

Working Document
of
The Platte Valley Habitat Partnership's
(PVHP)
Mule Deer Habitat Plan



August 7, 2013

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Executive Summary

This working document of the Platte Valley Habitat Partnership's (PVHP) Habitat Plan provides the information needed to better understand mule deer habitat and requirements in the Platte Valley. Most importantly, it outlines the work that has been, will be, and is planned to be done to improve habitat conditions for mule deer in the Platte Valley. The "source" document should be referred to when seeking additional detail and explanation of the PVHP's collaborative process, mule deer habitat ecology, and federal agency project development.

The PVHP is comprised of private landowners, concerned citizens, hunters, outfitters, members of the Saratoga-Encampment-Rawlins Conservation District (SERCD) and the staffs of the Wyoming Game and Fish Department (WGFD), Bureau of Land Management (BLM), University of Wyoming Extension, the U.S. Forest Service (USFS) and NGOs. Attributes and considerations of mule deer habitat in the Platte Valley are discussed by season. Efforts to improve habitat on summer and fall ranges are especially important to ensure maximum fawn production and survival is attained; this is paramount to mule deer population stability and recovery.

Proposed habitat improvement projects in some portions of the Platte Valley will require extra planning and consideration in sage-grouse core and lynx analysis areas. Habitat improvement projects have been on-going in the Platte Valley. These projects will be considered when designing new projects. Mule deer focus areas for habitat improvement have been delineated but do not preclude beneficial project development for mule deer anywhere in the Platte Valley. To best plan future projects, the PVHP identified important vegetation and habitat attributes, including desired conditions, specific to enhancing mule deer habitat. Wyoming Game and Fish Commission (WGFC) funding of PVHP projects will be tied to the identified desired conditions. PVHP planning documents and project development and implementation will be updated as necessary to accommodate changing conditions, new information, opportunities, and issues.

The PVHP is founded on the principles of collaboration, science, and adaptive management. As the Partnership learns more about methods to improve mule deer habitat, and increases efficiencies and the efficacy to do so, both the Plan and the Working Document will change. These documents are living documents that will change as the Partnership learns more about mule deer habitat, mule deer, and any subjects it decides to embrace.

Introduction

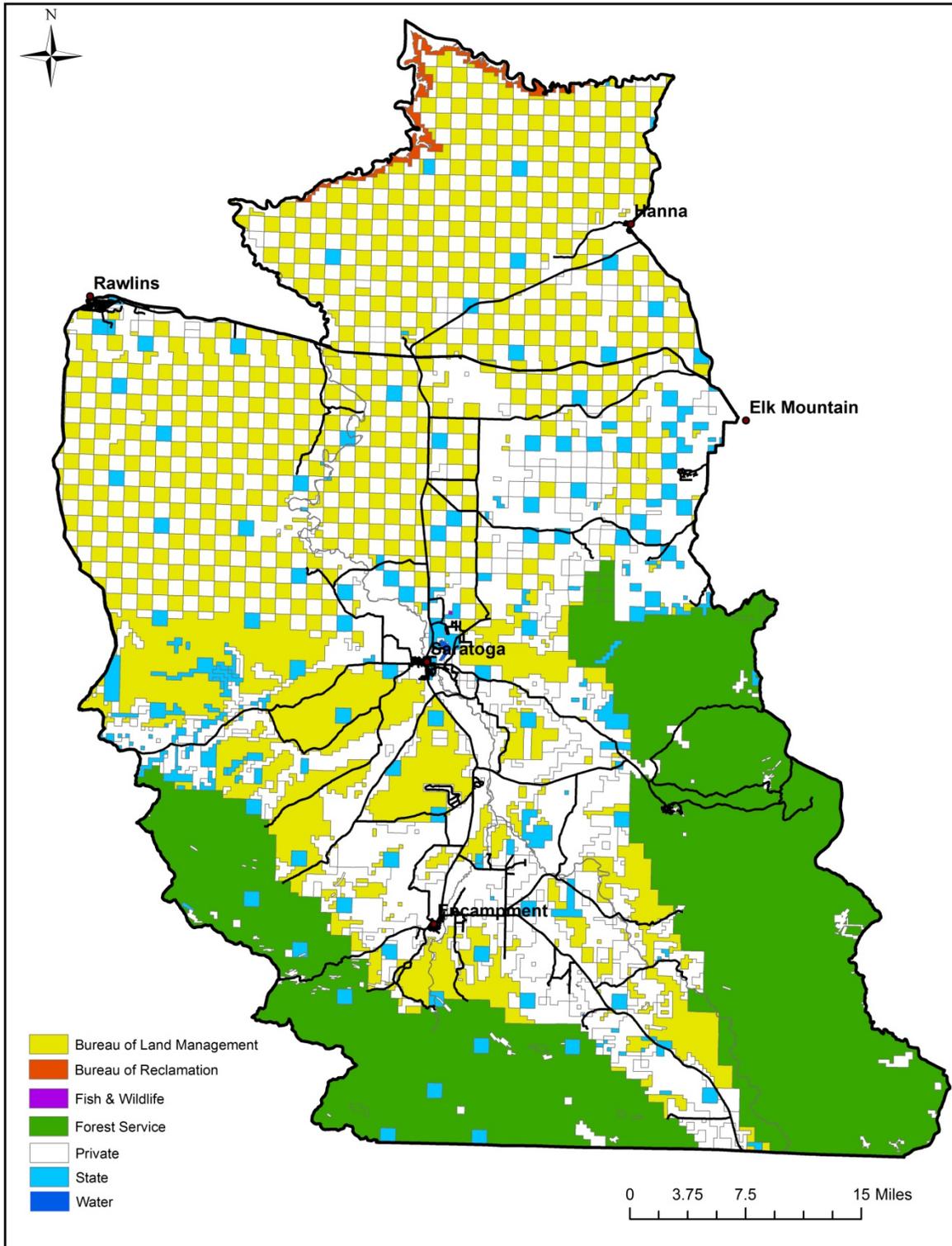
The purpose of this document is to provide a greatly abbreviated version of the PVHP plan or the "source" document. The source document should be referred to when seeking additional detail and explanation of the PVHP's collaborative process, mule deer habitat ecology, and federal agency project development. This document provides a concise description of mule deer habitat and requirements in the Platte Valley and the work that has been, will be, and is planned to be done to improve habitat conditions for mule deer. The process for project development and the application for the WGFC funds are clearly outlined.

The PVHP and this plan exist because of the deep concern and real action by local residents and landowners, as well as non-profit and governmental partners around the State of Wyoming. This deep concern and recognition of the importance of habitat to improve mule deer numbers in the Platte Valley was made a priority by those who participated in the Platte Valley Mule Deer Initiative (PVMDI).

The PVHP is founded on the principles of collaboration, science, and adaptive management. As the Partnership learns more about methods to improve mule deer habitat, and increases efficiencies and the efficacy to do so, both the Plan and the Working Document will change. These documents are living documents that will change as the Partnership learns more about mule deer habitat, mule deer, and any subjects it decides to embrace.

The Platte Valley has a mixed ownership of private, Federal (USFS and BLM), and state lands (Figure 1). Collaboration amongst these entities is essential to develop successful landscape-level habitat improvements. For one long year (May 2012-May 2013), stakeholders met almost every month for a whole day, to find ways to stabilize and improve mule deer habitat in the Platte Valley of Wyoming. Step by step the participants in this process found ways to work together to define geographical, institutional, ecological and other issues, explore solutions and implementation strategies and ways to measure success. Without the considerable amount of work behind the scenes by private landowners, concerned citizens, hunters, outfitters, members of the SERCD and the staffs of the WGFD, BLM, University of Wyoming Extension, the USFS and NGOs, no project work to realize these strategies on the ground could be started. All this hard work has culminated in the PVHP and this Plan.

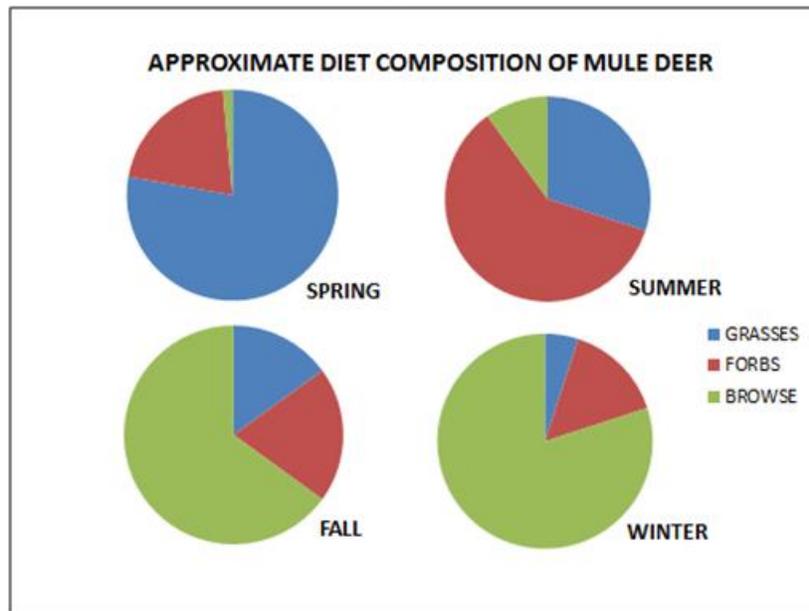
Figure 1. Landownership in the Platte Valley



Mule Deer and their Habitat in the Platte Valley

Mule deer are primarily browsers, with the majority of their diet being comprised of forbs and browse. Because deer have a smaller rumen than other ungulates in relation to their body size, they are forced to be much more selective and specific in their dietary intake. Deer must select the most nutritious plants and parts of plants instead of consuming large quantities of low-quality feed such as mature grass. The seasonal mule deer diet varies from a growth promoting (high protein and phosphorous) diet in spring to a fattening (high carbohydrate, fat, and energy) diet in fall, to a maintenance (low protein and energy) diet in winter. Seasonal use of plant types varies from high grass use in spring, high forb use in summer and fall to high shrub use in winter (Figure 2).

Figure 2. Seasonal diet composition of mule deer seasonally by vegetation type.



Plant communities consisting of mixed species are more beneficial for deer than single species plant communities. Disturbance is essential for maintaining high quality deer habitat by creating mosaic plant communities across the landscape and increasing plant vigor and nutrition.

Habitat types within the Platte Valley vary from high elevation forests to sagebrush and desert shrub environments with irrigated croplands throughout the Valley floor (Figure 3). Many of the mule deer in the Platte Valley migrate between relatively moist higher elevation, summer range habitats and lower, drier, foothill or basin wintering areas. In most of the Platte Valley, this movement primarily occurs in April and May and again in October and November. In many areas, deer making seasonal movements will use mid-

elevation, mountain shrub transitional ranges that can provide high quality forage. There is an ongoing telemetry study that will provide further insight into mule deer movements and habitat use throughout the Platte Valley and this information will assist in prioritizing future habitat projects in the Valley.

Mule deer habitats or ranges in the Platte Valley are categorized into summer, transition, and winter (Figure 4). High elevation habitat types in the Platte Valley utilized by mule deer as summer range include coniferous forests (lodgepole pine, Douglas fir, spruce, other spp.) and smaller parcels of deciduous forest, mainly aspen, in the Snowy Range and Sierra Madre mountain ranges. Mature forests are used for thermal and hiding cover and open meadow or shrub habitats are utilized for foraging. Poor diet quality on summer and fall habitats results in lower fawn productivity and recruitment.

Transition ranges provide abundant, high quality forage that can improve the condition of deer prior to arriving on winter ranges and help deer regain condition more quickly in the spring. In the fall, mule deer will typically reside at mid-slope elevations through the breeding season. Lands in these transition ranges are comprised of private, State of Wyoming, fringe areas of USFS lands, and lands administered by the BLM (Rawlins Field Office). Shrubby vegetation such as antelope bitterbrush, while requiring more energy to process but is high in carbohydrates, is preferred by mule deer as they gain condition and fat stores in preparation for winter.

During mild winters (i.e. minimal amounts of snow), mule deer will use transitional ranges for extended periods. In the Platte Valley, snow depths directly influence the choice of traditional wintering areas as mule deer search for areas where energy costs are lower and food availability, specifically exposed shrubs, is higher. There are several areas traditionally selected by mule deer to serve as winter range including: the Encampment River Canyon, Beaver Hills, Bennett Peak, Baggot Rocks, Cedar Hills, Savage Meadows, and Fort Steele Breaks winter ranges. During the heart of the winter and early spring when little ground forage is available due to snow cover in the Platte Valley, mule deer are on a starvation diet of twigs and branches from browse species. In addition to sagebrush, important species on winter range in the Platte Valley include antelope bitterbrush, true mountain mahogany, and winterfat.

As snow recedes and grasses and forbs emerge, mule deer stop eating shrubs of relatively low nutritional value and start consuming more palatable, succulent, and nutritionally rich herbaceous plants. By following snowmelt patterns to higher elevations, animals access high-quality emerging plant shoots, capitalizing on high protein levels found in grasses and forbs.

For more detailed information on mule deer habitat please refer to Chapter 3 in the Platte Valley Habitat Plan beginning on page 13.

Figure 3. Vegetation types in the Platte Valley (Source: USGS GAP Analysis data)

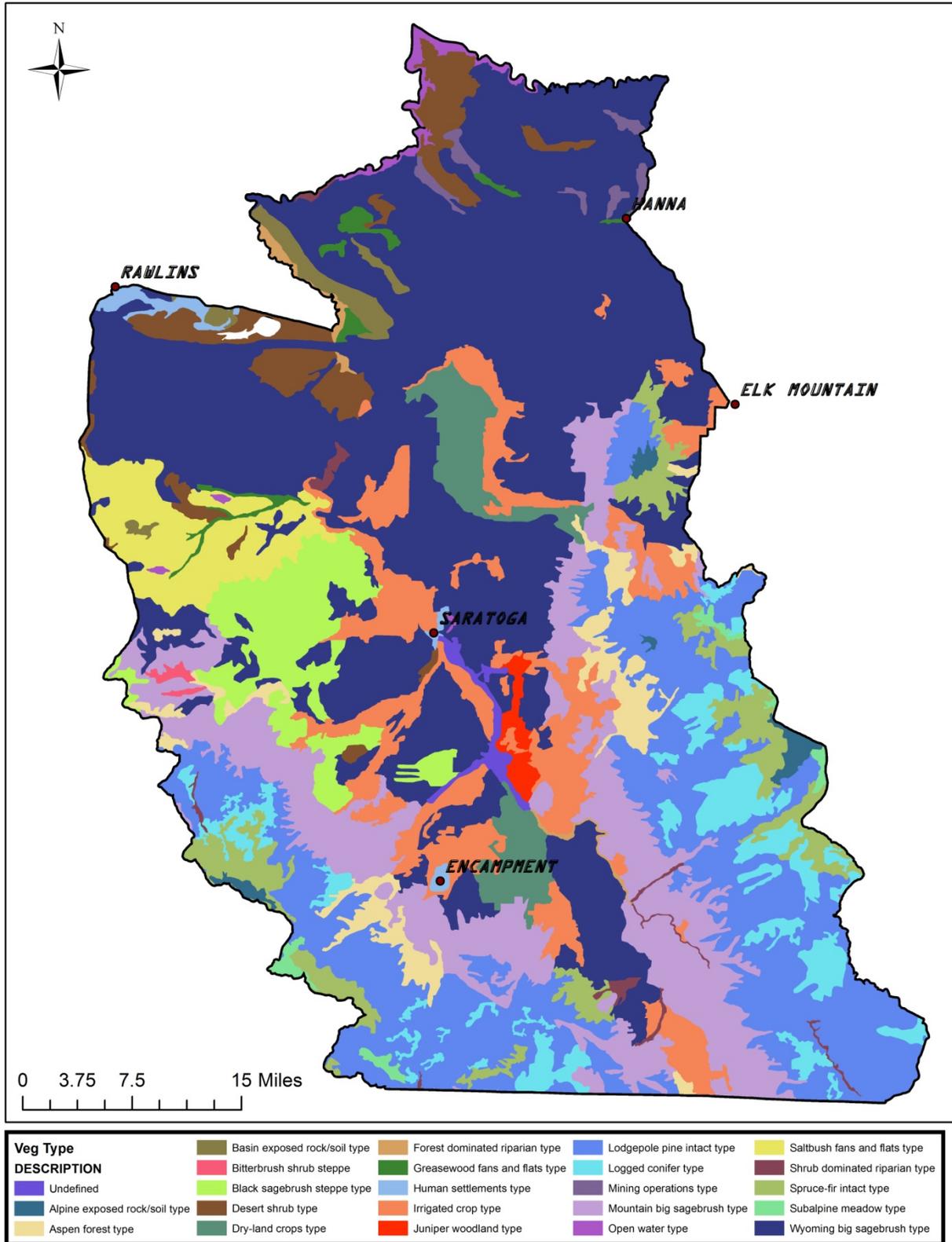
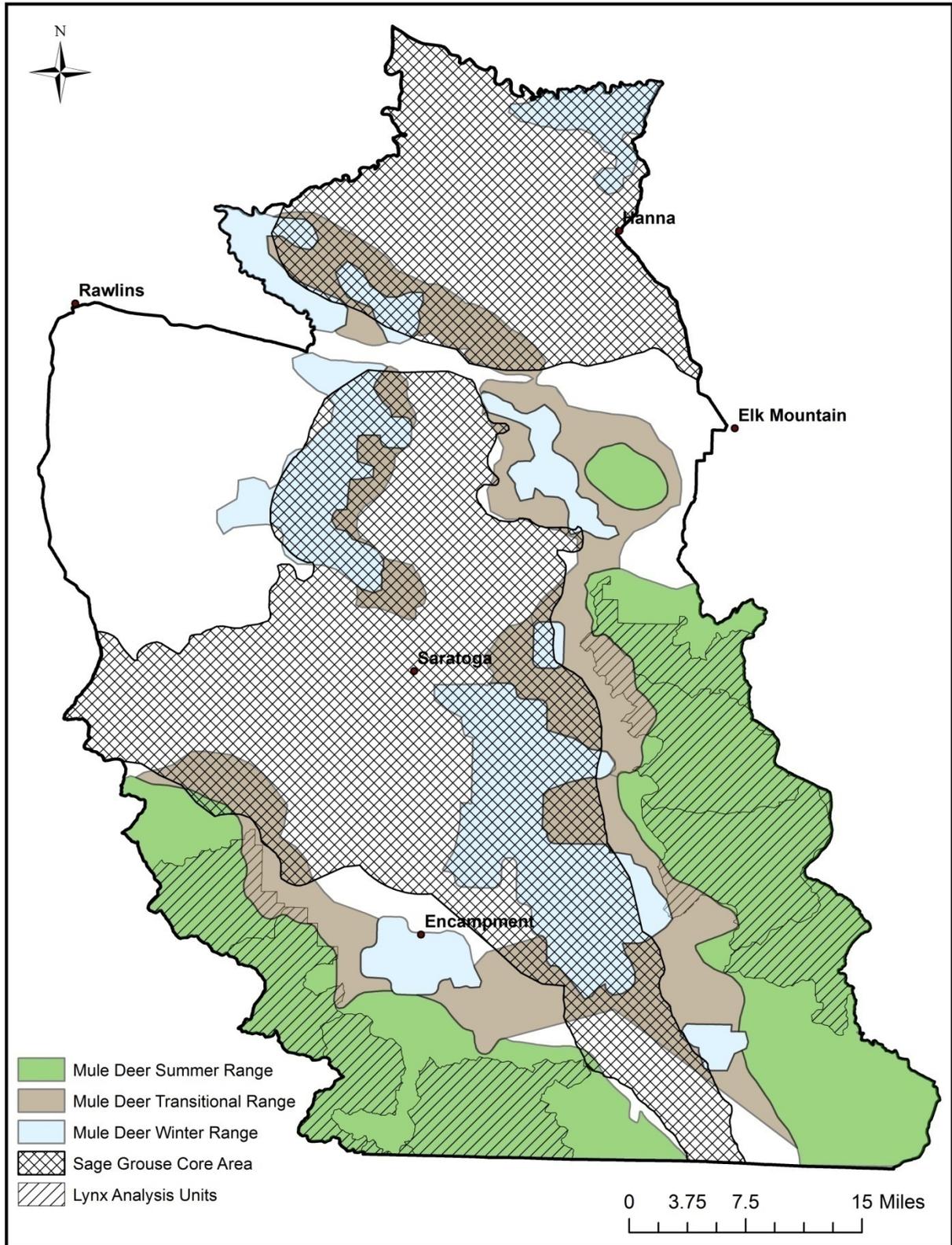


Figure 4. Mule deer seasonal habitats in the Platte Valley and sage-grouse core and lynx analysis units.

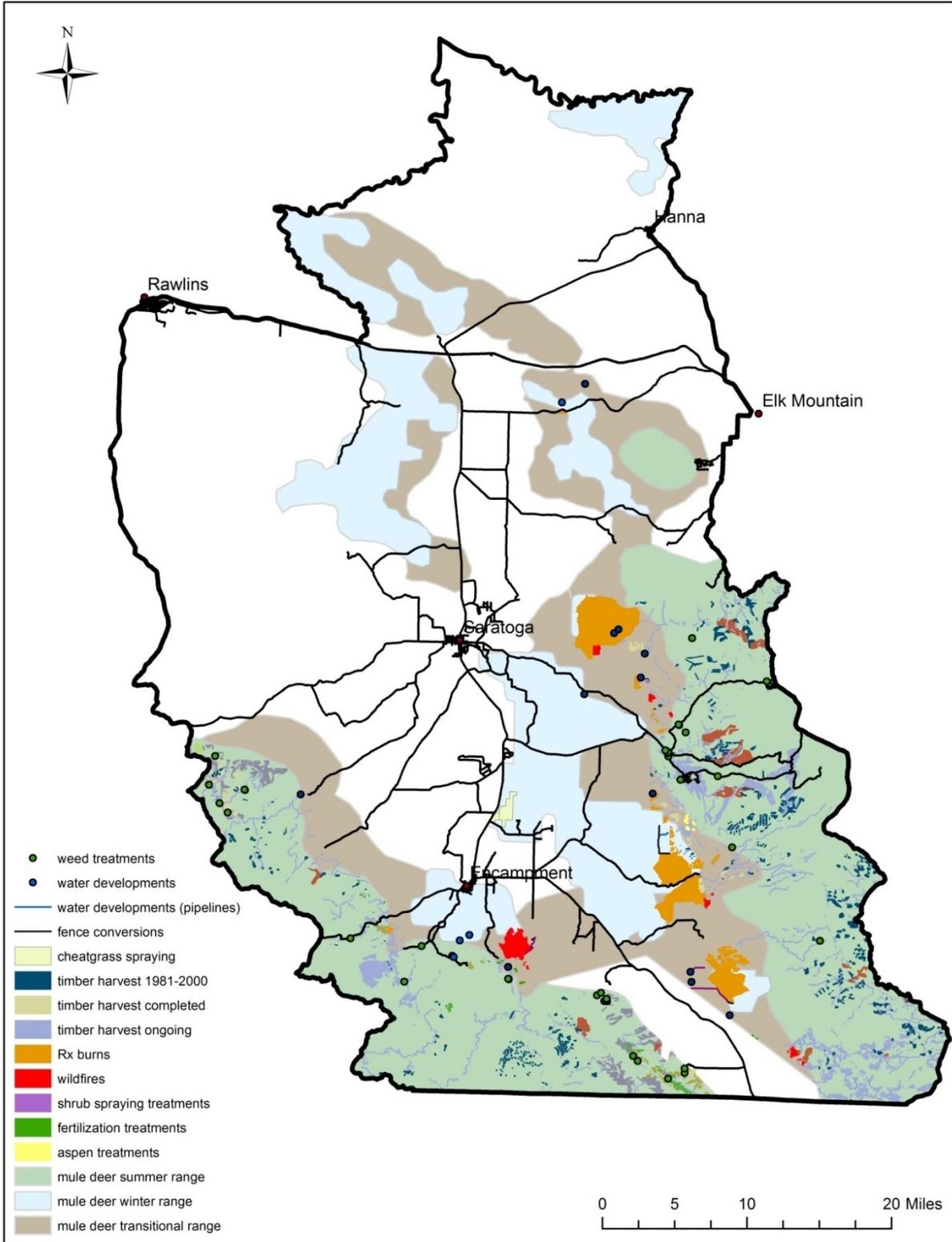


Project Proposals and Funding

Habitat improvement projects have been completed throughout the Valley by Federal, State, NGO partners, as well as by private landowners, often in cooperation with each other (Figure 5). More detailed explanation of these projects can be found in chapter 4 of the source document beginning on page 53. Projects will continue in the Valley and it is the desire of the PVHP to see these projects continue in a collaborative manner. Projects will be designed at a landscape scale whenever possible involving multiple stakeholders/partners while considering previously completed projects to ultimately improve habitat for mule deer.

In July 2010, a research study was initiated by WGFD and the University of Wyoming to provide more information on the movements, status, and abundance of the Platte Valley mule deer herd. Movement data from GPS-collared deer will be analyzed in an effort to learn more about migration patterns and habitat use within the valley. This information will be invaluable to the PVHP as it moves forward with developing habitat enhancement projects throughout the valley. As the results of this research are finalized this fall, priority areas for habitat enhancement projects will be re-evaluated and the habitat plan will be updated accordingly.

Figure 5. Mule Deer seasonal ranges with past and current habitat improvements



To best plan future projects, the PVHP identified important vegetation and habitat attributes specific to enhancing conditions for mule deer:

1. Shrub Nutritive Quality
2. Vegetation Production and Utilization
3. Species Diversity
4. Species Density
5. Aspen Regeneration
6. Riparian Habitat
7. Animal Barriers and Disturbance

Within each attribute, PVHP identified the “desired conditions” to guide habitat enhancements and project designs for the Platte Valley (Table 1). Desired conditions were designed to focus on the seasonal range where it would have the greatest impact on mule deer. Tools and methods for treatments are outlined in the “source document.”

The ability to monitor habitat treatments to achieve the desired condition of the habitat and ultimately improve the mule deer herd is a crucial aspect of this plan. A list of potential monitoring methods was identified and includes those employed by the Federal agency partners and methods available to private landowners (Table 1).

Table 1. Habitat features with examples of desired conditions and methods to monitor success of the project in meeting the prime objective. Full descriptions of techniques can be found in the respective references.

(S=Summer Range, T=Transition Range, W=Winter Range).

Prime Objective: To Improve Habitat Conditions to Increase the Population Size and Health of Mule Deer

Shrub Nutritive Quality

Desired Conditions

- Improve digestibility and protein content of browse (T, W)
- Increase young age class of preferred browse species (S, T, W)

Monitoring Methods

- Fecal Analysis
- Lab analysis of nutritive content (forage analysis)
- Browse Production/Utilization Transects
- Shrub Stand Age Classification

References

- Wyoming Game and Fish Department 2007

Vegetative Production and Utilization

Desired Conditions

- Increase herbaceous production (S, T)
- Increase shrub production (S, T, W)
- Adequate size/scale of treatment to minimize impact of grazing ungulates (S, T, W)

Monitoring Methods

- Harvest Method
- Ocular Estimation
- Browse transect (Fall production surveys; spring utilization surveys)
- Exclusion cages
- Robel Pole
- Hedging Class

References

- Interagency Technical Reference 1999
- Wyoming Range Service Team 2008
- Wyoming Game and Fish Department 2007

Species Diversity

Desired Conditions

- Increase diversity of plant types, ages and sizes preferred by mule deer (S, T, W)

Monitoring Methods

- SamplePoint
- Photo Point
- Line-Intercept (cover by lifeform,

References

- Interagency Technical Reference 1999
- Wyoming Range Service Team 2008
- Booth et al. 2006

<ul style="list-style-type: none"> • Increase desired forb cover/ diversity (S, T) • Establish diverse shrub size, age, species and density within that community type (S, T, W) • Increase native shrub and herbaceous cover in beetle kill and lodgepole stands (S, T) • Decrease/minimize invasive species (S, T, W) 	<p>age, species)</p> <ul style="list-style-type: none"> • Daubenmire Plots • 3 x 3 Plot • Pace Frequency • Sage Grouse Protocol Transect • Rooted/Nested Frequency Transect • Sample Pollinator Monitoring Protocol 	<ul style="list-style-type: none"> • www.xerces.org/pollinator-conservation • Stiver et al. 2010
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Species Density

<p><u>Desired Conditions</u></p> <ul style="list-style-type: none"> • Increase density of species preferred by mule deer (S, T, W) 	<p><u>Monitoring Methods</u></p> <ul style="list-style-type: none"> • Belt Transect • Rooted/Nested Frequency • SampleFreq • Pace Frequency 	<p><u>References</u></p> <ul style="list-style-type: none"> • Interagency Technical Reference 1999 • Wyoming Range Service Team 2008 • Booth et al. 2006
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Aspen Regeneration

<p><u>Desired Conditions</u></p> <ul style="list-style-type: none"> • Create more young age class aspen stands (S, T) • Increase aspen density (S, T) • Increase aspen acreage (S, T) • Maintain healthy aspen stands (S, T) 	<p><u>Monitoring Methods</u></p> <ul style="list-style-type: none"> • Aerial photography • GIS mapping • Aspen Density measurement (stems/acre) • Ocular assessments documenting disease • Age Class 	<p><u>References</u></p> <ul style="list-style-type: none"> • Wyoming Game and Fish Department 2007
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Riparian Habitat

Desired Conditions

- Improve stream health (S, T, W)
- Increase stream stability (S, T, W)
- Improve watershed hydrology (S, T, W)

Monitoring Methods

- Proper Functioning Condition
- Greenline Stability
- Macroinvertebrate Sampling
- Channel Cross-section Mapping
- Aerial Photos
- Photo Points
- Live-Dead Index

References

- Winward 2000
- Prichard et al. 1998
- Barbour et al. 1999
- Clemmer 1994
- Rosgen 2008
- Keigley et al. 2001

Animal Barriers and Disturbance

Desired Conditions

- Increase wildlife-friendly fences (S, T, W)
- Decrease motorized disturbance (W)

Monitoring Methods

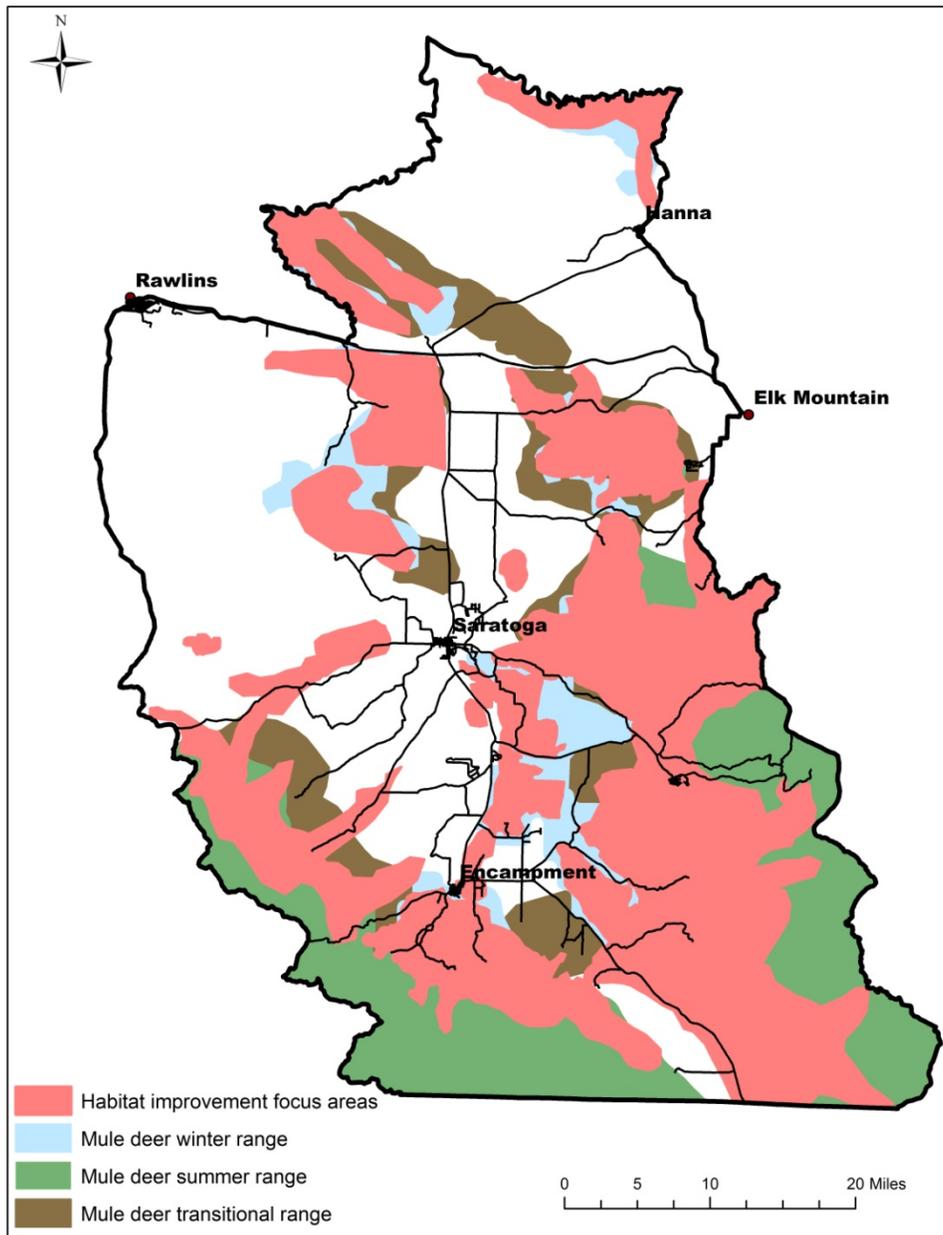
- GIS Mapping and Effectiveness Monitoring Record number of miles of fences removed, converted and constructed
- Record effectiveness of closures with periodic inspections
- Recording highway mortalities

References

- Paige 2012

Some habitat improvement projects in those portions of the Platte Valley encompassed by the sage-grouse core or lynx analysis areas (Figure 4) will require extra planning and consideration, as restrictions in these areas may limit certain treatment types. "Focus" areas have been delineated based on known mule deer habitat use to provide initial direction for habitat project development (Figure 6). Projects focused on mule deer habitat from throughout the Platte Valley are appropriate and DO NOT have to occur within these delineated "focus" areas. The focus areas will be changed and refined as new data (i.e., incorporation of telemetry data) and information is made available.

Figure 6. PVHP Habitat Improvement Focus Areas.



Proposed projects using the WGFC's funding will be required to go through the WGFD's Saratoga Habitat Biologist (SHB). The SHB will provide technical expertise with regard to project identification, habitat inventory, treatment practice recommendations, project application for funding, and oversee implementation. The SHB will also be responsible to either fill out the PVHP project application or ensure, if filled out by others, it is complete and accurate. The process for project development and application for WGFC funding is outlined in Figure 7. Similarly a series of steps internal to the WGFD has been established for project review and approval of WGFC funding (Figure 8). All projects seeking WGFC funding are required to focus primarily on mule deer habitat and address the "desired conditions" outlined in Table 1. Certainly, the more "desired conditions" addressed the more likely the project will be funded.

Figure 7. Step by step process for PVHP project development.

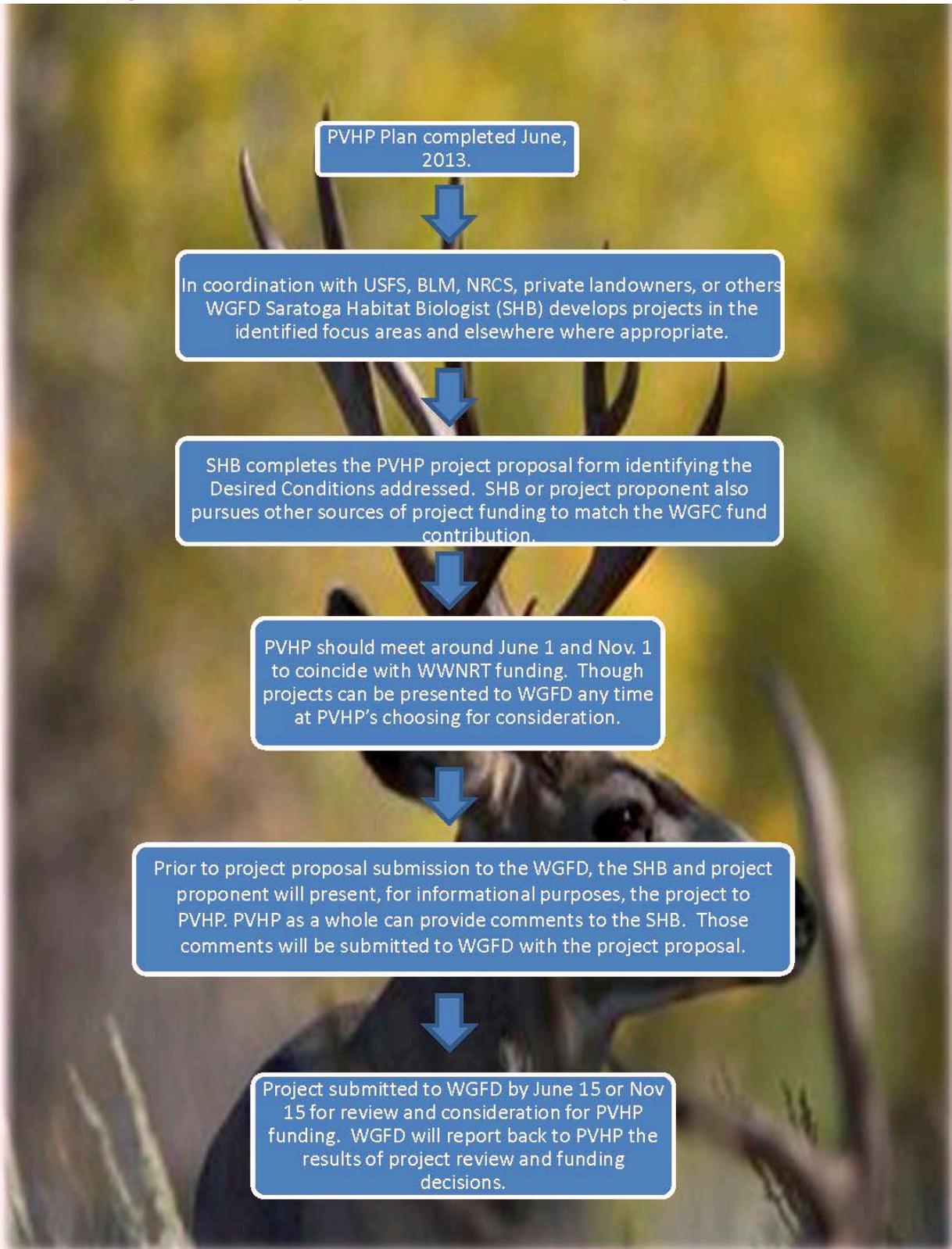
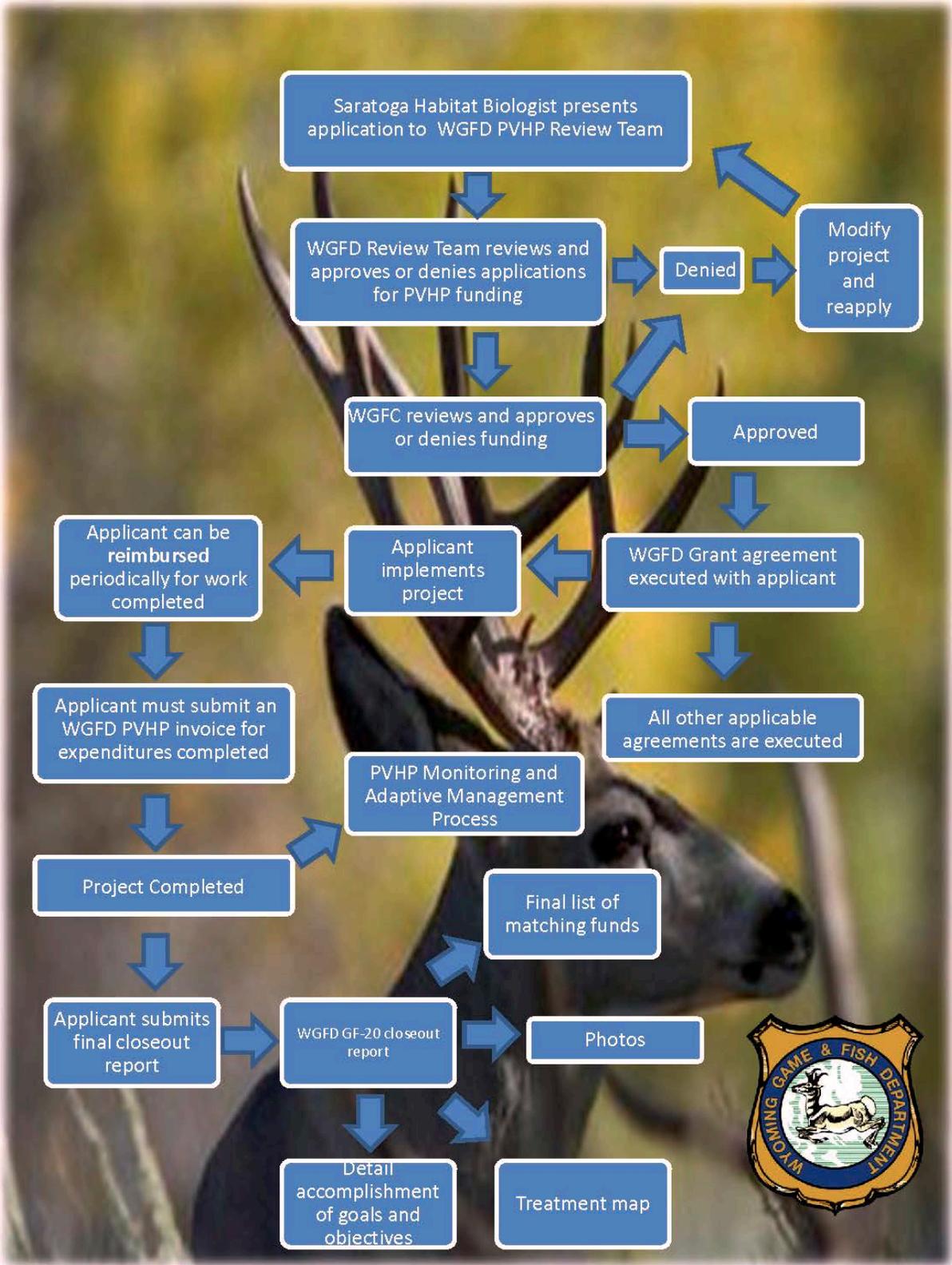


Figure 8. Step by step process for WGFC funding and WGFD internal review and approval for funding.



Given the importance of BLM and USFS administered lands and to help ensure the success of mule deer habitat enhancement work in the Platte Valley, PVHP recognizes the need to comply with BLM Standards and Guidelines and the Medicine Bow National Forest Land and Resource Management Plan.

In addition to the projects to be identified this summer, several projects are currently in planning. PVHP and the WGFD would like to assist federal land management agencies and landowners to develop and perhaps fund these projects to enhance habitat for mule deer. They include:

- **BLM Chad Allotment Grazing Infrastructure Development**
- **Cedar Ridge Thinning & Riparian Enhancement**
- **Chad Allotment sagebrush thinning**
- **Aspen Regeneration Rx Burn – BLM Methodist Allotment**

The WGFD's Saratoga Habitat Biologist will coordinate with the partners involved in these projects to develop applications for the WGFC funding starting this spring/summer.

For those interested in habitat projects designed to improve mule deer habitat in the Platte Valley and to apply for PVHP funding please contact the WGFD's SHB.

Adaptive Management

As mentioned in the introduction, this Working Document is a living document that will change over time as the Partnership tackles new subjects, and continues its learning regarding mule deer habitat improvements and other subjects.

When the Plan and this Working Document are completed, the Partnership needs to be able to:

- Learn about proposed projects and determine that they meet PVHP desired conditions.
- Learn whether the objectives of implemented projects related to PVHP efforts and others' efforts are achieved and benefits are attained based on project monitoring data.
- Be able to explore alternative strategies if objectives and benefits are not achieved.
- Convene to continue learning about new and additional science and methods.
- Be able to convene to re-examine the PVHP process and objective, and alter or expand its purpose and methods as it deems fit.
- Take on additional objectives in the future.

- Provide “a table” where anyone can present new information or seek input regarding mule deer habitat and/or other issues.

The PVHP is “the table” where all stakeholders can convene to revisit issues, continue learning and adapt. Where mule deer habitat improvements specifically are concerned, in relation to the funding allocated by WGFD for implementation projects, an adaptive management process was needed. Adaptive Management is possible when there are ongoing efforts to collect evidence to determine whether decided strategies are effective. In the PVHP context, the monitoring data that will be collected before and after implementation will be used for the group to collaboratively determine whether objectives are met or whether alternative methods should be used.

To create this adaptive management process, Figure 9 was created by PVHP to illustrate the continuous nature of its process and how it is integrated with projects on the ground. Figure 10 shows in more detail how adaptive management will be applied to PVHP project implementation. Table 2 was agreed to by the PVHP as the timing and purpose of the future meetings that will be needed to implement their adaptive management strategy.

In general the Partnership will need to take time to evaluate and decide on issues and appropriate steps forward (the What). Next, the group will need to plan how to take those next steps forwards in ways that are realistic, efficient and effective (the How). After planning comes implementation, where the projects or other activities will be implemented. This is followed with monitoring to explore effects of projects implementation. This data will be analyzed to be evaluated and used for deciding next steps. The monitoring is critical and creates the cornerstone of any adaptive management process, in order to learn how to move forward, and what to measures to avoid. Hence the objectives, desired conditions and monitoring methods described in Table 1 are critical to PVHP’s effectiveness at improving mule deer habitat conditions in the Platte Valley. Adaptive management is the wheel that allows learning to continue and the PVHP to be effective at achieving its objectives.

Figure 9: Adaptive Management as used by PVHP

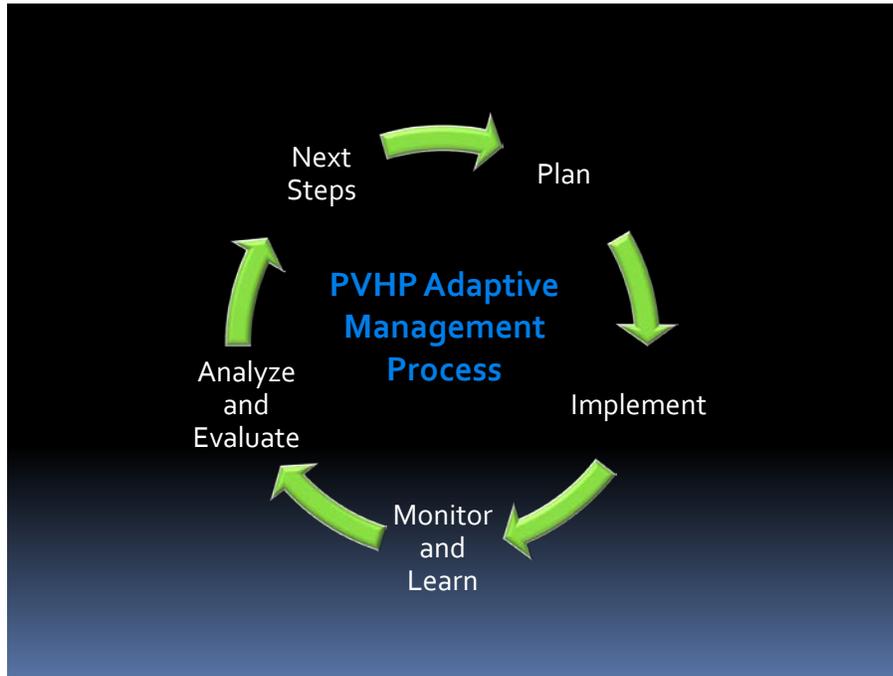


Figure 10: Adaptive Management for PVHP Project Implementation

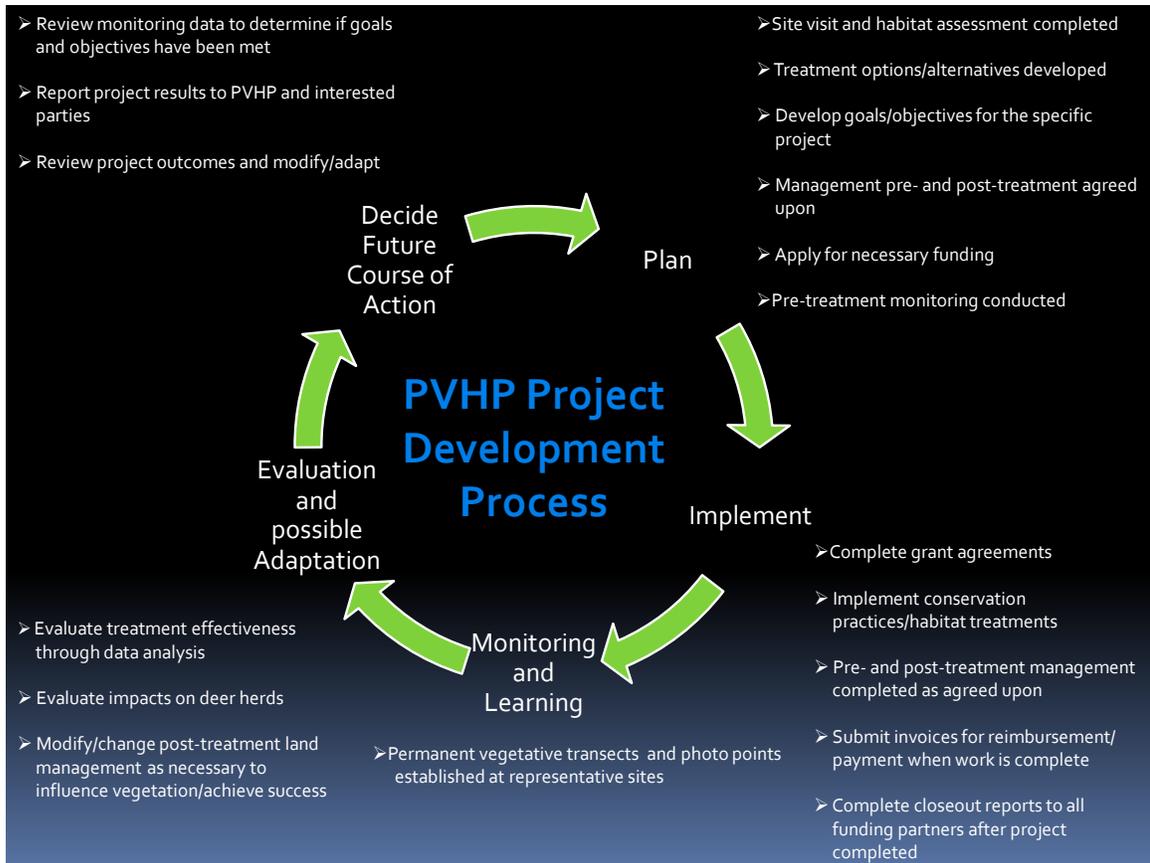


Table 2. Proposed Adaptive Management Schedule for 2013 - 2014

Period	Action	Subjects	Result
Fall and Winter 2012, Spring 2013	Plan	Vision, Goal, Objectives, Criteria for Success, Adaptive Management, Decision Making Process, Funding Methods, Habitat Strategies, Monitoring Strategies, Next Steps.	PVHP Plan and Working Document
Summer 2013	Do	<ul style="list-style-type: none"> • Project Implementation • Base line and project monitoring • Project Development for Private and Public lands • Transition of facilitation/ leadership 	<ul style="list-style-type: none"> • Monitoring data • New Projects based on PVHP Strategies.
Fall 2013	Evaluate and Analyze	<ul style="list-style-type: none"> • Monitoring Data • Project Proposals (PVHP and WGFD) • Project Implementation Experiences • New Research 	<ul style="list-style-type: none"> • New Projects for 2014 • Adjusted (if necessary) Implementation based on Experience and Research.
Spring 2014	Plan	<ul style="list-style-type: none"> • Funding and Implementation of new Projects for inclusion in next Plan. • Adjusted Monitoring methods. 	<ul style="list-style-type: none"> • Revise the Working Document as needed
Fall 2014	Evaluate and Analyze	<ul style="list-style-type: none"> • Monitoring Data • Project Proposals (PVHP and WGFD) • Project Implementation Experiences • New Research 	<ul style="list-style-type: none"> • New Projects for 2015 • Adjusted (if necessary) Implementation based on Experience and Research.
Ongoing	Planning, Evaluating , Analyzing	<ul style="list-style-type: none"> • PVHP can meet whenever it feels a need to convene and discuss any issue. 	<ul style="list-style-type: none"> • Deliberations will improve methods and results will be included in the plan

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