FWP.MT.GOV

THE **OUTSIDE** IS IN US ALL.

Montana Action Plan Update
2022

For

Implementation of Department of the Interior Secretarial Order 3362: “Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors”

September 1, 2022

Prepared by:
Montana Fish, Wildlife and Parks

Table of Contents

Introduction

Many wildlife populations migrate long distances each year to survive and reproduce, but that movement has become increasingly difficult due to habitat fragmentation and barriers created by a range of factors. Additionally, winter range has been eroded by habitat fragmentation and noxious weeds. State and federal agencies, conservation groups, and others are trying different ways to maintain connectivity, big game mobility, and winter ranges.

Montana Fish, Wildlife, and Parks (FWP) has anchored many big game migrations by acquiring Wildlife Management Areas (WMAs) that serve as protected ungulate winter range. The Judith River, Sun River, Wall Creek, Mount Silcox, and many other WMAs were purchased to protect and conserve winter elk habitat. These critical WMAs, purchased in partnership with wildlife conservation organizations such as the Rocky Mountain Elk Foundation (RMEF) and others, provide secure winter habitat for big game that reduces damage to adjacent private land and ensures the long-term conservation of wintering habitat. Conservation easements—legal agreements purchased by partners and FWP that prevent subdividing on private land and the accompanying fences and roads that go with it—also sustain big game migrations. For nearly 40 years, FWP's Habitat Montana Program has used hunter license dollars to help purchase conservation easements to protect and enhance several hundred thousand acres of wildlife habitat. According to FWP biologists and researchers, more big game animals migrate to or reside year-round in wintering areas on private ranch and farmlands than public land holdings in Montana.

Elk are the most well-known migratory big game species in Montana. Known elk migrations range from just 15 miles, such as between the Sun River WMA and the Bob Marshall Wilderness, to 125 miles, like the migration route from winter range on Dome Mountain WMA in the Paradise Valley to summer range high in Yellowstone National Park. Because of the past and continued public interest in elk, most early game range acquisitions were for elk winter habitat, and more winter range and migration routes have been conserved for elk than any other species in Montana.

Some populations of pronghorn do not need to travel far, meeting their seasonal needs by moving within their year-long range. But some make great migrations. Biologists have tracked herds traveling more than 200 miles from southern Alberta and Saskatchewan south into Montana to winter.

Many eastern Montana mule deer are non-migratory, moving annually within their home range to find preferred seasonal habitats, while many western Montana mule deer populations occupying mountainous habitat are partially migratory, with varying proportions of herds travelling between distinct seasonal habitats. For example, some mule deer summering in Yellowstone National Park have migrated north through the Paradise Valley and over Interstate 90 to winter in lower elevations of the Bridger Mountains. In late fall, other mule deer migrate from the Swan Mountains across the full extent of the Bob Marshall Wilderness to winter ranges on the Rocky Mountain Front (Williams and Dixon 2013).

Secretarial Order 3362

U.S. Secretary of the Interior Ryan Zinke signed Secretarial Order 3362 (SO3362) on February 9, 2018 (Appendix A) to improve habitat quality and western big game winter range and migration corridors for pronghorn, elk, and mule deer. The order fosters improved collaboration with states and private landowners and facilitates all parties using the best available science to inform development of guidelines to help ensure robust big game populations continue to exist. Priority states include Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

SO3362 directs appropriate bureaus within the Department of the Interior to work in close partnerships with the above-mentioned states to enhance and improve the quality of big game winter range and migration corridor habitat on federal lands under the management jurisdiction of the Department of the Interior in a way that recognizes state authority to continue to conserve and manage big game species and respects private property rights. Through scientific endeavors and land management actions, wildlife such as Rocky Mountain elk, mule deer, pronghorn, and a host of other species will benefit. Additionally, SO3362 seeks to expand opportunities for big game hunting by improving priority habitats to assist states in their efforts to increase and maintain sustainable big game populations across western states.

The United States Department of Agriculture (USDA), through the USDA Forest Service (USFS) and USDA Natural Resource Conservation Service (NRCS), will collaborate with Department of Interior (DOI), the states, and other natural resource managers across the broader landscape when developing an all-lands approach to research, planning, and management for ecological resources. This approach incorporates migration corridors 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.

Federal Lands

Montana boasts over 27 million acres of federal lands, nearly one third of the state. Much of that land provides excellent hunting opportunities and supports winter habitat and migration corridors for elk, mule deer, and pronghorn. The Bureau of Land Management (BLM) manages over eight million acres of mostly range land and some forested land across the state. The BLM undertakes various conservation and restoration efforts that benefit big game winter range and migration corridors, such as removing fence, treating invasive weeds, and improving native vegetation. The United States Fish & Wildlife Service (USFWS) manages ten national wildlife refuges in Montana (over 1.2 million acres) most of which allow hunting during some portion of the season. National parks contain important big game seasonal ranges and migration corridors. The National Park Service (NPS) manages 1.2 million acres in Montana and maps wildlife corridors, treats invasive species, addresses wildlife-vehicle collisions, and employs fuels reduction to conserve and restore big game winter range and migration corridors. The USFS manages 10 national forests in Montana that comprise nearly 19 million acres. Most national forest lands that are legally accessible via a public road, navigable waterway, or adjacent state or federal land are open to hunting. FWP and USFS biologists collaborate to identify forest management prescriptions to manage forests in ways

conducive to continued use by large numbers of migratory elk and deer (e.g., Lyon et al. 1985, USFS and FWP 2013).

Summary of 2022 Update

Several updates are reflected in this 2022 version of the Montana Action Plan for Implementation of DOI Secretarial Order 3362.

The text covering Priority Area A, Continental Divide to Rocky Mountain East Front (Figure 1), includes updates on a variety of projects. The collaborative invasive weed treatment project that was awarded National Fish and Wildlife Foundation (NFWF) funding has resulted in a $637,382 investment in weed management and is in the final phase of implementation. The research to better understand various vital rate and ecological information for mule deer in Priority Area A has culminated with a final report focusing on assessment of seasonal space use and migration, population dynamics and vital rates, summer forage nutrition with particular focus on forest disturbance, summer and winter habitat selection, and fall migration patterns during hunting season (DeCesare et al. 2021). New opportunities are being sought to work with local NRCS offices to implement upland habitat maintenance and improvement projects and/or to incorporate wildlife friendly fence designs into the existing working landscape. Project development to address fuel accumulation is underway. Identified benefits of these projects include improving or protecting several types of wildlife habitats from the threat of high-intensity wildfire (include winter range habitat), promote aspen regeneration in certain areas, protect and enhance existing whitebark pine stands, and prevent increases in susceptibility of forest stands to mountain pine beetle or other infestations.

Priority Area B, Yellowstone National Park to Paradise Valley, has been dropped in exchange for an area in southeast Montana, i.e., Bighorn River to Little Missouri River. While work is being done in the Paradise Valley to document wildlife movement and barriers to passage, there are no on-the-ground projects ready for implementation or in need of immediate funding. Community organization is underway, with the intended formation of a local working group focused on landowner interests and the formation of another group focused on wildlife and transportation issues. Collaborative research to GPS collar mule deer and pronghorn is underway, and seasonal ranges and movement corridors will be identified based on these new datasets. FWP, through a grant received from the Greater Yellowstone Coordinating Committee, recently funded fence modification efforts that were completed on private lands near Big Creek. These areas in need of modification were identified by the pronghorn movement data and implemented in partnership with the National Parks Conservation Association. Mule deer and pronghorn collaring efforts will conclude in this area in 2023, after which time we hope to have community supported projects to propose for funding.

There are shovel ready, community supported projects in new Priority Area B, Bighorn River to Little Missouri River (Figure 2). Current pronghorn and elk research findings in the area are starting to identify migration corridors, impediments to movements, and season of use and habitats based on fine scale GPS collar data. Additionally, FWP has mapped and classified most fences, cross fences, and gates within the priority area to consider along with animal movement data.

These datasets will be used to identify and prioritize areas of high concern where habitat projects are needed. There is a lot of work to complete and additional resources will advance conservation efforts in this priority area.

The name of Priority Area C has been updated to include mention of the Beaverhead to reflect geography of the entire priority area more accurately, i.e., Anaconda Range to Beaverhead, Big Hole, Bitterroot, and Upper Clark Fork Watersheds (Figure 3). Pronghorn in this priority area migrate the longest distance of any of the eight pronghorn populations that FWP deployed GPS collars on during 2020. We have identified several priority fence modification or removal needs associated with this pronghorn population based on clear movement barriers that are evident in the data. We have also evaluated the effects of different fence types on pronghorn movements. We are implementing a spatial analysis that combines GPS collar data with fence spatial data to quantify altered and unaltered encounters with fence segments (Xu et al. 2020). Finally, we are still pursuing two high-priority land conservation needs, the Maclay property and the Hackett Ranch property. Both properties are critical for big game, as evidenced by GPS collar data and maps. We have also identified an important region for conservation easements within critical elk winter range in the Upper Clark Fork watershed.

Existing and new partnerships along with opportunities to leverage funding between partners has led to working at the large scale necessary to facilitate big game migration in Priority Area D, Canadian Border to the Musselshell Plains (Figure 4). Most recently, a Regional Conservation Partnership Program (RCPP) was established for the period of 2021-2026, making USDA funds available to private producers across the area to address threats to big game migration corridors and winter ranges. The Ranchers Stewardship Alliance (RSA) prioritization tool that was funded with NFWF dollars is being used to evaluate and identify high priority projects. The majority of funds from the two SO3362 grants awarded to RSA have been used to improve big game winter range and ungulate migration across the priority area through grassland reseeding, fence removal or modification, and improved grazing management. The two previously identified focus areas of US Highway 191 south of Malta near Beaver Creek and US Highway 2 west of Glasgow are being removed considering the previous grant awards and projects implemented there.

Public agencies, non-governmental organizations (NGOs), and private landowners have been and continue to collaborate on land conservation in Priority Area E, Heart of the Salish (Figure 5). FWP and Trust for Public Lands (TPL) acquired $26 million from the USFS Forest Legacy Program (FLP) for two nationally ranked #1 projects within Priority Area E, i.e., the Montana Great Outdoors Project (FY23) and the Upper Thompson Phase 1 Project (FY24). Recent accomplishments include Kootenai Forest Lands Project Phase I and II and the Lost Trail conservation easement projects. The Montana Great Outdoors and Upper Thompson Phase 1 conservation projects need additional funding as does work within the USFWS Lost Trail Conservation Area, noxious weed control throughout the priority area, and highway mitigation to reduce wildlife-vehicle collisions. Priority Area E serves as winter range for elk, yet little is known about the movement and habitat use of these animals. Management of this wildlife resource would be greatly enhanced by obtaining information on how migratory and resident herds use the area.

In all priority areas FWP will continue conducting spatial analyses of big game GPS collar movement data, working closely with United States Geological Survey (USGS), BLM, university, and other partners. Results from these analyses will help guide identification of focal areas within our large priority areas in future Montana action plans, along with assessments of threats to seasonal habitats or animal movements and conservation opportunities that we identify in collaboration with private landowners, NGOs, and other government agencies.

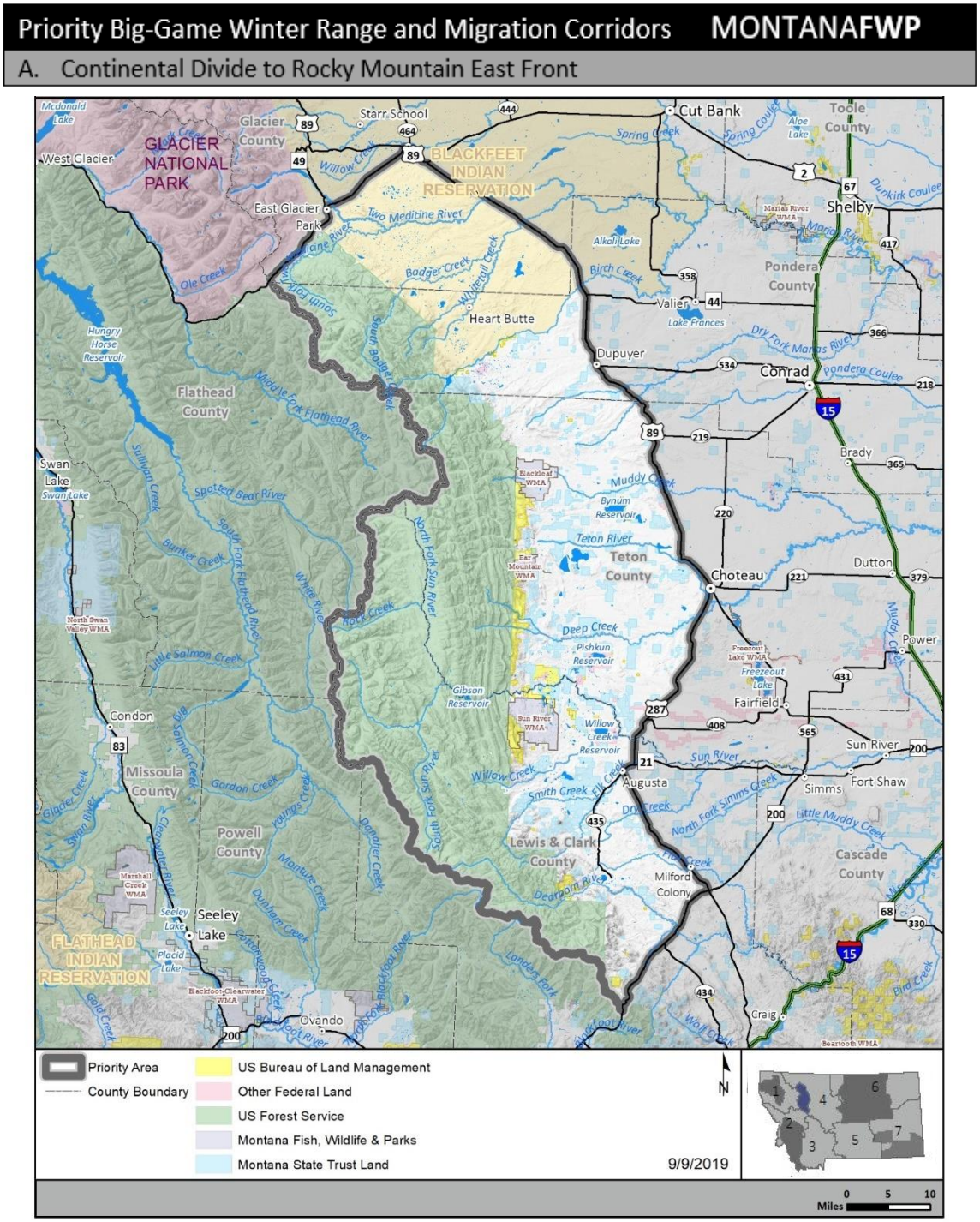

Figure 1. Priority Area A, Continental Divide to Rocky Mountain East Front. Administrative boundaries and FWP lands data from FWP, Helena, MT. Other reference information from ESRI and Montana State Library, Helena, MT. Map produced by FWP Geographic Data Services.

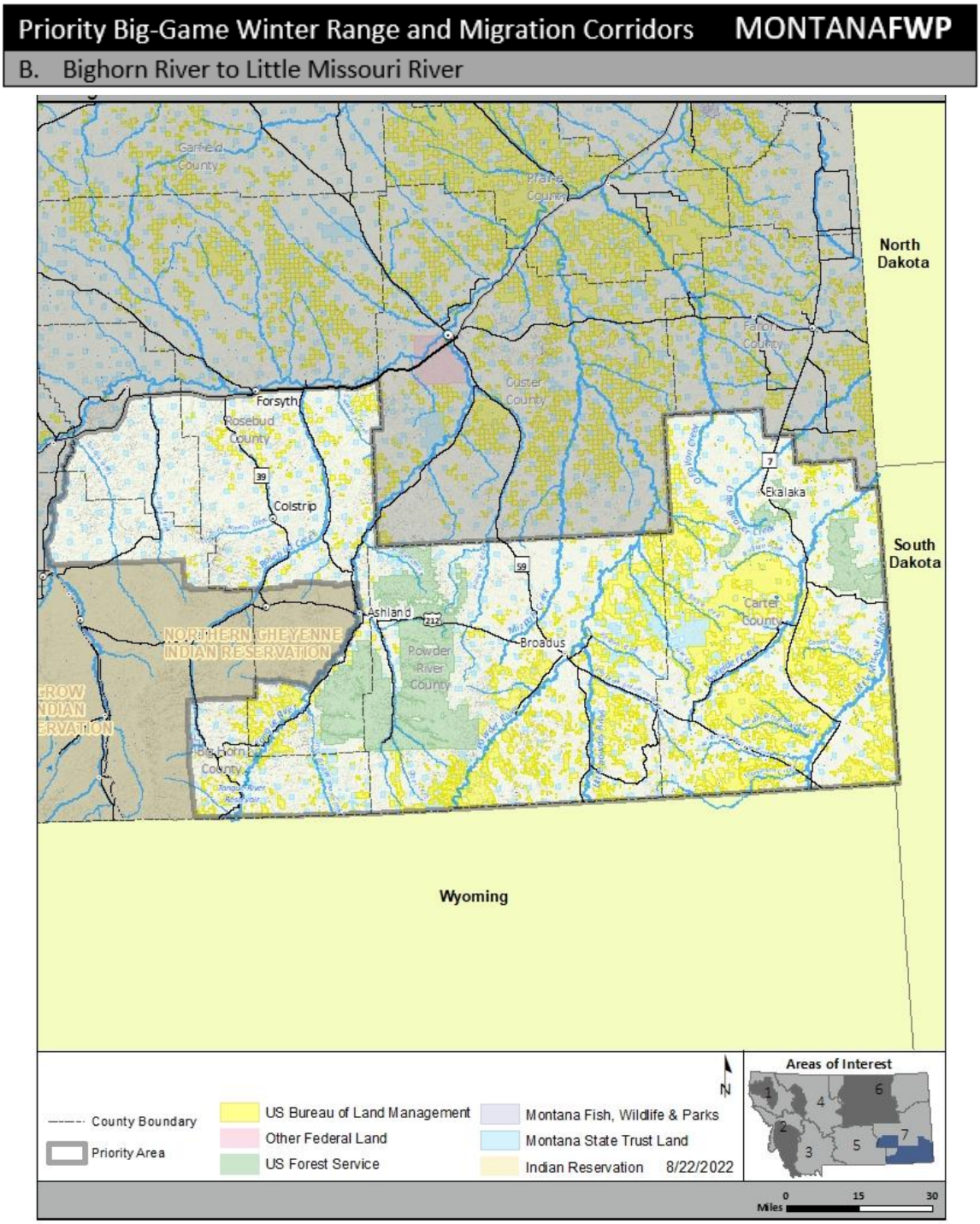

Figure 2. New Priority Area B, Bighorn River to Little Missouri River. Administrative boundaries and FWP lands data from FWP, Helena, MT. Other reference information from ESRI and Montana State Library, Helena, MT. Map produced by FWP Region 7.

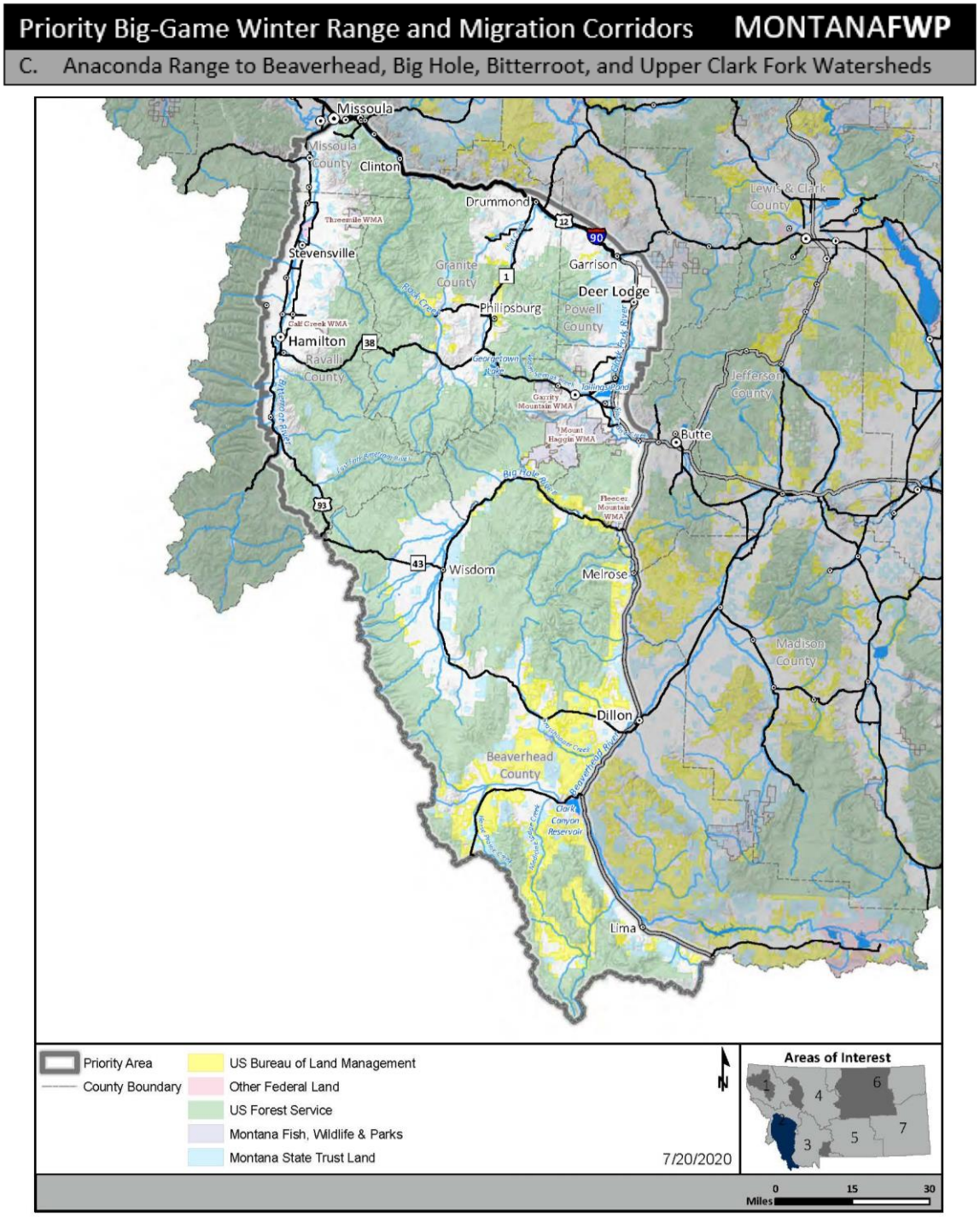

Figure 3. Priority Area C, Anaconda Range to Beaverhead, Big Hole, Bitterroot, and Upper Clark Fork Watersheds. Administrative boundaries and FWP lands data from FWP, Helena, MT. Other reference information from ESRI and Montana State Library, Helena, MT. Map produced by FWP Geographic Data Services.

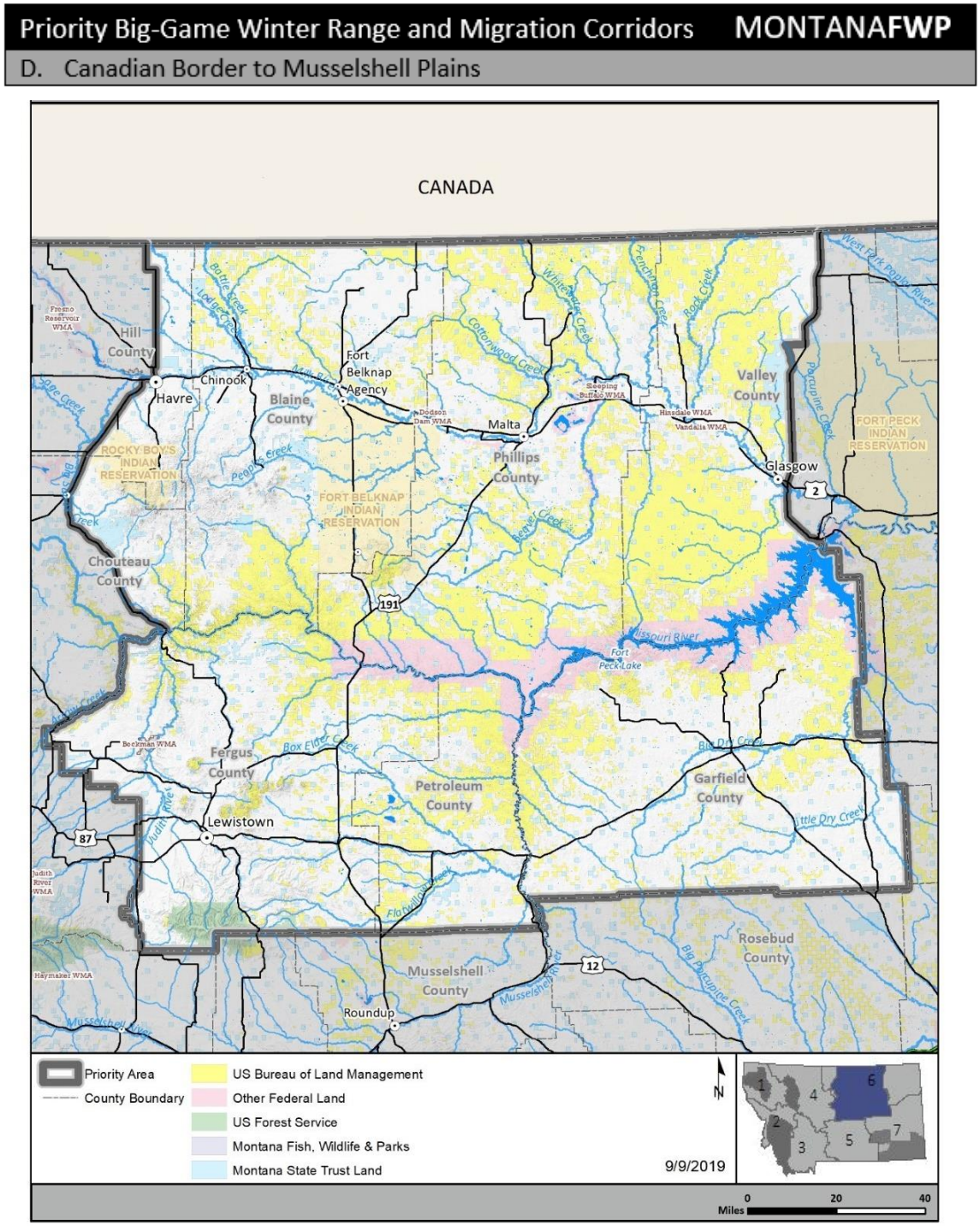

Figure 4. Priority Area D. Canadian Border to Musselshell Plains. Administrative boundaries and FWP Lands data from FWP, Helena, MT. Other reference information from ESRI and Montana State Library, Helena, MT. Map produced by FWP Geographic Data Services.

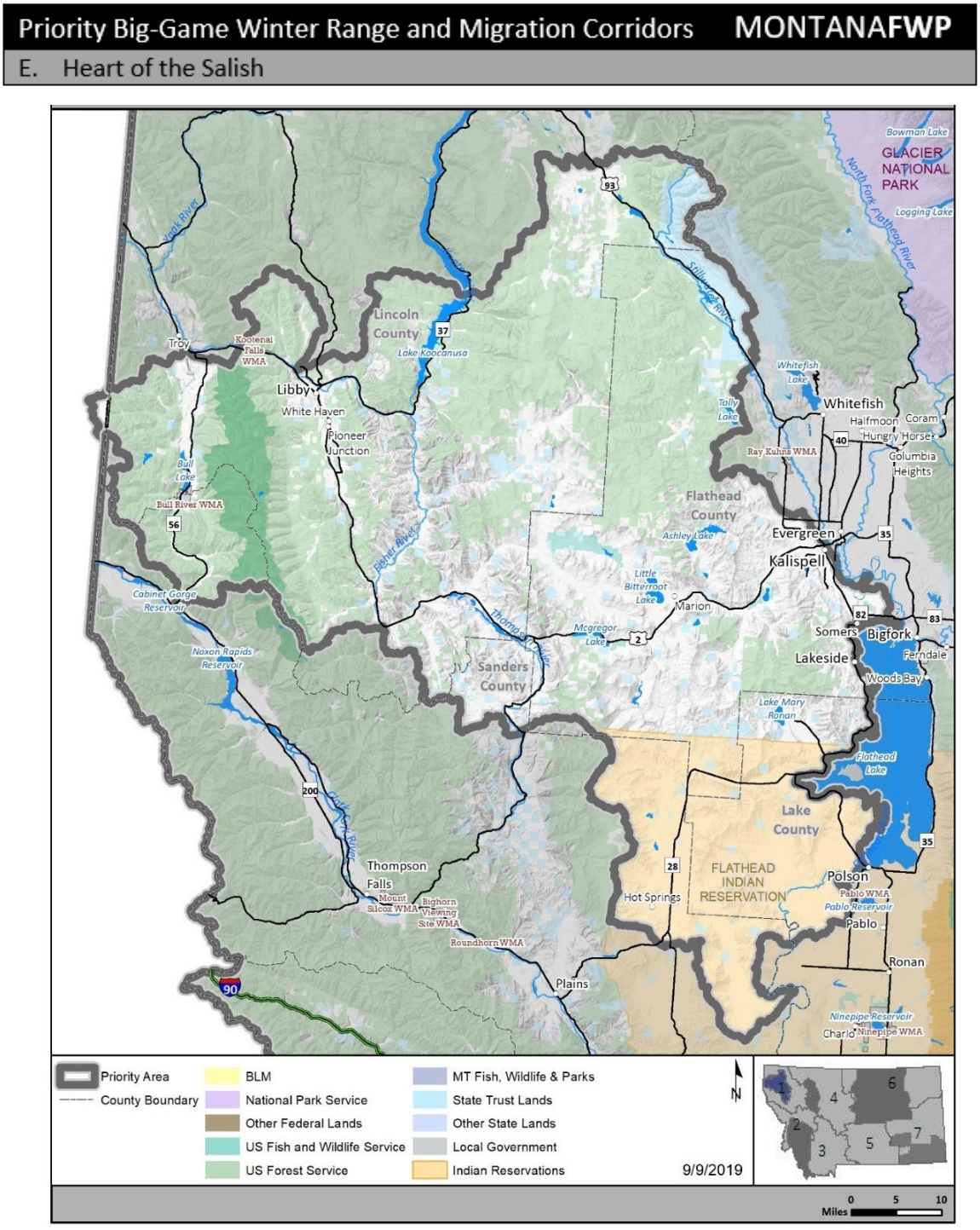

Figure 5. Priority Area E, Heart of the Salish. Administrative boundaries and FWP lands data from FWP, Helena, MT. Other reference information from ESRI and Montana State Library, Helena, MT. Map produced by FWP Geographic Data Services.

Priority Area A: Continental Divide to Rocky Mountain East Front

Why: This corridor hosts an extensive diversity of native wildlife species including elk, mule deer and pronghorn. Further, this corridor hosts multiple iconic wildlife species, such as grizzly bears, mountain goats, bighorn sheep, wolves, wolverines and Canada lynx, and connects the world-renowned Bob Marshall Wilderness complex with the similarly valued "Rocky Mountain Front" where the Rocky Mountains meet the plains. Recently, a portion of this area was included in the Rocky Mountain Front Heritage Act passed by the 113th Congress of the United States in 2013.

The Rocky Mountain Front (RMF) contains some of Montana's longest studied and/or monitored big game migrations: the first studies of elk migration in the Sun River herd took place in the 1920s (Picton and Picton 1975). These studies followed the creation of the Sun River Game Preserve by the Montana legislature in 1913, which closed hunting and eliminated livestock grazing in a large portion of wildlife habitat (e.g., elk, bighorn sheep) along the east side of the continental divide within what eventually would become part of the Bob Marshall Wilderness. Due to the latter and in conjunction with other management strategies, elk populations subsequently grew, leading to conflicts with livestock producers over forage utilization and eventually to the establishment of the FWP-owned Sun River Game Range (now Wildlife Management Area) to provide winter forage and space for elk. Hunting seasons were liberalized in the area following studies finding overutilization of winter and summer forage by elk in the 1940s and 1950s (Picton and Picton 1975). More detailed elk migration studies later revealed specific migratory paths used by elk and provided evidence that resident elk were being overharvested, as migratory elk did not return to winter range until after hunting seasons were over (Picton 1960, Knight 1970). Following these studies, elk hunting seasons in the area have been designed and managed by quota and other licenses to ensure balanced harvest representation of both migratory and resident herd segments. Current elk distribution within the priority area extends from its northern to southern boundary and includes year-round range as well as critical migration corridors and winter range habitat.

Seasonal mule deer ranges, migration routes and associated timing along the RMF were mapped in general terms approximately 40 years ago (Kasworm 1981, Ishle 1982). These studies identified that wintering mule deer populations along the RMF were composed of 1) deer that were yearlong residents on the winter range or migrated short distances into the foothills, 2) deer that migrated to summer ranges located between the Front Range and the Continental Divide and travelled between 8 and 34 km between ranges, and 3) deer that migrated across to the west side of the Continental Divide in the Middle Fork of the Flathead River with movements ranging from 21 – 50 km. These early studies provided information on the timing of migration and location of winter ranges that has since been used to structure mule deer hunting seasons to ensure population segments with different migration strategies are not overharvested. Recently, a study investigating fine-scale mule deer winter habitat selection was conducted to improve understanding of habitat requirements in this area (Smith 2011). Since 1980, wintering mule deer population sizes along the southern RMF (south of the Teton River) have declined, while wintering herds north of the Teton River have generally been stable. The causes for the decline of southern RMF mule deer is not known, but there are hypotheses related to reduced and/or shifted summer range quality and quantity for migratory herd segments, declining winter range forage quality, competition with growing elk and white-tailed deer populations, and effects of increased predation. Beginning in 2017, new research was started along the southern RMF area to begin to better understand various vital rate and

ecological information for mule deer in this area. This research was completed in 2021 with a final report focusing on assessment of seasonal space use and migration, population dynamics and vital rates, summer forage nutrition with particular focus on forest disturbance, summer and winter habitat selection, and fall migration patterns during hunting season (DeCesare et al. 2021). Similar to elk, mule deer distribution within Priority Area A extends from its northern to southern boundary and includes year-round range and critical migration corridors and winter range habitat.

Although there are pronghorn that reside year-round within the priority area, less is known of their annual habitat use and/or migration strategies (if they migrate at all). Priority Area A is considered to be at the western edge of higher quality pronghorn habitat on this side of the continental divide in Montana so population levels within this priority area are lower compared to elk and mule deer.

Other significant wildlife studies have or continue to occur in this priority area and can help to bolster, albeit secondarily, support for conservation management ideas and projects related to SO3362.

Spatial Location: This corridor includes a swath of diverse land in west-central Montana running from Highway 200 in the south to Glacier National Park in the north and connects USFS and BLM properties in the west to private and Montana state lands (Department of Natural Resources and Conservation (DNRC)/FWP) in the east (Figure 1).

Habitat Types: Habitat types within this priority area are diverse and range from alpine above tree line, both mesic and xeric conifer forests, open grasslands, shrub grasslands, and deciduous wetland/riparian. The strong diversity of habitat types ultimately supports similar diverse wildlife populations and habitat use.

Important Stopovers: Seasonal use by wildlife includes areas within the Bob Marshall Wilderness Complex to the Continental Divide during the summer to lower elevation parturition, breeding and transitional in the spring through fall seasons; to important intermountain grassland and foothill habitats during the winter period located on the interface between public and private lands.

Landownership: Dominated by USFS and BLM lands in the west, this corridor trends to private lands in the east mixed with Montana state lands (DNRC/FWP), USFWS, Bureau of Reclamation, and Tribal lands.

Land Uses: Recreation (public and commercial, consumptive and non-consumptive), livestock grazing, ranching and farm production.

Risks/Threats: Habitat fragmentation or conversion primarily associated with some private lands. Erosion or modifications in habitat quality via noxious weeds, ongoing habitat management concerns (i.e., conifer encroachment on big game winter range), and large landscape wildfires. Highway 2 and associated railroad corridor in the north, and Highway 200 in the south, represent some level of deterrents to successful wildlife movement.

Current Focal Areas and Actionable Habitat Projects:

- **Noxious Weed Management**

The RMF consists of some of the most diverse habitat and vegetative communities within Montana. This heterogeneity demonstrates why this area hosts diverse wildlife species, including key winter range and migratory corridors for the SO3362 focal species. Minimizing the impacts of noxious weeds within this priority area has been and continues to be one of the primary habitat management priorities amongst private and public landowners.

The Rocky Mountain Front Weed Round Table (Round Table) conducts strategic, collaborative noxious weed management while partnering with local stakeholders to benefit the economic, biological, and social well-being of the RMF. The Round Table consists of landowners, community leaders, local county weed districts, the Blackfeet Indian Tribe, local watershed groups, and non-government/government entities. Additional funding helps with administration costs and project implementation. Focal areas within the priority area include key watersheds/drainages such as Muddy Creek, upper Dearborn River, Deep Creek, and Birch Creek (Figure 6).

During the fall of 2019, the Round Table and FWP coordinated an extensive proposal for a multi-faceted approach to weed management within the priority area. This approach built off previous significant efforts in this area and includes activities focused on weed management education; WMA, BLM and private land herbicide treatments; biological weed management control options; vector control efforts; and an overall monitoring design. In the spring of 2020, NFWF awarded FWP and the Round Table $299,958 over a three-year period. With a match of $337,424, the project has resulted in a $637,382 investment in weed management. The proposed project is now in the final phase implementation.

Additional noxious weed management needs remain in this Priority Area, hence the need to maintain this focal work as a priority within this Priority Area. Given the scope of the Round Table work completed, considerations of additional work within large landscapes in this Priority Area, such as USFS lands, is of interest. Building off existing and ongoing work and leveraging partnerships with potential NGO groups is one consideration for such opportunities. Such efforts would provide added opportunity to maintain and/or improve important habitat types and migration corridors for elk, mule deer and/or pronghorn, among other wildlife. Estimated costs of such work would likely not exceed costs associated with the Round Table work previously identified.

- **Highway 2/Railroad Wildlife Mitigation**

At over 2.5 million acres, the Bob Marshall Wilderness complex and Glacier National Park form one of the largest protected areas in the continental United States. Straddling the Continental Divide, these two areas form a vital linkage between vast areas of public land to the south towards Yellowstone National Park, and contiguous protected areas north of the US-Canada border. However, US Highway 2 and the Burlington Northern-Santa Fe (BNSF) railroad separate Glacier National Park to the north from the Bob Marshall Wilderness complex to the south. Although the

geographic boundary of the priority area does not include this entire corridor, any potential work/project proposal related to this area would have to factor in the entire highway and railroad corridor (Figure 7) to best reflect the intent to better understand the impacts and/or implement any potential future mitigation measures.

Wildlife movement locations across this corridor have only been moderately studied, but as traffic volumes increase, we expect connectivity to diminish. Concern over maintaining wildlife movements has led the Crown Manager's Partnership, the Great Northern Landscape Conservation Cooperative, Cushman et al. (2009), and a recent interagency group of biologists working in this region to identify this highway and railroad corridor as a priority area for wildlife connectivity planning (Ament and Creech 2016, Waller and Graves 2018). Wildlife using this area include moose, elk, mule deer, white-tailed deer, grizzly bears, and many other species. The recent local working group summarized existing research and has begun to address research needs to prioritize specific highway mitigation efforts (Waller and Graves 2018). The initial report found that animal trails are closely associated with culverts and suggested that upsizing culverts would likely promote animal movement. They also found that several previous reports identified six moderately fine-scale locations for wildlife highway crossing structures (1) the South Fork of the Flathead intersection with US Highway 2 near Hungry Horse, MP 142 (Ament et al. 2014), 2) near MP 173 (Roesch 2010), 3) east of Essex, MP 181 to 184 (Roesch 2010; Ament et al. 2014), 4) MP 189 to 193 (Roesch 2010; Ament et al. 2014), 5) MP 197-197.2 (Holdhusen 2016), and 6) MP 199.8-200 (Holdhusen 2016). Data currently and recently collected can be used to prioritize more specific locations. Costs of any options are currently unknown.

- **Habitat Fragmentation**

Priority Area A maintains some of the most intact, unfragmented habitat and landscapes in not only Montana, but the lower 48 states. Big game, large carnivores and a host of small mammals, reptiles and amphibians depend on these large intact ecosystems. Large working private ranches play a vital role in conserving these species and habitat on the RMF. Preserving these lands through conservation easements, upland habitat maintenance/improvement and/or wildlife friendly fence projects helps to maintain the biological integrity of this landscape while ensuring a way of life for ranchers and others who depend on the land for their livelihoods.

Over the last 20+ years, significant collaborative work has been completed through implementing conservation easements in this priority area (Figure 8). To date, tens of thousands of private land acres have been conserved with conservation easements by working with partners such as the USFWS, The Nature Conservancy, The Conservation Fund and other land trusts. At this time, discussions with landowners related to conservation easements are ongoing, but no clearly defined project(s) has been identified. However, as/if an opportunity does come forward, the ability to develop a project proposal through SO3362 to assist with successful implementation of a conservation easement would be warranted. As such, costs associated with any such proposal are unknown at this time.

In addition, opportunity exists to work with local NRCS efforts to implement upland habitat maintenance/improvement projects and/or incorporate wildlife friendly fence designs into the existing working landscape. Focus of the upland habitat work would, perhaps in cooperation with

wildlife friendly fence designs, allow wildlife movement while not drawing them into areas with tree, food and shelter plantings. No specific projects related to this have been identified to date, but given NRCS exclusive involvement with private landowners, the potential for additional work is a great opportunity for private and public land (i.e., inholdings or adjacent) collaborative work. Estimated costs related to such work are variable but in the neighborhood of $50,000 - $250,000 to include match dollars.

- **Habitat Enhancement**

As with many areas, habitat enhancement work is a critical component of maintaining and improving wildlife habitat. The RMF is no different with one particular current focus related to conifer (Douglas fir) encroachment and removal. Such work is intended to improve native grass, forb and/or shrub production (big game forage); improve productivity in aspen stands by removing competing conifers; improve forest health by selectively thinning Douglas fir stands impacted by insects, disease, and overcrowding; improve livestock grazing management practices, and/or minimize the threat of wildfire in the area by reducing fuels.

Areas with ongoing work related to this effort are on the 1) Blackleaf and Sun River WMAs, both of which are managed first and foremost as winter range habitat for elk and mule deer; 2) USFS lands located in the upper Elk/Smith Creek areas; 3) other private lands in various locations or perhaps adjacent to the latter areas.

Current work on the Sun River WMA is in cooperation with local USFS staff conducting on-the-groundwork with additional funding assistance being provided by the RMEF. Although this habitat management need is certainly something pertinent to portions of the entire priority area, especially with respect to big game winter range/migration corridor habitat types, current thoughts are to build on success in the both the Sun River and Blackleaf WMA areas, potentially including adjacent private and public lands (see Figure 9). Ongoing discussions related to this are occurring with the potential for a project proposal to be developed and submitted in the next call for project proposals. Estimated costs related to this project would depend on the size and location of the project, although a proposed financial ask could be in the range of $50,000 – $150,000 (with match money coming in from other private, state, or other resources).

The USFS Elk/Smith project began being developed over a decade ago and has a primary role of addressing fuel accumulation in this priority area due to the general monoculture regrowth of vegetation (i.e., conifer) as a direct result of the 1988 Canyon Creek wildfire. Other identified benefits of this project include improving or protecting several types of wildlife habitats from the threat of high-intensity wildfire (include winter range habitat), promoting aspen regeneration in certain areas, protecting and enhancing existing whitebark pine stands, and preventing increases in susceptibility of forest stands to mountain pine beetle or other infestations. Adjacent private landowners are aware of potential added benefits to collaborative work given the scope of the project area. Estimated costs related to such work would be variable and depend on the size/scope of the area.

Lastly, opportunities also exist to work with local NRCS staff to implement similar type work with other private landownerships across the broader landscape within the priority area. Such work

could include forest stand improvement, woody residue treatment, and herbaceous weed treatment. These would all help with the conifer encroachment, and aid producers with stock water, fence and grazing management practices once conifer work is completed. All this would be focused in areas in which habitat quality and/or migration corridors would be preserved or improved while aiding private landowner/livestock operations. Estimated costs related to such work would be variable and depend on the size/scope of the area.

Other Ongoing or Completed Work:

- During the 2022 SO 3362 grant cycle, the Center for Large Landscape Conservation was awarded funds to aid in work associated with "Improving Habitat Quality in Western Big Game Migration Corridors Across the Blackfeet Nation (MT)". This work plans to "coordinate with the Blackfeet Conservation District to address habitat connectivity on the Blackfeet Nation through removal and upgrade of fences, reduction of animal-vehicle collisions along key sections of highway, and improvement of habitat through control of invasive species. Project will provide capacity and educational opportunities to improve habitat management and fence line modifications on 26,000 acres of tribal lands." Funds awarded include $172,000 NFWF grant dollars matched with $171,600, totaling $343,600.
- Land conservation efforts such as conservation easements by public agencies, NGOs, and private organizations. Private/public land noxious weed mitigation work. Habitat management strategies such as conifer removal, prescribed burn activity, wildfire management, etc.
- FWP is using GPS collar technology to produce fine-scale maps of seasonal ranges and perhaps migration routes of southern RMF mule deer and examine the quality and distribution of their seasonal forage (DeCesare et al. 2021).
- The USFWS and The Nature Conservancy are working in collaboration with many partners including FWP and The Conservation Fund, acquiring perpetual conservation easements along the RMF. Landscape conservation at this scale will have significant benefits to big game corridors. The USFWS seeks to acquire conservation easements on up to 295,000 acres of private land in the RMF to protect elk, mule deer, and pronghorn habitat and migration corridors.
- The Round Table continues to conduct strategic, collaborative noxious weed management while partnering with local stakeholders to benefit the economic, biological, and social well-being of the RMF. Other public/private weed management efforts are also ongoing in this area. As noted, the NFWF awarded project funding in the spring of 2020 for ongoing collaborative weed management work in this priority area.
- Douglas fir management/removal is occurring in cooperation with RMEF on the Sun River and Blackleaf WMAs to improve winter range habitat conditions for elk and deer.
- RMEF, with support from other government and NGOs, recently completed a land purchase and transfer to the USFS in the Falls Creek area. This project will considerably improve public access to 25,000+ acres of USFS public land, much of which is general year-round habitat for mule deer and elk.

Cost of current or needed projects: See estimated costs under Actionable Habitat Projects above.

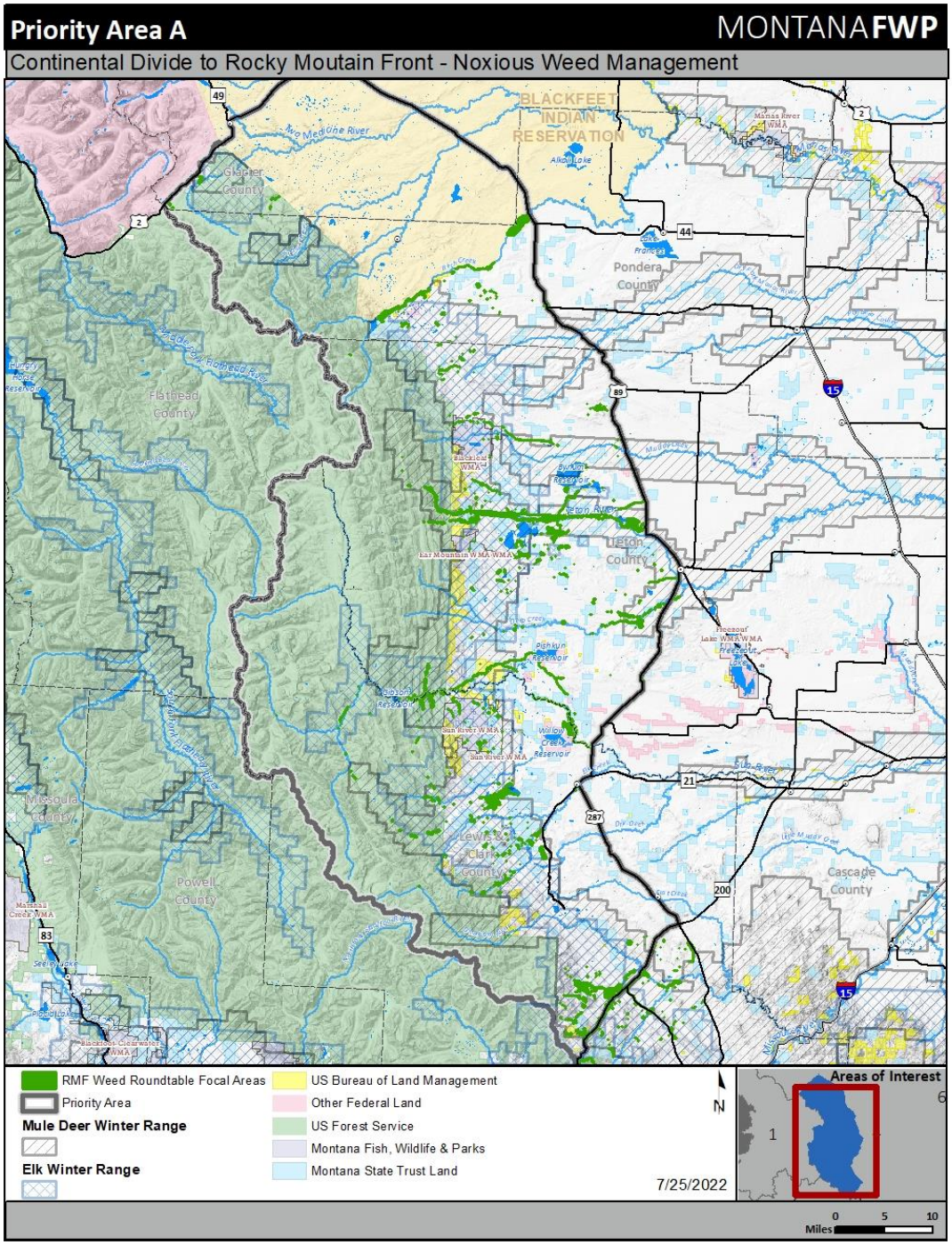

Figure 6. Focal Area 1 in Priority Area A: Noxious weed mitigation work areas based on inventories by the Rocky Mountain Front Weed Round Table. Weed data, big game winter range, and administrative boundaries from FWP, Helena, MT. Other reference information from Montana State Library, Helena, MT and RMF Weed Roundtable. Map Produced by FWP Geographic Data Services.

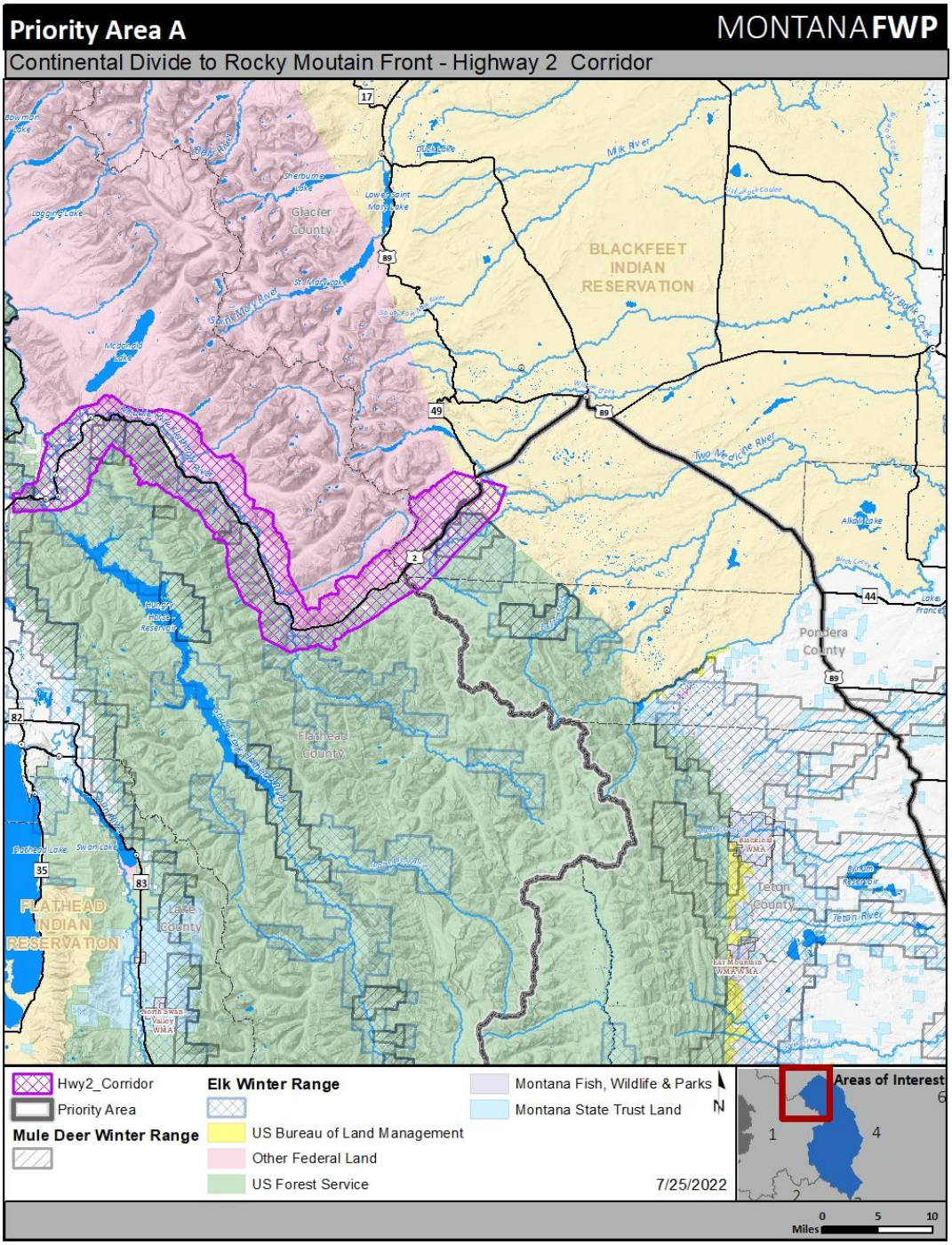

Figure 7. Focal area 2 in Priority Area A: U.S. Highway 2 and the BNSF Hi Line railroad corridor. Railroad corridor, big game winter range, and administrative boundaries from FWP, Helena, MT. Other reference information from Montana State Library, Helena, MT. Map Produced by FWP.

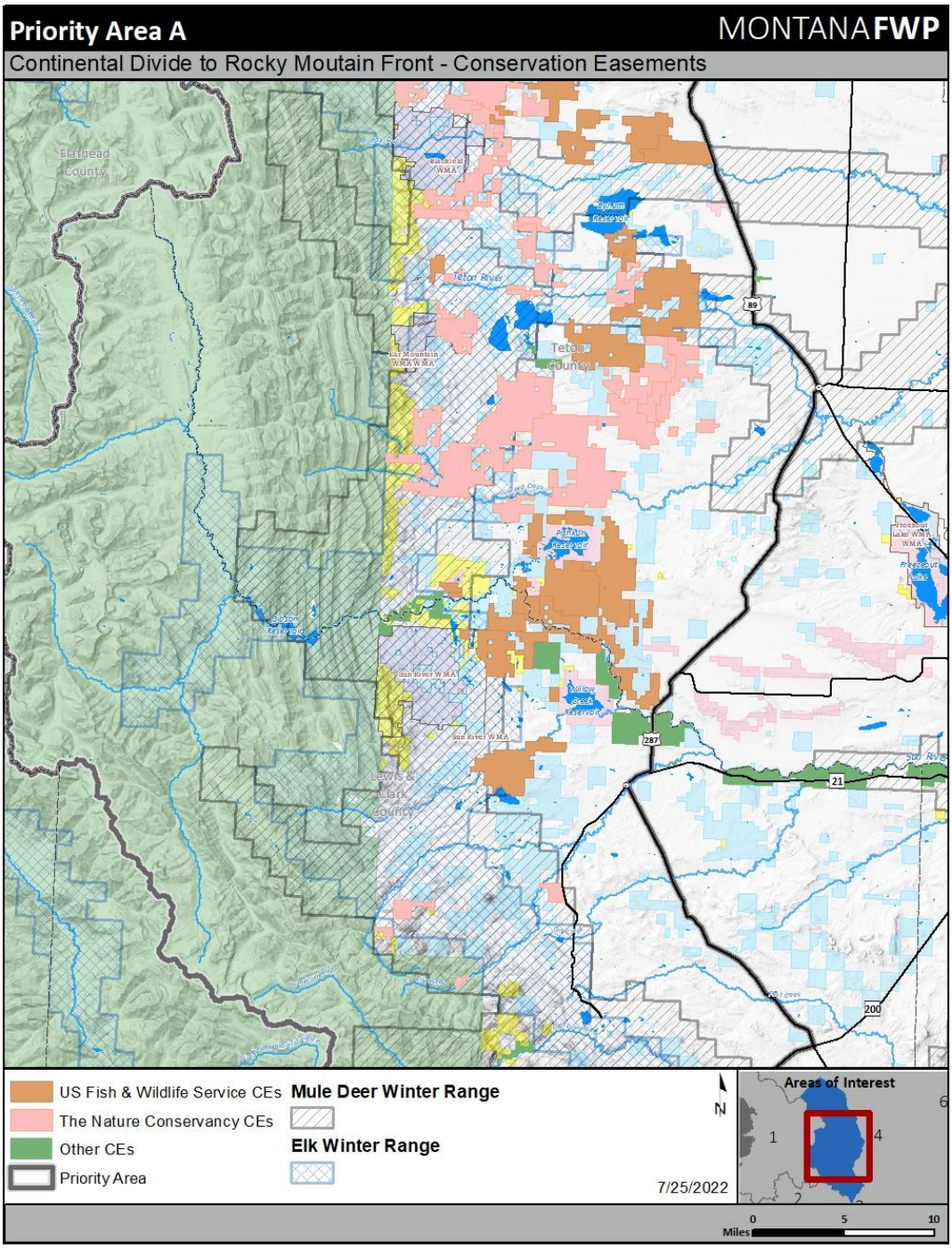

Figure 8. Focal area 3 in Priority Focal Area A: Conservation easements, private land habitat and fence improvement projects, and big game winter range. Big game winter range and administrative boundaries from FWP, Helena, MT. Other reference information from Montana State Library, Helena, MT. Map Produced by FWP.

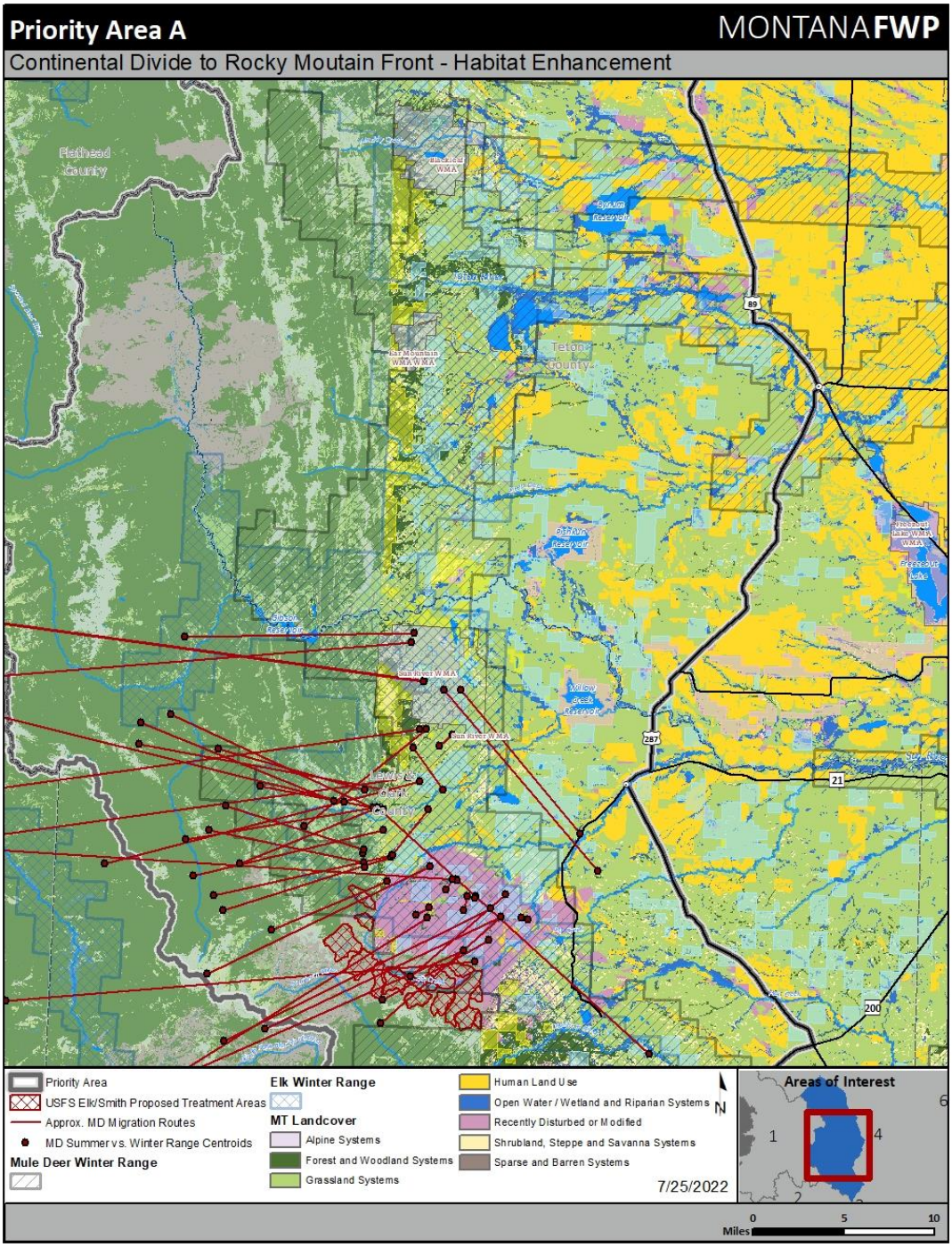

Figure 9. Focal area 4 in Priority Area A: Landcover types in FWP Wildlife Management Areas and elk and mule deer winter range. Habitat enhancement projects will focus on conifer removal in the forest/woodland cover types to improve big game winter range habitat. Big game winter range and administrative boundaries from FWP, Helena, MT. Land cover and other reference information from Montana State Library, Helena, MT. Map Produced by FWP.

Priority Area B: Bighorn River to Little Missouri River

(previously Yellowstone Park to Paradise Valley)

Why: This corridor hosts elk, mule deer, and pronghorn. Current research shows that pronghorn populations inhabiting the sagebrush and grasslands of southeastern Montana and northern Wyoming are composed of a multitude of movement behaviors that include residents and migrants. Data being gathered as part of the ongoing statewide Pronghorn Movement and Population Ecology Study has shown several individuals with one-way migratory movements ranging from 35–70 miles. There also appears to be a migration corridor, with multiple pronghorn making annual treks from southeast Montana into northeast Wyoming (Figures 10-11). Many pronghorn in the study experience movement restrictions due to natural and unnatural barriers. Livestock fences and fences associated with highways are the most impactful, ranging from semi-permeable to impermeable barriers for numerous individuals.

Mule deer herds in the area are composed primarily of resident animals that make small scale seasonal shifts between habitats. Mule deer have been observed making short migrations to winter range with movements from grassland and sagebrush communities to rough breaks along the Tongue River in the Ashland area (Griffiths 1990, Olenicki 1993). In the Boxelder Creek area mule deer were recorded making up to 28-mile migrations during winter months (Carnes 2009).

Elk herds within the priority area are still growing and expanding their distribution as they started to reoccupy this area only 30–40 years ago. Most of the elk are considered nonmigratory, but data currently being collected has shown some substantial movements with one elk making an approximate 227-mile journey from the Broadus area to South Dakota (Figures 12-13). Elk populations in the priority area are above the current objective set in the Montana Elk Management Plan (2005). Current research shows that on a landscape dominated by private land elk seem to select for private land during hunting seasons where access may be limited, thus reducing the effectiveness of public elk harvest to address population growth that is leading to the area being over objective. Elk populations throughout the priority area are proving to be problematic for some landowners and over-crowding of hunters on the limited public land are two sentiments heard when elk management discussions occur throughout the region.

Spatial Location: This corridor includes the southeast corner of Montana ranging from the Bighorn River all the way through the grasslands, sagebrush and forested lands to the borders of Wyoming and South Dakota (Figure 2).

Habitat Types: Habitat types range from sagebrush grasslands to ponderosa pine/juniper uplands and scattered deciduous wetland/riparian areas along the Bighorn, Tongue, and Powder Rivers as well as other major creek drainages.

Important Stopovers: Annual use by elk, mule deer, and pronghorn.

Landownership: Dominated by private lands with some BLM, USFS, and Montana state lands (DNRC/FWP).

Land Uses: Livestock and farm production.

Risks/Threats: Habitat fragmentation primarily of private lands. Erosion of habitat quality via noxious weeds. Unnatural movement barriers, particularly for pronghorn.

Current Focal Areas and Actionable Habitat Projects:

- FWP is working to minimize the effects of barriers such as fences, roads, and highways on migrating ungulates in this area. There is a lot of work to complete and additional resources would advance this conservation action.
- FWP has multiple conservation easements in the area and a new one currently moving through the process.
- FWP has enrolled multiple largescale properties within termed leases in the area and is in the process of getting another conservation lease option available in the region with the goal to enroll 300,000-500,000 acres.
- The Miles City BLM Field Office works with the FWP, BLM permittees, and private landowners to maintain wildlife-friendly fencing and keep fence gates open during the winter, where possible.

Other Ongoing or Completed Work: Land conservation through conservation easement and leases as well as habitat enhancement efforts by public agencies, NGOs, and private landowners.

Current pronghorn and elk research findings in the area are starting to identify migration corridors, impediments to movements, and season of use and habitats based on fine scale GPS collar data. Additionally, FWP has mapped and classified most fences, cross fences, and gates within the priority area to use with animal movement data and have used those datasets to identify and prioritize areas of high concern where habitat projects are needed.

- The Miles City BLM Field Office has replaced 170 miles of woven-wire and/or barrier fences since 2009. These fences impede big game daily and/or seasonal movement, cause direct mortality, and interrupt habitat use in areas crucial for pronghorn, mule deer, white-tailed deer, and elk populations.
- Since 2013, the Miles City Field Office has enhanced wildlife habitat on 23,000 acres of public lands with the use of mechanical tree thinning and range improvement projects. Mechanical treatment has been shown to provide protections of forage crucial to ungulate species during winter months and rejuvenated forbs and shrubs used by big game in the spring. Prescribed fire in forested habitat has been applied to 4,400 acres of public land, which has been known to increase native forbs and grasses for big game the years following the fire. Many of these acres were completed within the Priority Area.
- The USFS under the Custer Gallatin National Forest Management Plan has established three Back Country Areas totaling approximately 30,000 acres where road use and motorized travel is limited. The Ashland Ranger District has also established approximately 27 miles of seasonal closures for big game security. These closures are enforced September 1 through December 31, providing approximately 21,000 acres of fall habitat with enhanced security from disturbance.
- The Ashland Ranger District has also removed cross fencing in the Taylor Creek drainage to improve big game migration. The district also used prescribed burnings in spring of 2021 (funded by RMEF) to improve foraging. Additional prescribed burns occur annually in the

Ashland Ranger District with RMEF helping support the annual burning of 3,000 to 4,000 acres. A wildlife travel corridor was left out of a commercial harvest timber sale to aid elk moving to more timbered ground.

- To help enhance habitat the Ashland Ranger District has planted roughly 15,000 acres of ponderosa pine since 2000. Additional plantings of hardwoods, specifically green ash and chokecherry habitats have also occurred with thousands of seedlings planted.

Cost of current or needed habitat treatments: Unknown.

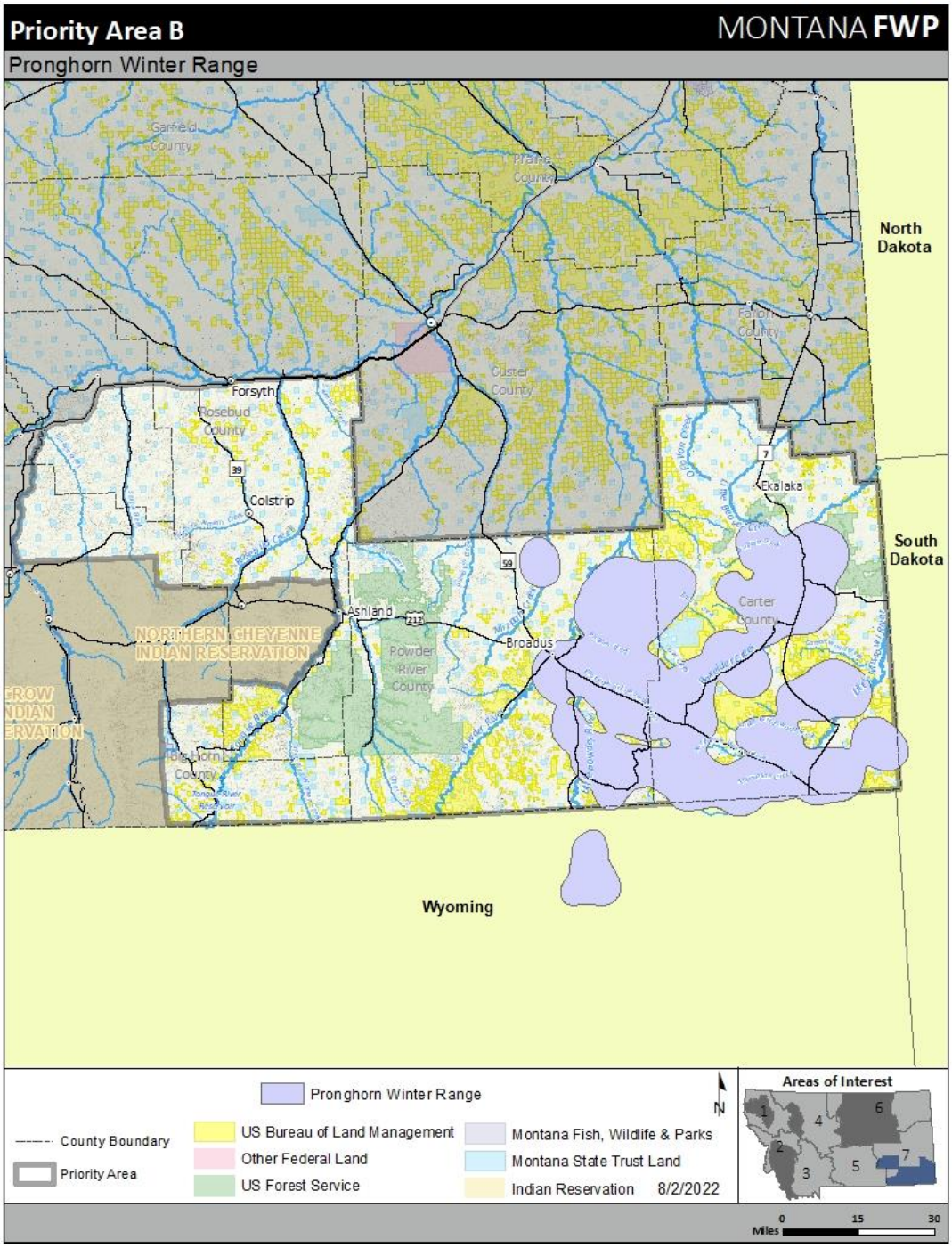

Figure 10. Mapped winter range from GPS collared pronghorn doe in Priority Area B from the winter of 2020 through the fall of 2022.

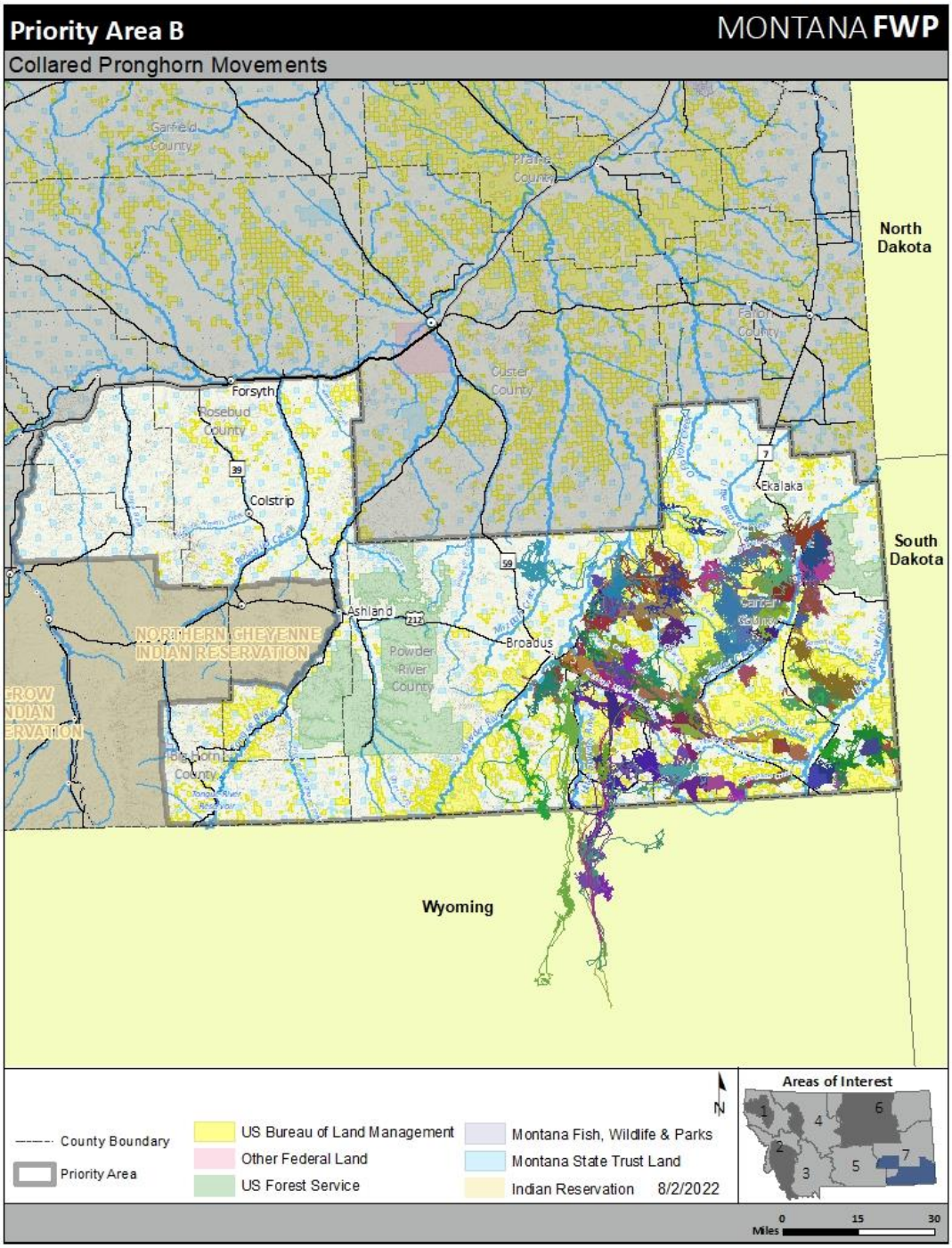

Figure 11. GPS collared pronghorn doe movements in Priority Area B from the winter of 2020 through the fall of 2022. Colors represent individual animals.

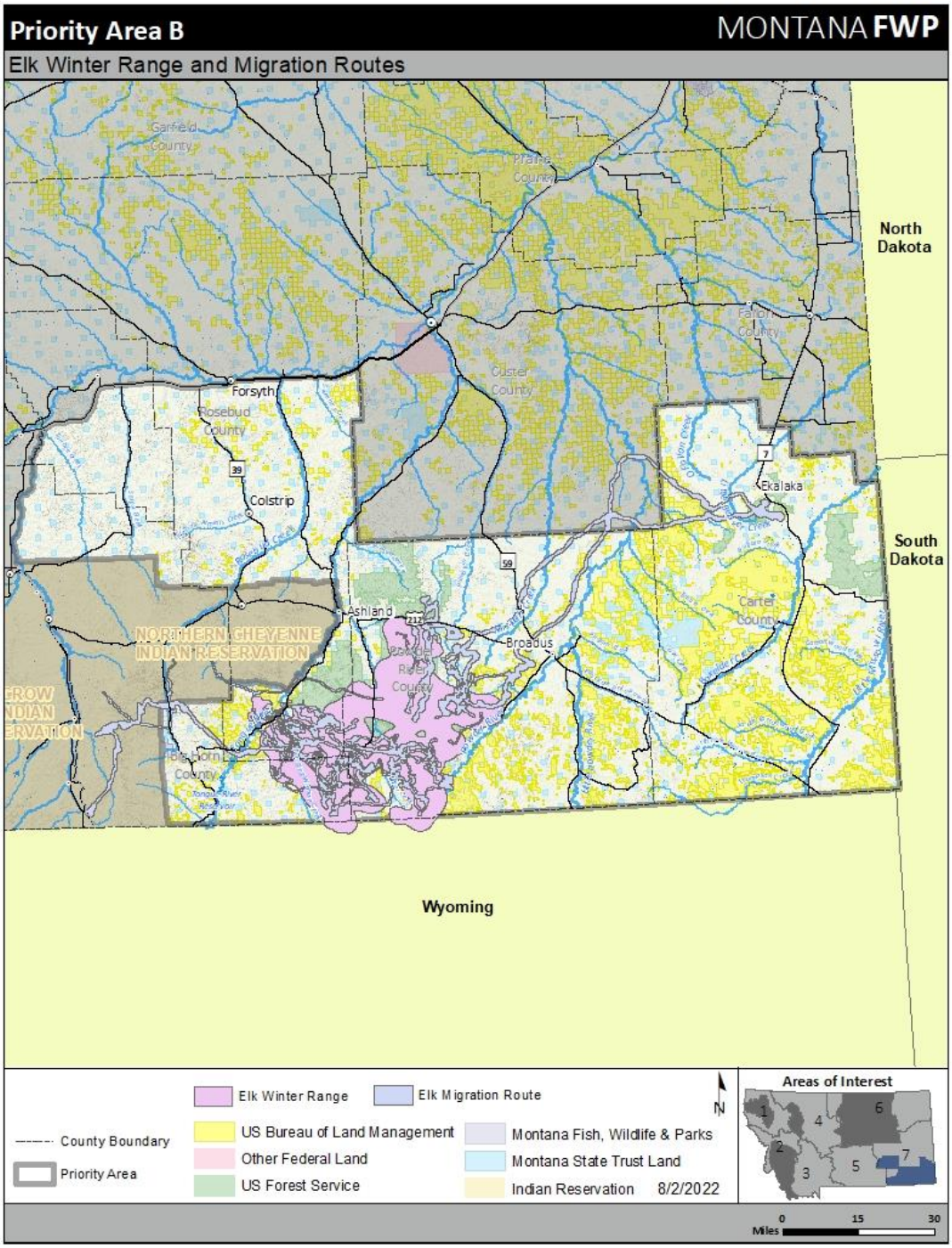

Figure 12. Mapped elk winter range and migration routes in Priority Area B from GPS collared elk from the winter of 2021 to the fall of 2022.

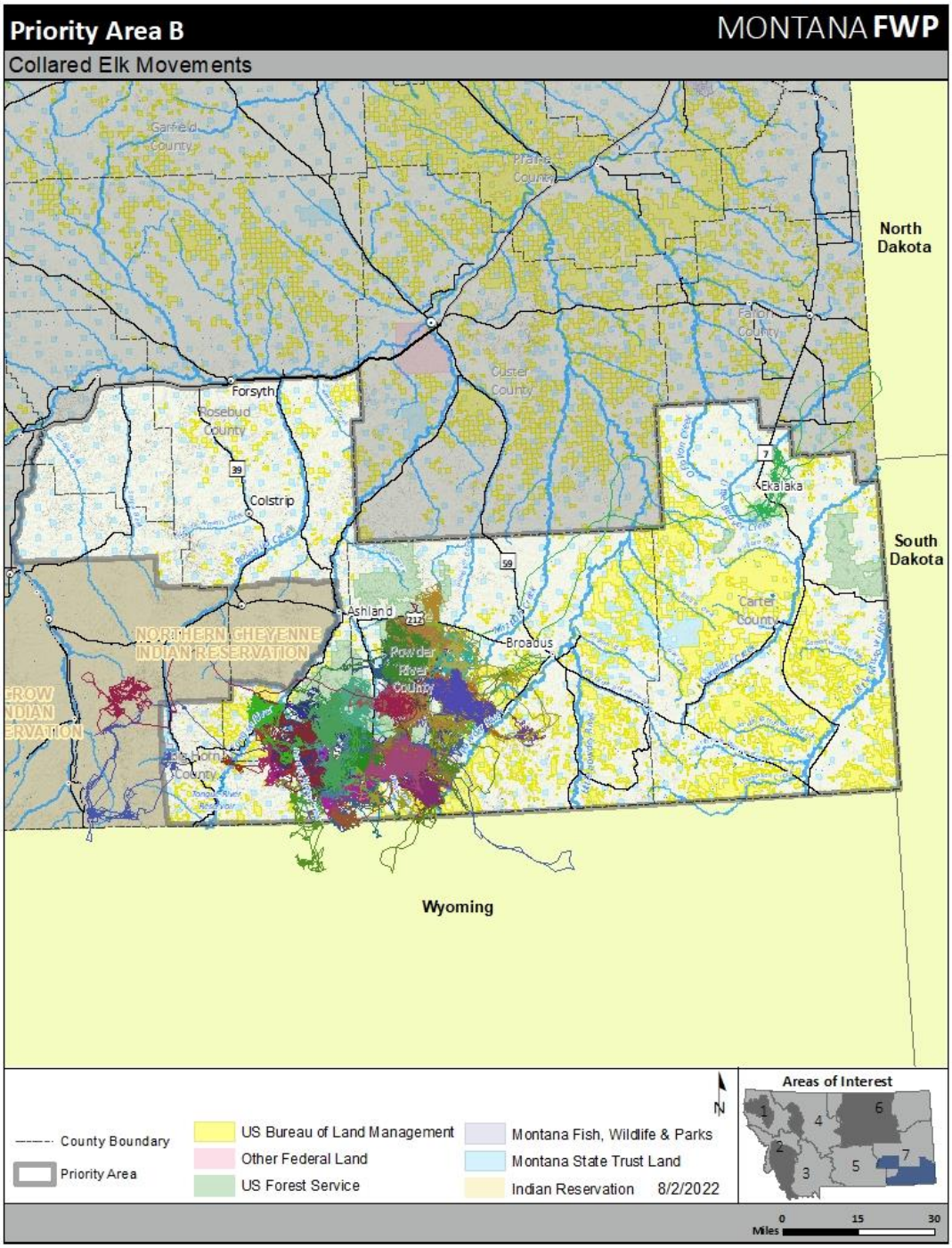

Figure 13. GPS collared elk movements in Priority Area B from the winter of 2021 through fall of 2022. Colors represent individual animals.

Priority Area C: Anaconda Range to Beaverhead, Big Hole, Bitterroot, and Upper Clark Fork Watersheds

(previously Anaconda Range to Big Hole, Bitterroot, and Upper Clark Fork Watersheds)

Why: This corridor hosts multiple species that include elk, mule deer, and pronghorn. Further, this corridor and an established USFS Wilderness area include portions of three wildlife-rich watersheds.

Elk herds in Western Montana are composed of variable mixtures of residents, partial migrants, and migrants. Forage quantity and quality on both winter and summer ranges has a large effect on the proportion of herds that migrate from winter ranges to higher elevation summer ranges. Irrigated agriculture on winter range reduces elk migratory behavior, but elk are more likely to migrate away from winter range if better forage is available elsewhere or if they experience high elk density on winter range (Barker et al. 2018, 2019). When higher-elevation, summer range forage varies predictably between years, elk are more likely to migrate regardless of whether they have access to irrigated agriculture on winter range (Barker et al. 2019). Plant productivity is the strongest predictor of elk habitat selection during summer across western Montana (Ranglack et al. 2016), and the influence of plant productivity on elk distribution continues into the late summer and early fall period (Ranglack et al. 2017), when migration to winter range begins. However, exposure to hunting pressure has a large effect on the timing of fall elk migration (Rickbeil et al. in prep), and restricted elk hunter access on private lands and security areas for elk on public lands (i.e., areas further from roads with at least some canopy cover) are the primary drivers of elk distribution in the fall migratory period across southwestern and western Montana (Proffitt et al. 2013, Ranglack et al. 2017). Undeveloped, native winter ranges for elk and maintenance of predictably high-quality forage on public land summer ranges are important for the conservation of elk migration and for elk distribution on public lands in general. Habitat management practices and disturbances can alter elk forage quantity and quality (Proffitt et al. 2016, DeVoe et al. 2019). Habitat treatments such as logging, forest thinning, removal of encroaching conifers, invasive weed management, and prescribed fire can be used to modify forage quantity and quality, as can large-scale natural disturbances such as wildfire and forest insect outbreaks. Additionally, maintaining elk hunter access on private lands can prevent private land refuges which may draw elk away from public lands during the hunting season.

Pronghorn herds winter in the southern portion of Priority Area C southwest of Dillon and migrate to various summer ranges throughout the area (Figure 14). The winter range is a mix of private, BLM, and DNRC lands. Sheep ranching was the predominant historical use of this area and miles of woven wire fences remain. In more recent decades, livestock use has converted to beef production and sheep fencing is no longer necessary yet remains on the landscape.

A segment of the pronghorn population that winters on Horse Prairie migrates to and throughout the upper Big Hole watershed. The longest documented migration within this herd based on recent GPS collar location data is to summer range on FWP's Mt. Haggin Wildlife Management Area at the northern end of Priority Area C. The distance between these seasonal habitats is approximately 90 linear miles.

New West Bitterroot Valley focal area- The Bitterroot Valley is experiencing very high residential development as more agricultural lands are converted to subdivisions and small acreage ranchettes. On the west side of the valley, most big game winter range in the foothills of the rugged Bitterroot Mountains has already experienced this development, leaving relatively few large tracts of winter range. Conservation easements are critical to preserve movement corridors not only east-west across the valley but north-south along the foothills, while minimizing game damage to private property and retaining hunting opportunities for the public.

New North Bitterroot Valley focal area– Similar to the previous focal area, the northern end of the Bitterroot Valley is also experiencing sprawling residential development as agricultural and timber lands are converted to subdivisions and small-acreage ranchettes. Development in this area is fragmenting large expanses of intact wildlife habitat and encroaching on regionally important movement corridors for a wide range of both terrestrial and aquatic wildlife species. Winter range for elk and deer has been particularly impacted by this development, leading to relatively few large tracts of winter range remaining especially on the west side of the Bitterroot Valley. Development along Highway 93 is creating an increasingly prominent movement barrier for wildlife species seeking to cross the Bitterroot Valley or access the Lolo Creek drainage. Conservation easements are critical to preserve movement corridors that not only run east-west across the Bitterroot Valley and from the Bitterroot Valley to the Lolo Creek drainage, but also north-south along the foothills of the Bitterroot Mountains. Conservation easements in this area also help minimize game damage to private property and retain important yet diminishing hunting opportunities for the public.

Spatial Location: This corridor includes a swath of land in southwest Montana running from the Idaho border through the Bitterroot, Upper Clark Fork, and Upper Big Hole and Beaverhead watersheds (Figure 3).

Habitat Types: Habitat types range from alpine above tree line, both mesic and xeric conifer forests, open grasslands, large intact sagebrush stands, and deciduous wetland/riparian (Figure 15).

Important Stopovers: Seasonal use by wildlife includes the summer range of elk and mule deer throughout the upper Big Hole Valley and migration to winter range in the Bitterroot Valley, lower reaches of the Big Hole watershed, and Idaho (Figure 16). The upper Beaverhead watershed also contains elk winter and summer ranges and migratory pathways from the Tendoy and Pioneer mountains and Idaho. Priority Area C also encompasses pronghorn winter and summer ranges in the upper Beaverhead watershed and migration corridor for pronghorn from Idaho, along with migration corridors and summer range in the upper Big Hole watershed.

Landownership: Landownership is predominantly USFS lands east and west above the largely private valley bottom. Other land types include BLM and Montana state lands (DNRC/FWP).

Land Uses: Land use is primarily livestock and hay production, timber, hunting, fishing and other forms of recreation.

Risks/Threats: Risks and threats to big game are primarily in the form of impermeable fences; habitat fragmentation primarily of private lands; erosion of habitat quality via noxious weeds; conifer encroachment and unsustainable land use practices; and vehicle collisions on Interstate 15 and Highways 1 and 93.

Current Focal Areas and Actionable Habitat Projects: Based on the movement data from collared pronghorn collected from 2020 to current as part of Montana's statewide Pronghorn Movement and Population Ecology Project, FWP is implementing methods to 1) identify potential barriers that may be limiting landscape permeability or altering important movements of pronghorn, 2) prioritize and implement remediation projects, and 3) monitor improvements to permeability and movements of pronghorn at remediated areas.

To identify potential movement barriers, FWP biologists have used maps of the movement trajectories of collared pronghorn to visually identify altered movement patterns. In 2021 a partnership of federal and state agencies, conservation groups and private landowners began a 3-year commitment to replace or modify approximately 26 miles of impermeable fencing on pronghorn winter range and along migration routes. National Wildlife Federation is hosting a coordinator position to oversee this work. A summary of accomplishments to date can be found in Box A.

Since 2018, USFWS Partners for Fish and Wildlife has used SO33622 and matching funds to improve wildlife passage and summer and winter habitat through the upper Big Hole Valley to benefit pronghorn migration, resident elk, moose, mule deer and sage grouse. In partnership with FWP they have used data from the current FWP pronghorn and sage grouse studies to identify specific migratory corridors, important seasonal habitats and identify problems areas and restoration opportunities. In the past three years, USFWS-Partners has allocated approximately $223,657 and removed, modified or replaced 33.26 miles fence that will improve access to important habitats for big game, removed invasive confers, restored mesic habitat and provided infrastructure to landowner to implement grazing management practices that benefit sage steppe habitat. Details of these accomplishments can be found in Box B.

Data from collared pronghorn studies led by ID over the past 10 years demonstrate that a historical migration between ID and MT pronghorn populations is greatly impeded by woven wire fences along MT Highway 324, hampering the potential for demographic and genetic exchange on summer range (Figures 17-18). The Southwest Montana Fencing for Wildlife partners have identified this fence as a priority project and plans to make improvements over the next two years (Figure 19). In partnership, ID Fish and Game added a new priority area to their SO3362 state action plan adjacent to MT's Priority Area C so that both states can work jointly on restoring this migration route.

To facilitate the identification of potential barriers to pronghorn movements and prioritize remediation efforts, FWP has developed an online platform based in ArcGIS Online for mapping fences and recording fence attributes. The ArcGIS Online platform for fence mapping is a collaboration between FWP, the BLM (Montana/Dakotas) state-wide wildlife program, and University of Montana that was initiated summer 2021 to collect and aggregate spatial fence data. The overall objective of the fence mapping project is to collect and aggregate spatially precise fence locations into a centralized database that could be updated and accessed simultaneously by multiple users for research and conservation applications. Within the ArcGIS Online platform, fence spatial and attribute data can be added to a line feature layer, and other point location information, such as gates or pronghorn crossings, can be added to a point feature layer. This information can be added by drawing fences in the office based on aerial maps and in the field using tablets. When in the field, users can add attributes to mapped fences, verify and move

positions of mapped fences, and map any additional fences. Given expressed interest and need by BLM, data is currently being collected by BLM staff at a broader scale outside the study areas of the Montana Pronghorn Movement and Population Ecology project.

In addition, FWP is currently working to implement a spatial analysis that combines the GPS collar data with the fence spatial data to quantify altered and unaltered encounters with fence segments (Xu et al. 2020). This method will rank the fence segments based on the level of altered movements relative to unaltered movements, which will be output as an interactive map for biologists to use as an additional tool to identify, prioritize, and monitor fence modifications (Figure 19).

FWP has evaluated the effect of different fence types on pronghorn movements as part of Montana's statewide Pronghorn Movement and Population Ecology Project. In this analysis, FWP mapped and measured 979 km of fences, which were classified into three fence types, including low strand (average lowest wire height < 41 cm), high strand (average lowest wire height ≥ 41 cm), and woven wire. We identified 5,581 fence encounters from movement trajectories of 265 collared pronghorn in six study areas across Montana. We found that woven wire fences substantially increased altered movement responses and passage times as compared to low and high strand fences. Both low and high strand fences resulted in similar responses of being relatively permeable with short passage times, suggesting that, regardless of bottom wire height, strand fences are often permeable. These results indicate the managers should prioritize woven wire fence types for modification efforts. This analysis has been submitted as a manuscript to a peer-review journal and is currently in press (DeVoe et al., in press).

West Bitterroot Valley

The 540-acre Hackett ranch represents an important conservation easement opportunity. While relatively small, its presence as one of the larger intact, undeveloped tracts of winter range in the area is evident in Figure 20. Elk, mule deer, white-tailed deer, moose, and wild turkey frequently use the property. Its adjacency to public land and over 30-year enrollment in hunting access programs have made it a popular destination for hunters. The property contains a mixture of dry forest, open range/grassland, and hayfields, as well as ~1 mile of deciduous riparian creek-bottom (in addition to several seasonal seeps and springs). The diversity of habitat types creates conditions favorable to a variety of bird species including Montana Species of Concern.

Because of the very high development potential, the value of conservation easements in this area is high and fundraising is challenging. The Hackett family is committed to ensuring this property remains intact for wildlife habitat and recreational opportunities.

North Bitterroot Valley

The proposed 822-acre Maclay Ranch Conservation Easement would be an essential component of a network of protected public and private lands that form a corridor in an east-west direction across the Bitterroot Valley (Figure 21). The proposed Maclay Ranch Conservation Easement would also connect directly to the Lolo Creek drainage, a major movement corridor for wildlife into and across the Bitterroot Valley and between Montana and Idaho via Lolo Pass. These corridors are in an area consistently identified by FWP and other conservation organizations as one of the most important areas for conserving landscape-scale connectivity for wide-ranging and migratory wildlife. The section of Highway 93 running through this area has a high number of wildlife collisions and elk and bears have crossed or attempted to cross the valley at or near the area where this conservation easement would be located. Because of the frequency of wildlife

collisions and value of the area as a movement corridor, the portion of Highway 93 to which the proposed Maclay Ranch Conservation Easement would connect is a priority for possible future investment in wildlife crossing structures.

The primary habitat benefits of the Maclay Ranch property are elk/deer winter range in close proximity to security/thermal cover, as well as a mosaic of burned and unburned forest in the higher elevations. The diversity of forest types creates conditions favorable to a variety of forest-dwelling bird species including Montana Species of Concern. The property also contains grasslands, which are a limited habitat type in the Bitterroot Valley. The grasslands provide hunting grounds for raptors and nesting and foraging habitat for songbirds. Wetlands and wet meadows on the property also provide habitat for a range of species.

BOX A: SW Montana Fencing for Wildlife Program Update (October 2021)

Summary:

From April through September 2021, National Wildlife Federation and partners completed **11.9 miles** of fence modifications in the **Horse Prairie (8.5 miles)** and **Bell Ranch - Frying Pan Basin (3.4 miles)** areas of Beaverhead County to support seasonal habitat and migration for pronghorn and other big game species. This work was funded through National Fish and Wildlife Foundation grants with integral partner support offered by Montana FWP, USFWS Partners Program, BLM, Montana DNRC, The Nature Conservancy, Youth Employment Program, landowners, volunteers, and local fence contractors.

Accomplishments:

Our goal was 10 miles modified or removed and we accomplished **11.9 miles** (26 mile goal for 2021-2024). Breakdown of modification/removal as follows:

- **5.5** miles of bottom wire modified, where wire was increased to 16" or 18" above ground.
- **4.7** miles of bottom and top wire modified, with bottom wire at 16" or 18" and top at 42". Included over 3 miles of woven fence removal & rebuild.
- **1.7** miles of total removal, with majority of metal wire scrapped for recycling.

Volunteer engagement:

- 93 volunteers led by NWF's Wildlife Project Coordinator provided 663 volunteer-hours assisting with fence modification and removal.

NWF staff, volunteers, and partners helped remove 2.1 miles of a woven wire fence in Horse Prairie that was rebuilt to wildlife-friendly specifications. Photo credit: Michael Parks

BOX B: USFWS Partners for Fish and Wildlife Program : Big Hole SO3362 Projects 2018-2021

1) HCR Project: Private and State Lands. 2018-2021: 13 miles In Kind + 9 miles NFWP and HCR = 22 Miles, 110 acres of confer removal, 6 acres Mesic Restoration, 32 Zeedyke Structures, 2 solar stock wells, 4891 acres upland range improvement (National Fish and Wildlife Foundation Grant $40K + Landowner $40K = $80,000). Does not include HCR In Kind for 13 additional miles of fence installed before grant was received
2) GD Warm Springs Wildlife Fence. Private. 2018. Installed 0.75 miles new wildlife\riparian fence (AGRP $4,306)
3) LR WS Wildlife Fence. Private. 2019: Removed 1-mile woven wire and replaced with 4-strand wildlife fence (SO 3362 for $15,369)
4) Vaquero Wildlife Fence. Private. 2020: Removed 5.31 miles of Jackleg, 5 -Strand and woven wire fence. Installed 4. 5 miles of new 4-strand wildlife fence. (SO 3362 $28, 841 + landowner $36,051 + Removal $ MCC and Locals $10,000 Removal = $74, 892)
5) Stanley Wildlife Fence. Private. 2021: Removed 1-mile woven wire fence and replaced with 4-strand wildlife fence (SO 3362 for $10,667)
6) Vaquero Wildlife Fence II. Private. 2021: Modified 1.34 miles of fence by removing bottom 2 wires and replacing with one strand smooth wire. (SO 362 for YEP $2,468)
7) JK Wildlife Fence. Private 2021: Removed 1,300 Ft of woven wire fence and modified 1,200 ft replaced (SO 3362 MCC and YEP $3,116)
8) EK Grizzly Bear Fence. Private. 2021: Installed 200 Ft of electrified Bear fence around sheep pasture (PFW, P&C, landowner $14,643)
9) CB Wildlife Fence. Private. 2021: Installed 4,420 feet of 4-strand wildlife fence ($6,658 = landowner $6,658 = $13,316)
10) JR Ski Hill Wildlife Fence. Private. 2021: Removed 2,700 Ft of 5 strand and woven wire fence and replaced with 4-strnd wildlife fence (SO 3362 for $4,880)
11) HCR Project: Private and State Lands. 2018-2021: 13 miles In Kind + 9 miles NFWP and HCR = 22 Miles, 110 acres of confer removal, 6 acres Mesic Restoration, 32 Zeedyke Structures, 2 solar stock wells, 4891 acres upland range improvement (National Fish and Wildlife Foundation Grant $40K + Landowner $40K = $80,000). Does not include HCR In Kind for 13 additional miles of fence installed before grant was received
12) GD Warm Springs Wildlife Fence. Private. 2018. Installed 0.75 miles new wildlife\riparian fence (AGRP $4,306)
13) LR WS Wildlife Fence. Private. 2019: Removed 1-mile woven wire and replaced with 4-strand wildlife fence (SO 3362 for $15,369)
14) Vaquero Wildlife Fence. Private. 2020: Removed 5.31 miles of Jackleg, 5 -Strand and woven wire fence. Installed 4. 5 miles of new 4-strand wildlife fence. (SO 3362 $28, 841 + landowner $36,051 + Removal $ MCC and Locals $10,000 Removal = $74, 892)
15) Stanley Wildlife Fence. Private. 2021: Removed 1-mile woven wire fence and replaced with 4-strand wildlife fence (SO 3362 for $10,667)
16) Vaquero Wildlife Fence II. Private. 2021: Modified 1.34 miles of fence by removing bottom 2 wires and replacing with one strand smooth wire. (SO 362 for YEP $2,468)
17) JK Wildlife Fence. Private 2021: Removed 1,300 Ft of woven wire fence and modified 1,200 ft replaced (SO 3362 MCC and YEP $3,116)
18) EK Grizzly Bear Fence. Private. 2021: Installed 200 Ft of electrified Bear fence around sheep pasture (PFW, P&C, landowner $14,643)
19) CB Wildlife Fence. Private. 2021: Installed 4,420 feet of 4-strand wildlife fence ($6,658 = landowner $6,658 = $13,316)
20) JR Ski Hill Wildlife Fence. Private. 2021: Removed 2,700 Ft of 5 strand and woven wire fence and replaced with 4-strand wildlife fence (SO 3362 for $4,880)

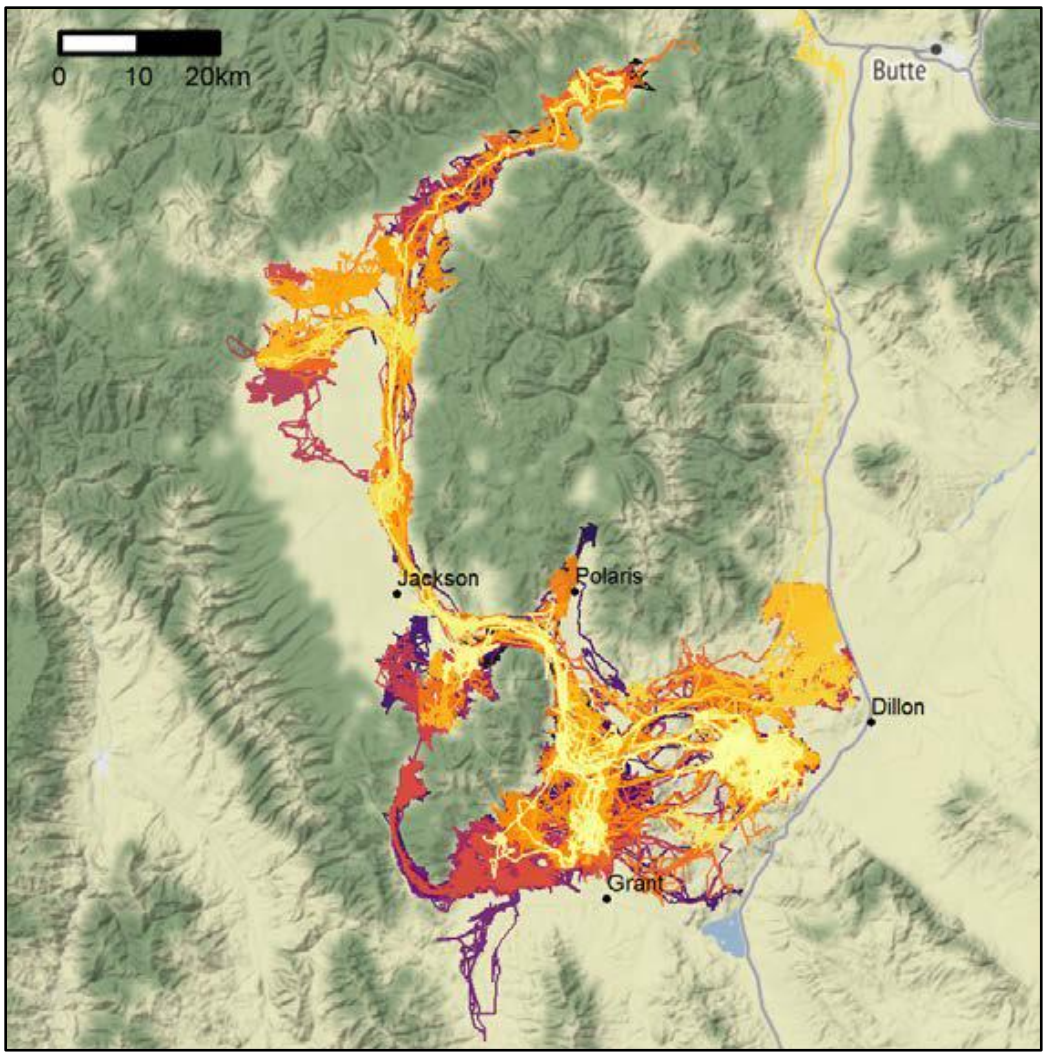

Figure 14: GPS collared pronghorn doe movements in Priority Area C, January 2020-May 2022.

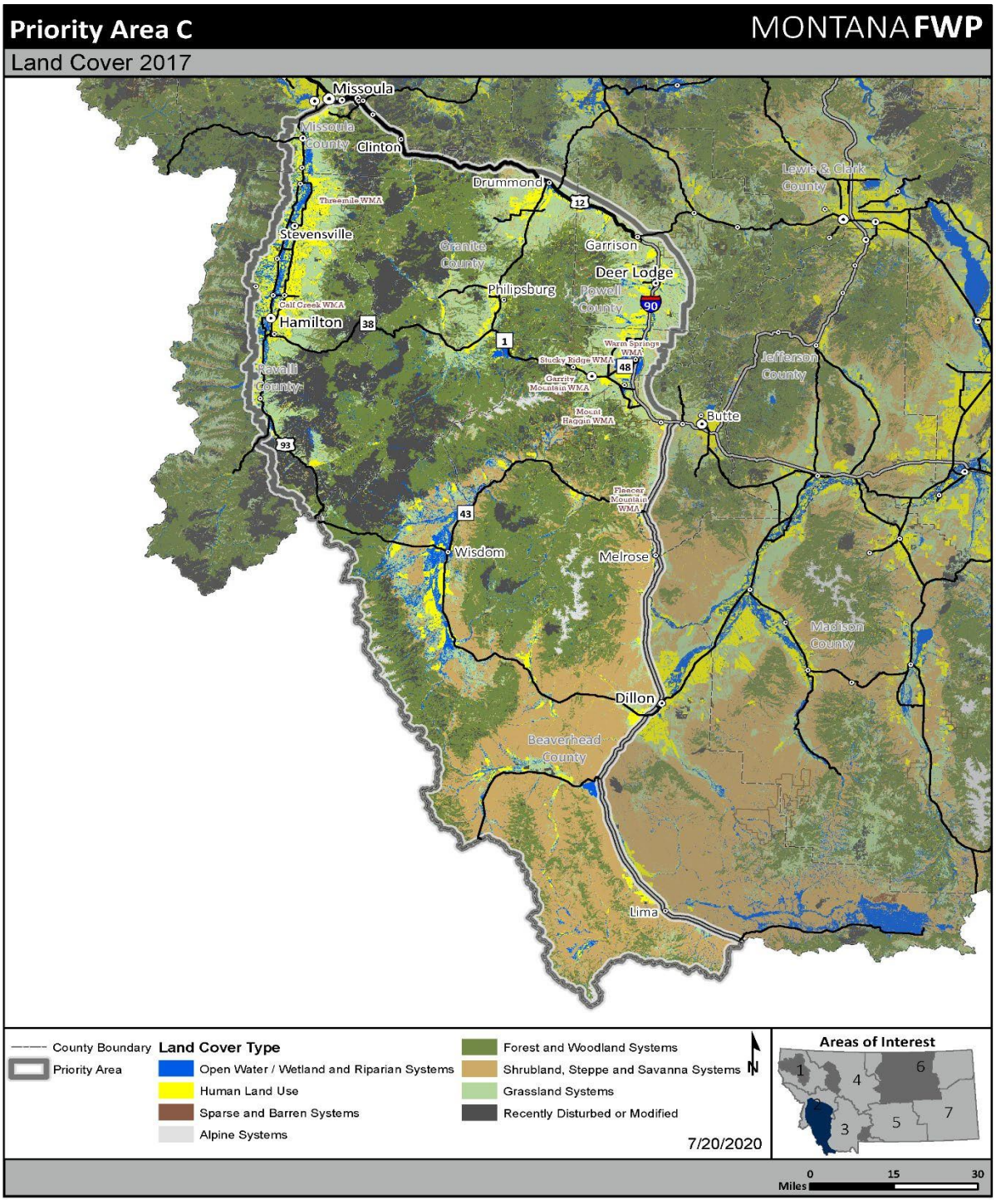

Figure 15. Landcover within Priority Area C.

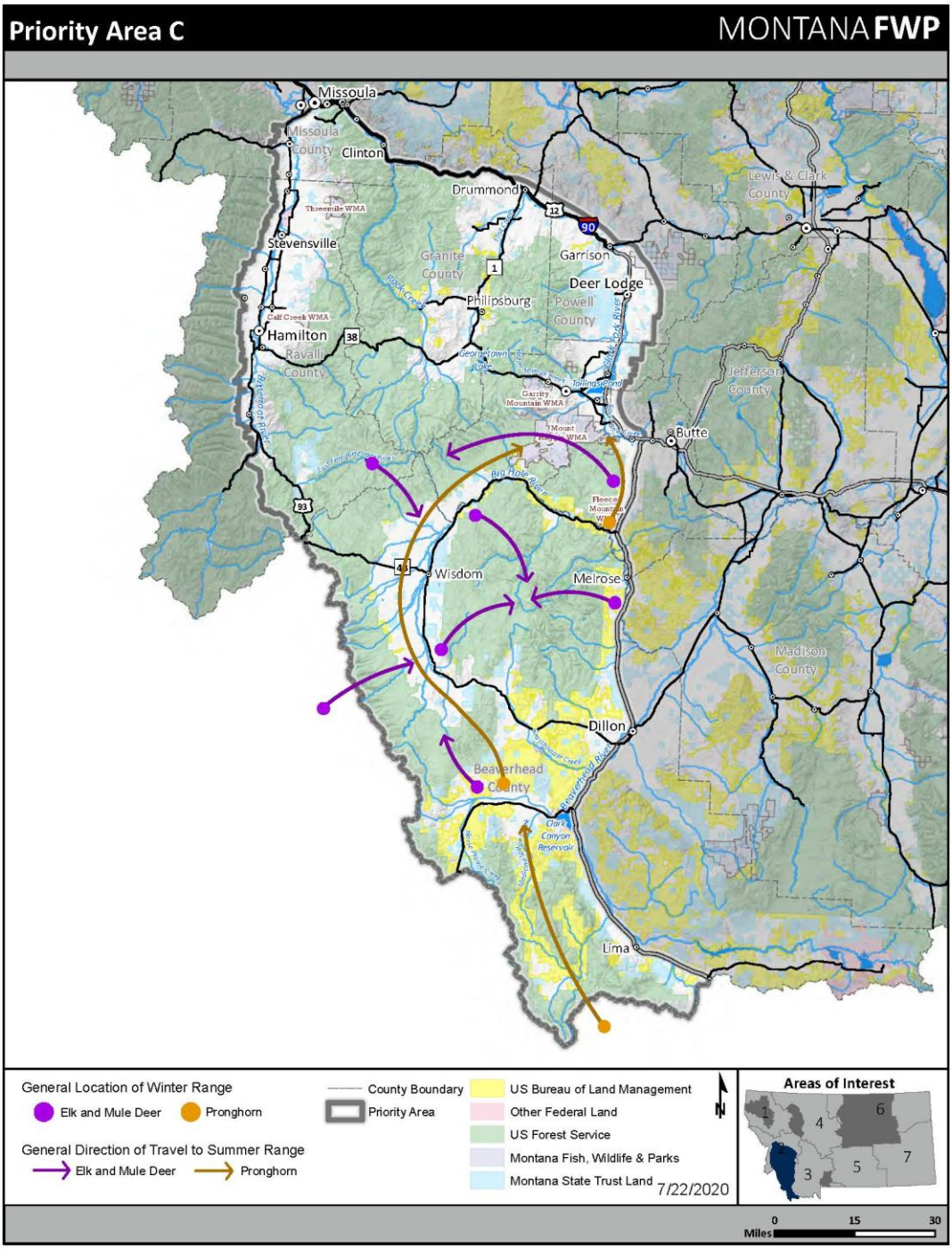

Figure 16. Big game movements within Priority Area C.

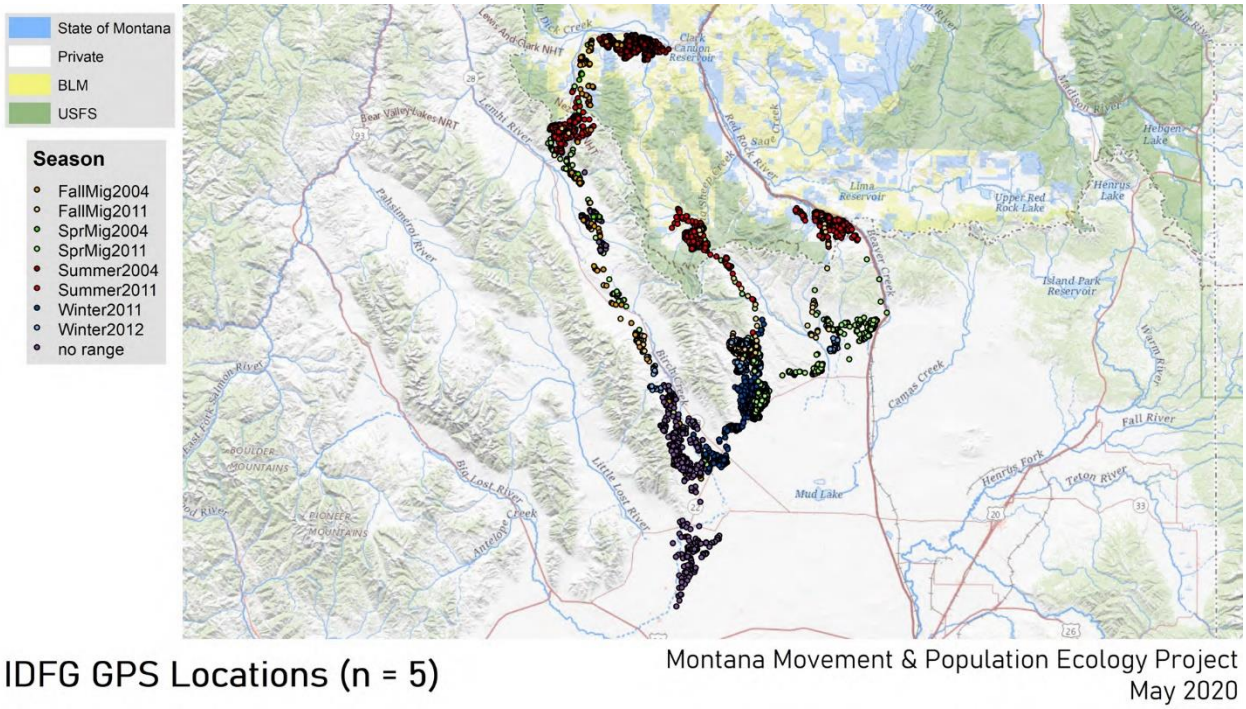

Figure 17. Movements of collared pronghorn that winter in Idaho and migrate north to summer range in Montana. It appears that the woven wire fence along MT Highway 324 restricts any further movement on the northern end of ID pronghorn migration and prevents mixing with MT pronghorn herds.

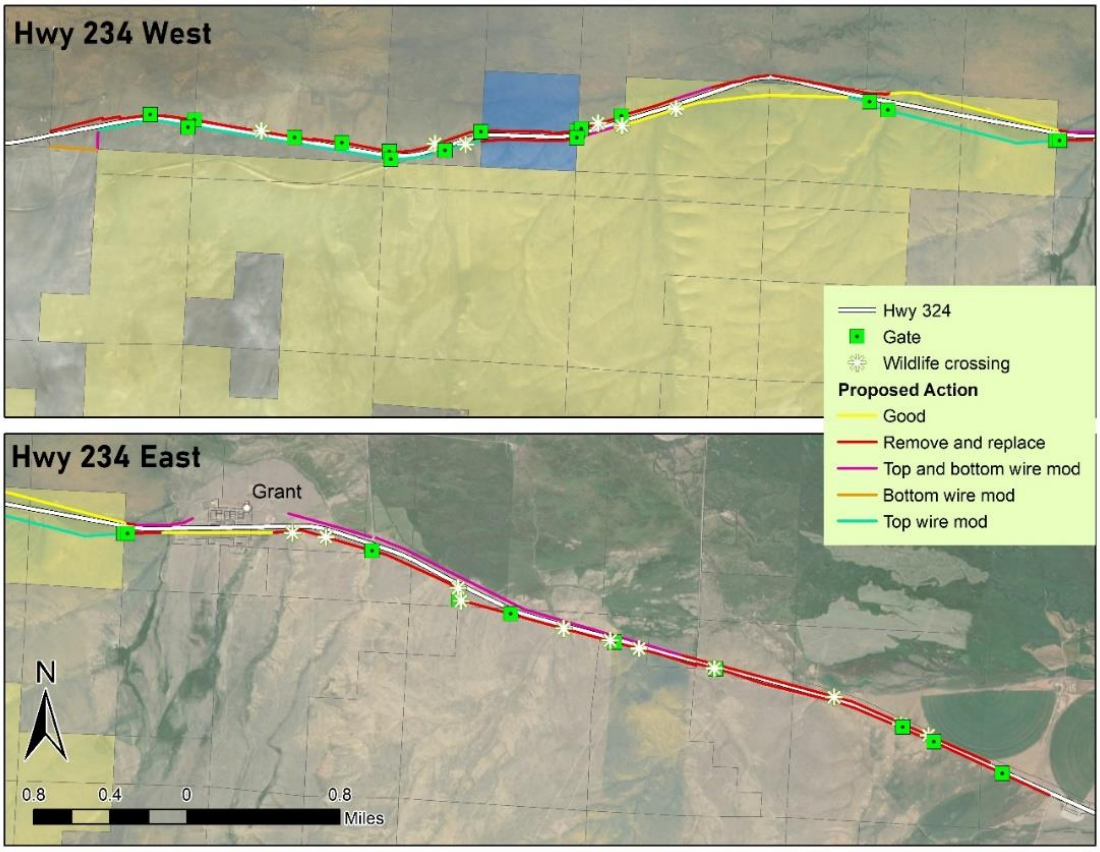

Figure 18: Impermeable fences along MT Highway 324 identified for replacement or modification in the Horse Prairie Fence project within Priority Area C.

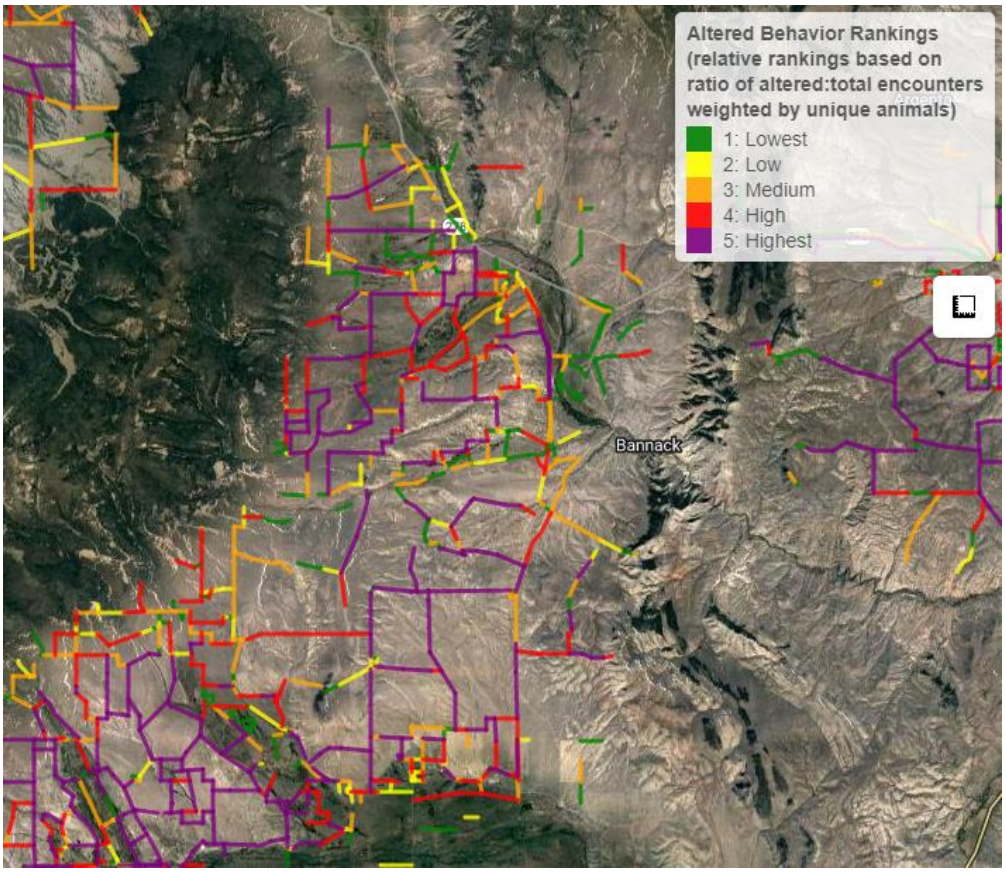

Figure 19. Screenshot of interactive map displaying mapped fences ranked by levels of altered movements of collared pronghorn. Methods for this analysis are currently in development and have not been finalized.

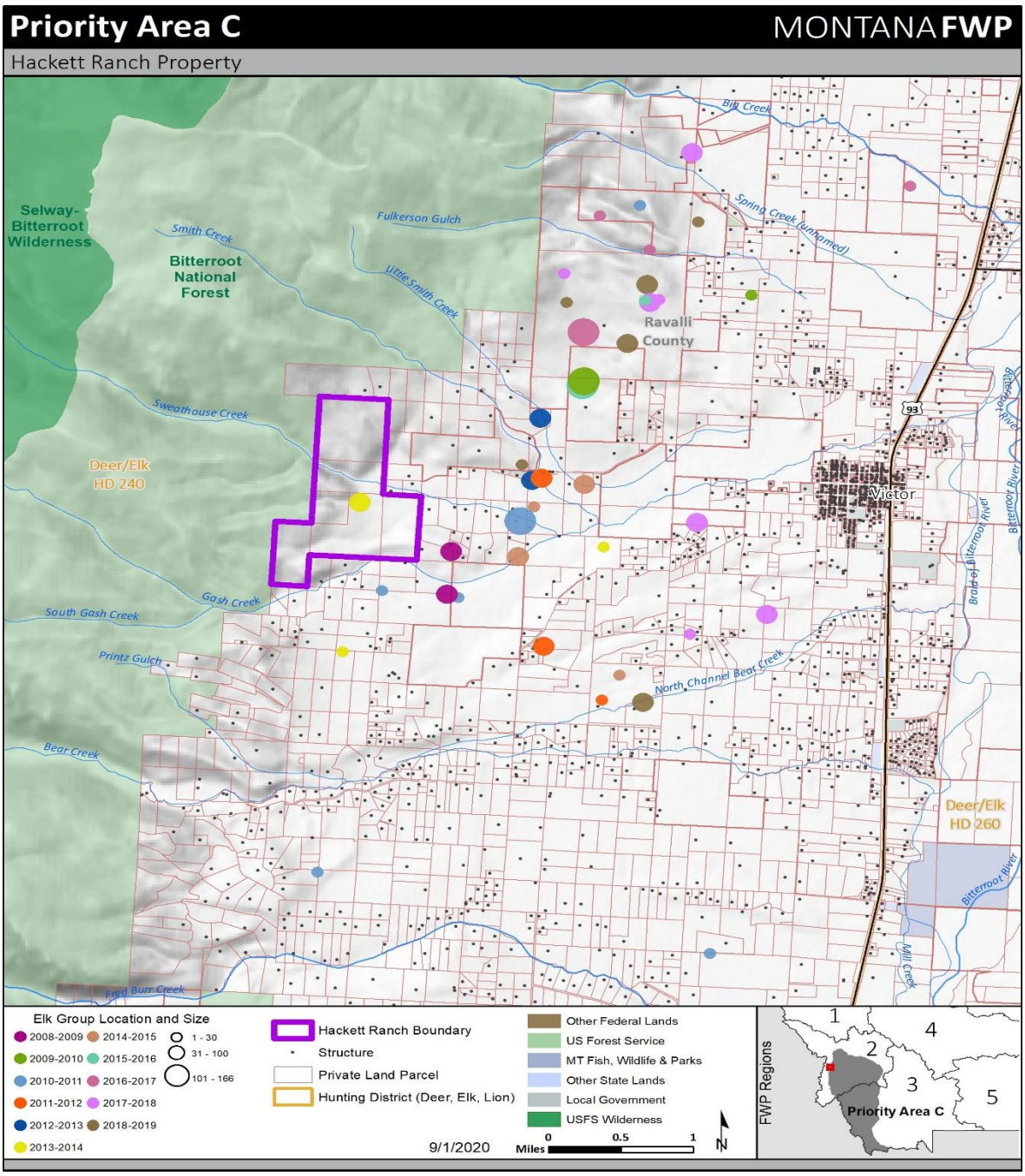

Figure 20. Locations and sizes of elk herds observed during spring green-up census counts (usually conducted in March-April).Elk survey data, administrative boundaries, and FWP Lands data from FWP, Helena, MT. Other reference information from ESRI and Montana State Library, Helena, MT. Map Produced by FWP Geographic Data Services.

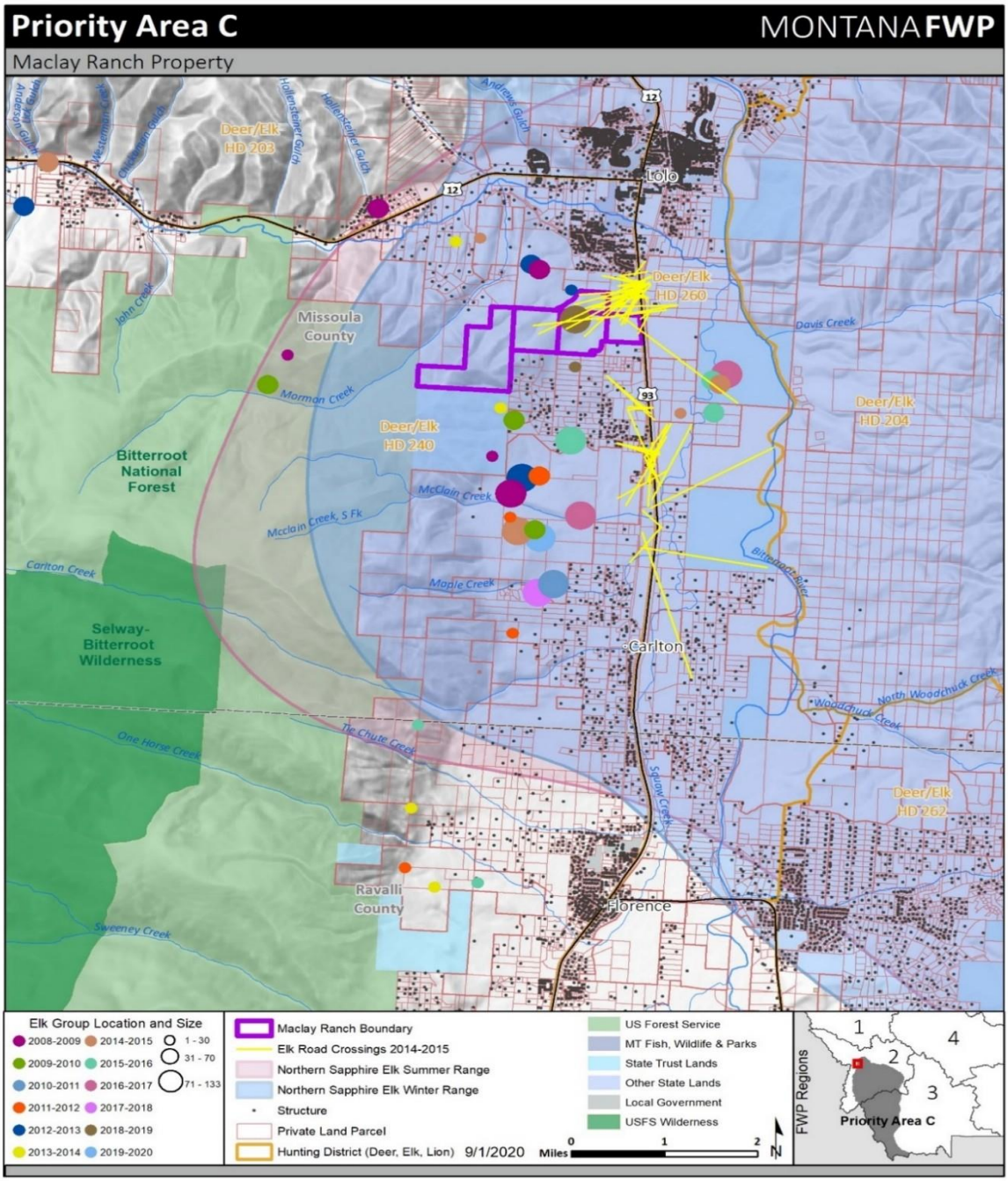

Figure 21. Locations and sizes of elk herds observed during spring green-up census counts (usually conducted in March-April). Yellow lines indicate known crossings of Highway 93 by six elk GPS collared as part of a 2014-2015 study (GPS locations available upon request). Shaded areas indicate cumulative winter range (blue) and summer range (red) of collared elk. Elk survey data, administrative boundaries, and FWP Lands data from FWP, Helena, MT. Other reference information from ESRI and Montana State Library, Helena, MT. Map Produced by FWP Geographic Data Services.

Priority Area D: Canadian Border to Musselshell Plains

Why: This corridor hosts elk, mule deer, and pronghorn. Pronghorn populations inhabiting the grasslands of northern Montana and southern Canada are composed of residents and migrants, with several distinct migratory behaviors including seasonal migration, facultative winter migration, post-fawning migration, and the use of stopover sites (Jakes et al. 2018). The longest documented round-trip migration for the species occurred in the northern portion of this region, totaling over 550 miles (Jakes et al. 2018). During migration and at stopover sites, pronghorn movements are affected by native habitat and landscape characteristics (e.g., intact grassland and sagebrush steppe areas, forage productivity, hydrological features, southerly aspects, and intermediate slopes) and anthropogenic features (e.g., roads, railways, energy wells, and fences) at variable spatial scales (Jakes 2015). Scale-integrated movement models have allowed for predictive modeling and mapping of priority spring and fall migration corridors for pronghorn among blocks of native grassland habitat across the region (Jakes 2015). Work documenting movements and movement impediments of pronghorn in the southern portion of this priority area was initiated in early 2020 and will conclude in 2023. To date, it appears that pronghorn populations in the Musselshell and Garfield County areas are non-migratory.
(https://fwp.mt.gov/binaries/content/assets/fwp/conservation/pronghorn/p-r-report---montana-pronghorn-project---2021.pdf) Future Montana Action Plans will identify specific movement impediments and other habitat issues for pronghorn in these areas.

These mapping efforts, along with maps of known movement impediments for pronghorn (e.g., fences; Poor et al. 2014) have allowed private landowners, agencies, local sportsmen and conservation organizations, and NGOs to focus management actions on facilitating pronghorn movement and migration across the region. Management actions have included land conservation, transportation planning and highway collision mitigation, railway operational planning, and fence removal and modifications on public and private lands. Additional work in this region has clarified the most effective fence modification designs to facilitate movements by pronghorn and deer (Burkholder et al. 2018, Jones et al. 2018).

Mule deer herds in this region are composed of varying proportions of resident and migratory animals. Based on radio telemetry data, approximately half of the mule deer wintering in the northeastern portion of this region in the Bitter and Buggy Creek areas make long-distance migrations to summer ranges ≥60 miles north in southern Canada (FWP, unpublished data). Mule deer wintering areas north of Highway 2 further west in this region are composed of resident animals inhabiting winter ranges year-round largely along linear drainages entering Montana from Alberta and Saskatchewan (Hemmer et al. 2017). South of the Missouri River, the only data available in this portion of the priority area originates from Hamlin and Mackie (1989), and while seasonal movements occurred in the Sand Creek/Carroll Coulee study area, most deer were non-migratory. It is assumed that this pattern is similar across the rest of this area with larger movements from higher elevation summer ranges to lower elevation winter ranges in the isolated mountain ranges (i.e., North and South Moccasins, Judiths, Big and Little Snowies).

Elk in this region are generally non-migratory, occupying what would traditionally be considered “winter ranges” year-round (Proffitt et al. 2016a), as is thought to be the case with elk herds across

eastern Montana in prairie-breaks habitat. Elk herds across this region are often larger than herd size objectives (http://fwp.mt.gov/fishAndWildlife/management/elk/).

A primary issue leading to the large and growing elk herds in this region is the propensity for elk to use private lands without hunter access during hunting seasons, reducing the effectiveness of public elk harvest for limiting population growth (Proffitt et al. 2016a, Thompson et al. 2016). In the western part of this region in the Missouri River Breaks, elk distribution overlaps publicly accessible lands in some areas enough for hunter harvest to be effective at limiting population size, but selection for private lands without hunter access by elk inhabiting the Larb Hills in the eastern portion of this region reduces the ability of harvest to control elk population size (Thompson et al. 2016). Elk populations in this region are approaching, or have surpassed, the limits of tolerance by many private landowners, and hunter over-crowding is a consistent theme of public comment when proposals are made to liberalize elk hunting opportunities. Hunter access to hunt elk on private lands and opportunities to harvest elk on public lands will therefore be paramount to the future of elk populations in this region. Other portions of the priority area south of the Missouri River have more limited public land and therefore very limited elk harvest opportunities.

Spatial Location: This corridor includes a swath of land in north central Montana ranging from the US/Canadian border in the north to the Musselshell plains in the south. The area is bisected in the middle by the Missouri River and Fort Peck Reservoir (Figure 5).

Habitat Types: Habitat types range from sagebrush grasslands to deciduous wetland/riparian areas to Missouri River Breaks.

Important Stopovers: Annual use by elk and mule deer. Winter use by pronghorn that rely heavily on sagebrush and seasonal use by fawning pronghorn.

Landownership: Dominated by private lands with some BLM and Montana state lands (DNRC/FWP). The Charles M. Russell NWR in the south is managed by the USFWS.

Land Uses: Livestock and farm production.

Risks/Threats: Habitat fragmentation primarily of private lands. Erosion of habitat quality via noxious weeds. US Highway 2 and the BNSF railroad corridors run generally east/west and represent the greatest threat to migratory movements and serve as wildlife travel/resting corridors during heavy snow accumulation. US Highway 191, which runs north/south in the priority area, represents a major barrier to big game movements as there is a large amount of old sheep fence that acts as an almost impenetrable feature.

Ongoing and Completed Work

- Land conservation efforts by public agencies, NGOs, and private landowners.
- FWP and partners are collaring and studying the pronghorn herds in south Phillips County, east Fergus and Petroleum Counties, and in Garfield and Rosebud Counties, all of which are within this priority area, as part of the larger pronghorn research project. This project will be completed in 2023 and will inform future on-the-ground projects and updates to the Montana Action Plan, beyond the currently available data and maps of pronghorn habitat and migration routes from the northern portion of this priority area.
- FWP has initiated a study to understand the effects of fence modifications by using camera traps and collar location data to monitor pronghorn movement behaviors one year prior to and one year after modification of woven wire and 4-strand barbed fences to wildlife friendly standards at four sites. The objective of this study is to evaluate the effectiveness of modifying fences intended to improve landscape permeability for pronghorn and the results will be used to improve future modification efforts. This project was initiated in summer 2021 and is in collaboration with The Nature Conservancy and a private landowner. As of summer 2022, one fence has been modified and the remaining fences will be modified fall 2022. FWP will continue to monitor camera-traps through summer 2023.
- FWP is working to minimize the effects of barriers such as fences, roads, highways, and railroads on migrating ungulates in this area. Because agency and NGO resources are limited, current work has focused on some of the most important migration routes. Even within those priorities, much work is yet to be done and additional resources would advance this conservation action.
- FWP continues to work with transportation (highway department and railroad) to facilitate wildlife passage. MDT, FWP, and Montanans for Safe Wildlife Passage sponsored a wildlife-highway summit in December 2018 where participants worked together and discussed the importance of planning for wildlife and transportation. The Wildlife and Transportation Steering Committee is continuing to work on recommendations that came out of the summit. An MOU was signed by the state agencies to work on wildlife passage.
- A Memorandum of Agreement remains in place between FWP and MDT regarding the installation, operation and maintenance of 14 pronghorn crossing signs on Highway 2 and Highway 191 in Phillips and Valley Counties. Annual coordination of planned MDT projects to discuss possible wildlife movement accommodations.
- The NRCS has established a Targeted Implementation Plan (TIP) to improve connectivity corridors for pronghorn in the Northern Blaine County portion of priority area D. This secures $720,000 for grazing management improvement practices on private lands to improve wildlife habitat and fence permeability for wildlife (Figure 22)
- Pheasants Forever lead the establishment of a Big Game Habitat Improvement Regional Conservation Partnership Program (RCPP) under NRCS, which is established for the period 2021-2026, making USDA funds available to private producers across priority area D to address threats to big game migration corridors and winter ranges (Figure 23). Improvement practices include grazing management, grassland restoration, retaining intact rangelands and fence permeability projects. Pheasants Forever has also hired a person to coordinate this work amongst the partners and has established a ranking tool to evaluate applications.

https://www.nrcs.usda.gov/wps/portal/nrcs/mt/programs/financial/rcpp/28b3fcb1-8b83-4d77-8e72-43ad248ed418/

- FWP works with the Rancher Stewardship Alliance (RSA) and their Conservation Committee to help facilitate projects that improve ranching practices and wildlife habitat. Since 2016, the RSA through their Conservation Committee and Board has received four NFWF grants and through those funds has been able to positively impact habitat through the reseeding of approximately 9,000 acres, transitioning of roughly 11,000 acres worth of expired Conservation Reserve Program (CRP) stands into grazing systems along with treating approximately 7,800 acres of undesirable crested wheatgrass, which does overlap some of the CRP acres.
- The RSA along with NWF and agency biologists have completed the prioritization tool, which was funded in part by a grant received by NFWF for SO3362 in 2018. The RSA's Big Game Subcommittee provided biological data and expert knowledge to develop one map that spatially targeted priority landscapes for big game winter range and another that targeted big game migratory priority landscapes using primary and secondary inputs with varying scores (Figures 24 and 25).
- The combined efforts of the partnership within members of the RSA Conservation Committee have resulted in the following big game winter range and migration improvements north of the Missouri River:
    - Grassland reseeded: 2,119 acres
    - Grazing management improved: 34,406 acres
    - Fence modified for wildlife passage: 89 miles
    - Fence removed: 8.3 miles
- The combined efforts of the Winnett Agricultural Enhancement and Sustainability (ACES) group and USFWS Partners for Fish and Wildlife biologists have resulted in the following big game winter range and migration improvements south of the Missouri River:
    - Grassland reseeded: 1,455 acres
    - Grazing management improved: 33,502 acres
    - Fence modified for wildlife passage: 15 miles
    - Fence removed: 39 miles
- The USFWS Charles M. Russel NWR is using best available science and restoration techniques to enhance and restore pronghorn migration corridors and winter range for mule deer and elk on the refuge. In the past five years, the Charles M. Russel NWR has removed 109 miles (21 miles in the last two years) of interior fence as well as improved approximately 2,500 acres of wildlife habitat through prescribed burns.
- The USFWS is collaborating with numerous partners including FWP and NWF on studies to better understand connectivity and corridors for pronghorn, greater sage grouse and mule deer in this Northern Great Plains Landscape.
- The USFWS has a very active conservation easement program across this landscape. Perpetual landscape protection is based on biological priorities.
- The USFWS has developed a Candidate Conservation Agreement with Assurances (CCAA) for working with private landowners in this landscape. While the primary focus of the CCAA is threat reductions for grassland birds and sage grouse, it will support habitat conservation for pronghorn and other big game species. Key partners are The Nature Conservancy, BLM and many private landowners.

- The BLM Malta Field Office works with the FWP, BLM permittees, and private landowners to maintain wildlife-friendly fencing and keep fence gates open during the winter, where possible, within wildlife migration corridors. In 2021, 4.5 miles of fence was converted to wildlife-friendly fence standards and an additional .75 miles of fence was removed. Both projects are within pronghorn and mule deer winter and season migration range. They are also currently in the process of mapping allotment fences in their area to help in future migration improvement projects.
- The BLM finalized the Pumpkin Creek Area land exchange in 2009, creating a contiguous block of federal land covering approximately 20,556 acres. The BLM partners with NGOs and FWP to improve wildlife habitat, stream restoration and wildfire suppression.
- In 2021, the Glasgow BLM Field Office modified 9.75 miles of fence to be more wildlife friendly and have identified an additional nine miles to be modified in 2022 and beyond. In addition, two livestock exclosures were constructed and will protect approximately 580 acres of big game winter range.
- The Glasgow BLM Field Office also conducted native prairie reconstruction activities on 1,400 acres, improving both big game migration and winter range habitat. In addition, habitat restoration activities along the south fork of Lone Tree Creek were implemented to prevent a head cut mitigation. These efforts maintained and restored 36 acres of riparian habitat in critical big game winter range.
- In 2021 BLM and Pheasants Forever (PF) partnered to fill a coordinating biologist position to help with sage grouse monitoring, sagebrush conservation and public access. BLM is an active participant with many conservation partners focusing on wildlife friendly fencing, mesic restoration, native prairie conservation, conifer removal from sagebrush, mechanical conifer thinning and prescribed burning in the southern portion of Priority Area D. Partners include Winnett ACES, FWP, PF, NRCS, USFWS-PFW, DNRC, RMEF, MDF, NWTF and many private landowners.
- Since 2009, the Lewistown BLM Field Office has treated about 60,000 acres through prescribed burns and mechanical treatments to improve habitat conditions in sagebrush/grasslands and ponderosa pine breaks. Several logging treatments have been completed which focused on aspen rehabilitation on about 200 acres. These efforts have continued and expanded since the 2020 update to also include mesic/riparian restoration. BLM continues to coordinate and work on wildlife friendly fence modifications or removals, with over 10 miles completed since 2020. GPS collared pronghorn movement data is being used to prioritize fence modification efforts in coordination with private landowners, FWP and other partners.
- The BLM Miles City Field Office has replaced 130 miles of woven-wire and/or barrier fences since 2008. These fences impede big game daily and/or seasonal movement, cause direct mortality, and interrupt habitat use in areas crucial for pronghorn, mule and white-tailed deer, and elk populations.
- Since 2008, the BLM Miles City Field Office has enhanced wildlife habitat on 23,000 acres of public lands with the use of mechanical tree thinning. Mechanical treatment has been shown to provide protections of forage crucial to ungulate species during winter months and rejuvenated forbs and shrubs used by big game in the spring. Prescribed fire in forested habitat has been applied to 4,400 acres of public land, which has been known to increase native

forbs and grasses for big game the years following the fire. The BLM Miles City Field Office inventoried 3,087 miles of roads on BLM public lands and evaluated 2,354 miles to identify impacts on big game and upland game birds.

<u>Costs of Needed Habitat Treatment:</u> Unknown

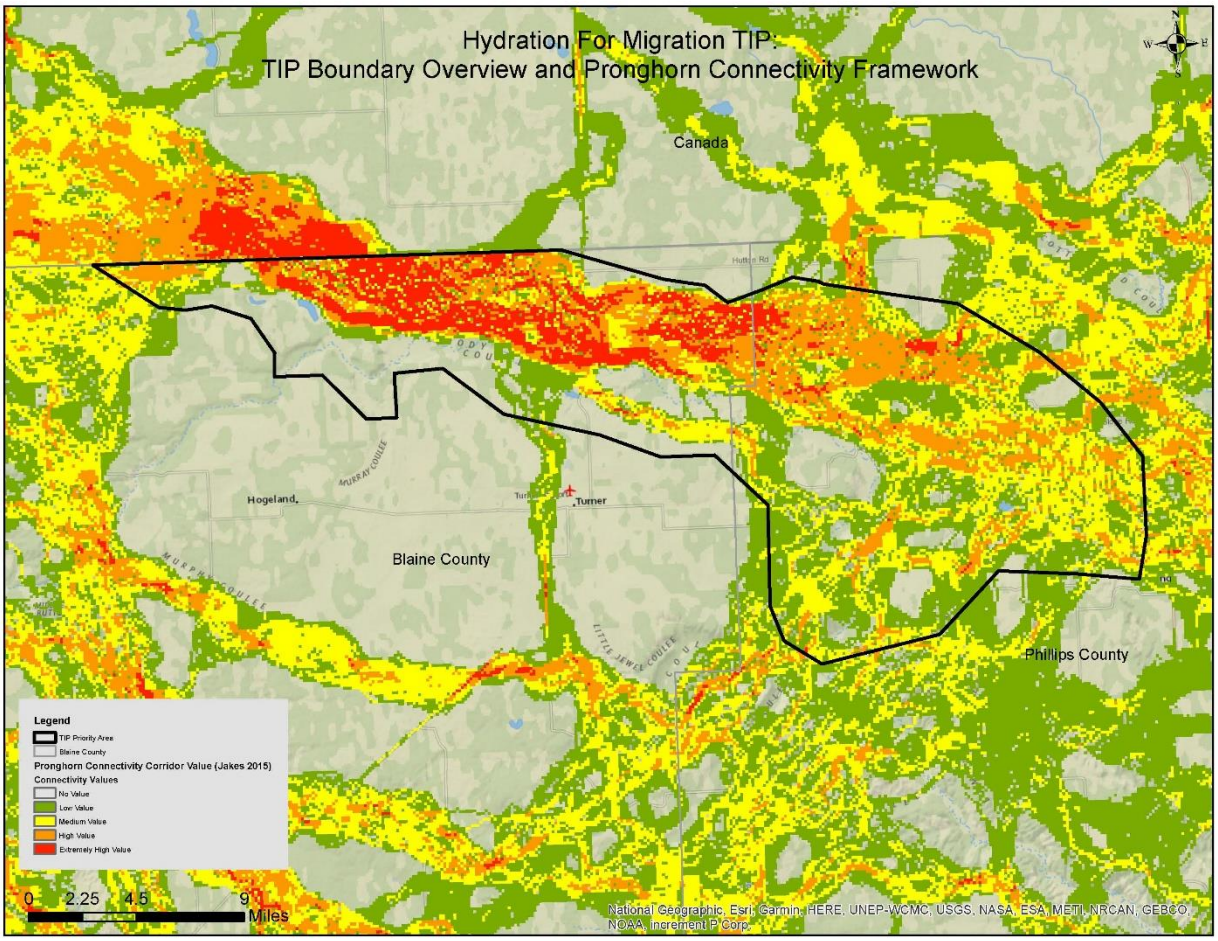

Figure 22. USDA's Hydration for Migration Targeted Implementation Plan in Northwestern portion of Priority Area D.

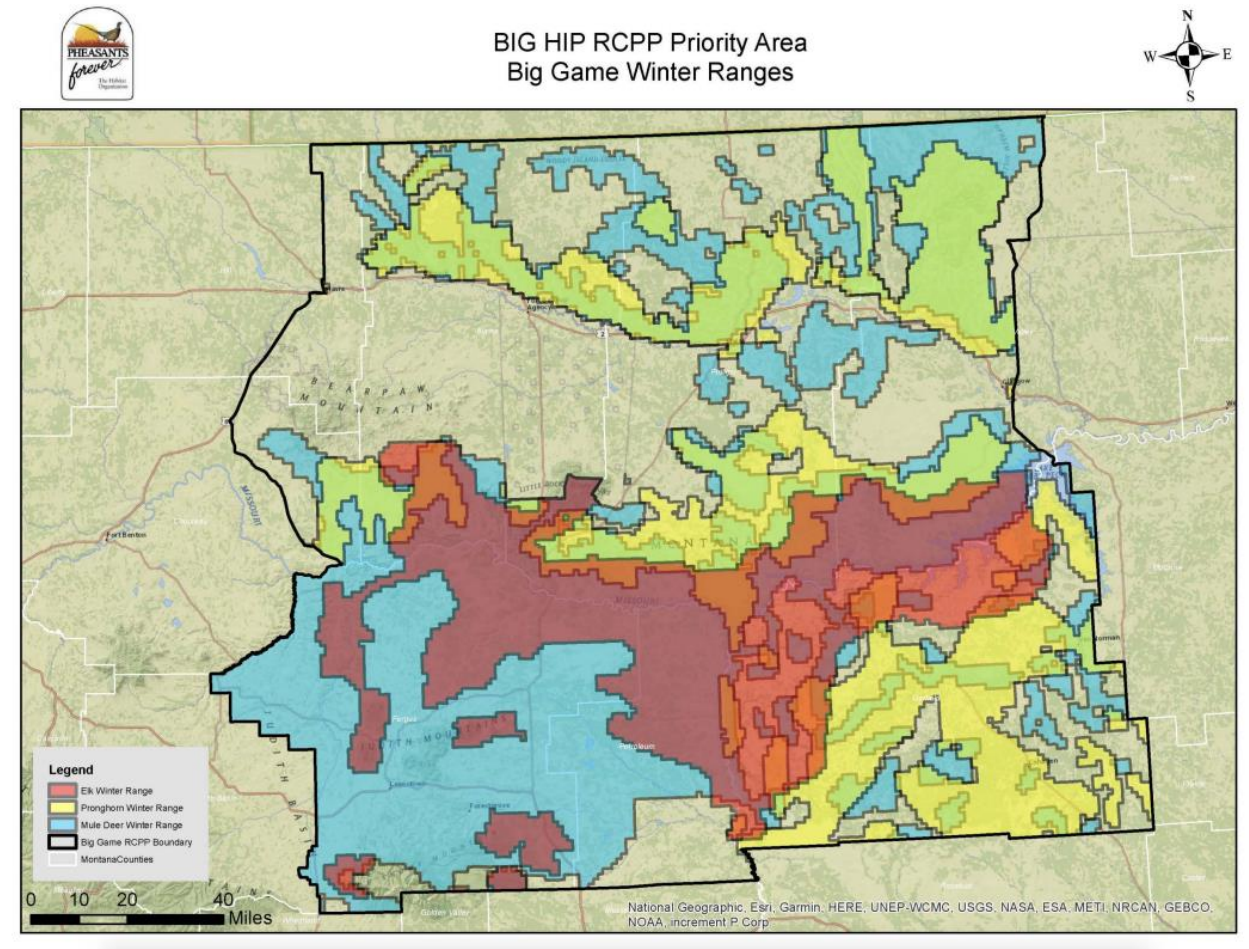

Figure 23. Priority Area for USDA's Big Game Habitat Improvement RCPP Project

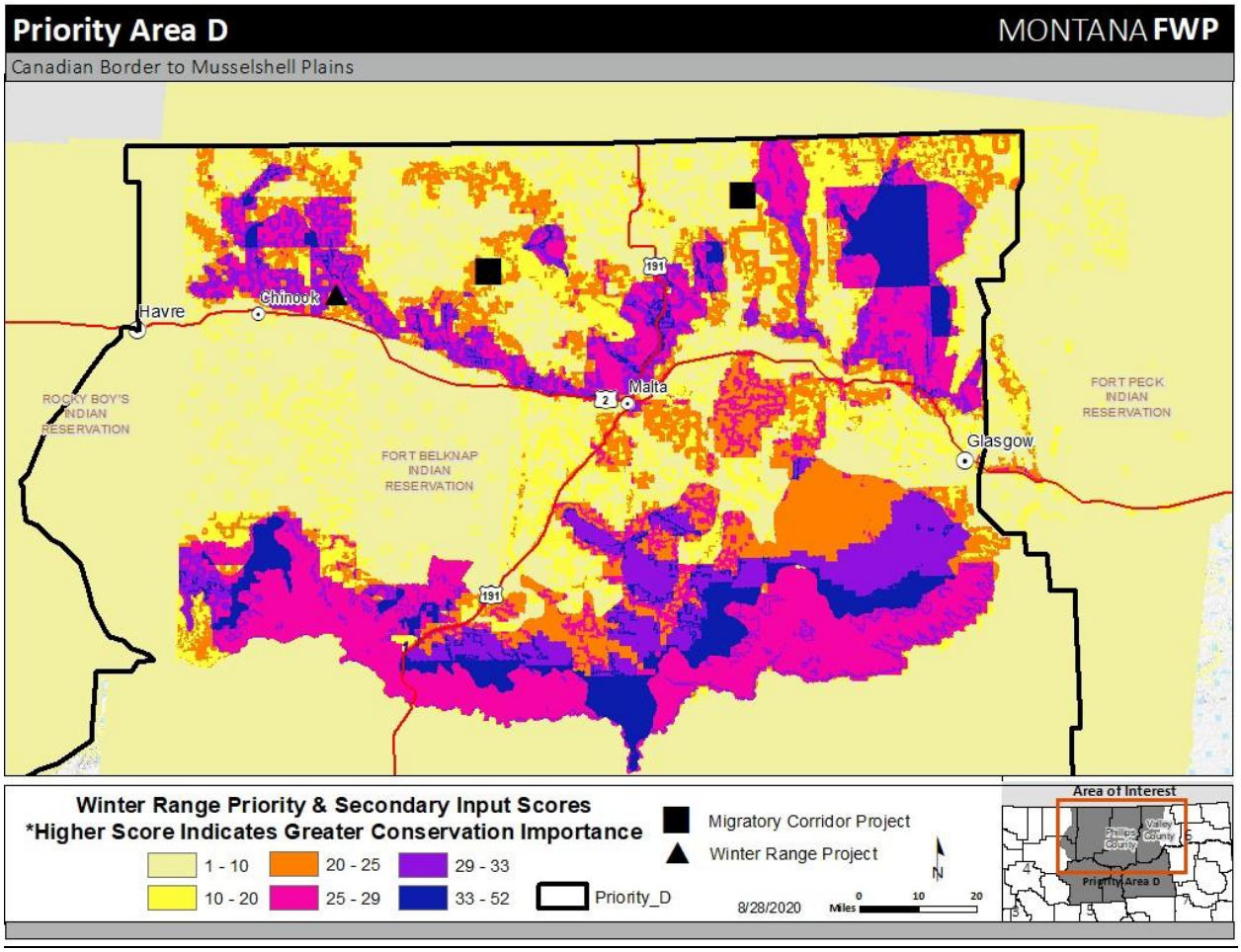

Figure 24. Priority landscapes for big game winter range. Winter range data and administrative boundaries from FWP, Helena, MT. Other reference information from Montana State Library, Helena, MT. Map Produced by FWP.

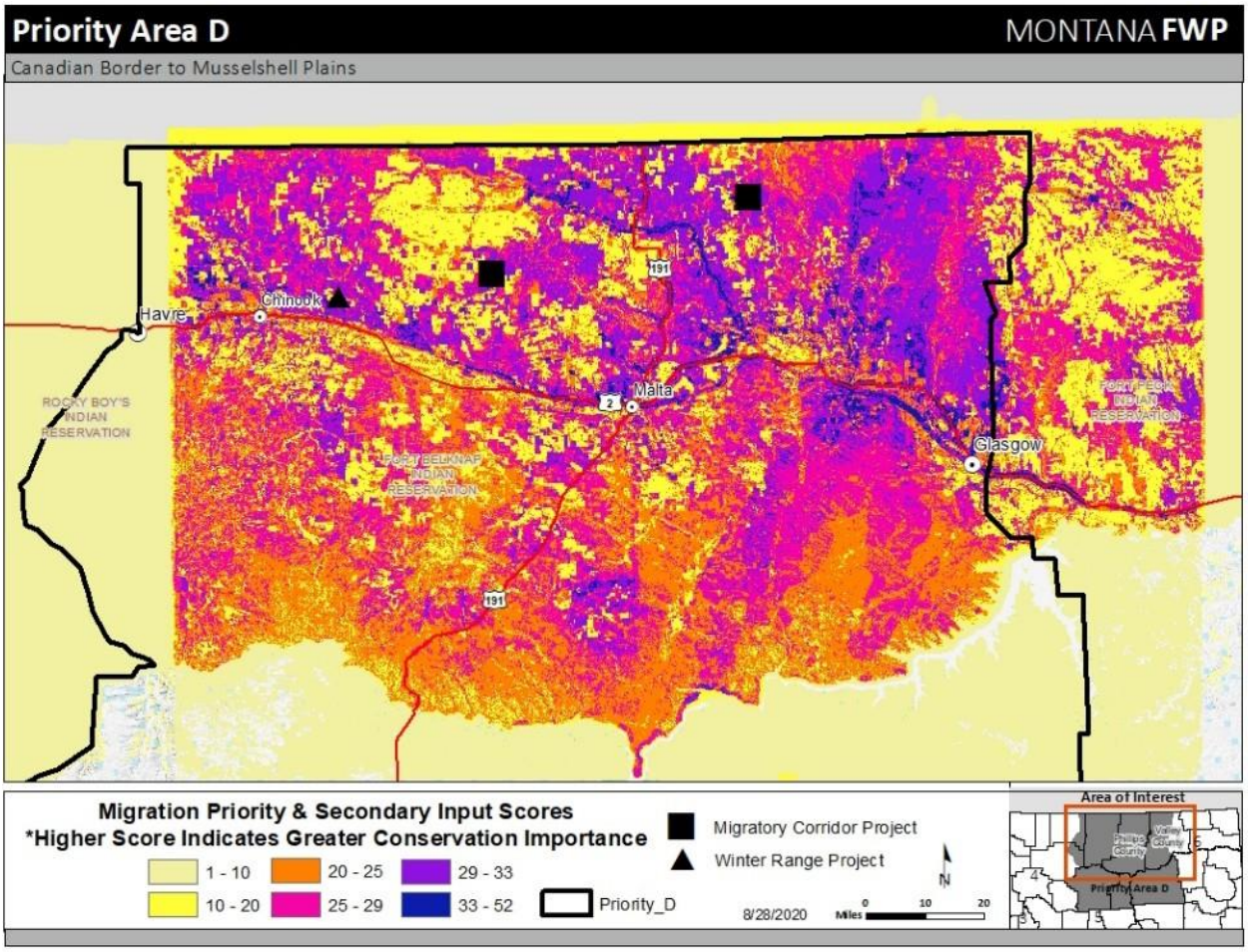

Figure 25. Priority landscapes for big game migration. Migration data and administrative boundaries from FWP, Helena, MT. Other reference information from Montana State Library, Helena, MT. Map Produced by FWP

Priority Area E: Heart of the Salish

Why: This area is a migration corridor and wintering grounds for both elk and mule deer. Elk GPS collaring data collected by the Confederated Salish and Kootenai Tribes between 2012 and 2016 shows elk wintering grounds on the Flathead Indian Reservation and a movement corridor to the north all the way to where Sunday Creek enters the Stillwater River.

Mule deer GPS collaring data collected by the University of Montana, in collaboration with FWP, between 2017 and 2019 shows deer wintering along the Fisher River and then migrating to higher grounds both west and east of this area for fawning and summer foraging areas. For those that move west, some go as far as the alpine cirque basins of the Cabinet Mountains Wilderness. Those that migrate east move into the Flathead National Forest along Good and Sunday creeks and just to the west of the Stillwater State Forest.

This area also supports grizzly bears, wolverine, wolves, Canada lynx, and fishers as well as an additional 50 fish and wildlife species identified as Species of Greatest Conservation Need in Montana's State Wildlife Action Plan including but not limited to Townsend's big eared bat, harlequin duck, Coeur d'Alene salamander, and Columbia River redband trout.

Spatial Location: This corridor includes a swath of land in northwest Montana running from the Flathead Indian Reservation north through the Lost Trail National Wildlife Refuge (NWR) and even farther north to the national forest land west of the Stillwater State Forest. It also runs from the top of the Cabinet Mountains to the same area west of the Stillwater State Forest (Figure 5).

Habitat Types: Habitat types include both mesic and xeric conifer-dominated forests, subalpine meadows, alpine above tree line, deciduous dominated forest and woodland, deciduous shrubland, floodplain and riparian, forested marsh, montane grasslands, and wet meadow with a few bog/fen areas.

Important Stopovers: Important stopover areas for mule deer include areas of core winter range along the Fisher River, some of which have been protected by a conservation easement, and an area along Libby Creek just south of Libby that deer use in the spring until their high-elevation summer ranges are accessible. Important stopover areas for elk include core winter ranges on the Flathead Indian Reservation and around the Lost Trail National Wildlife Refuge that provides key habitat for both migratory and resident elk.

Landownership: This area is primarily a mix of national forest land (some of which is designated wilderness), the Lost Trail National Wildlife Refuge, private timber company land, and Flathead Indian Reservation land. Other land types include other private land and Montana state lands (DNRC/FWP).

Land Uses: These public and private lands have a mix of uses, but primarily consist of timber harvest, recreation, and some farm and livestock production.

Risks/Threats: The main risk or threat in this area is habitat fragmentation due to conversion

of timber land to private residential use. This threat is both immediate and long-term. The main solution would be to place as much of the remaining private land under no-development conservation easements as is feasible. Degradation of habitat quality via the spread of noxious weeds is also a threat.

Vehicle collisions along US Highway 2 (US 2) are a source of mortality for wildlife as is the BNSF railroad through Wolf Creek and the lower Fisher River. These threats are both immediate and long-term. Several areas have been identified for consideration for wildlife crossings or other mitigation measures where MDT has active highway improvement projects in progress. The following are general locations for prioritization.

- US 2 from reference post (RP) 51.0 to RP 55.0. experiences considerable seasonal and daily movements by large ungulates and has been identified as an important corridor for grizzly bear movement. This area is located to the northeast of Pleasant Valley and the Thompson Chain of Lakes. MDT has completed several aquatic mitigation projects in this area that provide high quality nesting, rearing, foraging and loafing habitat for a wide variety of wildlife species. Engineering and geotechnical work that was completed for recent highway re-construction revealed that some areas may be suitable for construction of wildlife crossings while most of it is not due to unstable geology and fens. MDT has worked to maintain habitat connectivity by minimizing right-of-way fence construction thereby allowing wildlife to move freely across the landscape.

- US 2 from RP 106.0 to RP 113.0 experiences substantial seasonal movements by large ungulates, especially elk. This area is around Smith Valley and Kila just to the west of Kalispell. MDT works to minimize wildlife-vehicle collisions by placing eastbound and westbound facing Portable Variable Message Signs to alert motorists to the seasonal presence of elk. This would be an appropriate location to consider implementing emerging technologies such as radar detection and driver warning systems.

Current Focal Areas: FWP has designated two focal areas within this priority area to focus on for actionable habitat projects and current conservation efforts for the next year. Both areas contain private timber company lands that are the subject of potential habitat protection projects through no-development conservation easements to be held by FWP.

The first priority area is centered around the Lost Trail National Wildlife Refuge (NWR) and surrounding US Forest Service and private timber company land (Figure 26). This area has been a priority for conservation for FWP Region 1 for decades.

The second priority area is located east and south of the city of Libby (Figure 27). This area has been the focus of the habitat conservation efforts including two recently completed conservation easement projects totaling 50,000 acres.

Ongoing and Completed Work: Public agencies, NGOs, and private landowners have been and continue to collaborate on land conservation in this area. FWP and TPL acquired $26 million from the USFS Forest Legacy Program (FLP) for two nationally ranked #1 projects within Priority Area E, the Montana Great Outdoors Project (FY23) and the Upper Thompson Phase 1 Project (FY24).

The 114,000-acre Montana Great Outdoors Project consists of Green Diamond Resource Company and Southern Pine Plantations lands southwest of the USFWS Lost Trail Conservation area in Focal Area #1 and lands in the Wolf and Dunn creek drainages in Focal Area #2. The 23,000-acre Upper Thompson Phase 1 Project includes scattered sections south of McGregor Lake providing important habitat connectivity. Additionally, UFWS established the Lost Trail Conservation Area in 2021, which allows USFWS to pursue up to 100,000 acres of conservation easements with Green Diamond and Southern Pine Plantations within this boundary. USFWS intends to purchase conservation easements from Southern Pine Plantations in three phases occurring in FY23, FY24, and FY25.

Recent accomplishments include Kootenai Forest Lands Project Phase I and II (FY19 and FY21, 50,000 acres) and the Lost Trail (FY20 7,200 acres) Conservation Easement Projects. Additionally, 142,000 acres of land owned by Weyerhaeuser in the Thompson and Fisher River drainages were placed under conservation easement in 2003.

Cost of Needed Habitat Treatment: The Montana Great Outdoors and Upper Thompson Phase 1 conservation projects that FWP and partners are working on will cost $51.5 million ($26 million funded by FLP, $25.5 million additional funding needed). The remaining habitat conservation in this priority area including lands in the USFWS Lost Trail Conservation Area may cost tens of millions of dollars. Costs of weed management in this area is unknown, but FWP may be able to partner with private landowners for noxious weed control through our Wildlife Habitat Improvement Program (WHIP).

Costs to prevent wildlife-vehicle collisions vary greatly depending on the method employed: radar detection systems cost tens of thousands of dollars, underpass crossings are $350,000 or more, and overpasses for a 2-lane highway start at approximately $3 million.

Cost of Needed Wildlife Monitoring: Priority Area E also serves as winter range for elk. Currently, little is known about the movement and habitat use of these resident elk. Management of this wildlife resource would be greatly enhanced by obtaining information on how the migratory and resident herds use the area. Placing GPS collars on elk found on the Lost Trail NWR and surrounding area would provide information on how migrating and residential elk use this landscape. The data would also improve our ability to work with land management agencies and private timber companies to improve habitat conditions for elk through various timber and land manage practices. This monitoring effort would cost approximately $150,000 or more to collar and track 20 to 30 animals. This data will also be crucial to understand potential pathways for movement of chronic wasting disease should it spread from the recently discovered epicenter in white-tailed deer in the City of Libby. Information gained from collared elk would help to establish potential surveillance areas and formulate plans for managing chronic wasting disease.

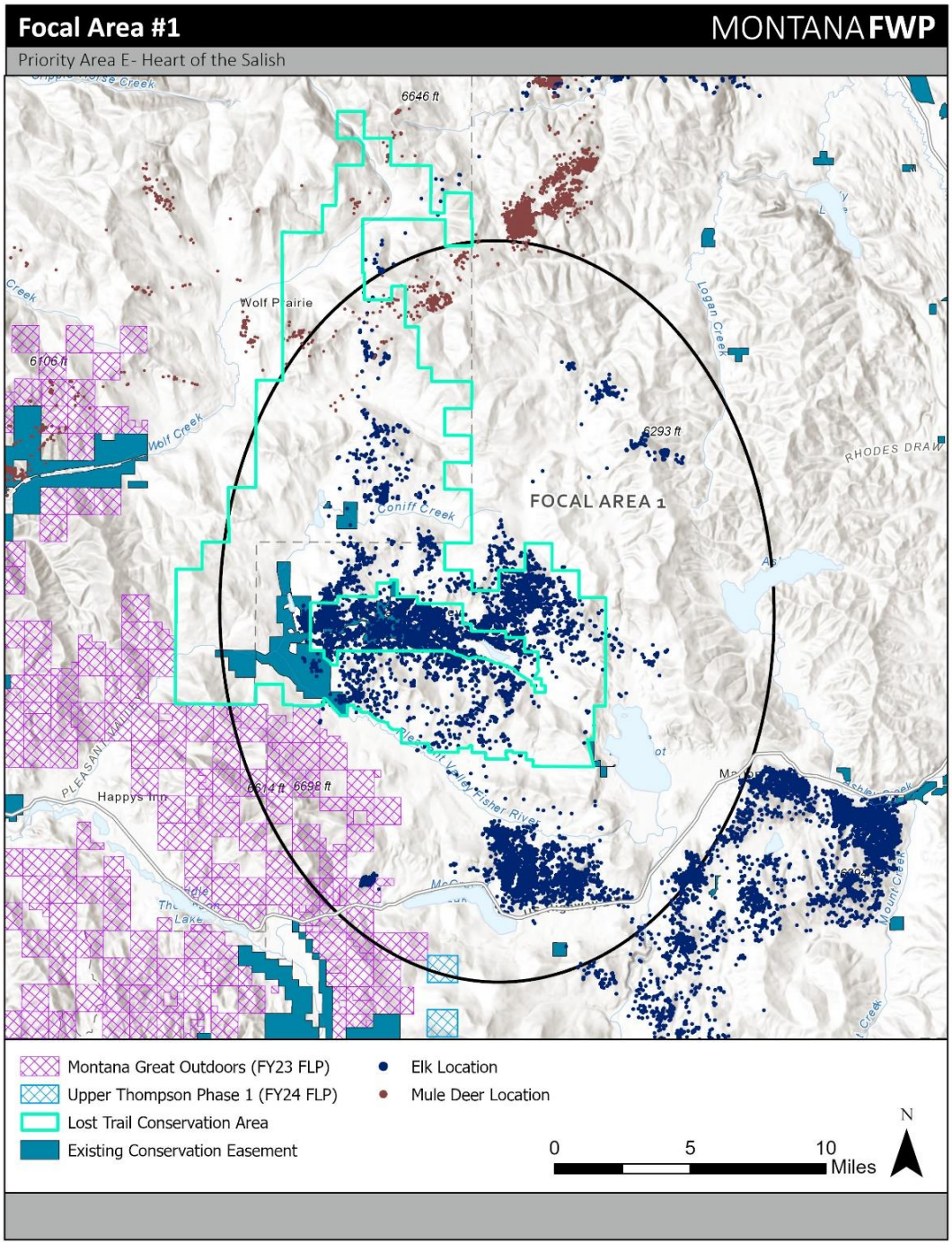

Figure 26. Focal area #1 is centered around the Lost Trail National Wildlife Refuge and includes one of FWP's current conservation easement projects, the Montana Great Outdoors Project, as well as the USFWS Lost Trail Conservation Area which was established in 2021.

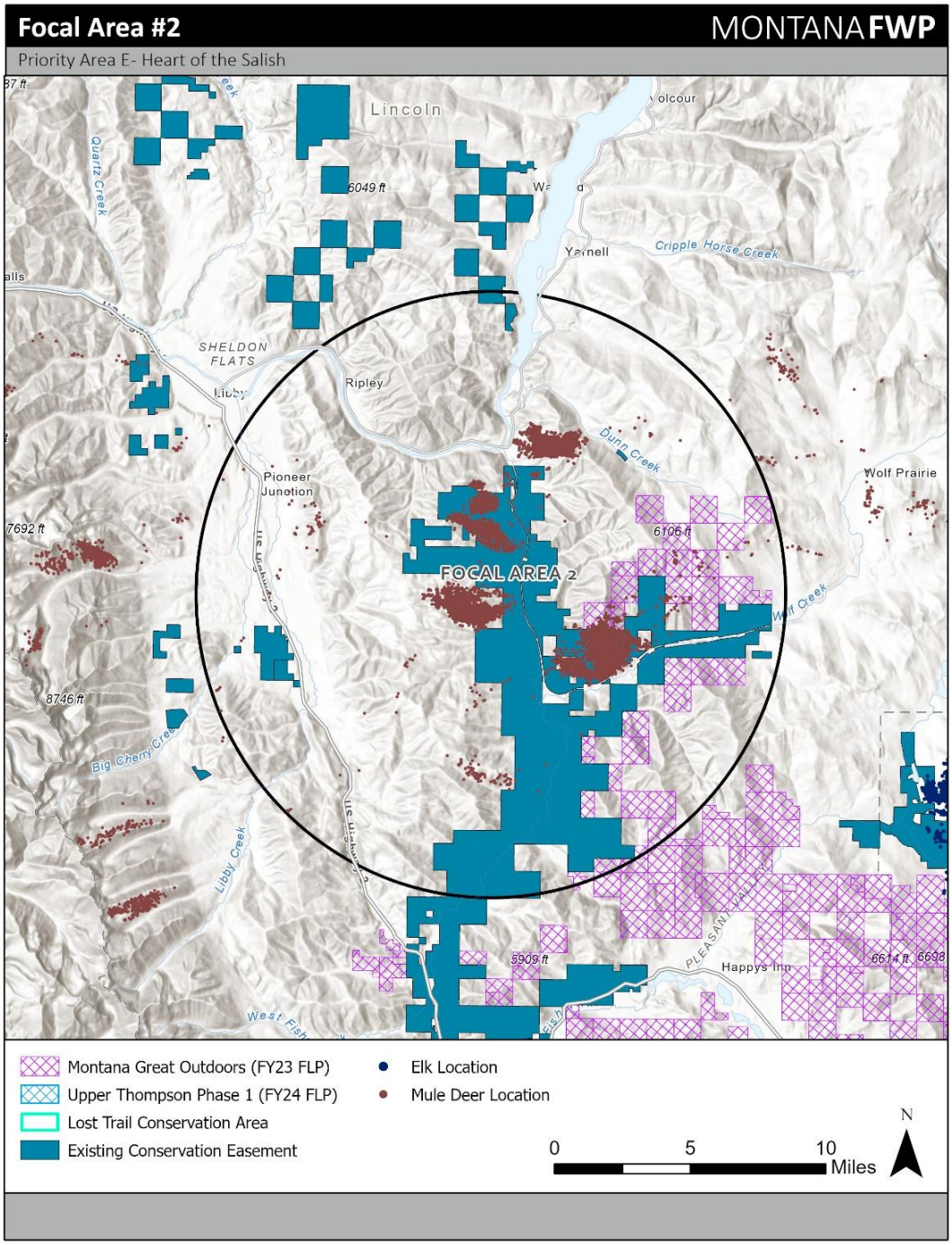

Figure 27. Focal area #2 is centered around the Fisher River drainage just south of the Kootenai River.

Literature Cited

Ament, R., P. McGowen, M. McClure, A. Rutherford, C. Eliss, and J. Grebenc. 2014. Highway mitigation for wildlife in northwest Montana. Sonoran Institute, Northern Rockies Office, Bozeman, MT, 84 pp.

Ament, R., and T. Creech. 2016. Crown of the Continent Ecosystem, The Glacier-Great Bear Connectivity Conservation Area Briefing. The Center for Large Landscape Conservation, Bozeman, MT, 5 pp.

Barker, K., M. Mitchell, and K. M. Proffitt. 2019. Native forage mediates influence of irrigated agriculture on migratory behavior of elk. Journal of Animal Ecology. https://doi.org/10.1111/1365-2656.12991.

Barker, K., K. M. Proffitt, J. DeVoe, and M. Mitchell. 2018. Land management practices alter traditional nutritional benefits of migration for elk. Journal of Wildlife Management DOI: 10.1002/jwmg.21564.

Burkholder, E.N., A.F. Jakes, P.F. Jones, M. Hebblewhite, and C.J. Bishop. 2018. To jump or not to jump: mule deer and white-tailed deer fence crossing decisions. Wildlife Society Bulletin 42:420-429.

Carnes, J. C. 2009. Mule deer population ecology and chronic wasting disease study southeast Montana-Fish, Wildlife and Parks Region 7, Final Report, July 2009. Montana Fish, Wildlife, and Parks. 51 pp.

Cushman, S.A., K.S. McKelvey, and M.K. Schwartz. 2009. Use of empirically derived source-destination models to map regional conservation corridors. Conservation Biology 23:368-376.

DeCesare, N. J., C. Peterson, T. Hayes, C. Anton, D. Messmer, T. Chilton-Radandt, B. Lonner, E. Lula, T. Thier, N. Anderson, C. Loecker, C. Bishop, and M. Mitchell. 2021. Montana statewide mule deer study: ecology of mule deer in northern forests and integrated population modeling in the prairie-breaks. Final Report for Federal Aid in Wildlife Restoration Grant W-167-R. Montana Fish, Wildlife and Parks, Helena, Montana.

DeVoe, J., K. Proffitt, M. Mitchell, C. Jourdonnais, K. Barker. 2019. Elk forage and risk tradeoffs during the fall archery season. The Journal of Wildlife Management. 83. 10.1002/jwmg.21638.

DeVoe, J., K. Proffitt, and J. Millspaugh. Fence types influence pronghorn movement responses. Ecosphere. In press.

Griffiths, D. E. 1990. Green vegetation and fecal protein relationships in two southeastern Montana mule deer populations. M. S. Thesis, Montana State University, Bozeman. 99 pp.

Hamlin, K. L., and R. J. Mackie. 1989. Mule deer in the Missouri River Breaks, Montana: A study of population dynamics in a fluctuating environment. Montana Department of Fish, Wildlife, and Parks, Federal Aid in Wildlife Restoration Completion Report W-120-R, Helena, USA

Hemmer, S., R. Rauscher, J. Ramsey, K. Carson, J. Gude, and E. Almberg. 2017. Interim report: targeted Chronic Wasting Disease Surveillance in HDs 600 and 401. Montana Fish, Wildlife and Parks, Helena, Montana. 5pp.

Holdhusen, B. 2016. Wildlife game trail survey: US Highway 2 mileposts 193-209. Unpublished report. Can be obtained by contacting authors of this report.

Ishle, H. B. 1982. Population ecology of mule deer with emphasis on potential impacts of gas and oil development along the east slope of the Rocky Mountains, Northcentral Montana. M.S. Thesis. Montana State University, Bozeman. 96pp

Jakes, A.F., C. C. Gates, N.J. DeCesare, P.F. Jones, J.F. Goldberg, K.E. Kunkel, and M. Hebblewhite. 2018. Classifying the migration behaviors of pronghorn on their northern range. Journal of Wildlife Management 82: 1229-1242.

Jakes, A.F. 2015. Factors influencing seasonal migrations of pronghorn across the Northern Sagebrush Steppe. PhD Dissertation, University of Calgary, Calgary AB. 259 pp.

Jones, P.F., A.F. Jakes, D.R. Eacker, B.C. Seward, M. Hebblewhite, and B.H. Martin. 2018. Evaluating responses by pronghorn to fence modifications across the Northern Great Plains. Wildlife Society Bulletin 42:225-236.

Kasworm, W. F. 1981. Distribution and population characteristics of mule deer along the East Front, Northcentral Montana. M.S. Thesis. Montana State University, Bozeman. 76 pp.

Knight, Richard R. 1970. The Sun River Elk Herd. Journal of Wildlife Management Wildlife Monograph 23: 3-66.

Lyon L.J., T.N. Lonner, J.P. Weigand, C.L. Marcum, W.D Edge, J.D. Jones, D.W. McCleerey, and L. Hicks. 1985. Coordinating elk and timber management: final report of the Montana cooperative elk-logging study, 1970-1985. Montana Fish, Wildlife and Parks, Helena Montana. 53 pp.

Montana Fish, Wildlife and Parks. 2005. Elk Management Plan. Montana Fish, Wildlife and Parks, Helena, MT. 404 pp.

Olenicki, T. J. 1993. Seasonal variation of fecal nitrogen and forage succulence in relation to condition and movements of two southeastern Montana mule deer populations. M. S. Thesis, Montana State University, Bozeman, Montana. 119 pp.

Picton, H.D. 1960. Migration patterns of the Sun River Elk Herd, Montana. Journal of Wildlife Management 24:279-290.

Picton, H.D and I.E. Picton. 1975. The saga of the sun: a history of the Sun River Elk Herd. Federal Aid in Wildlife Restoration Project W-130-R Final Report. Montana Department of Fish and Game, Helena, Montana. 55pp.

Poor E.E., A. Jakes, C. Loucks, and M. Suitor. 2014. Modeling Fence Location and Density at a Regional Scale for Use in Wildlife Management. PLoS ONE 9(1): e83912.

Proffitt, K.M., S. Thompson, D. Henry, B. Jimenez, and J.A. Gude. 2016a. Effects of hunter access on elk resource selection in the Missouri Breaks, Montana. Journal of Wildlife Management 80:1167–1176.

Proffitt, K.M., M. Hebblewhite, W. Peters, N. Hupp, and J. Shamhart. 2016. Linking landscape scale differences in forage to ungulate nutritional ecology. Ecological Applications 26:2156-2174.

Proffitt, K. M., J.A. Gude, K.L. Hamlin, and M.A. Messer. 2013. Effects of hunter access and habitat security on elk habitat selection in landscapes with a public and private land matrix. The Journal of Wildlife Management 77: 514-524.

Ranglack, D.H., K.M. Proffitt, J.E. Canfield, J.A. Gude, J. Rotella, and R.A. Garrott. 2017. Security areas for elk during archery and rifle hunting seasons. Journal of Wildlife Management 81: 778–791.

Ranglack, D.H., R.A. Garrott, J. Rotella, K.M. Proffitt, J.A. Gude, and J. Canfield. 2016. Evaluating elk summer resource selection and applications to summer range habitat management. Technical Report, Montana Department of Fish, Wildlife and Parks, 36 pp. http://fwp.mt.gov/fishAndWildlife/diseasesAndResearch/research/elk/default.html

Roesch, M. J. 2010. Identifying Wildlife Crossing Zones for the Prioritization of Highway Mitigation Measures Along U.S. Highway 2: West Glacier, MT to Milepost 193. Unpublished professional paper.

Smith, S. M. 2011. Winter habitat use by mule deer in Idaho and Montana. M.S. Thesis. University of Montana. 51 pp.

Thompson, S., D. Henry, M. Sullivan, K. Proffitt and J. Gude. 2016. Fall elk distribution in the Missouri River Breaks. Montana Fish, Wildlife and Parks, Helena, Montana. 37 pp. http://fwp.mt.gov/fishAndWildlife/diseasesAndResearch/research/elk/default.html

Waller, J. and T. Graves. 2018. Keeping the Crown of the Continent Connected: an Interagency US2 Connectivity Workshop Report. Unpublished report. National Park Service, Glacier National Park. 30 pp. https://irma.nps.gov/DataStore/Reference/Profile/2259314

Williams, J. and T. Dixon. 2013. Incredible journeys. Montana Outdoors, March-April 2013 Issue http://fwp.mt.gov/mtoutdoors/HTML/articles/2013/migration.htm

Xu, W., D. Nandintsetseg, V. Herrmann, H. Sawyer, and A. D. Middleton. 2020. Behavior Analysis. R. <https://github.com/wx-ecology/BaBA>. Accessed 10 Aug 2020.

Appendix A SO3362: Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors

THE SECRETARY OF THE INTERIOR

WASHINGTON

ORDER NO. 3362

Subject: Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors

Sec. 1 **Purpose.** This Order directs appropriate bureaus within the Department of the Interior (Department) to work in close partnership with the states of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming to enhance and improve the quality of big-game winter range and migration corridor habitat on Federal lands under the management jurisdiction of this Department in a way that recognizes state authority to conserve and manage big-game species and respects private property rights.

Through scientific endeavors and land management actions, wildlife such as Rocky Mountain Elk (elk), Mule Deer (deer), Pronghorn (pronghorn), and a host of other species will benefit. Additionally, this Order seeks to expand opportunities for big-game hunting by improving priority habitats to assist states in their efforts to increase and maintain sustainable big game populations across western states.

Sec. 2 **Authorities.** This Order is issued under the authority of section 2 of Reorganization Plan No. 3 of 1950 (64 Stat. 1262), as amended, as well as the Department's land and resource management authorities, including the following:

Federal Land Policy and Management Act of 1976, as amended, 43 U.S.C. 1701, U.S. Geological Survey Organic Act, as amended, 43 U.S.C. 31, *et seq.;*

1. National Wildlife Refuge System Improvement Act of 1997, as amended, 16 U.S.C. 668dd *et seq.;* and

2. National Park Service Organic Act of 1916, as amended, 54 U.S.C. 100101, *et seq.*

Sec. 3 **Background.** The West was officially "settled" long ago, but land use changes continue to occur throughout the western landscape today. Human populations grow at increasing rates with population movements from east and west coast states into the interior West. In many areas, development to accommodate the expanding population has occurred in important winter habitat and migration corridors for elk, deer, and pronghorn. Additionally, changes have occurred across large swaths of land not impacted by residential development. The habitat quality and value of these areas crucial to western big-game populations are often degraded or declining.

The Bureau of Land Management (BLM) is the largest land manager in the United States (U.S.) with more than 245 million acres of public land under its purview, much of which is found in Western States. The U.S. Fish and Wildlife Service (FWS) and National Park Service (NPS) also manage a considerable amount of public land on behalf of the American people in the West. Beyond land management responsibilities, the Department has strong scientific capabilities in the U.S. Geological Survey (USGS) that can be deployed to assist State wildlife agencies and Federal land managers. Collectively, the appropriate bureaus within the Department have an opportunity to serve in a leadership role and take the initiative to work closely with Western States on their priorities and objectives as they relate to big-game winter range and migration corridors on lands managed by the Department.

Consistent with the American conservation ethic, ultimately it is crucial that the Department take action to harmonize State fish and game management and Federal land management of big-game winter range and corridors. On lands within these important areas, if landowners are interested and willing, conservation may occur through voluntary agreements.

Robust and sustainable elk, deer, and pronghorn populations contribute greatly to the economy and well-being of communities across the West. In fact, hunters and tourists travel to Western States from across our Nation and beyond to pursue and enjoy this wildlife. In doing so, they spend billions of dollars at large and small businesses that are crucial to State and local economies. We have a responsibility as a Department with large landholdings to be a collaborative neighbor and steward of the resources held in trust.

Accordingly, the Department will work with our State partners and others to conserve and/or improve priority western big-game winter range and migration corridors in sagebrush ecosystems and in other ecotypes as necessary. This Order focuses on the Western States of: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah,

Washington, and Wyoming. These States generally have expansive public lands with established sagebrush landscapes along with robust big-game herds that are highly valued by hunters and tourists throughout the Nation.

The Department has broad responsibilities to manage Federal lands, waters, and resources for public benefit, including managing habitat to support fish, wildlife, and other resources.

Secretary's Order 3356, "Hunting, Fishing, Recreational Shooting, and Wildlife Conservation Opportunities and Coordination with States, Tribes, and Territories," (SO 3356) was issued on September 15, 2017. SO 3356 primarily focused on physical access to lands for recreational activities, particularly hunting and fishing. This Order is focused on providing access to big game animals by providing direction regarding land management actions to improve habitat quality for big-game populations that could help ensure robust big-game populations continue to exist. Further, SO 3356 includes a number of directives related to working with States and using the best available science to inform development of guidelines, including directing relevant bureaus to:

1. Collaborate with State, tribal, and territorial fish and wildlife agencies to attain or sustain State, tribal, and territorial wildlife population goals during the Department's land management planning and implementation, including prioritizing active habitat management projects and funding that contributes to achieving wildlife population objectives, particularly for wildlife that is hunted or fished, and identifying additional ways to include or delegate to States habitat management work on Federal lands;

2. Work cooperatively with State, tribal, and territorial wildlife agencies to enhance State, tribe, and territorial access to the Department's lands for wildlife management actions;

3. Within 180 days, develop a proposed categorical exclusion for proposed projects that utilize common practices solely intended to enhance or restore habitat for species such as sage grouse and/or mule deer; and

4. Review and use the best available science to inform development of specific guidelines for the Department's lands and waters related to planning and developing energy, transmission, or other relevant projects to avoid or minimize potential negative impacts on wildlife.

This Order follows the intent and purpose of SO 3356 and expands and enhances the specific directives therein.

Sec. 4 **Implementation.** Consistent with governing laws, regulations, and principles of responsible public stewardship, I direct the following actions:

With respect to activities at the national level, I hereby direct the BLM, FWS, and NPS to:

1. Within 30 days, identify an individual to serve as the "Coordinator" for the Department. The Coordinator will work closely with appropriate States, Federal agencies, nongovernmental organizations, and/or associations to identify active programs focused on big- game winter range and/or migration corridors. The programs are to be organized and cataloged by region and other geographic features (such as watersheds and principles of wildlife management) as determined by the Deputy Secretary, including those principles identified in the Department's reorganization plan.

2. Within 45 days, provide the Coordinator information regarding:

1. Past and current bureau conservation/restoration efforts on winter range and migration corridors;

2. Whether consideration of winter range and corridors is included in appropriate bureau land (or site) management plans;

3. Bureau management actions used to accomplish habitat objectives in these areas;

4. The location of areas that have been identified as a priority for conservation and habitat treatments; and

5. Funding sources previously used and/or currently available to the bureau for winter range and migration corridor conservation/restoration efforts.

3. Within 60 days, if sufficient land use plans are already established that are consistent with this Order, work with the Coordinator and each regional Liaison (see section 4b) to discuss implementation of the plans. If land use plans are not already established, work with the Coordinator and each regional Liaison to develop an Action Plan that summarizes information collected in section 4 (a) (1) and (2), establishes a clear direction forward with each State, and includes:

1. Habitat management goals and associated actions as they are associated with big game winter range and migration corridors;

2. Measurable outcomes; and

3. Budgets necessary to complete respective action(s).

1. <u>With respect to activities at the State level,</u> I hereby direct the BLM, FWS, and NPS to:

1. Within 60 days, identify one person in each appropriate unified region (see section 4a) to serve as the Liaison for the Department for that unified region. The Liaison will coordinate at the State level with each State in their region, as well as with the Liaison for any other regions within the State. The Liaison will schedule a meeting with the respective State fish and wildlife agency to assess where and how the Department can work in close partnership with the State on priority winter range and migration corridor conservation.

2. Within 60 days, if this focus is not already included in respective land management plans, evaluate how land under each bureau's management responsibility can contribute to State or other efforts to improve the quality and condition of priority big-game winter and migration corridor habitat.

3. Provide a report on October 1, 2018, and at the end of each fiscal year thereafter, that details how respective bureau field offices, refuges, or parks cooperated and collaborated with the appropriate State wildlife agencies to

further winter range and migration corridor habitat conservation.

4. Assess State wildlife agency data regarding wildlife migrations early in the planning process for land use plans and significant project-level actions that bureaus develop; and

5. Evaluate and appropriately apply site-specific management activities, as identified in State land use plans, site-specific plans, or the Action Plan (described above), that conserve or restore habitat necessary to sustain local and regional big-game populations through measures that may include one or more of the following:

1. restoring degraded winter range and migration corridors by removing encroaching trees from sagebrush ecosystems, rehabilitating areas damaged by fire, or treating exotic/invasive vegetation to improve the quality and value of these areas to big game and other wildlife;

2. revising wild horse and burro-appropriate management levels (AML) or removing horses and burros exceeding established AML from winter range or migration corridors if habitat is degraded as a result of their presence;

3. working cooperatively with private landowners and State highway departments to achieve permissive fencing measures, including potentially modifying (via smooth wire), removing (if no longer necessary), or seasonally adapting (seasonal lay down) fencing if proven to impede movement of big game through migration corridors;

4. avoiding development in the most crucial winter range or migration corridors during sensitive seasons;

5. minimizing development that would fragment winter range and primary migration corridors;

6. limiting disturbance of big game on winter range; and

7. utilizing other proven actions necessary to conserve and/or restore the vital big-game winter range and migration corridors across the West.

1. With respect to science, I hereby direct the USGS to:

1. Proceed in close cooperation with the States, in particular the Western Association of Fish and Wildlife Agencies and its program manager for the Crucial Habitat Assessment Tool, prior to developing maps or mapping tools related to elk, deer, or pronghorn movement or land use; and

2. Prioritize evaluations of the effectiveness of habitat treatments in sagebrush communities, as requested by States or land management bureaus, and identified needs related to developing a greater understanding of locations used as winter range or migration corridors.

1. I further hereby direct the responsible bureaus and offices within the Department to:

1. Within 180 days, to update all existing regulations, orders, guidance documents, policies, instructions, manuals, directives, notices, implementing actions, and any other similar actions to be consistent with the requirements in this Order;

2. Within 30 days, provide direction at the state or other appropriate level to revise existing Federal-State memorandums of agreement to incorporate consultation with State agencies on the location and conservation needs of winter range and migration routes; and

3. Consult with State wildlife agencies and bureaus to ensure land use plans are consistent and complementary to one another along the entire wildlife corridor in common instances where winter range or migration corridors span jurisdictional boundaries.

2. Heads of relevant bureaus will ensure that appropriate members of the Senior Executive Service under their purview include a performance standard in their respective current or future performance plan that specifically implements the applicable actions identified in this Order.

Sec. 5 **Management.** I hereby direct the Deputy Secretary to take is responsible for taking all reasonably necessary steps to implement this Order.

Sec. 6 **Effect of Order.** This Order is intended to improve the internal management of the Department. This Order and any resulting reports or recommendations are not intended to, and do not create any right or benefit, substantive or procedural, enforceable at law or equity by a party against the United States, its departments, agencies, instrumentalities or entities, its officers or employees, or any other person. To the extent there is any inconsistency between the provision of this Order and any Federal laws or regulations, the laws or regulations will control.

Sec. 7 **Expiration Date.** This Order is effective immediately. It will remain in effect until its provisions are implemented and completed, or until it is amended, superseded, or revoked.

Date: FEB O 9 2018