2020 WYOMING ACTION PLAN
For
Implementation of Department of the Interior Secretarial Order 3362: "Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors"

Introduction

The purpose of this action plan is to provide an update and further guide the implementation of the Department of Interior Secretarial Order 3362 (SO 3362) in Wyoming as well as provide information about the research priorities previously identified in the State Action Plans from 2018 and 2019. The Wyoming Game and Fish Department (WGFD) has identified the top five migratory mule deer herds in the State. The rationale for prioritization as well as identification of threats to the corridors are briefly described and evaluated in the next section for each location. These priority areas all have some degree of mule deer movement data and the WGFD is working through our migration corridor designation process. These Priority herds are Platte Valley Mule Deer, Wyoming Range Mule Deer, Dubois Mule Deer, Sublette Mule Deer, and Baggs Mule Deer.

Wyoming has a considerable amount of information on habitat use and seasonal distribution including migration corridors. The University of Wyoming Cooperative Wildlife Research Unit and numerous partners created the Wyoming Migration Initiative (WMI) where many studies have occurred or are underway. We included an appendix to this report to give an update on the research priority herds from the last two years where Department of Interior (DOI) funds have contributed to our data collection efforts (see Appendix A). The priority research herds for 2018 and 2019 included Sublette Pronghorn, Medicine Bow Pronghorn—Shirley Basin, North Bighorn Mule Deer, Platte Valley Mule Deer, Carter Mountain Pronghorn and Powder River and Pumpkin Buttes Mule Deer. Yellowstone and Grand Teton National Parks are included in seasonal range designations and big game movements and were considered during the development of the State's priorities.

SO 3362 directs the appropriate bureaus within the DOI to collaborate closely with the wildlife agency of each western state. SO 3362 recognizes the states have direct responsibility and jurisdiction for the management of big game. In addition, SO 3362 recognizes the rights of private landowners and their contribution to the conservation of migration corridors and winter range habitat. DOI is coordinating with the states on scientific endeavors and land management actions that help inform and conserve state identified priority corridors and winter range.

Conditions in the broader landscape may influence the function of migration corridors and winter ranges of big game populations. Such conditions may include habitat fragmentation, land use patterns, resource management and urbanization. The United States Department of Agriculture (USDA), through the United States Forest Service (USFS) and Natural Resources Conservation Service (NRCS), will collaborate with DOI, WGFD, and other natural resource managers across the broader landscape when developing an all-lands approach to research, planning and management. This includes managing migration corridors and winter range in a manner that promotes the welfare and populations of elk, deer, and pronghorn, as well as the ecological integrity of terrestrial ecosystems in the plan area.

Wyoming has approximately 62,147,200 total acres, 18,357,570 or 48% of which is under the management authority of the federal government. The Bureau of Land Management (BLM) manages 18,357,570 acres, the USFS manages 9,237,620 acres, and the National Park Service (NPS) manages 2,393,200 acres. The United States Fish and Wildlife Service (USFWS) manages 93,040 acres, including 24,000 acres at the National Elk Refuge. Other agencies make up the remainder of federal ownership. Also, the Wyoming Game and Fish Commission (WGFC) owns 168,000 acres and the State of Wyoming owns 3,6,96,800 acres through the Office of State Lands and Investments (OSLI). There are also private lands throughout big game habitats. This ownership structure requires cooperative partnerships to work across all the habitat categories and ownerships for big game species.

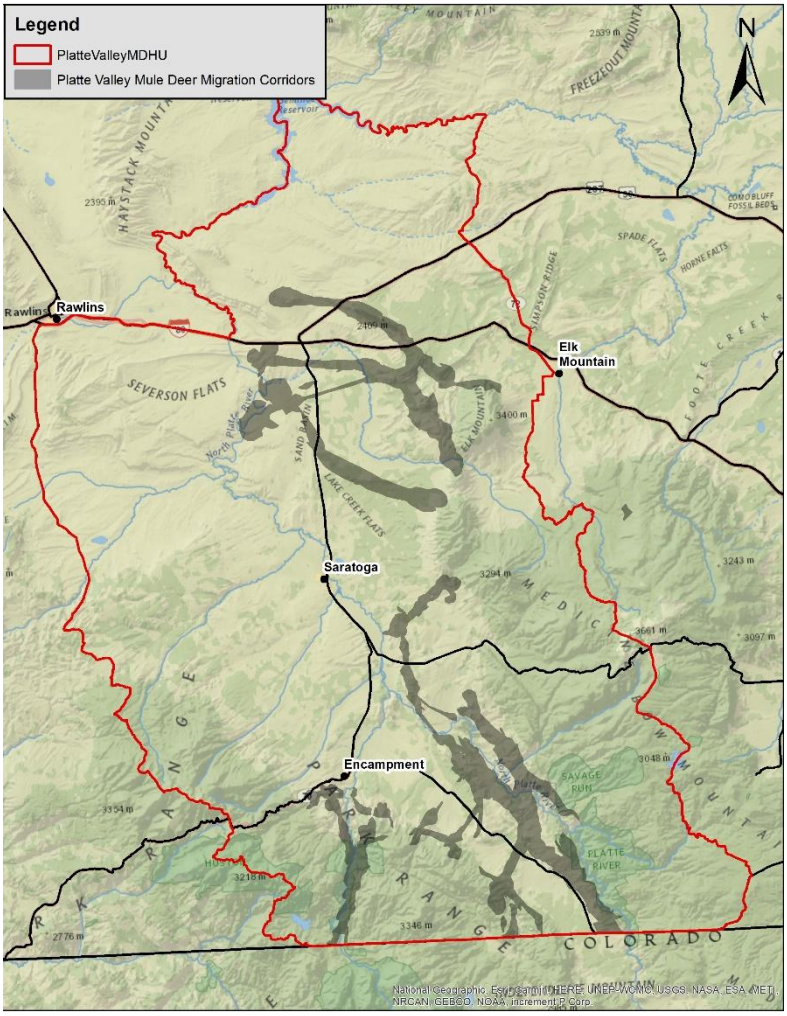
Since the 2019 State Action Plan was completed, the Governor of Wyoming has signed into effect the Wyoming Mule Deer and Antelope Migration Corridor Protection Executive Order 2020-1. This Executive Order designated the Platte Valley, Baggs and Sublette Mule Deer Migration Corridors and outlines a process for additional corridors to be designated or identified in the future. The Executive Order also identifies how development and disturbances should be managed in order to ensure functionality of the migration corridors into the future.

Priority Corridors/Winter Range

The WGFD identified five priority migration corridors for mule deer herd units in Wyoming. These include Platte Valley, Wyoming Range, Dubois, Sublette, and Baggs Mule Deer Herds. Managers have collected mule deer movement data to some degree in each of these areas and are currently working with stakeholders and agency personnel to identify proactive conservation actions that are geared toward conserving vital habitats in each of these herd units.

Mule deer crossing Fremont Lake Bottleneck in the Sublette mule deer migration corridor

Wyoming Migration Corridor Priority: Platte Valley Mule Deer



Platte Valley mule deer designated migration corridor

Why the area was selected as a priority:

The Platte Valley mule deer designated migration corridor represents high priority seasonal habitats that were documented through the use of GPS collar technology and delineated using a Brownian Bridge Movement Model (BBMM). This corridor documents important habitats used by approximately 5,000 mule deer migrating from summer range in Colorado to winter range in Wyoming. The corridors also illustrate the barrier to migration caused by the development of Interstate 80 (I-80) where at present only approximately 400 mule deer utilize one machinery underpass for safe passage to winter range.

Spatial Location:

The Platte Valley migration corridor is located primarily in Carbon County in south central Wyoming and into Jackson County in north central Colorado.

Habitat Types:
Habitats include alpine meadows, subalpine and montane forests, mixed mountain shrub, sagebrush-grasslands, cottonwood riparian, and agricultural croplands. The forests are a mix of subalpine fir, Engelmann spruce, Douglas-fir, lodgepole pine, aspen, and a few ponderosa pines, with associated grass/forb/shrub understory vegetation. Big sagebrush, antelope bitterbrush, and true mountain mahogany dominate the lower elevation winter ranges. Elevation within the corridor ranges from just over 12,000 feet at Medicine Bow Peak to 6,400 feet along the North Platte River.

Important Stopover areas within the corridor:
Important stopover areas have been identified through the BBMM analysis and include areas in the Encampment River Wilderness Study Area (WSA), Beaver Hills, Bennett Peak, Baggot Rocks, Cedar Breaks, Savage Meadows and St. Mary's Ridge areas.

Land ownership:
Land ownership is mixed within the migration corridor and encompasses 196 square miles consisting of: Private (50%), BLM (30%), USFS (14%) and OSLI (6%).

Land Uses:
Federal lands not designated as Wilderness are managed for multiple use. Common uses include livestock grazing, motorized and non-motorized recreation, and extractive and renewable energy development. Some BLM lands are currently designated as WSAs. Mule deer also migrate through parcels that have been leased for oil and gas or through areas with ongoing energy development. Lands managed by the OSLI are managed primarily for livestock grazing. Private lands along the corridor network are primarily used for agricultural purposes and rural residential development.

Risk/Threats:
The northern Platte Valley corridor network has been modified by the construction of I-80, U.S. Highway 30 and the Union Pacific (UP) railroad. There is one I-80 machinery underpass where approximately 400 mule deer have been documented passing through the structure seasonally. This underpass is located in an area where there is game fencing to direct animal movement to the crossing structure. On other portions of I-80 which are not game fenced, the Wyoming Department of Transportation (WYDOT) has documented a high number of wildlife/vehicle collisions for mule deer, elk, pronghorn and moose. The most significant future threats in this area are increased traffic on I-80, Highway 30, and the UP railroad, as well as extractive and renewable energy development. The southern corridor network is currently used by approximately 5,000 mule deer, most of which are migrating into Wyoming for winter range from summer ranges in Colorado. The most significant future threat to these corridors is presumed to be habitat fragmentation from rural residential development, as well as increased disturbance from off highway vehicle (OHV) recreation and human disturbance on winter ranges (e.g. antler hunting).

Additionally, throughout the herd unit habitat conditions have deteriorated over the years with invasion of noxious weeds including cheatgrass as well as invasion of conifers and late seral stages of vegetation which provide forage value far below potential. Fence conditions are variable throughout the herd unit and in many places include woven wire fence or designs that pose challenges for migrating mule deer.

Are the Risk/Threats Immediate or Long-term:
All of the identified threats are long-term.

Actions necessary to reduce or eliminate risks/threats:
In the northern corridor network, risks/threats could be reduced with the development of underpasses/overpasses on I-80, U.S. Highway 30, and the UP railroad. Threats to the corridor network in the southern portion could be reduced by maintaining open habitats on private lands through planning and zoning at the county level. BLM lands could provide better protections for corridor and stopover habitats through implementing motorized travel management plans. A travel management plan could also reduce harassment of mule deer from antler hunters. Implementation of a shed antler season east of the Continental Divide would reduce human disturbance to wintering and migrating mule deer. Invasive species control and vegetation management are needed to improve foraging conditions throughout the herd unit.

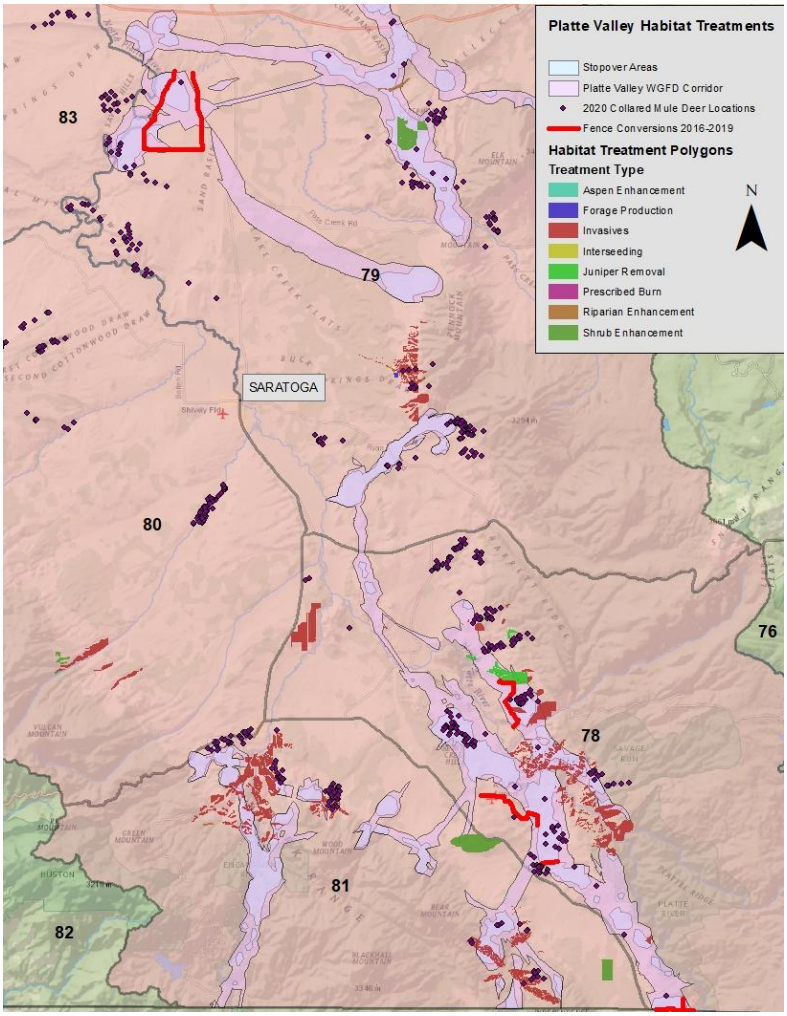
Current efforts (what is the activity; who is conducting the work; and partners involved):
The WGFD has partnered with Carbon County Conservation District (CCCD), BLM, USFS, OSLI and private landowners to implement vegetation management treatments targeting cheatgrass, juniper encroachment, shrub communities and aspen stands totaling over 24,000 acres since 2014. Additionally, fence modifications had occurred on 35 miles to further enhance the functionality of migration corridors.

Fence modification and juniper thinning projects have occurred in the Platte Valley mule deer herd

The WGFD is also working with WYDOT, CCCD, local conservation organizations, BLM, USFS, and OSLI to influence improvements/protections where possible. Underpasses/overpasses in many cases are cost prohibitive for conventional funding sources but are being evaluated with stakeholder groups. The BLM advises they are potentially a decade away from completing a travel management plan in this area.

Cost of current or needed habitat treatments; road crossings etc.:
The large scale habitat treatments and interstate/highway crossings structures and fencing necessary to improve the Platte Valley network of migration corridors would be very costly and could reach several million dollars. Over $1 million has been allocated for habitat treatments, monitoring, fence modifications and migration work in the Platte Valley herd unit in the last five years.

Other Issues for awareness: None known.

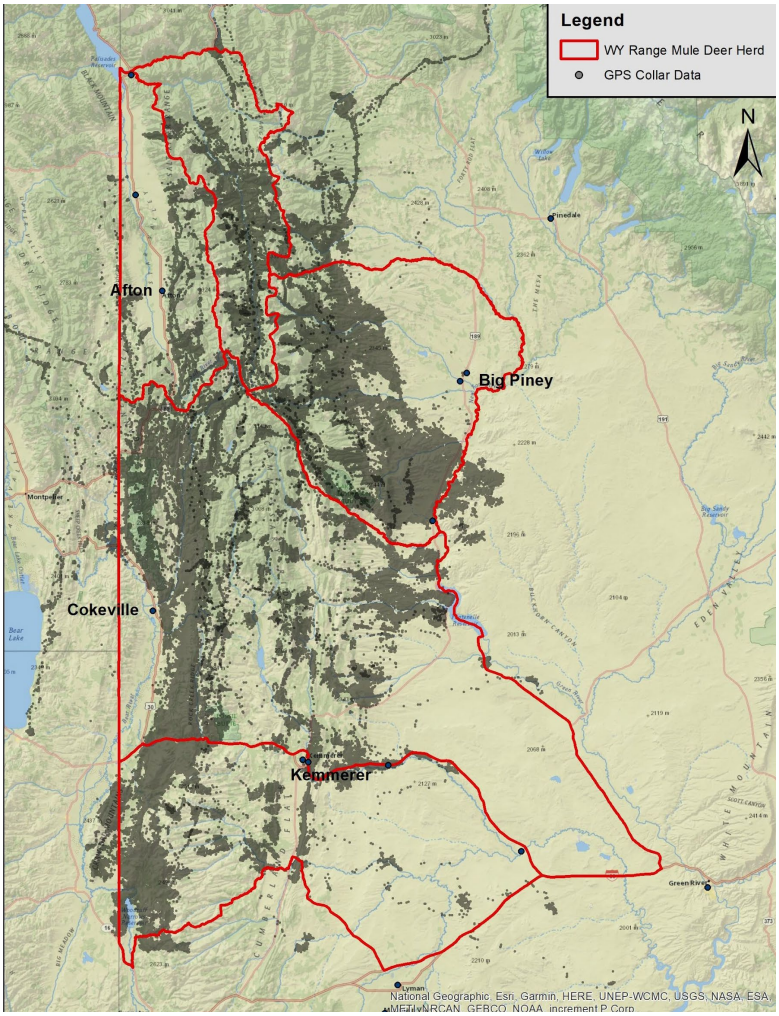


Habitat treatments that have been implemented from 2014-2019 in the Platte Valley mule deer herd

Wyoming Migration Corridor Priority: Wyoming Range Mule Deer

Why the area was selected as a priority:

The Wyoming Range mule deer herd is one of the premier mule deer populations for both hunting and wildlife viewing in the intermountain west. This herd has complex and dynamic movement patterns with some mule deer migrating extensive distances (150+ miles) between high elevation summer ranges to several distinct winter range complexes. GPS telemetry studies have demonstrated that individual mule deer have a strong fidelity to the same summer and winter ranges. The WGFD will be analyzing GPS collar data with the BBMM in order to identify a draft Wyoming Range mule deer migration corridor within the next year. Proactive management is necessary to assure persistence of migration corridors as mule deer cross a mix of land ownership and land-use patterns. To be consistent with Executive Order 2020-1, WGFD will complete a threat evaluation in order to determine if the designation process should be pursued, once the BBMM data is finalized.



GPS Collar Data collected in the Wyoming Range mule deer herd which will be analyzed with BBMM for potential migration corridor designation

Spatial Location:

The Wyoming Range mule deer herd migrates up to 150 miles between seasonal ranges in western Wyoming, southeastern Idaho, and northeastern Utah.

Habitat Types:

Mid to high elevation summer ranges include alpine basins, spruce-fir forests, aspen stands and mountain meadow/tall forb communities. Fall/transition areas at slightly lower elevation contain mountain big sagebrush, mixed conifers, aspen, and riparian communities. Lower elevation foothill and basin habitats are typified by Wyoming and mountain big sagebrush communities interspersed with areas of antelope bitterbrush and mixed-mountain shrubs. Sagebrush dominated winter range habitats are primarily located along the southern and southeastern flanks of the Wyoming Range, and also include some juniper, isolated aspen stands, and limited acreages of bitterbrush. Much of the winter range habitats are sagebrush and desert shrub basins, with rocky outcrops and topographically diverse canyons.

Important Stopover areas within the corridor:
Recent research indicates that mule deer spend 95% of their migration period in a series of stopover sites, where they congregate to feed and replenish energy stores in areas with nutritious forage. In many instances mule deer stopover sites overlap with delineated crucial winter range habitat due to the extensive movement into and through some winter habitats as snow depth and winter severity increases through winter months. This is especially true in the Wyoming Range, and illustrates the importance of stopover habitat within migration corridors as foraging habitats. Stopover habitats will be delineated through the upcoming BBMM analysis.

Land ownership:
During annual migrations, mule deer in the Wyoming Range herd cross a mix of land ownership patterns. While most summer ranges are located on USFS lands, transition areas and winter ranges can include USFS, BLM, OSLI and private lands.

Extensive GPS collar research has helped prioritize management actions on the ground

Land Uses:
Land uses on both USFS and BLM lands include livestock grazing, timber harvest, motorized and non-motorized recreation, and energy development. Some BLM lands are designated as areas of critical environmental concern (ACEC), special recreation management areas (SRMA), special management areas (SMA), or WSAs. Some Wyoming Range mule deer move through the Raymond Mountain and Rock Creek ACECs as well as the Lake Mountain WSA. Also, conservation easements are in place protecting habitats on some private lands. Mule deer also migrate through parcels that have been leased for oil and gas, or areas with ongoing energy development and production. State lands, managed by OSLI are managed primarily for "long-term growth in value" and "optimum, sustainable revenue production" to generate funds for public schools. Accordingly, the primary uses of these lands are livestock grazing and energy development. Private lands along the corridor are primarily used for agriculture and urban development.

Risk/Threats:
Portions of the Wyoming Range mule deer migration corridor are intact and functioning with significant conservation work already completed to facilitate habitat enhancements, highway crossings, and wildlife-friendly fencing. Additional conservation and land use efforts are needed to benefit mule deer in the

future. Habitat conditions are critical due to the arid climate and condition of some plant communities. Habitat treatments in aspen communities are especially important to improve understory plants to maximize nutrition for does and fawns on transitional and summer ranges. Invasive plant communities in portions of the corridor have decreased habitat functionality, and the invasion of cheatgrass is currently limiting management options in some places. Significant resources must be put into cheatgrass control or many proactive habitat enhancements will not be feasible.

A critical highway crossing at Nugget Canyon has been addressed with several underpasses. Roadways and increasing traffic volumes in the corridor can impact seasonal movements of deer and may become a more significant barrier to mule deer movements. Right-of-way fences and deep snow conditions are a concern for late migrants (difficult for deer to cross). Mule deer habitats are often favored recreation areas, and protection of these vital habitat features from excessive human recreation (motorized and non-motorized) would enhance their long term persistence on the landscape. The possibility of additional wind energy projects, and solar farms seem imminent. A large reservoir (Sublette Reservoir) has been proposed in the migration corridor. Subdivision and recreational property development could have adverse impacts in specific areas. Minimizing or mitigating disturbance in the corridor will benefit mule deer habitats in this herd.

<u>Are the Risk/Threats Immediate or Long-term:</u>
Establishment of invasive plant communities are an immediate and long-term threat. Improving vegetation conditions and fence permeability are long-term threats that have ongoing attention. Managing public access and recreation are long term, as is urban development and energy development. Increasing traffic volume, wildlife vehicle collisions, and wildlife crossing structures are also long-term issues.

<u>Actions necessary to reduce or eliminate risks/threats:</u>
Maintaining collaborative relationships with private landowners, oil and gas operators, non- governmental organizations (NGO's), local county governments, federal land managers and the public is essential to ensure mule deer migration remains unimpeded. Management actions in this herd are most successful with a collaborative approach. Conservation easements are strongly supported as an important tool to maintain open space.


Fence modification and prescribed fire have been use throughout the Wyoming Range mule deer herd

Current Efforts:
Habitat enhancement work in cooperation with federal land management agencies, livestock grazing permittees, and private landowners has been ongoing and will continue into the future. From 2014-2019 over 19,000 acres of shrubs and aspen and over 47,000 acres of cheatgrass have been treated as well as 5 miles of fence have been modified with many more miles funded for modification in the next two years. Since 2013 over $4 million has been spent on habitat improvements including fence modifications and over $2 million have been spent on research. National Environmental Policy Act (NEPA) is underway to begin a new 10-year cooperative vegetation management project on the south end of the Wyoming Range with BLM and WGFD.

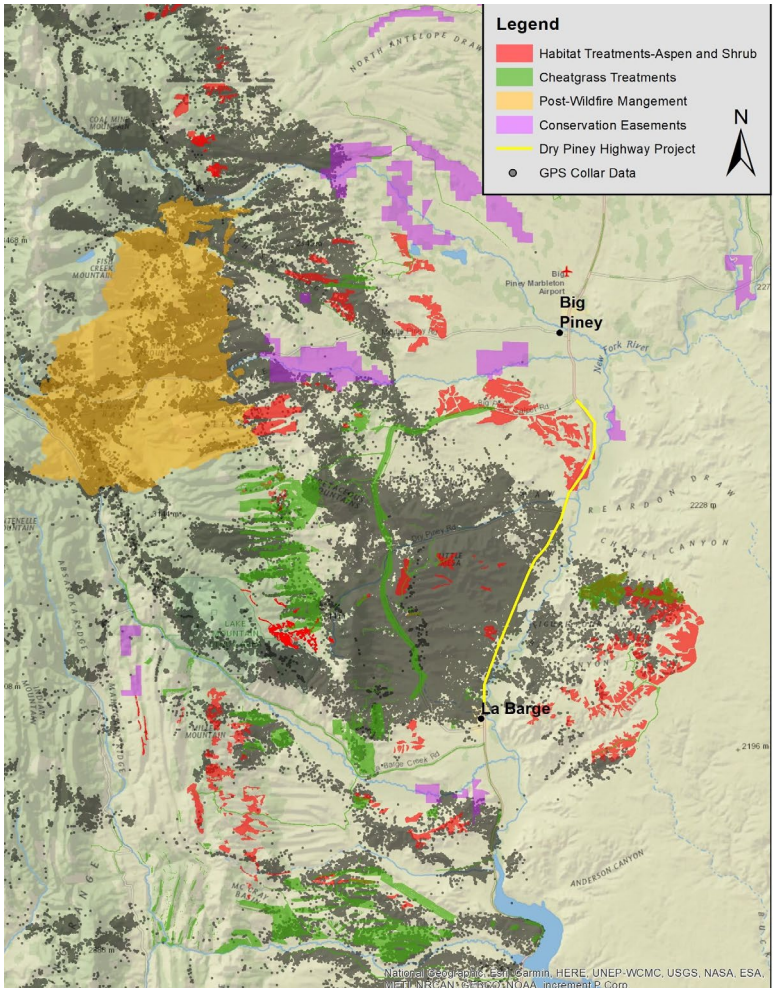
The WGFD is currently working with WYDOT and others to address wildlife crossings throughout the herd unit, with particular focus on an underpass project near Dry Piney Creek on Highway 189 south of Big Piney. In early 2019 the Wyoming Game and Fish Commission (WGFC) and WYDOT each provided $1.25 million towards the Highway 189 crossing project which prompted the successful acquisition of a $14 million federal Department of Transportation grant to complete the project. This project has a timeframe of completion likely in 2021 and 2022.

The BLM has funded an evaluation of deer movement and habitat use between LaBarge Creek and the Ham's Fork River to improve GPS collar data for Wyoming Range mule deer seasonal range delineations. These efforts include collaborations with the University of Wyoming (UW), WYDOT, local governments, local NGOs, BLM, USFS, OSLI, and individual land owners.

Cost of current or needed habitat treatments; road crossings etc.:
Aspen and sagebrush projects on BLM land are adequately funded in the Big Piney to LaBarge area by the various partners. The 10-year project implementation on additional private land and BLM land on the south end of the Wyoming Range is only partially funded ($1 million, of an anticipated $6 million total, funded by the BLM). Cheatgrass management and fence modification projects will require significant funding for many years into the future.

Other Issues for awareness:
Additional deer winter ranges and migration corridors are suspected between LaBarge and Kemmerer (LaBarge Creek and the Ham's Fork River). With support from the BLM, mule deer in this area were captured in March 2019, and data will be incorporated into the upcoming BBMM analysis.

The Dry Piney highway crossing project is planned to include 8 underpasses and 16 miles of ROW exclusion fence

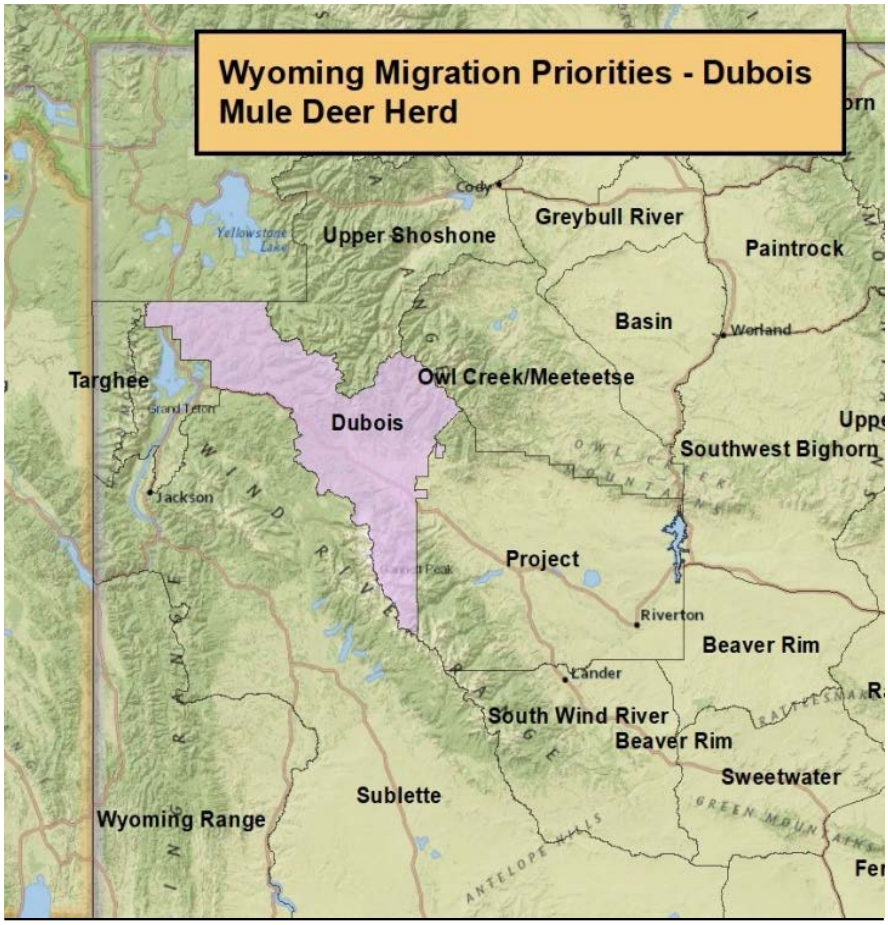


Habitat treatments that have been implemented from 2014-2019 in the Wyoming Range mule deer herd and mule deer GPS collar data points

Wyoming Migration Corridor Priority: Dubois Mule Deer

Why the area was selected as a priority:

This area or herd unit is part of the Eastern Greater Yellowstone Ecosystem mule deer monitoring project implemented to collect GPS data to catalogue big game seasonal use patterns in northwestern Wyoming. This data, in concert with an analysis of WYDOT crash and Wildlife Vehicle Crash (WVC) data from 2010-2018, shows that U.S. Highway 26/287 from approximately milepost 45 to milepost 75 consistently has a high frequency of mule deer-vehicle collisions every year. This stretch of highway was ranked as the highest priority within WYDOT District 5 at the 2017 Wyoming's Wildlife and Roadways Summit (Lutz et al. 2017). Deer-vehicle collision rates, according to WYDOT's data, are highest in the fall (mid-October to mid-November coinciding with mule deer migration into and through the area), somewhat lower through the winter and early spring (January-April), and low in the summer and early fall (June-September). Traffic volume along this stretch of highway is relatively low. Annual average daily traffic is about 1,700 vehicles, with fall and winter months averaging about 1,100 vehicles daily. The high number of collisions relative to traffic makes this area one of the worst in the state in terms of risk to drivers.



Dubois mule deer herd unit

WYDOT and WGFD site visit to discuss highway crossing solutions in the Dubois mule deer herd

Spatial Location:
The area is located in northwestern Wyoming starting in Fremont County near the town of Crowheart westward to the higher elevations of Togwotee Pass in the Teton Wilderness and Mount Leidy Highlands in Teton County.

Habitat Types:
Habitats are best described as mule deer first move during the fall from the mountains into foothill and riparian habitats within the upper Wind River Basin. This is an area of diverse habitats, including mountain big sagebrush, mixed conifers, aspen, juniper, and riparian communities associated with the Wind River and its tributaries. Agriculture fields consist primarily of alfalfa and native grass hay production.

A variety of habitat types exist in the Dubois mule deer herd

Important Stopover areas within the corridor:
Recent research on the Sublette mule deer herd indicates that mule deer spend 95% of their migration period in a series of stopover sites, where they congregate to feed and replenish energy stores in areas where forage is especially nutritious. This appears to be very similar in the Dubois herd and some seasonal mule deer movements overlap with delineated crucial winter range habitat as well.

Land ownership:
Migrations occur primarily on USFS and BLM lands. Winter ranges are primarily on BLM, WGFD Wildlife Habitat Management Areas (WHMAs) and private lands.

Land Uses:
USFS and BLM lands are primarily managed for wildlife habitat and have been removed from mineral and oil/gas leasing. Also, conservation easements are in place protecting habitats on some private lands. WSAs on BLM lands also provide management emphasis for wildlife habitats. WGFC lands on the Whiskey Mountain, East Fork, and Spence/Moriarity WHMAs protect wildlife habitats. Small acreage ranchettes and small hay meadows are prevalent in this area.

Risk/Threats:
Increased traffic volume on this stretch of highway is resulting in increased wildlife mortality (primarily mule deer, but also includes bighorn sheep, moose, elk and white-tailed deer). Also, continued development of ranchettes is a concern. Invasive species invasion including both cheatgrass and other species as well as generally late seral vegetation and conifer encroachment has decreased forage conditions throughout the herd unit. Fences throughout the herd unit include variable styles, many of which are old and not to wildlife friendly specifications.

Are the Risk/Threats Immediate or Long-term:
Increasing traffic volume, wildlife vehicle collisions, and fences are both short and long-term. Invasive species invasion is both immediate and long-term. Vegetation management is a long-term threat.

Actions necessary to reduce or eliminate risks/threats:
The WGFD and WYDOT are collaboratively working on solutions to the highway crossing challenges. A consultant has been hired to work with an interagency group to develop solutions. Fence modifications, invasive species control and vegetation management projects need to be implemented.

Current efforts (what is the activity; who is conducting the work; and partners involved):
The WGFD and WYDOT have purchased and deployed 2 sets of Variable Messaging Signs (VMS) for use only when wildlife are in the area to warn drivers during key periods of the year when wildlife and motorists are at most risk. The two agencies have also engaged with the Dubois community about the need to mitigate wildlife vehicle collisions. Collaborative efforts with USFS and Fremont County Weed and Pest have resulted in vegetation and invasive species project plans, many of which are awaiting full funding to complete implementation.

Cost of current or needed habitat treatments; road crossings etc.:
The variable messaging signs cost $115,000 and the contractor cost is estimated at $50,000. A total of $52,000 has been allocated for aspen treatment and cheatgrass control in the Dubois herd unit. Additional funding to conduct habitat treatments and invasive species management is needed.

Other Issues for awareness:
U.S. Highway 26/287 from approximately milepost 45 to milepost 75 has high traffic volumes seasonally and there is considerable local interest (Dubois citizens) to work collaboratively to mitigate wildlife/vehicle mortality.

Wyoming Migration Corridor Priority: Sublette Mule Deer

Why the area was selected as a priority:
Migration in this herd unit is complex and dynamic with some mule deer migrating extensive distances (150+ miles). Animals migrate between high elevation summer ranges to several distinct winter range complexes. GPS based telemetry studies have demonstrated that not only do individual mule deer have a strong fidelity to the same winter ranges every year, they also use the same migration corridors and summer ranges. Proactive management is necessary to assure persistence of this migration corridor as mule deer cross a mix of land ownership and land-use patterns. During additional collaring efforts, mule deer movements have been documented into Idaho. This migration corridor will be periodically evaluated

as additional animal movements are documented.

Spatial Location:
The Sublette mule deer herd migration corridor is approximately 150 miles in length including lands in western Wyoming with one radio collared animal traveling into southeast Idaho (a distance of over 240 miles).

Sublette mule deer designated migration corridor

Habitat Types:
Mid to high elevation summer ranges include alpine basins, spruce-fir forests, aspen stands, and mountain meadow/tall forb communities. Fall and spring habitat use includes the mountain foothill habitat in the upper Green River Basin (an area of diverse habitats including mountain big sagebrush, mixed conifers, aspen, and riparian communities) then in winter transitions down in elevation to foothill and basin habitats (typified by Wyoming and mountain big sagebrush communities interspersed with areas of antelope bitterbrush and mixed-mountain shrubs with serviceberry and chokecherry), and then finally into sagebrush dominated winter range habitat (sagebrush habitat with isolated aspen stands and limited acreages of bitterbrush). Much of the winter range habitats can be characterized by sagebrush and desert

shrub basins, rocky outcrops and canyons, and diverse topography. Aspen communities are often isolated with limited regeneration due to low precipitation, conifer encroachment, and ungulate browsing pressure. The southern reaches of the corridor receive wild horse use.

Important Stopover areas within the corridor:
Recent research indicates that mule deer spend 95% of their migration period in a series of stopover sites, where they congregate to feed and replenish energy stores in areas where forage is especially nutritious. In many instances these mule deer stopover sites overlap with delineated crucial winter range habitat due to the extensive movement into and through some winter habitats to access winter habitats elsewhere within this herd unit. Stopover habitat includes the Prospect Mountains, Finger Lakes area on the west slope of the Wind River Range and area near Monument Ridge in the Hoback River drainage.

Land ownership:
During migration, mule deer in the Sublette herd cross a mix of land ownership patterns. In the extreme northwest portions of the corridor mule deer cross private lands, USFS, designated Wilderness areas, and NPS lands. In the central and southern portion of the 150 mile corridor animals cross private lands, OSLI, WGFC, and BLM lands.

Land Uses:
Federal lands not designated as Wilderness or managed by the NPS are managed for multiple use. Common uses include livestock grazing, motorized recreation, and energy development. Some of the BLM lands are designated as ACEC, SRMA, and SMA. The Sublette mule deer herd migrates through the Greater Sand Dunes, Steam-boat, and South Pass Historic Landscape ACECs, as well as the Steamboat Mountain SMA, Scab Creek WSA, Scab Creek SRMA, and the Wind River Front SMA. Mule deer also migrate through parcels that have been leased for oil and gas or areas with ongoing energy development. State lands, managed by OSLI are managed primarily for “long-term growth in value” and “optimum, sustainable revenue production” to generate funds for public schools. Accordingly, the primary uses of these lands are livestock grazing and energy development. Private lands along the corridor are primarily used for agricultural purposes and urban development. Also, conservation easements are in place protecting habitats on some private lands.

Risk/Threats:
Portions of the Sublette corridor are intact and functioning. Numerous conservation projects have been completed to address fencing, bottlenecks, and habitat concerns. Additional efforts focusing on conservation and land use will benefit mule deer in the future. Habitat conditions and range use are important factors due to the arid conditions and the advanced seral stages of some plant communities. Invasive plant communities in portions of the corridor decrease habitat functionality. Increasing traffic volumes on some highway segments and on popular secondary roads may result in these areas becoming a more significant barrier to mule deer movements in the future. Wildlife crossing areas on several roadways impact seasonal movements of deer.

Right-of-way (ROW) fences are a concern in some areas and these fences become a greater barrier for late migrants as deeper snow conditions make it more difficult for deer to cross ROW fences. Fence permeability near subdivisions and WGFD elk feed grounds will also be an important factor for maintaining corridor function. Habitat features in the southern portions of the corridor as well as in the

more mesic habitats in the western portion of the corridor are also favored recreation areas. Protection of these vital habitat features from human recreation, unregulated motorized access, and overuse by ungulates would enhance their long term persistence on the landscape.

Are the Risk/Threats Immediate or Long-term:
Late seral communities and invasive plants are an immediate and long-term threat. Managing public access and recreation are long-term, as are urban development and oil and gas leasing. Preparing for increasing traffic volume, wildlife vehicle collisions, and wildlife crossing structures is long-term.

Sublette mule deer herd also overlaps with the Pinedale Anticline and other important energy resources

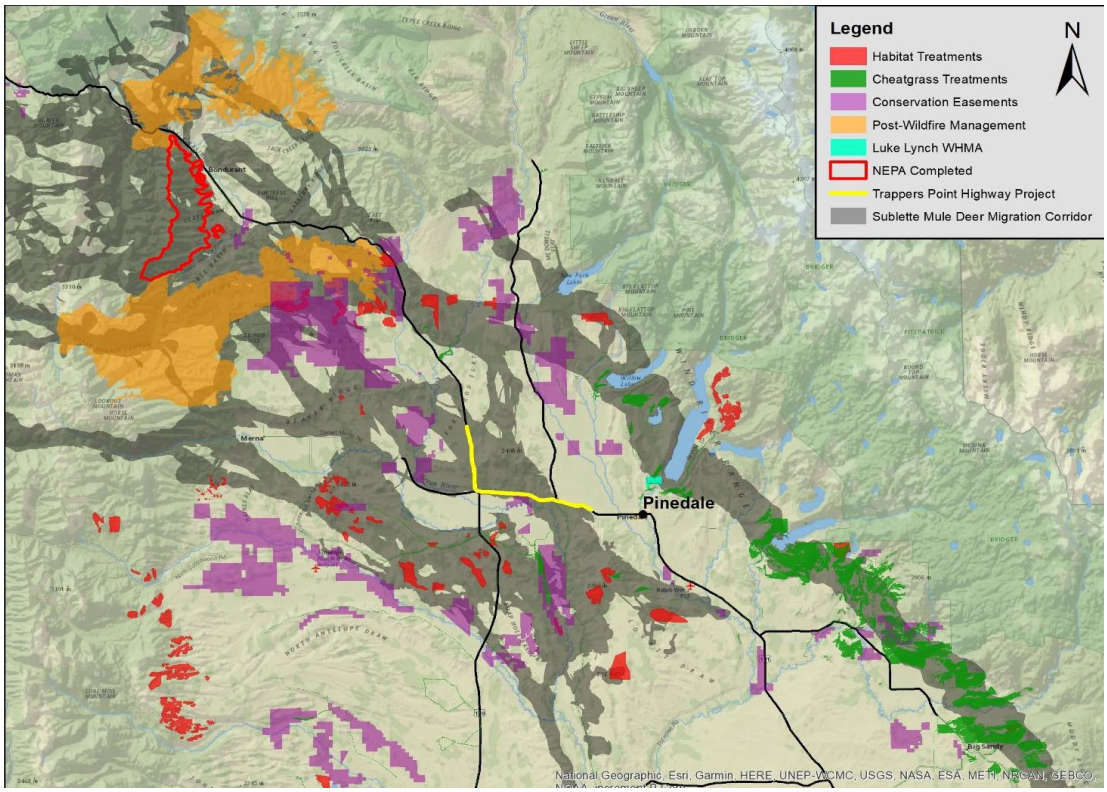
Actions necessary to reduce or eliminate risks/threats:
Overall, managers believe the risks mule deer face can be addressed to some extent through maintaining relationships with private landowners, oil and gas operators, NGO's, local county governments, federal land managers, and the public. Ongoing effort to continue to collaborate with stakeholders to ensure mule deer migration remains unimpeded will be necessary. Cheatgrass and other vegetation management projects need to continue into the future to protect vital habitats from wildfire threat and maintain the habitat quality our mule deer require.

Current efforts (what is the activity; who is conducting the work; and partners involved):
The WGFD is working with UW, WYDOT, Sublette County Conservation District, local conservation organizations, BLM, USFS, OSLI, and numerous land owners. The Conservation Fund recently purchased and donated a 364 acre parcel of land (Luke Lynch WHMA) in the Fremont Lake bottleneck area to the WGFC. The WGFD in collaboration with the Governor's Office, OSLI, and BLM have been working on mitigation measures to reduce impacts of oil and gas leasing.

Cost of current or needed habitat treatments; road crossings etc.:
While a lot of work has been completed in this herd unit, regional personnel continue to work with stakeholders to improve seasonally important habitats, fence modifications, and land use planning. Over

the last five years over $6,000,000 has been expended on projects including noxious weed control, modifying fences to meet wildlife friendly standards and habitat treatments. During the next several years, another $1,500,000 has been committed working on fence replacement, habitat projects, and noxious weed management, but additional funding is required.

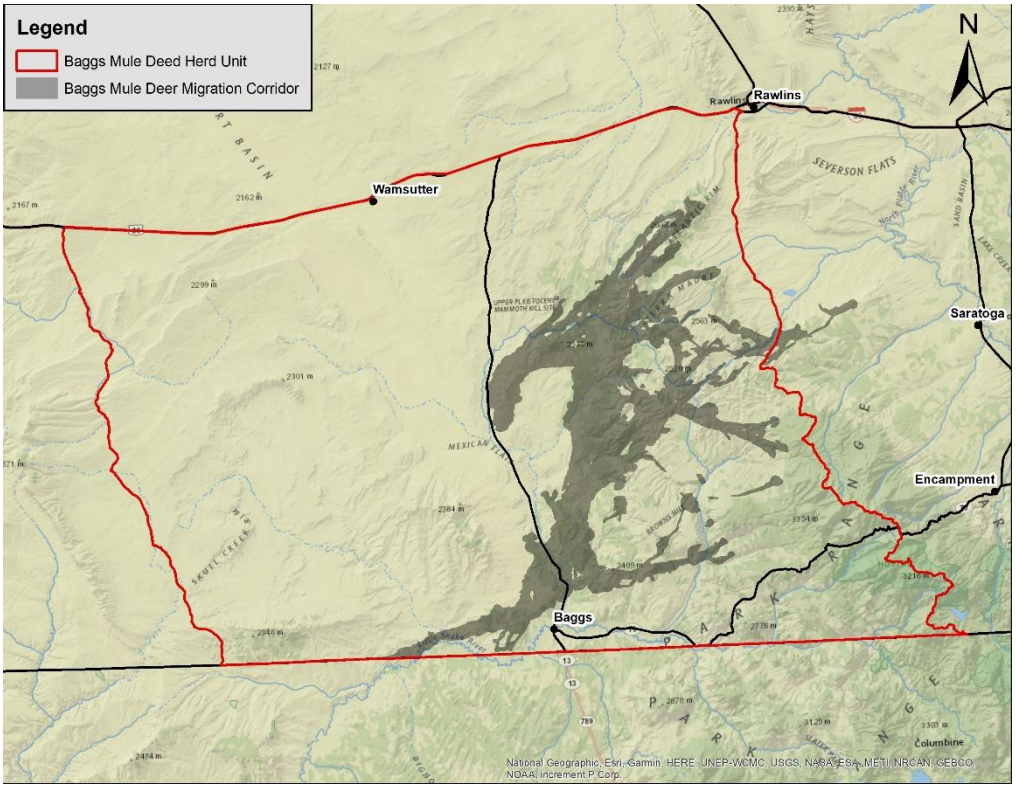
Cheatgrass treatments and conservation easements have been important tools used in the management of the Sublette mule deer herd



Habitat enhancements and management projects that have been completed from 2014-2019 to enhance function of the Sublette Mule Deer migration corridor

Other Issues for awareness:
Additional collaring efforts are underway to identify short distance migrants in the southeastern portion of the herd unit and to further document animal movements through Grand Teton National Park (GTNP) and into southeast Idaho.

Wyoming Migration Corridor Priority: Baggs Mule Deer



Baggs mule deer designated migration corridor

Why the area was selected as a priority:
The Baggs mule deer herd is one of the more popular and robust deer populations in Wyoming, supporting a significant amount of deer hunting on an annual basis. It has become increasingly popular as nearby herds have shifted to more conservative management. Despite a liberal annual hunter harvest, the population continues to respond to habitat conditions. The migration corridor for this herd is only 50 miles long in Wyoming compared to the longer Wyoming Range and Sublette mule deer herds. An additional 40 miles of this corridor occurs in Moffat County, Colorado, and is used during severe winter weather. The corridor is narrow and confined to transitional and winter ranges, becoming more complex and braided in higher elevation habitat near summer range. Winter severity influences migration length, with some deer moving only 30-40 miles during mild years.

Spatial Location:
The Baggs mule deer migration corridor spans from the western slope of the Sierra Madre Mountains in Carbon County, Wyoming, and moves southwesterly to the extreme southeast corner of Sweetwater

County and 40 miles into Moffat County, Colorado near the town of Maybell.

Habitat Types:
Mule deer habitats are dominated by mixed mountain shrubs, aspen, and mesic alpine habitat types on summer ranges to more xeric mahogany-sagebrush-juniper habitats in lower elevation winter ranges. Significant areas of beetle killed conifer occur on summer range, some of which is falling and opening the canopy for more productive aspen habitat. Healthy aspen occur within this mountain range in Wyoming, and mountain shrub communities tend to be in climax to decadent condition. The aspen component within the herd unit can be prolific throughout mule deer transition and summer ranges, depending on location. The mixed mountain shrub component includes serviceberry, antelope bitterbrush, and mountain mahogany and is key to the viability of this mule deer herd.

Important Stopover areas within the corridor:
Recent research on the Sublette herd indicates that mule deer spend 95% of their migration period in a series of stopover sites, where they congregate to feed and replenish energy stores. It appears that a similar foraging behavior is exhibited by mule deer in the Baggs herd unit and stopover habitats have also been identified using the BBMM.

Land ownership:
During migration, mule deer in the Baggs herd cross a variety of jurisdictions ranging from summer habitats on USFS to lower elevation transitional and winter ranges managed by the BLM. Some private and OSLI lands are also within the corridor.

Land Uses:
Energy development, both traditional oil and gas and newer sources such as wind and solar, are the main industrial land use, along with traditional ranching.

Risk/Threats:
Energy development, specifically oil, natural gas, wind, and solar energy are ongoing developments in this herd. Continued coordination with the BLM, OSLI, and energy developers will remain a priority to minimize disturbance in migration corridor habitats. Invasive species invasion and current fence conditions are threats where partners are working towards solutions.

Are the Risk/Threats Immediate or Long-term:
Increased energy development, both traditional oil and gas and newer sources such as wind and solar, remain long term risks in this herd. Vegetation management and fence modifications are both immediate and long-term threats.

Actions necessary to reduce or eliminate risks/threats:
To insure that there are no significant declines in mule deer distribution and abundance, it will be important to maintain habitat function of mule deer seasonal ranges. Upon corridor designation, geospatial data has been made available to the federal land managers and public to encourage the development of an acceptable plan for avoidance, minimization, rectification and/or restoration to maintain habitat function prior to project development. Habitat projects including invasive species treatments and fence modifications are planned within the herd unit.

Highway underpasses have been constructed and used by various wildlife in the Baggs mule deer herd

Current efforts (what is the activity; who is conducting the work; and partners involved):
The WGFD is working with local officials, BLM, USFS, Colorado Division of Wildlife, UW, WYDOT, the Little Snake River Conservation District, local sportsmen groups, conservation organizations, OSLI, and numerous private landowners. Fence modification efforts have been very successful and over 30 miles are in process of modifications. Additionally sagebrush mowings have occurred to enhance forage quality in the herd.

Cost of current or needed habitat treatments; road crossings etc.:
Over $500,000 has been allocated for habitat projects in the Baggs mule deer herd unit in the last five years.

Other Issues for awareness: None known

Wildlife friendly fence modification have occurred throughout the Baggs mule deer herd unit

Other Current Activities, Management Actions:

Ungulate Migration Corridor Strategy

WGFD spent several months working with the public and stakeholders to develop a strategy for conserving ungulate migration corridors. The culmination of that inclusive process was the Ungulate Migration Corridor Strategy adopted by the WGFC at their January 2016 Commission meeting. Migration corridors are considered "vital" under this strategy which also identifies key components of corridor, bottleneck, and stop-over research findings. Additionally the Commission revised their standard range definitions to include ungulate migration corridor, ungulate stopover, ungulate migration bottleneck, and ungulate movement route use by WGFD personnel (WGFD, 2016).

Wyoming Game and Fish Commission Activities

The Wyoming Game and Fish Commission (WGFC) has contributed significantly to improved management of migration corridors through funding research, highway crossing projects and on the ground improvement projects. WGFC has committed $2.5 million dollars over the last five years towards nine priority Mule Deer Initiative herds. These funds have been matched by outside funding totaling $14.3 million dollars. In total, 45 projects have been funded that address either direct habitat challenges or studies that are designated to target future habitat actions. WGFC has also contributed $2,000,000 towards two highway crossing projects in the last two years. Additionally, in 2020 WGFC contributed $500,000 towards invasive annual grass mapping and management in important habitats.

Wyoming Governor's Advisory Group for Migration

In summer 2019, Governor Mark Gordon tasked a Migration Corridor Advisory Group with developing recommendations to improve the state's policies related to big game migration. In August, the group finished its work and presented the Governor with its recommendations. The recommendations begin with an overarching call to pursue an Executive Order related to big game migration corridors and the industries, economies and private landowners that enhance, overlap, and grow from Wyoming's world-class migrations. The advisory group included representatives from the oil and gas, mining and agriculture sectors, as well as conservation, recreation, sportsmen groups, and a county commissioner.

Wyoming Mule Deer and Antelope Migration Corridor Protection Executive Order 2020-1

In January 2020, the Governor of Wyoming signed into effect the Wyoming Mule Deer and Antelope Migration Corridor Protection Executive Order 2020-1. This Executive Order designated the Platte Valley, Baggs and Sublette Mule Deer Migration Corridors and outlined a process for additional corridors to be designated or identified in the future. The Executive Order also identified how development and disturbances should be managed in order to ensure functionality of the migration corridors into the future.

Wyoming Migration Initiative

The Wyoming Migration Initiative is a model for catalyzing science-based conservation and management of wildlife corridors. Founded in 2012 as a project of the Wyoming Cooperative Fish and Wildlife Research Unit, the initiative works with collaborators to collect data needed to effectively conserve migratory wildlife. (Kauffman, 2016)

Wyoming Wildlife Roadways

A collaborative effort was initiated between the WGFD and WYDOT to reduce wildlife vehicle collisions as a result of the Wyoming Wildlife and Roadways Summit in 2017. The Wyoming Wildlife and Roadways Initiative Implementation Team is a multi-stakeholder group tasked with prioritizing and implementing highway crossing projects that were identified at the Summit (Lutz et al. 2017).

National Fish and Wildlife Foundation (NFWF) Funds

The WGFD in collaboration with Mule Deer Foundation received a total of $913,000 of NFWF funds in 2018 under the NFWF grant program - *Improving Habitat Quality in Western Big Game Range and Migrations Corridors Fall 2018.* The funds will be allocated in the following manner and actions are further described in the herd units listed below:
$150,000 for the Platte Valley Herd Invasives and Habitat work
$719,550 for the Sublette Herd Initiative Invasives and Fence Work

In 2019 WGFD was awarded $249,000 of NFWF funds through the same grant program. The funds will be allocated in the following manner and actions are further described in the herd units listed below:
$75,000 for the Baggs Herd Fence Work
$114,000 for the Wyoming Range Herd Invasives and Fence Work
$60,000 for the Dubois Herd Invasives Work

Partners for Fish and Wildlife (PFW) Funds

In 2018 WGFD and USFWS PFW Program received a total of $293,000 to implement projects associated with SO 3362. The funds were awarded in the following manner and the actions are further described in the herd units listed below:
$150,000 for the Baggs Herd Wildlife Highway and Enhancement Work
$113,800 for the Sublette Herd Fence Work
$30,000 Platte Valley Herd Fence Work

In 2019 WGFD and USFWS PFW Program received a total of $116,500 to implement projects associated with SO 3362. The funds were awarded in the following manner and the actions are further described in the herd units listed below:
$47,500 Wyoming Range Herd Fence Work
$49,000 Baggs Herd Grazing Management and Water Development Work
$20,000 Dubois Herd Fence Work

DOI SO 3362 Research Funds

In both 2018 and 2019, DOI provided $300,000 to assist with data collection efforts in Research Priority Herds. We have provided updates on these research herds in Appendix A. In 2018, $175,000 was provided for Carter Mountain Pronghorn and $125,000 was provided for Powder River and Pumpkin Buttes Mule Deer GPS collar projects. In 2019, $125,000 was provided to Sublette Pronghorn, $40,000 was provided for Medicine Bow Pronghorn—Shirley Basin, $50,000 was provided for Platte Valley Mule Deer and $85,000 was provided for North Bighorn Mule Deer GPS collar projects.

Other Agency Agreements and Frameworks

In 2020, the State of Wyoming and USFS signed a shared stewardship agreement that should help

facilitate additional management actions on the ground. Additionally, USFS awarded Joint Chief's funds in the Sublette mule deer herd which is implementing projects outlined in this Plan. NRCS Sage Grouse Initiative funds are also incorporated into invasive species and grazing management in the Sublette, Baggs, Platte Valley and Wyoming Range mule deer herds.

Programmatic NEPA projects have been completed on two National Forests which have helped improve efficiencies at the field level to implement important vegetation projects. The Medicine Bow Landscape Vegetation Analysis (LaVA) project and Medicine Bow-Routt National Forest and Thunder Basin National Grassland Invasive Plant Species Management Environmental Impact Statement (EIS) occur within the Platte Valley mule deer herd and the Bridger Teton National Forest Invasive Plant Management EIS overlaps with the Sublette and Wyoming Range mule deer herds. Efforts from other groups are underway to expand agency agreement processes in order to implement additional work on the ground in future years.

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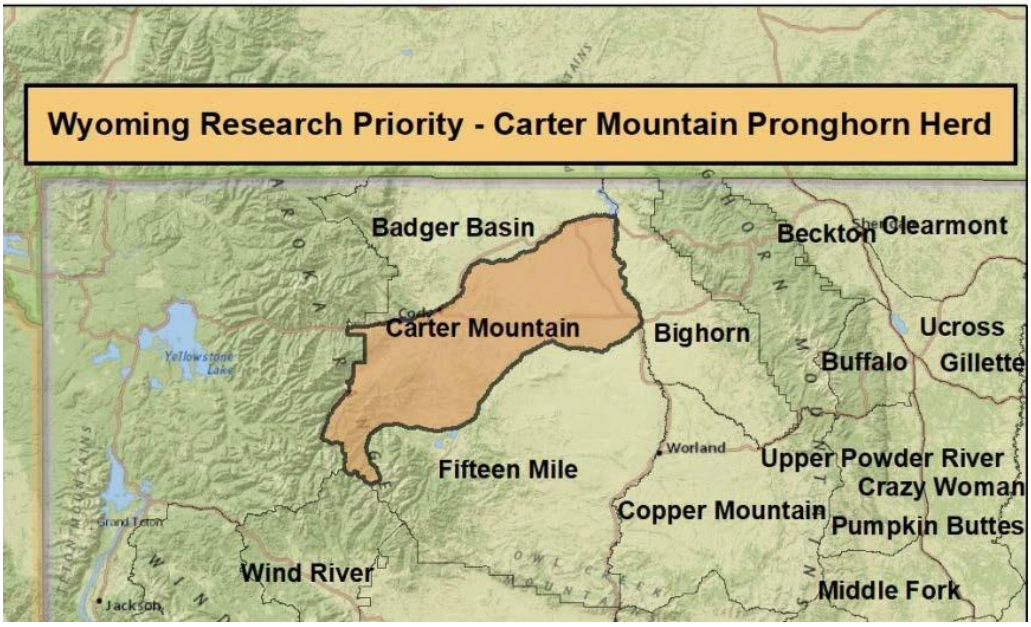
Appendix A: Research Priority Herd Updates

In the 2018 and 2019 State Action Plans, the WGFD identified the Carter Mountain Pronghorn, Powder River/Pumpkin Buttes Mule Deer, Sublette Pronghorn, Platte Valley Mule Deer, Medicine Bow Pronghorn—Shirley Basin and North Bighorn Mule Deer herds as research priorities. This section updates progress made on these research projects over the last two years.

Carter Mountain Pronghorn (2018 SO 3362 Funding $175,000):



Carter Mountain pronghorn herd unit

Why the area was selected as a priority:
This herd crosses 2-4 state highways and multiple fences along the pronghorn's 40+ mile migration in an area known as Antelope Alley. However, prior to the recently funded GPS collar study, no telemetry studies have been conducted on this herd to map seasonal ranges, including migration corridors and identify barriers. WYDOT's crash and WVC data from 2011-2015 show 2.4-4.6 vehicle/pronghorn collisions per mile on U.S. Highway 120 between mileposts 62 and 65.5 (Lutz et al. 2017). At the 2017 Wyoming Wildlife and Roadways Summit, this crossing was identified as one of the highest priorities in WYDOT District 5. The right-of-way fence in this key stretch was modified to help thousands of migrating pronghorn negotiate the highway crossing.

Spatial Location:
The Carter Mountain Pronghorn Herd migrates approximately 40 miles from the east slope of the Absaroka Mountains (specifically Carter Mountain) east to the interior of the Bighorn Basin.

Habitat Types:
Summer range on the side of Carter Mountain is best described as diverse with open plains of mountain

big sagebrush mixed with aspen and riparian communities. In the winter, pronghorn move down in elevation to the Bighorn Basin to use Wyoming big sagebrush, saltbush, and other desert species.

Important Stopover areas within the corridor:
Important crossings occur along Dry Creek at U.S. Highways 120 and 14/16/20, but others are undocumented and will be identified through BBMM analysis when the data collection effort is complete.

Land ownership:
In the summer, the Carter Mountain pronghorn herd can be found on a mix of state, USFS, BLM, and private lands on the east slope of Carter Mountain. As the herd migrates east off of private land, most reside on a mix of BLM and OSLI lands. Fences are designed to exclude pronghorn from private croplands during migration.

Land Uses:
Federal lands are primarily managed for multiple use. Common uses include livestock grazing, motorized recreation, and energy development. Pronghorn are thought to migrate through and around oil and gas parcels and areas with ongoing energy development (Oregon Basin Oil Field). Private lands along the corridor are primarily used for agriculture and urban development.

Risk/Threats:
Highways and right-of-way fencing are currently the most visible threats. Thousands of pronghorn cross U.S. Highway 120. During severe winters, pronghorn also attempt to cross U.S. Highways 14/16/20, 32 and 310. Old fencing in the interior of this herd unit away from roads is also limiting animal movements and is a threat. Habitat conditions and range use are critical on winter range due to arid conditions and the invasion of cheatgrass. Improved migration data should outline bottlenecks and obstacles.

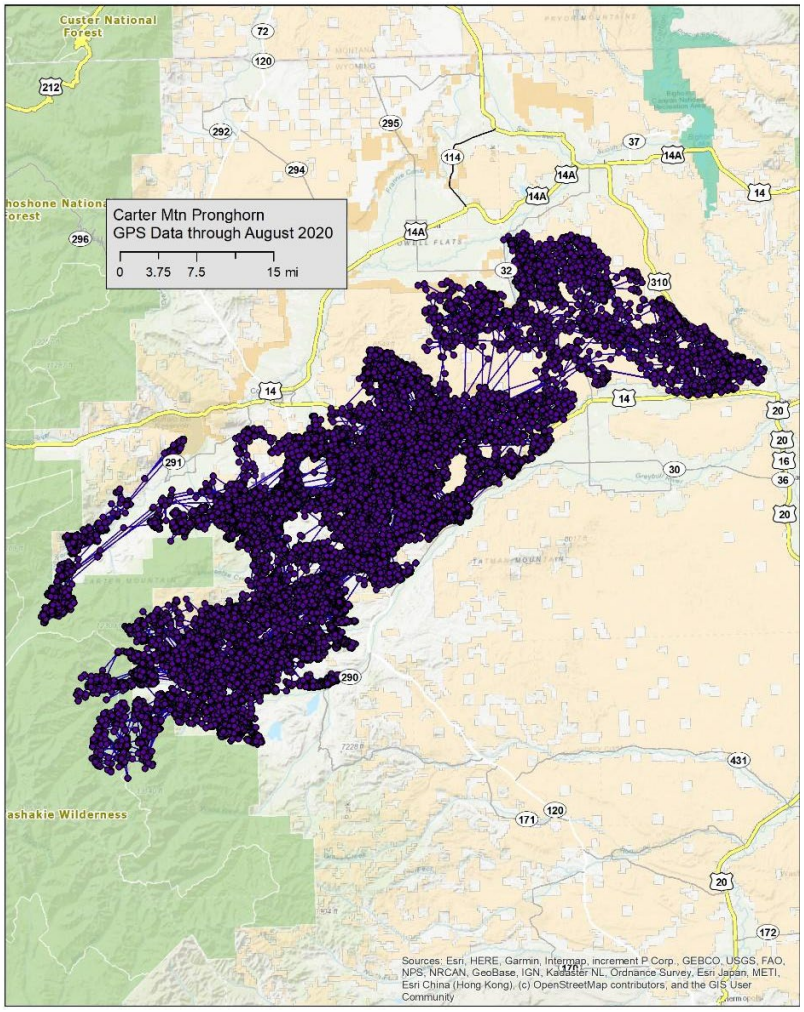
Are the Risk/Threats Immediate or Long-term:
Wildlife/vehicle collisions and modifying existing fences are both immediate and long-term issues. Managing invasive plant communities is an immediate and long-term threat. Managing public access and recreation are long-term, as is urban development and oil and gas leasing.

Actions necessary to reduce or eliminate risks/threats:
Managers have recommended the construction of an overpass on U.S. Highway 120 to help thousands of migrating pronghorn cross a busy state highway. Deployment of dynamic messaging signs on U.S. Highway 14/16/20 near pronghorn crossings, especially in severe winters would also help reduce risks. The deployment of GPS collars on pronghorn to identify seasonal distribution and movement corridors and barriers is a high priority for managers. Removing old fences in the interior of this herd unit, and continuing to modify right-of-way fencing are potential solutions to help reduce risks.

Current efforts (what is the activity; who is conducting the work; and partners involved):
The WGFD is working with WYDOT and the BLM to modify existing right-of-way fences to be more wildlife-friendly. These agencies also identified specific highway crossings where specialized fences called "goat bars" were installed on U.S. Highway 120 to help pronghorn cross. Captures were completed in November 2019.

Cost of current or needed habitat treatments; road crossings etc.:
Managers radio collared 100 doe pronghorn in the herd unit and will monitor year-round movements for 3 years.

Other Issues for awareness:
Wildlife managers have kept some fencing in place to prevent migrating pronghorn from entering agricultural lands where they cause crop damage.

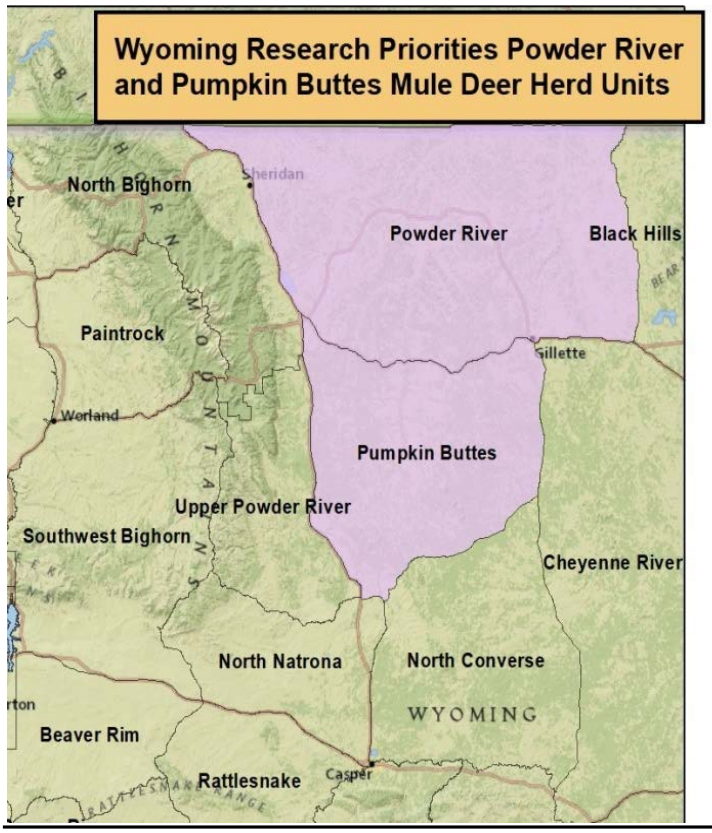


Carter Mountain Pronghorn GPS Collar Data collected November 2019-August 2020

Powder River and Pumpkin Buttes Mule Deer (2018 SO 3362 Funding $125,000):

Why the area was selected as a priority:
These 2 herd units border one another on the I-90 corridor with excellent deer habitat within the identified area. Although no migration corridors have been documented in this area, daily movement is common and seasonal movement may occur, although no detailed studies have been conducted. This

stretch of highway ranked highest in WYDOT District 4 for priority to address vehicle-deer collisions (Lutz et al. 2017).



Powder River and Pumpkin Buttes mule deer herds in northeast Wyoming

Spatial Location:
The area of concern includes a 24-mile stretch of I- 90 between Buffalo and Gillette extending from milepost 81 to 105, including lands adjacent to the interstate. Suspected movement patterns for mule deer occupying this area are up to 5-15 miles either side of I- 90.

Habitat Types:
Habitats include sagebrush and grassland. Cottonwood riparian habitat occurs along the Powder River. Mule deer seasonal range includes Yearlong and Winter/Yearlong range.

Important Stopover areas within the corridor:
No stopover areas have been identified

Land ownership:
Lands adjacent to I- 90 include a mix of private, BLM, and OSLI lands.

Land Uses:
Current land uses include livestock grazing, oil and gas development, and recreation.

Risk/Threats:
The majority of habitat is functioning as desired but I- 90 is a significant mortality factor with 8 mortalities per mile documented over a 5-year period. A better understanding of how traffic affects deer movement would enhance management efforts.

Are the Risk/Threats Immediate or Long-term:
Risks and threats are immediate as vehicle/deer collisions are ongoing.

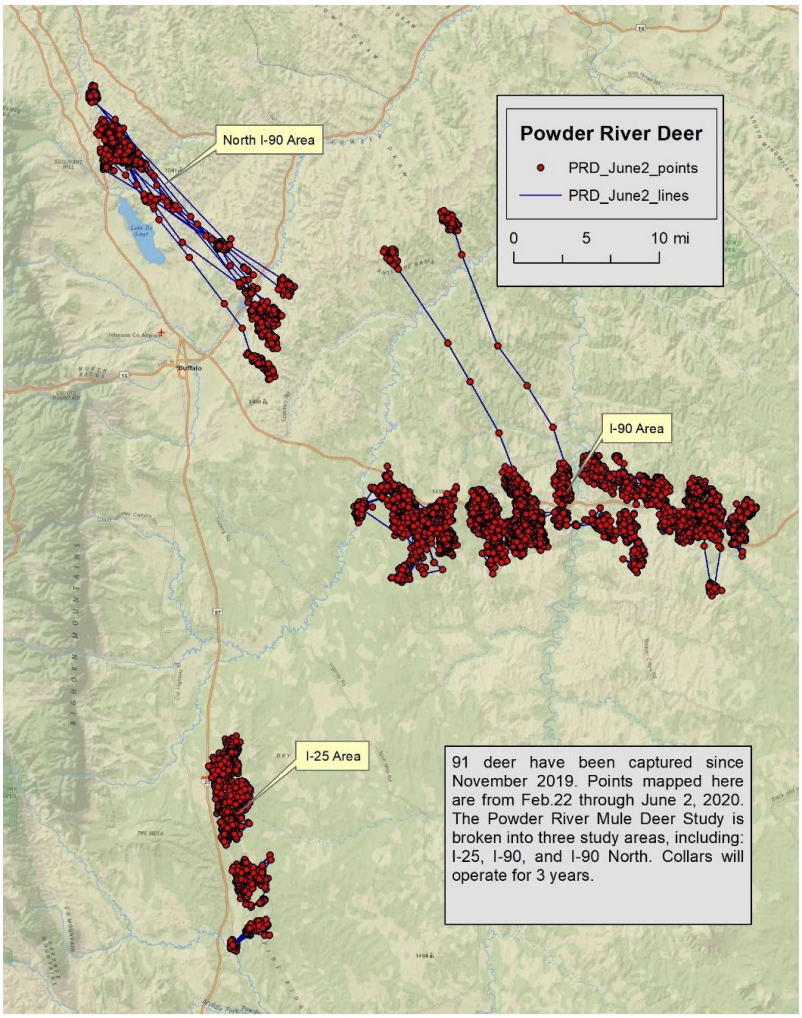
Actions necessary to reduce or eliminate risks/threats:
Signage is one option to alert motorists to deer activity. Right-of-way fencing is considered the only effective method to reduce collisions with underpasses needed to facilitate deer movements.


From November 2019 through September 2020, four vehicle collision mortalities of GPS collared individuals were documented. These data will help prioritize highway crossing and ROW project work.

Current efforts (what is the activity; who is conducting the work; and partners involved):
The WGFD and WYDOT are coordinating on a signing project to inform motorists of high deer activity in this area. A project to install LED border signs is being developed. Existing overhead Dynamic Message Signs are already being used to inform motorists.

Cost of current or needed habitat treatments; road crossings etc.:
Deer proof fence is being considered but is dependent on funding. Understanding deer movement patterns would better facilitate underpass installation.

Managers captured 91 doe mule deer since November 2019 and are currently monitoring year-round movements for a 3 year period to further identify seasonal habitats including movement corridors.



Powder River and Pumpkin Buttes Mule Deer GPS Collar Data, data shown from February-June 2020

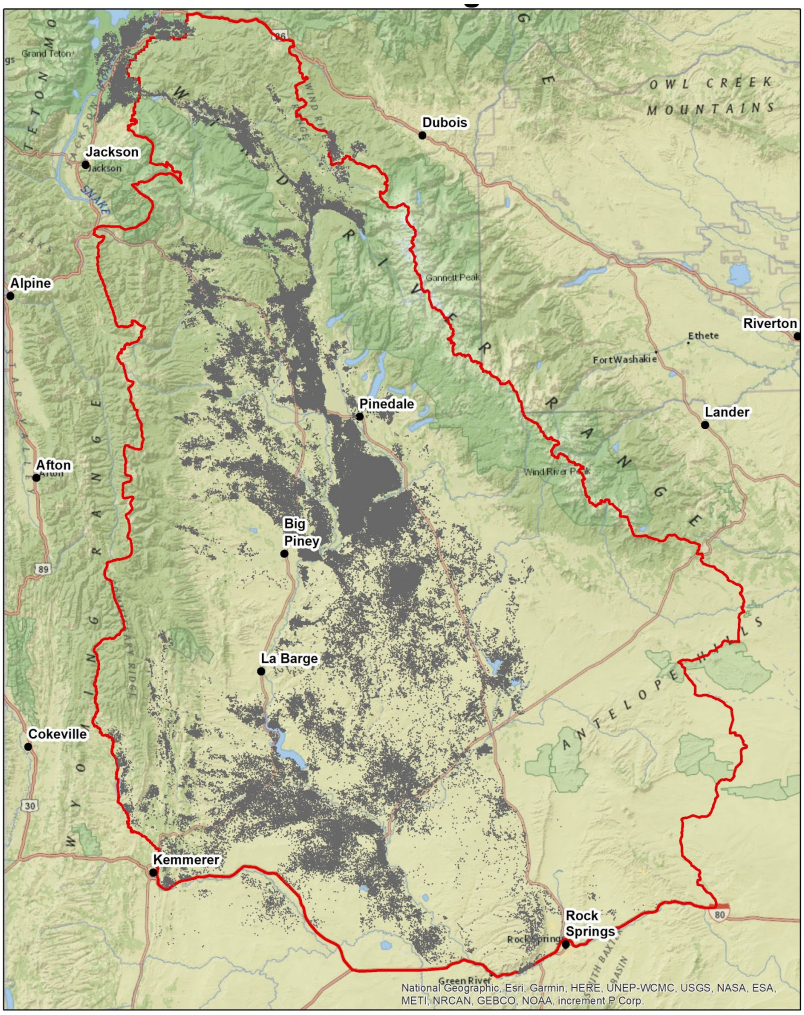
Sublette Pronghorn (2019 SO 3362 Funding $125,000):

Why the area was selected as a priority:

Pronghorn within the Sublette herd represent one of the largest pronghorn populations in North America. Individuals migrate nearly 180 miles between winter and summer ranges, crossing private, state, and federal lands, including many public land jurisdictions (OSLI lands, two BLM districts, USFS, and NPS lands). Pronghorn GPS collaring studies to date have focused on two areas in this herd: the segment summering north of the town of Jackson in and adjacent to GTNP, and within the central portion of the herd unit near the town of Pinedale.

Studies in and around GTNP have identified pronghorn movements into and out of the Jackson Hole valley (few animals winter in Jackson). Investigations in the central portion of the herd on largely BLM managed lands were conducted to evaluate the effect of large scale energy projects (natural gas), including the

Pinedale Anticline and Jonah Field developments. These projects and future planned gas fields (e.g., Normally Pressured Lance lying south of the aforementioned fields) have created significant disturbances



Sublette Pronghorn herd GPS collar data, 2002-2018

to pronghorn migration corridors and winter ranges. Sawyer et al. (2019) found over a 15-year period collared pronghorn in the Pinedale Anticline reduced the time spent in developed areas by nearly a month and the percentage of pronghorn abandoning winter ranges increased by 57%.

Additional collaring efforts have occurred in the southern reaches of the herd unit (especially near Fontenelle Reservoir and Farson) to document seasonal pronghorn movements where data gaps currently exist. Pronghorn appear to respond to surface disturbances such as large-scale energy developments, and additional analyses of pronghorn movements are underway at UW. Although a large data set has been collected on this population, the distribution of collars within the herd has not been ideal. Public outreach is ongoing as managers will be undergoing the designation process outlined in Executive Order 2020-1 in 2020.

Spatial Location:
The Sublette pronghorn herd occupies very diverse habitats from GTNP to South Pass and the Red Desert northeast of Rock Springs. The large geographic area occupied by this herd overlaps with many different land ownerships and covers varied land uses from protected intact habitats to areas of heavy energy development. The federally protected "Path of the Pronghorn" was formally designated in 2008, but this segment of the Sublette pronghorn migration corridor only includes USFS managed lands. Migration corridors and stopovers for the entire Sublette pronghorn herd were utilized for a BBMM that included 352 individual animals collared from 2002-2018 that migrated between summer and winter ranges.

Habitat Types:
Sublette pronghorn encounter a variety of habitat types during their annual migrations. Migrations vary in length, from long distance (i.e., Jackson to Rock Springs), medium distance (i.e., Bondurant to Pinedale), to short distance (i.e., north Pinedale to south Pinedale) movements. Migration distance influences habitat types encountered by migrating pronghorn in the Sublette herd, with shorter distance migrants (resident pronghorn) remaining on designated winter ranges year-round. Generally, winter range is characterized as low precipitation zones sagebrush and desert shrub communities with varying topography. Transition range includes sagebrush-dominated winter range with interspersed bitterbrush and rabbitbrush, to highly productive summer ranges in higher precipitation zones. Summer ranges include areas of high precipitation with increased herbaceous vegetation and sagebrush dominated habitats, although some pronghorn can be found very near (or moving through) aspen and conifer stands. Habitats in the southern ranges are undergoing industrial development and are negatively impacted by wild horse use.

Sublette Pronghorn have migrated 180 miles between summer and winter ranges

Important Stopover areas within the corridor:
BBMM of GPS collar data from Sublette pronghorn indicate numerous stopovers throughout the mapped corridors. These locations will be further refined with additional data collection.

Land ownership:
During migration, pronghorn in the Sublette herd cross a mix of land ownership. In the extreme northwest portion of the corridor, pronghorn cross private lands, USFS, and NPS lands. In the central portion of the 180 mile corridor, animals cross private, OSLI, WGFC, and BLM lands. During the winter, animals can be found on private, OSLI, and BLM lands.

Land Uses:

Federal lands not designated as Wilderness or managed by the NPS are managed for multiple use, including livestock grazing, motorized recreation, and energy development (wind, solar, natural gas and coal). Pronghorn migrate through leased oil and gas parcels where drilling may occur and areas with ongoing energy development. The world's largest deposit of trona is also found within this herd unit. OSLI lands are managed primarily for “long-term growth in value” and “optimum, sustainable revenue production” to generate funds for public schools. Accordingly, the primary uses of these lands are livestock grazing and energy development. Private lands along the corridor are primarily used for agriculture and urban development. Some BLM lands heavily used by pronghorn in the Sublette herd are designated as ACECs or WSAs. A significant amount of land within this herd unit is managed under the National Historic Trails system.

A portion of the Sublette Pronghorn herd summers in Grand Teton National Park

Risk/Threats:

The 2008 designation of the 'Path of the Pronghorn' gave federal protections to USFS administered lands within the migration corridor in the northwestern portion of the herd, and is an example of some of the work that has been accomplished to date to conserve Sublette pronghorn. Migration corridor and stopover identification for the entire Sublette pronghorn herd is ongoing and will help managers prioritize conservation efforts to benefit pronghorn in the future.

Habitat conditions and range use can influence habitat in areas with low productivity and advanced seral stages of some plant communities. Invasive plants may decrease habitat functionality in portions of the corridor. Increasing traffic volumes on some highway segments and on popular secondary roads may become a barrier to pronghorn movements. Wildlife crossings on several roadways impact seasonal pronghorn movements. Highway overpasses north of Pinedale along Highway 191 have increased pronghorn passage in a critical bottleneck (Trapper's Point), but a high-use crossing of Highway 189 north of Marbleton remains to be addressed. Right-of-way fences are a concern in some areas, especially where existing 'sheep'-style net wire fences are a major impediment to pronghorn crossing the highway, or becoming trapped within the highway right-of-way. Fence permeability near subdivisions and along the high use crossing of Highway 191 on the west end of Pinedale impedes migration within the Sublette pronghorn herd. Additional threats include competition with wild horses, periodic drought, solar, wind,

and traditional energy developments.

Are the Risk/Threats Immediate or Long-term:
The existing and future energy development within the central and southern portions of the Sublette pronghorn herd could pose an immediate and long-term threat. The loss of habitat to energy infrastructure directly reduces forage. Indirect effects, such as pronghorn avoidance of energy infrastructure, reduces pronghorn use of those habitats. Combined, those effects effectively reduce the carrying capacity of the habitat in the Sublette pronghorn herd. Not managing late seral habitats and untreated invasive plants are also both immediate and long-term threats. Preparing for increasing traffic volume, wildlife vehicle collisions, and wildlife crossing structures are all long-term. Managers expect that this herd will be impacted as development, traffic, noise, and human presence increase.

Trappers Point overpass is used by thousands of pronghorn each spring and fall by Sublette pronghorn

Actions necessary to reduce or eliminate risks/threats:
Several actions are necessary to reduce threats to this herd. Using current data, managers would like to analyze movement data, update important seasonal ranges, and designate migration corridors. Gathering more GPS collar data in the southern portion of the Sublette pronghorn herd will facilitate the identification of additional pronghorn migrations and identify potential barriers. Managers will continue to collaborate with energy companies, private landowners, NGO's, local governments, federal land managers, sportspersons, and the general public to ensure pronghorn migration remains unimpeded for the conservation of this herd.

Current efforts
The WGFD is working with UW to conduct more research on pronghorn in the southern portions of the Sublette herd. The WGFD is also working with UW to map migration corridors for the herd, and with WYDOT to prioritize highway crossings state-wide. In addition, the WGFD is working with Sublette County Conservation District, local conservation organizations, BLM, USFS, OSLI, and numerous land owners on fence modifications or removal and other projects to conserve Sublette pronghorn.

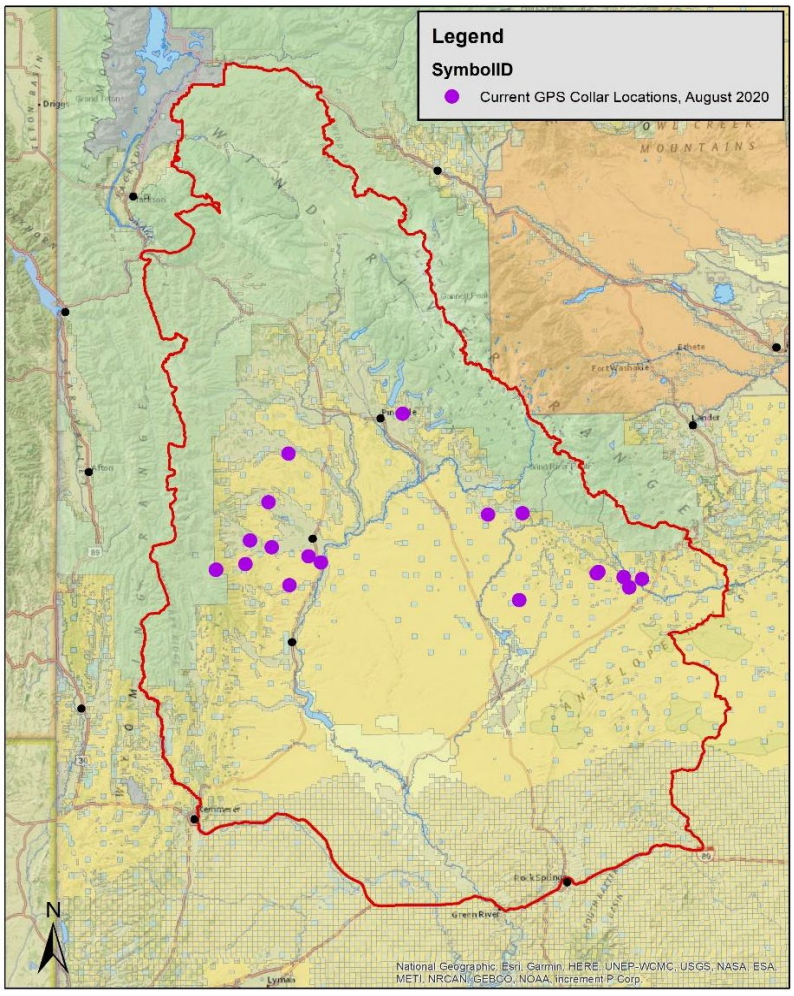
Cost of current or needed habitat treatments; road crossings etc.:
Costs will be assessed as site-specific mitigation projects are developed.

2019 DOI Research Funding

The WGFD has utilized DOI Research funds from 2019 to collar 19 pronghorn in March 2020 within the Sublette Pronghorn Herd. An additional 46 collars are planned to go out in winter 2020-21. These collars will all be deployed during winter months targeting the southern half of the herd unit in hunt areas 89, 91, 92, 93, 96 and 107 where GPS information is lacking on pronghorn movement. The collars will stay on animals 2-3 years and collect data on a 1-2 hour fix schedule, dependent on battery life budgeting. The Draft Sublette Pronghorn migration corridor will be revised and updated once this data collection effort is complete and additional BBMM analysis has been completed. Data analysis will be completed through the partnership with WMI and US Geological Survey (USGS).

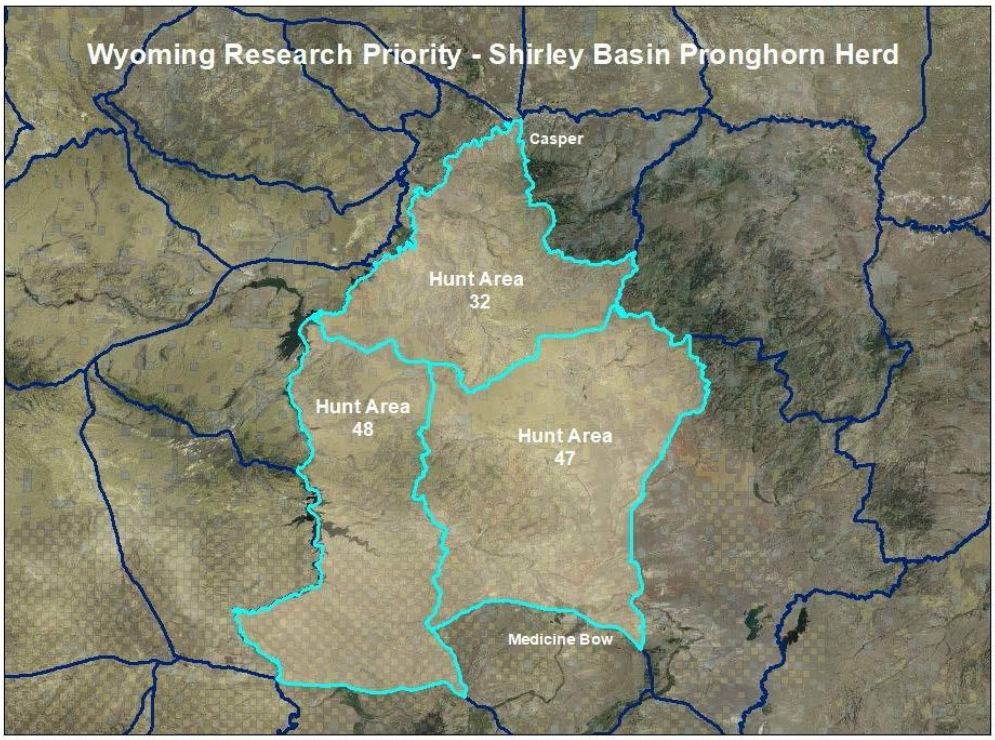
Other Issues for awareness

Pronghorn appear to have less fidelity to individual migration routes than mule deer. However, recent studies demonstrate that pronghorn are negatively impacted by surface disturbances in habitats along their migration corridors. Plasticity of pronghorn fidelity to migration corridors remains undetermined, and warrant a more thorough review of existing data to parse out thresholds at which pronghorn abandon traditional routes.



Sublette Pronghorn GPS Collar locations as of August 2020

Medicine Bow Pronghorn Herd-Shirley Basin (2019 SO 3362 Funding $40,000):



The portion of the Medicine Bow pronghorn herd targeted for the Shirley Basin study

Why the area was selected as a priority:
Substantial seasonal pronghorn movements occur from summer range in northern Shirley Basin to crucial winter-yearlong range in Bates Hole. Seasonal habitat delineations should be better understood in this portion of the Medicine Bow Pronghorn Herd Unit. Bates Hole likely supports some of the highest wintering densities of pronghorn in North America. It is therefore imperative to ensure these movements remain intact in perpetuity. Gathering baseline information will better inform land use planning efforts, and are of particular importance given the potential for large-scale industrial wind development expansion in northern Shirley Basin. Fence removal projects are also a priority in this area, and a project is underway to assess fence negotiation by pronghorn and ultimately convert a ~12-mile stretch of fence to wildlife-friendly standards. Defining seasonal habitats would help inform future land-use planning while also enabling managers to better focus conservation efforts (i.e. additional fence modification, risk assessment, and habitat projects).

Spatial location:
The Medicine Bow Pronghorn Herd is a large herd unit consisting of seven hunt areas in central Wyoming. The Shirley Basin portion of the herd is represented by Hunt Areas 32, 47, and 48. Priority areas within these hunt areas are north of the towns of Medicine Bow and Hannah, east of the North Platte River including Seminoe and Pathfinder Reservoirs, and south of the City of Casper in the area known as Bates Hole.

Pronghorn that summer in Shirley Basin migrate out of the central region to more hospitable areas in the winter. Winter range occurs at lower elevations and receives much less precipitation than summer range. Pronghorn that were fitted with satellite GPS collars as part of a wind energy development study were observed to migrate either south of the Shirley Mountains and west toward Seminoe Reservoir, or north from the Shirley Mountains into Bates Hole in Hunt Area 32. Those GPS collared pronghorn that migrated into Bates Hole traveled approximately 35 miles from summer to winter ranges, and used well-defined movement routes. However, given the nature of the ongoing wind energy study, pronghorn were only collared in eastern and northeastern Shirley Basin. Pronghorn migrations from other portions of northern Shirley Basin (e.g. west of Highway 487) have not yet been defined via collared animal movements. Pronghorn from other parts of Shirley Basin are suspected to also migrate into Bates Hole along well-defined movement routes, and likely travel similar distances to the aforementioned collared pronghorn from northeastern Shirley Basin.

Habitat types:
Summer range consists of rolling landscapes dominated by Wyoming big sagebrush rangelands. Pronghorn are more dispersed and can be found in both low and high elevation sagebrush habitats during the summer months. In the winter, pronghorn move northward out of Shirley Basin and combine with pronghorn from Bates Hole to form immense wintering herds at lower elevations along the Bates Creek, Stinking Creek, Bolton Creek, Bear Creek, Ledge Creek, and North Platte River drainages. Winter range habitats consist of Wyoming big sagebrush and grasslands, along with basin big sagebrush and greasewood habitats along riparian areas.

Important stopover areas within the corridor:
Important crossings occur along U.S. Highway 487, between Sand Creek and Bates Creek, but are greatly restricted and bottlenecked by woven-wire right-of-way fences. Some movements have been directly observed by biologists and local landowners, and were confirmed with GPS collar data from six pronghorn over the winter of 2018-19. Specific stopover areas have not yet been delineated with the aforementioned six collared pronghorn that migrated into Bates Hole.

Land ownership:
In the summer, pronghorn in Shirley Basin utilize a mix of BLM, OSLI, and private lands throughout the herd unit. As the herd migrates north and west, the proportion of pronghorn on private lands increases, as winter ranges correspond to lower-elevation areas closer to the North Platte River and other sources of water. Many of the fences pronghorn must traverse were designed to contain sheep, though the majority of landowners in the area have converted to cattle operations. One large sheep producer still requires woven-wire over a large portion of Bates Hole west of Highway 487. Woven-wire and five-stranded pasture fences are widespread and impede pronghorn movements.

Land uses:
Federal and state lands throughout the herd are managed for multiple use. Common uses include livestock grazing, motorized recreation, fishing, hunting, and some uranium mining. Private lands are primarily used for grazing and agriculture. Wind energy in Shirley Basin has rapidly expanded as a land use in recent years, and further development is expected to continue in the near future. Areas designated and leased for future wind energy development overlap crucial pronghorn habitats in much of Shirley Basin. Cooperative research is being conducted on the impacts of such developments on pronghorn

habitat use, survival, and movement.

Risk/threats:
Existing and proposed wind energy development may be a potential threat to pronghorn habitat use and movements given the large-scale habitat fragmentation associated with such developments. Highway right-of-way fences and interior pasture fences also impede pronghorn movements. Managers suspect thousands of pronghorn negotiate woven-wire or 5-strand barbed wire fences along Highway 487 and within interior pastures throughout Shirley Basin and Bates Hole annually, especially during migrations to and from winter range. Habitat quality is further degraded on some winter ranges due to cheatgrass infestation. Improved movement data via satellite GPS collars would pinpoint movement bottlenecks and obstacles, and better define stopover and high-use habitats to prioritize management efforts.

Fence modifications are important to maintain the ability of pronghorn to move between seasonal ranges

Are the risk/threats immediate or long-term:
Identifying migration corridors and modifying existing fences to facilitate movement is both an immediate and long-term priority. Encroachment and expansion of invasive plant communities is an immediate and long-term threat. Managing (via proper siting and disturbance density) and/or mitigating energy development is both an immediate and long-term concern.

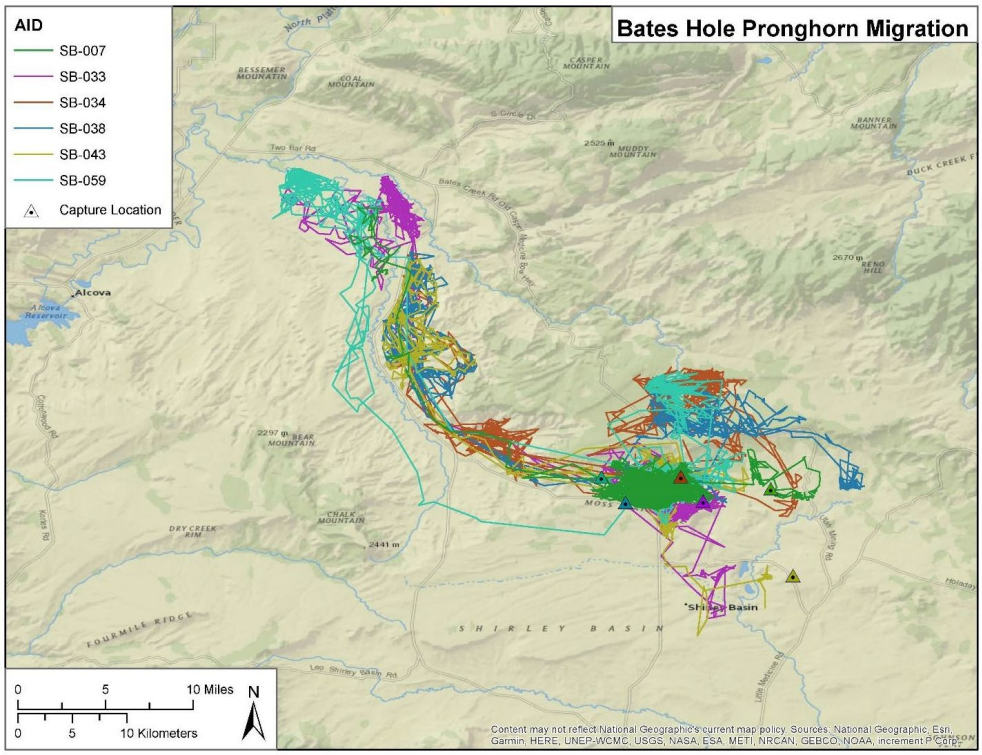
Actions necessary to reduce or eliminate risks/threats:
The deployment of satellite GPS collars on pronghorn to identify year-round and movement corridors and barriers is a high priority for managers, especially considering the proliferation of existing and proposed industrial-scale wind developments. Updating old fences in the interior of this herd unit and modifying right-of-way fencing have also been identified as a means to reduce risks for pronghorn.

Current efforts (what is the activity; who is conducting the work; and partners involved):
The WGFD is working with the BLM and WYDOT to convert over 12 miles of existing pasture fences to wildlife-friendly standards.

Cost of current or needed habitat treatments; road crossings etc.:
Costs will be assessed as site-specific mitigation projects are developed.

2019 DOI Research Funding
The WGFD has utilized DOI funds from 2019 to collar 40 doe pronghorn within the Medicine Bow Pronghorn Herd. Individuals summering in north central and northwest Shirley Basin were targeted for GPS collars in collaboration with the WMI. GPS collar data already collected from 6 individuals in eastern Shirley Basin has provided some information to help guide development of this project. Once data is collected, BBMM analysis will be completed by the WMI and USGS team. Movements will be evaluated for migratory, nomadic, and non-migratory behavior and the potential for a future corridor designation process will be determined once data has been analyzed. The study design has been developed based on available funding, including number of collars and duration of time collars will be maintained in this herd.

Other issues for awareness:
Some pasture fences will likely remain unaltered, as sheep are still present on one ranch and their associated grazing leases in the project area.

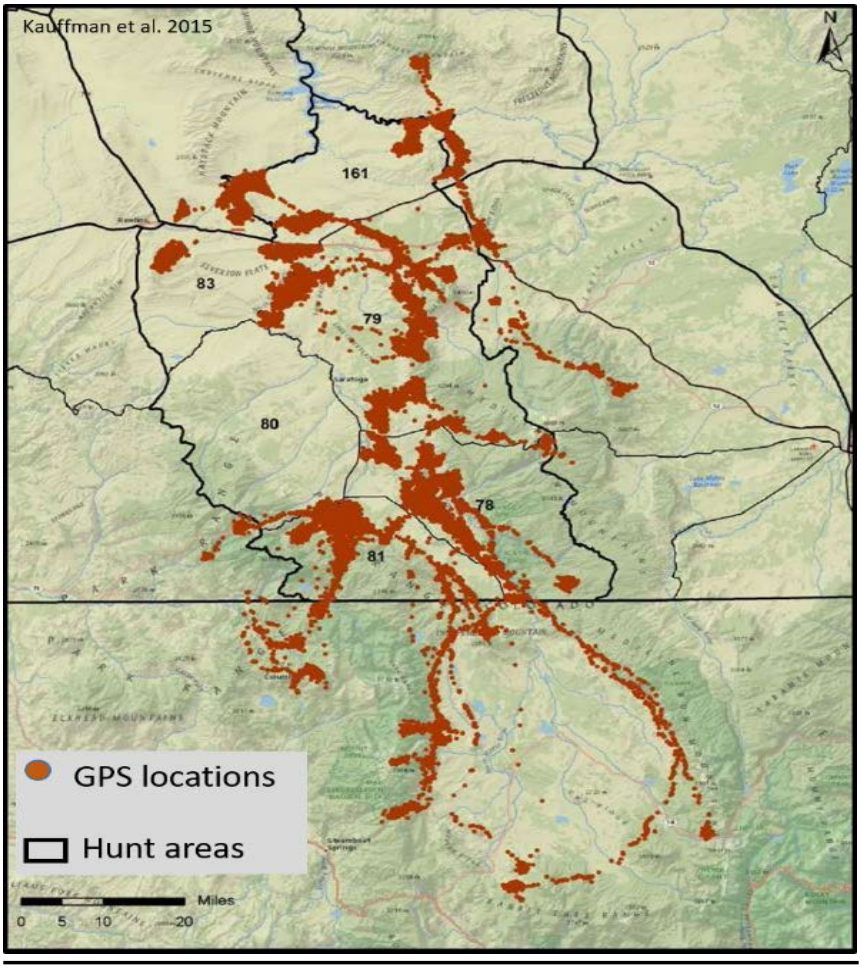


Medicine Bow pronghorn GPS collar data

Platte Valley Mule Deer (2019 SO 3362 Funding $50,000):

Why the area was selected as a priority:
The Platte Valley mule deer migration corridor represents high-use seasonal migration routes documented through GPS collar technology, and delineated using BBMM. The corridor highlights

important habitats used by approximately 5,000 mule deer migrating from summer range in Colorado to winter range in Wyoming. It also emphasizes the barrier to migration caused by the development of I-80. Currently, only a small percentage of the herd (approximately 400 animals) crosses the roadway to access winter range in the northern portion of the unit.



Platte Valley mule deer GPS collar data

Spatial Location:

The Platte Valley deer migration occurs primarily in Carbon County in south central Wyoming and in Jackson County in north central Colorado.

Habitat Types:

Habitats include alpine meadows, subalpine and montane forests, mixed mountain shrub, sagebrush-grasslands, cottonwood riparian, and agricultural croplands. The forests are a mix of subalpine fir, Engelmann spruce, Douglas fir, lodgepole pine, aspen, and a few ponderosa pines, with associated grass/forb/shrub understory vegetation. Big sagebrush, antelope bitterbrush, and true mountain mahogany dominate the lower elevation winter ranges. Elevation within the corridor ranges from just over 12,000 feet at Medicine Bow Peak to 6,400 feet along the North Platte River.

Important Stopover areas within the corridor:
Important stopover areas include areas in the Encampment River Wilderness Study Area, Beaver Hills, Bennett Peak, Baggot Rocks, Cedar Breaks, Savage Meadows, and St. Mary's Ridge.

Mule deer stopover and fawning areas are important for management consideration

Land ownership:
Land ownership is mixed within the migration corridor. The corridor encompasses 196 square miles that includes private lands (50%), BLM (30%), USFS (14%), and OSLI (6%).

Land Uses:
Federal lands not designated as Wilderness are managed for multiple use. Common uses include livestock grazing, motorized and non-motorized recreation, and both extractive and renewable energy development. Some BLM lands are designated as WSAs. Mule deer migrate through parcels that are leased for oil and gas development or through areas with ongoing wind energy development. Lands administered by OSLI are managed primarily for livestock grazing. Private lands along the corridor are primarily used for agriculture and rural residential development.

Risk/Threats:
The northern portion of the Platte Valley corridor is truncated by I-80, U.S. Highway 30 and the UP railroad. There is one I-80 machinery underpass where approximately 400 mule deer pass through seasonally. This underpass is located in an area where there is game fencing to direct animal movement to the structure. On unfenced sections of I-80, WYDOT has documented a high number of vehicle collisions with mule deer, elk, pronghorn, and moose. The most significant future threats in this area are increased traffic on I-80, Highway 30, and the railroad, as well as extractive and renewable energy development. Animals that use the southern portion of the corridor primarily migrate into Wyoming from Colorado to reach winter ranges. The most substantial future threats to these corridors are likely habitat fragmentation from rural residential development, substantial oil and gas development in northern Colorado, and increased disturbance from both off highway vehicle recreation and human disturbance on winter ranges. Finally, cheatgrass is distributed broadly in the corridor, and much of the shrub community is trending towards decadence, resulting in widespread need for habitat improvement.

Are the Risk/Threats Immediate or Long-term:
All risks and threats are immediate and long-term in nature.

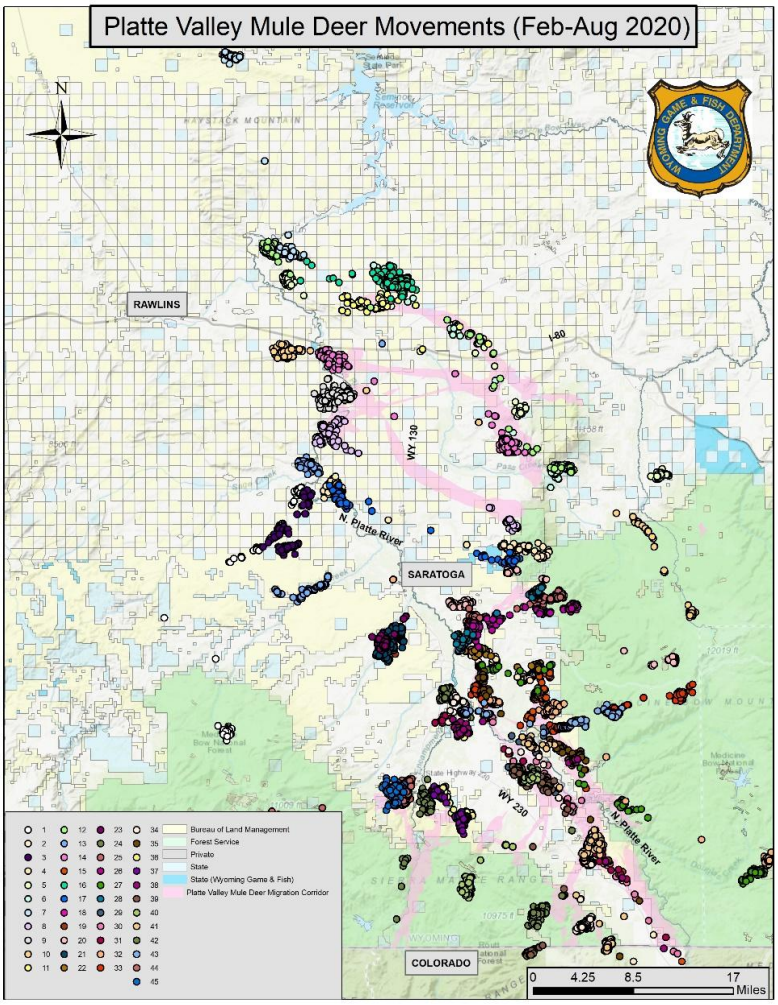
Actions necessary to reduce or eliminate risks/threats:
In the northern portion, risks and threats could be attenuated with the development of crossing structures on I-80, U.S. Highway 30, and the UP railroad. Threats to the southern portion could be reduced by maintaining open habitats on private lands through planning and zoning at the county level, and by improving fences to better allow for animal movement. BLM lands could provide better corridor and stopover habitats through the development of motorized travel management plans. In particular, a travel management plan would help to reduce animal disturbance on winter range. Habitat throughout the corridor could be enhanced with efforts to reduce conifer encroachment, improve shrub quality, and minimize cheatgrass cover.

Current efforts (what is the activity; who is conducting the work; and partners involved):
The WGFD is working with WYDOT, CCCD, Saratoga-Encampment-Rawlins Conservation District, local conservation organizations, BLM, USFS, and OSLI to influence habitat improvements. These projects include an assessment of suitable crossing structures and locations along I-80 near Halleck Ridge, large scale cheatgrass treatments, several fence conversion projects, and a combined juniper removal/aspen enhancement project. In addition, the Wyoming State Legislature recently authorized the WGFD to implement seasonal restrictions on shed antler hunting which has been implemented east of the Continental Divide. The BLM advises they are likely a decade away from completing a travel management plan in this area.

Cost of current or needed habitat treatments; road crossings etc.:
Costs will be assessed as site-specific mitigation projects are developed.

2019 DOI Research Funding
The WGFD has utilized DOI Research funds from 2019 to collar 45 doe mule deer within the Platte Valley mule deer herd. These collars were deployed in February 2020 targeting portions of the herd unit which will fill gaps in the existing data set. The collars will stay on animals 2-3 years and collect data on a 2 hour fix schedule, dependent on battery life budgeting. The designated Platte Valley mule deer migration corridor will be revised and updated once this data collection effort is complete and additional BBMM analysis has been completed. Data analysis will be completed through the partnership with the WMI and USGS.

Other issues for awareness:
None known.

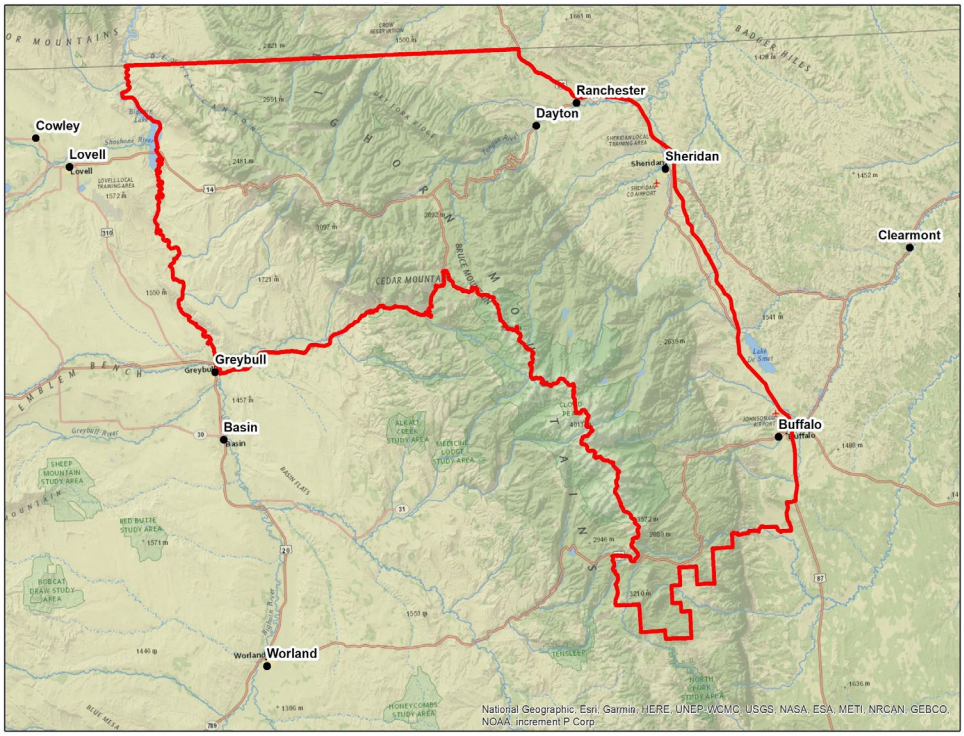


Platte Valley mule deer GPS collar locations February-August 2020

North Bighorn Mule Deer (2019 SO 3362 Funding $85,000):

Why the area was selected as a priority:

Averaging 3,351 hunters per year (2013-17) this herd unit is one of the more popular general hunting destinations in northern Wyoming. The WGFD managers and various stakeholders are concerned with mule deer populations and management in the northern Bighorn Mountains. WGFD managers have initiated pre-season mule deer surveys to gather baseline vital rates and summer distribution but they would like a better understanding of mule deer vital rates, seasonal habitats, habitat use, and movement. Harvest and habitat management can be effective, but currently local managers lack foundational resource selection data to prioritize these kinds of efforts. Segments of this population summer at higher elevations within the Bighorn National Forest and migrate to their respective winter range on both the east and west slopes. The specific direction and magnitude of this migration is unknown. Furthermore, as chronic wasting disease prevalence increases in neighboring herd units, the onus is on managers and research partners to determine the level of interchange with the North Bighorn mule deer herd.



North Bighorn mule deer herd

Spatial Location:

The North Bighorn mule deer herd includes the northern third of the Bighorn Mountain range north of U.S. Highway 14 to the Montana state line on the west slope and the Tongue River, Goose Creek, and Clear Creek watersheds along the east slope.

Habitat types:

Mule deer habitats within the Bighorn Mountains are mostly defined by elevational strata and aspect. Winter range varies within the elevation range between 4,000-7,000 feet where it consists of more xeric sites dominated by sagebrush and saltbush to more mesic sites dominated by rocky mountain juniper and curl leaf mahogany. Summer range varies as well between mountain big sagebrush dominated rangeland with intermittent aspen and willow communities occurring between 7,000-9,000 feet to sub-alpine slopes above 9,000 feet characterized by dense conifer forests and open meadows.

Important stopover areas within the corridor:

Stopover sites are mostly unknown due to the lack of telemetry data. However, it is suspected that most of the deer harvested within the general season (October 15-24th) are harvested while on transition range along the east and west faces of the Bighorn Mountains.

Land ownership:

The Bighorn National Forest divides the herd unit with abundant BLM lands to the west in the Bighorn Basin and private lands to the east in the Powder River Basin. Summer range for the North Bighorn Herd is almost entirely USFS ownership with the exception of non-migratory deer living on private and BLM lands

at lower elevations. Following their autumn migration, migratory deer appear to spend much of their time between BLM and private cropland and rangeland.

North Bighorn mule deer habitat

Land uses:

USFS and BLM federal lands are managed for multiple use. Common uses include cattle and domestic sheep grazing, recreation, timber harvest, bentonite mining, and energy development. Mule deer within this herd are thought to migrate through active bentonite mining claims north of Greybull (Steamboat Bentonite Mine). Private lands along the corridor are primarily used for agriculture and urban development.

Risk/threats:

It is likely that multiple variables contribute to poor population performance within the North Bighorn herd, however the cumulative impacts which lead to landscape-level habitat change is probably the leading driver. Conifer encroachment and succession has resulted in much of the herd unit exhibiting climax plant community characteristics where optimal browse is less prevalent. Additionally, annual invasive grass invasion is slowly shifting mule deer winter and transition range to a monoculture of grass with a frequent fire regime. Chronic wasting disease prevalence currently is 8.6% amongst adult males within the population. However, it is likely that neighboring herd units with higher prevalence rates could be contributing to transmission.

Are the risk/threats immediate or long-term:

These threats are almost entirely immediate and long-term as they cannot be mitigated or off-set only by immediate management action. Any strategy to improve habitat or reduce disease prevalence will require long-term commitments for herd unit level change.

Actions necessary to reduce or eliminate risks/threats:

WGFD plans to identify vital and seasonal habitats through GPS collaring of female mule deer in order to target habitat enhancement and barrier removal projects on the ground. This may include aggressive invasive plant treatment, aspen enhancement, conifer removal, riparian enhancement, highway crossing structures, or fence conversions. Targeted conservation easements to retain open space on private lands east of the Bighorn National Forest will protect functional habitat for migrating and wintering deer.

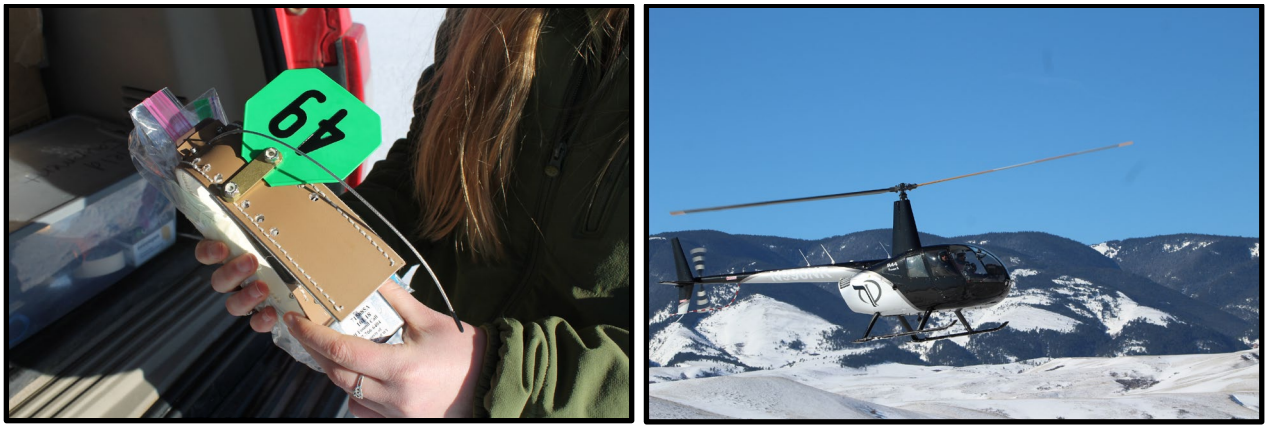
Movement data could also shift WGFD harvest management if the current structure is deemed unsuitable based on when and where deer migrate. Movement data could also lead to alternative or more targeted reclamation to existing or future mining claims.

Current efforts (what is the activity; who is conducting the work; and partners involved):
Current efforts are under way to enhance mule deer habitat on both summer and winter range. Partnership programs, such as the Shell Creek Collaborative and the Sheridan and Buffalo Municipal Watershed Projects between the WGFD and Bighorn National Forest have resulted in aspen and willow enhancement projects. Other conifer removal/aspen enhancement projects are additionally prescribed by both agencies independently throughout the forest. Conifer removal along riparian corridors is also occurring on winter range by private landowners, BLM, and the WGFD in order to stabilize watersheds and enhance shrub diversity.

Cost of current or needed habitat treatments; road crossings etc.:
Costs will be assessed as site-specific mitigation projects are developed.

2019 DOI Research Funding
The WGFD has utilized 2019 DOI Research funds towards the goal of collaring 120 doe mule deer within the North Bighorn mule deer herd. In March 2020, 25 collars were deployed on winter ranges and current collaring efforts on summer range are targeting an additional 60 individuals. An additional 35 collars will be deployed on winter range in December/March 2021. These collars have been deployed in the northern Bighorn Mountains, specifically in Hunt Areas 25, 50 and 53. The collars will stay on animals a minimum of 2 years and collect data on a 2 hour fix schedule, dependent on battery life budgeting. There has never been a detailed study of mule deer in the northern Bighorn Mountains, and consequently, seasonal ranges and migration corridors have not been delineated using GPS technology. Data analysis will be completed through the partnership with the WMI and USGS.

Other issues for awareness:
Wildlife managers have kept some fencing in place to prevent deer from entering agricultural lands where they cause crop damage.



North Bighorn mule deer captures have been successful to deploy GPS collars