for fence building included Natural Resources Conservation Service, private landowners, Ricketts Conservation Foundation, Wyoming Wildlife and Natural Resources Trust, and WY Mule Deer Initiative. Over two miles of wildlife friendly fencing were installed in Hoback Ranches in 2020 including about two miles of four-wire fence and about a half mile of pole top fence (Figure 6). New fences replaced boundary fence lines lost in the 2018 Roosevelt Fire. 2020 fence work completed the PAPO Hoback Ranches wildlife friendly fence project with a total of 9 miles of



Figure 5. Four-strand wildlife friendly fence installed in 2020.

wildlife friendly fencing installed in the SMD migration corridor (not including additional fences constructed by BLM). Three miles of wildlife friendly fencing were also installed in the SMD migration corridor on Grindstone Cattle Co. property including 2.5 miles of four-strand (Figure 5) and a half mile of pole top fence, as well as 0.6 miles of fourstrand fence built by Roberts Cattle Co. as part of the Hoback Rim Wildlife Friendly Fence project. The Pape-Miller Mule Deer

project completed 6.2 miles of wildlife friendly fencing on Pape Ranches property including 0.4 miles of top rail and 5.8 miles of four-strand fence.



Figure 6. Wildlife friendly top rail fence installed in 2020.



Figure 7. Custom drill stem pipe modification installed at Jackson Fork Ranch in 2020.

In addition to the modifications installed in 2019, nine new custom drill stem pip structures were installed in the bison pasture fences at Jackson Fork Ranch in Bondurant in early fall 2020. New modifications were updated with sucker rods in place of drill stem pipes for the bottom rails (Figure 7). Ungulate use was monitored using trail cameras during spring and fall migrations in 2020 (Figures 8 & 9). Additional modifications are planned for 2021.



Figure 8. Trail camera image of elk utilizing a bison fence modification at Jackson Fork Ranch during spring 2020 migration.



Figure 9. Image of mule deer using a bison fence modification at Jackson Fork Ranch during fall 2020 migration.



Figure 6 Example of 2020 Jackson Fork Ranch bison fence modification with signs of wildlife use during fall migration 2020.



Sublette Mule Deer Mitigation Project: Two-Year Post Data (BLM 2016)

Figure 11. Bar graph of pretreatment and two-year post treatment foliar cover results from vegetation monitoring for the Sublette Mule Deer Mitigation Project (BLM 2016).

Nine vegetation monitoring points were surveyed in 2020 (seven treatment sites and two control sites). The data from five of these sites were compiled with previously conducted two-year post surveys on mechanical treatments in the Ryegrass, Soapholes, Aspen Ridge, and Mesa areas of crucial winter mule deer range. Average percent foliar cover was determined using line point intercept surveys (Figure 11). Results indicate treatments display less shrub, sagebrush, and bare ground cover. Treatments have also yielded higher cover of grass species than control sites two-years post treatment. There was little difference between treatments and controls in forb and open canopy cover.

Surveys also indicate that treatment sites have generally recruited more plant species than control sites, but results are still inconclusive and more time is needed to assess treatment effects on species richness (Figure 12). Increased forb and grass diversity supports the resiliency of habitats and their ability to resist disturbances while simultaneously offering more variety in nutrition for mule deer.



Figure 12. Bar graph showing change in number of species in each growth type on surveyed treatment and control sites. RG = Ryegrass, SH = Soapholes, AR = Aspen Ridge. Results may not yet be conclusive as the number of treatments sites surveyed are greater than the number of control sites.

Shrub density belts were conducted on treatments and controls to assess progress on improving shrub age class diversity. Two years after treatments, effects are mainly seen in older age classes (Figure 13). Reduced decadent sagebrush and increased dead sagebrush can be considered successful treatment objectives. Decadent sagebrush did little to put out valuable leaders for ungulate browse, often taking up large amounts of resources while putting out limited nutrition. Dead sagebrush contributes to nutrient cycling by providing fertilizing litter to the soil, helps sites retain more moisture through wicking effects, and provides microhabitats for seed deposition and establishment. Younger age classes will take longer to respond; time is needed for seeds to germinate and establish in newly thinned areas. The larger percentages of young sagebrush in pretreatment surveys may come from differences across observers and criteria for surveying experiencing updates over time. Pretreatment surveys were conducted from 2013-2019 with several different biologists.



Figure 13. Pretreatment and two-year post treatment results of shrub age class diversity from the Sublette Mule Deer Mitigation Project (BLM 2016).

In 2018, three adjacent mechanical treatment techniques were implemented on the Ryegrass that included mowing, harrowing, and aerating late stage Wyoming big sagebrush. Shrub production surveys were conducted prior to treatment and in 2020 (Figs. 14 & 15).



Figure 14. Pretreatment and two-year post treatment result of shrub production surveys of three mechanical treatments and one control area from the Sublette Mule Deer Mitigation Project (BLM 2016).



Figure 15. Change in total length of measured leaders two-years post treatment from mechanical treatments and control areas.

The aerator treatment yielded shrubs with the most production of leaders and had the greatest increase in leader production across all treatments and controls. Mowing had the second largest increase in leader production, though it was only slightly higher in total production when compared to control shrubs. Harrowing had a greater increase in leader production than non-treated shrubs but less production than control shrubs overall. Shrub leaders provide a significant supply of nutrition to mule deer and are critical browse for them during winter and migration periods.

Monitoring is scheduled to continue in 2021 on treatments and associated controls from treatment years 2016 and 2019. Monitoring is ongoing on all treatments for 20 years or until vegetation objectives are met. For more details on Sublette mule deer habitat mitigation projects and data results, refer to Gold (2019).

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