

## **MONTANA ACTION PLAN**

### **For**

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

#### **INTRODUCTION -**

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 for example. State and federal agencies, conservation groups, and others are trying different ways to maintain connectivity, big game mobility, and improve winter ranges.

Montana Fish, Wildlife, and Parks (MFWP) 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 elk that reduces damage to adjacent private land by hungry elk and ensures the long-term conservation of wintering habitat. Conservation easements—legal agreements purchased by partners and MFWP that prevent subdividing on private land and the accompanying fences and roads that go with it—also sustain big game migrations. Over the past 35 years, MFWP’s Habitat Montana Program has used hunter license dollars to purchase conservation easements to protect and enhance several hundred thousand acres of wildlife habitat. According to MFWP biologists and researchers, more big game animals migrate to or reside year-round in wintering areas on private ranch and farm lands than public land holdings in Montana.

Elk are the most well-known migratory big game species in Montana. Elk migrations range from just 15 miles, such as between the Sun River WMA and the Bob Marshall Wilderness, to 125 miles, like the one from winter range in 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.

Many populations of pronghorn antelope don’t need to travel far, meeting their seasonal needs by moving only within their home range. But some make great migrations. Biologists have tracked herds traveling more than 200 miles south from southern Alberta and Saskatchewan into Montana in 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 I-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, on February 9, 2018 (Appendix A), to improve habitat quality and western big game winter range and migration corridors for antelope, 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 that helps ensure that robust big game populations continue to exist. Priority states currently 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 this Department 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 (elk), Mule Deer (deer), Pronghorn Antelope (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.

The United States Department of Agriculture (USDA), through the USDA Forest Service (USFS) and USDA Natural Resource Conservation Service, will collaborate with 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, to include 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 support winter habitat and migration corridors for elk, mule deer, and pronghorn. The Bureau of Land Management (BLM) manages over 8 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 fence removal, invasive weed treatments, and native vegetation seedlings. The U.S. 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 mortalities-vehicle collisions, and employs fuel 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. MFWP and USFS biologists collaborate to identify forest management prescriptions that will manage forests in ways conducive to continued use by large numbers of migratory elk and deer (e.g. Lyon et al. 1985, USFS and MFWP 2013).

Montana MFWP has identified four areas as priority big-game winter range and migration corridors, as follows:

## **PRIORITY BIG-GAME WINTER RANGE AND MIGRATION CORRIDORS –**

### **Priority area A: Continental Divide to Rocky Mountain East Front**

**Why:** This corridor hosts multiple species including elk and mule deer. Further, this corridor hosts multiple iconic wildlife species and connects the world-renowned Bob Marshall Wilderness complex with the similarly valued “Front” where the Rocky Mountains meet the plains. A portion of this area was included in the Rocky Mountain Front Heritage Act passed by the 113<sup>th</sup> Congress of the United States in 2013.

The Rocky Mountain East Front contains some of Montana’s longest studied and most iconic big game migrations: the first studies of elk migration in the Sun River herd took place in the 1920’s (Picton and Picton 1975). These studies followed the creation of the Sun River Game Preserve by the Montana legislature in 1915, which closed elk hunting and eliminated livestock grazing in a large portion of summer, migration, and winter range along the east side of the continental divide. Elk populations subsequently grew, leading to conflicts with livestock producers over forage utilization and eventually to the establishment of the state-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 1940’s and 1950’s (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 shared winter range until after hunting seasons were over (Picton 1960). Following this study, elk hunting seasons in the area have been designed and managed by quota to ensure representation of both migratory and resident herd segments.

Seasonal ranges, migration routes, and migration timing of mule deer along the Rocky Mountain Front were mapped in general terms approximately 40 years ago (Kasworm 1981, Ishle 1982). These studies identified that each wintering mule deer herd along the Rocky Mountain Front was composed of residents, short distance migrants (<21mi between seasonal ranges), and long-distance migrants (>21mi between seasonal ranges). 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. Since 1980, wintering mule deer population sizes along the Rocky Mountain Front south of the Teton River have been in a long-term decline, while wintering herds north of the Teton River have generally been stable. The causes for the decline of southern Rocky Mountain Front mule deer herds is not known, but hypotheses related to reduced summer range quality for migratory herd segments, declining winter range forage quality, and competition with growing elk herds have been put forth. Recently, a study investigating fine-scale mule deer winter habitat selection was conducted to improve understanding of habitat requirements in this area (Smith 2011).

**Spatial Location:** This corridor includes a swath of land in west-central Montana running from Highway 200 in the south to Glacier National Park in the north and connects Federal USFS and BLM properties in the west to private lands in the east.

**Habitat Types:** Habitat types range from alpine above tree line, both mesic and xeric conifer forests, open grasslands, and deciduous wetland/riparian.

Important Stopovers: Seasonal use by wildlife includes the continental divide during the summer to lower elevation calving and rutting areas to wind-blown wintering grassland ridges on the interface between public and private lands.

Landownership: Dominated by public USFS and BLM lands in the west, this corridor trends to private lands in the east. Other land types include Montana state lands, USFWS, Bureau of Reclamation, and The Nature Conservancy.

Land Uses: Timber, livestock and farm production, recreation.

Risks/Threats: Habitat fragmentation or conversion primarily of private lands. Erosion of habitat quality via noxious weeds. Highway 2 and its associated railroad corridor in the north, and HWY 200 in the south, represent deterrents to successful wildlife movement.

Current Efforts: Land conservation efforts by public agencies, private NGOs, and private ownerships.

Cost of current or needed habitat treatments: Unknown

### **Priority area B: Yellowstone National Park to Paradise Valley**

Why: This corridor hosts multiple species that include elk, antelope, and mule deer. Further, this corridor hosts multiple iconic wildlife species and connects the world-renowned Yellowstone National Park with the adjacent Paradise Valley.

Early studies of migration in the Northern Yellowstone elk herd occurred almost 50 years ago (Craighead et al. 1972). In the late 1980's, after the herd increased in numbers as compared to the previous studies, new studies of Northern Yellowstone elk distributions and migrations were conducted (Vore 1990). In the 2000's, several GPS collaring studies documented Northern Yellowstone elk fine scale movement and migration patterns. Collaborative analyses of Yellowstone National Park and MFWP elk GPS collar data have delineated migratory routes using Brownian bridge movement models and revealed a high level of fidelity by individual elk to their winter ranges, summer ranges, and migration corridors (White et al. 2010). Since wolf reintroduction and recovery, the proportion of the Northern Yellowstone herd wintering outside of Yellowstone National Park has increased substantially (White et al. 2012). The Northern Yellowstone elk wintering area outside of Yellowstone National Park is centered around Dome Mountain Wildlife Management Area and the surrounding private ranchlands, highlighting the importance of these areas to the future of this herd.

Pronghorn that winter in the Paradise Valley near Gardiner are partially migratory, with some animals moving into Yellowstone National Park, using a well-defined migration route near Mount Everts, and some animals remaining on winter range near Gardiner year-round (White et al. 2007). Following a decline from >500 to <250 animals in the early 1990's, this pronghorn herd remained below 300 animals for almost two decades, and scientists hypothesized that poor forage conditions on winter range would limit the herd size into the future (Boccadori et al. 2008). While winter ranges and migration routes for this herd have been mostly consistent over time, some animals have displayed behavioral plasticity in their seasonal ranges and whether they migrate (White et al. 2007). In recent years, pronghorn in this area have pioneered a new winter range further into the Paradise Valley, and this wintering herd segment is now approaching 20% of the >600 pronghorn that winter in the southern Paradise Valley and Gardiner Basin. The growth of this herd is an example of

successful collaboration among private landowners, agencies, and NGOs to improve migratory movements and population sustainability by removing or modifying fences in the area.

Spatial Location: This corridor includes a swath of land in southwest Montana running from YNP in the south to Livingston, MT in the north.

Habitat Types: Habitat types range from alpine above tree line, both mesic and xeric conifer forests, open grasslands, and deciduous wetland/riparian.

Important Stopovers: Seasonal use by wildlife includes the wintering exodus of elk, mule deer, and pronghorn from YNP to winter range in the Paradise Valley and their return in spring/summer.

Landownership: Dominated by NPS lands in the south, public USFS lands in the higher elevation areas to the east and west, and largely privately owned lower elevation areas along the Yellowstone River valley bottom. Other land types include Montana state lands.

Land Uses: Timber, livestock and farm production, recreation.

Risks/Threats: Habitat fragmentation primarily of private lands. Erosion of habitat quality via noxious weeds. HWY 89 is a high traffic source of mortality for wildlife.

Current Efforts: Land conservation efforts by public agencies, private NGOs, and private ownerships.

Cost of current or needed habitat treatments: Unknown

**Priority area C: 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, Barker et al in review). 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 in review). 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, elk hunter access on private land winter ranges, areas where elk are secure from hunters on public land, and

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. 2018). 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.

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

Habitat Types: Habitat types range from alpine above tree line, both mesic and xeric conifer forests, open grasslands, and deciduous wetland/riparian.

Important Stopovers: Seasonal use by wildlife includes the wintering exodus of elk from the Anaconda-Pintler Wilderness and Big Hole Valley to winter range in the Bitterroot Valley and lower reaches of the Big Hole River and their return in spring/summer.

Landownership: Dominated by public USFS lands east and west above the largely private valley bottom. Other land types include Montana state lands.

Land Uses: Timber, livestock and farm production, recreation.

Risks/Threats: Habitat fragmentation primarily of private lands. Erosion of habitat quality via noxious weeds. Interstates 15 and HWYs 1 and 93 represent high-traffic sources of mortality for wildlife.

Current Efforts: Land conservation efforts by public agencies, private NGOs, and private ownerships.

Cost of current or needed habitat treatments: Unknown

#### **Priority area D: Canadian Border to Fort Peck Reservoir**

Why: This corridor hosts elk, mule deer, and pronghorn antelope.

Pronghorn populations inhabiting the grasslands of northern Montana and southern Canada are composed of variable mixtures 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 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, such as intact grassland and sagebrush steppe areas, forage productivity, hydrological features, southerly aspects, and intermediate slopes, and anthropogenic features, such as roads, railways, energy wells, and fences, at variable spatial scales (Jakes 2015). Scale-integrated movement models based 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).

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 sportsman 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 roadway 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 up to 60+mi north in southern Canada (MFWP, 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).

Elk in this region are generally non-migratory, occupying winter ranges year-round (Proffitt et al. 2016), as is thought to be the case with elk herds across eastern Montana in prairie-breaks habitat. Despite their non-migratory nature, elk herds across this region are larger than herd size objectives, and elk throughout eastern Montana are the most over-objective herds in the state (<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. 2016, Thompson et al. 2016). In the western part of this region in the Missouri River Breaks, elk distribution overlaps publicly accessible lands 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 public comment theme 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.

Spatial Location: This corridor includes a swath of land in north central Montana ranging from the US/Canadian border in the north to the Missouri River/Fort Peck Reservoir in the south. Between Havre and Glasgow, approximately centered in the Malta area.

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

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

Landownership: Dominated by private lands with some BLM and Montana state lands. The Charles M. Russell National Wildlife Refuge in the south is managed by the FWS.

Land Uses: Livestock and farm production.

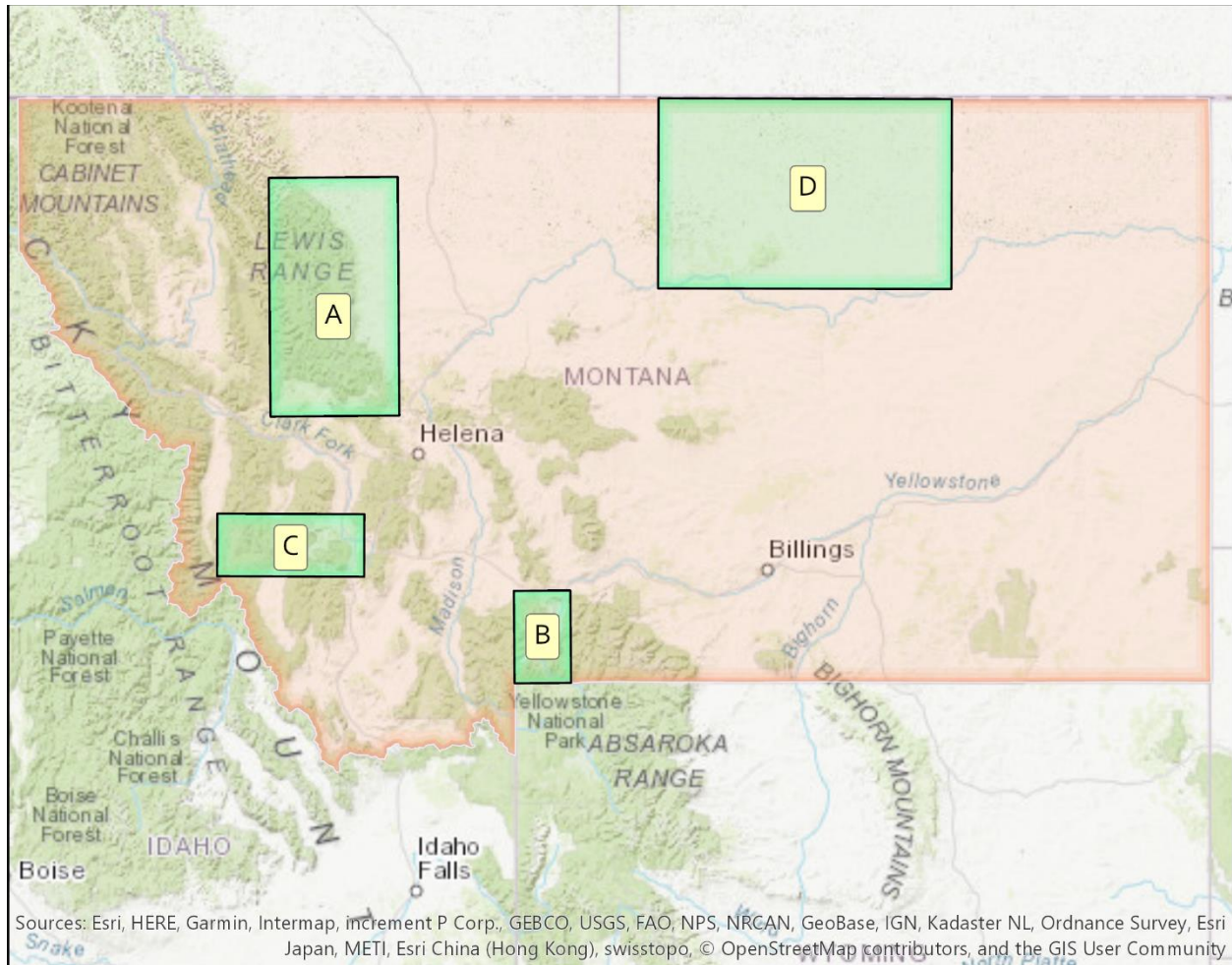
Risks/Threats: Habitat fragmentation primarily of private lands. Erosion of habitat quality via noxious weeds. One major highway and railroad corridor run generally east/west that represents the greatest when they serve as wildlife travel/resting corridors during heavy snow accumulation.

Current Efforts: Land conservation efforts by public agencies, private NGOs, and private ownerships.

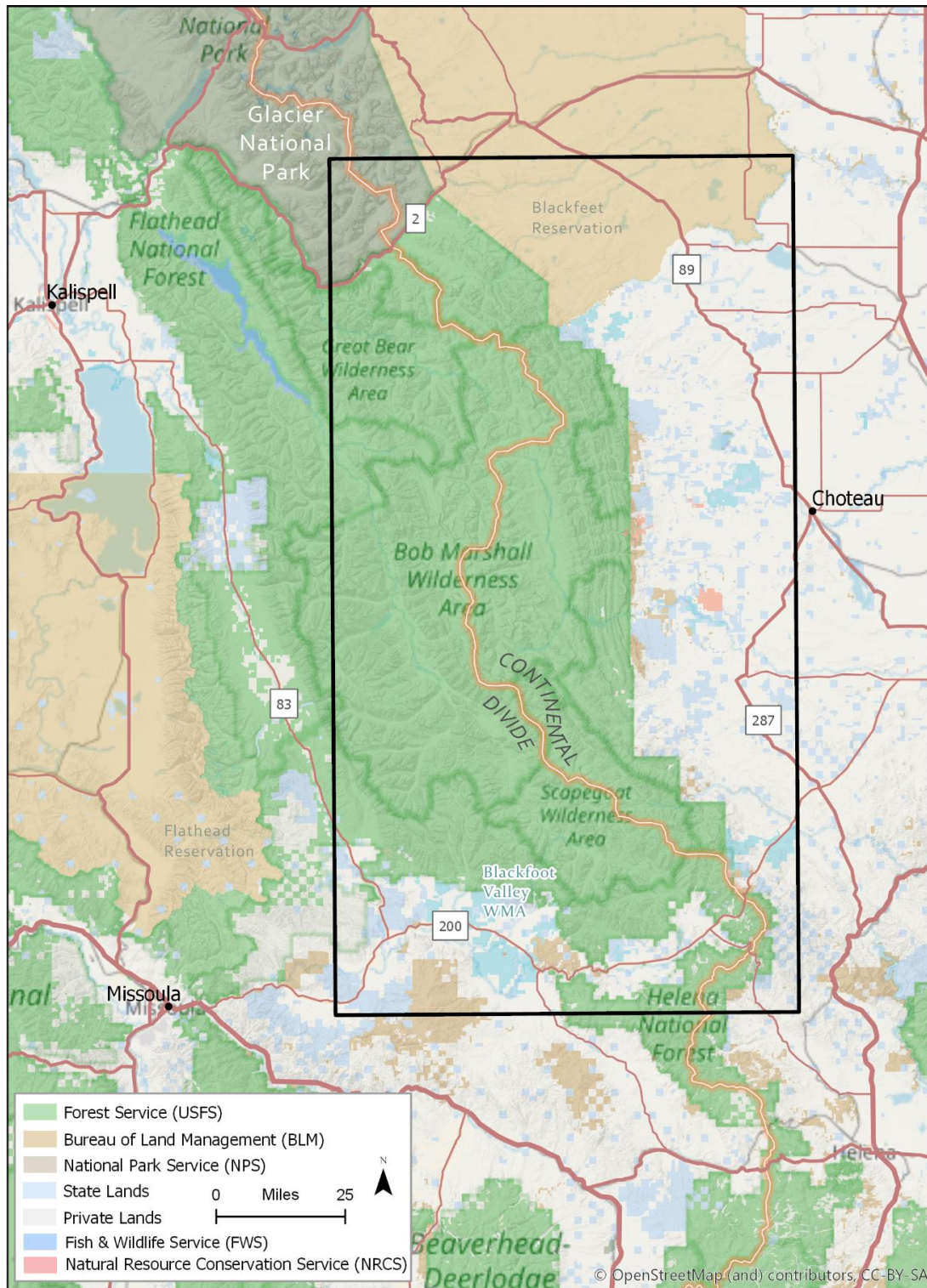
Cost of current or needed habitat treatments: Unknown



**Figure 1: Montana Fish, Wildlife and Parks Priority Migration Corridors (overview map).**  
**Note: this overview map shows areas that include priority winter range and migration corridors for elk, mule deer and pronghorn. The area boxes are for reference only and do not represent specific habitat or migration routes.**

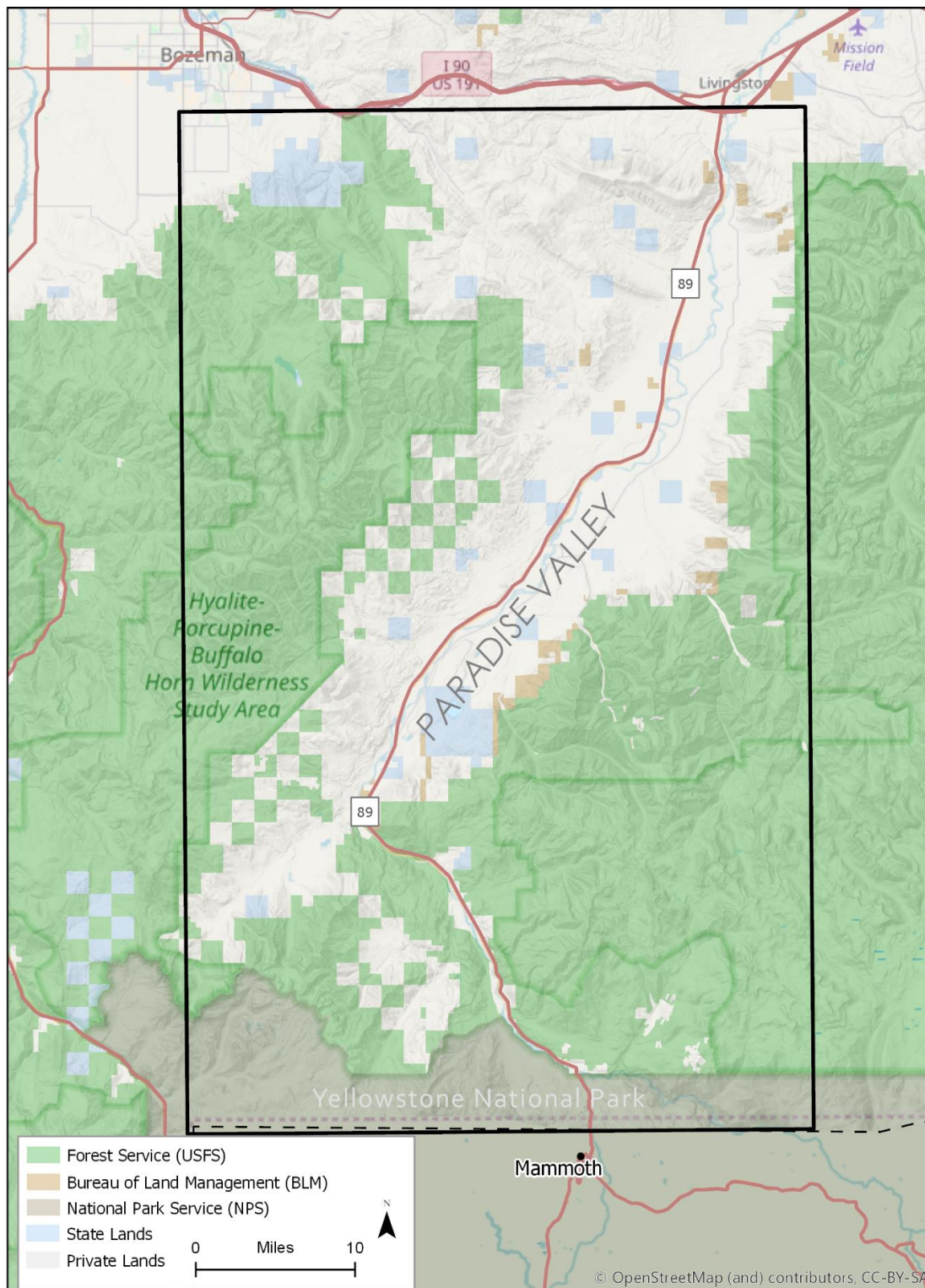


**Figure 2: Montana Fish, Wildlife and Parks Priority Migration Corridor A, *Continental Divide to Rocky Mountain East Front*. Note: this general area depiction does not represent any specific winter range or big game corridor.**

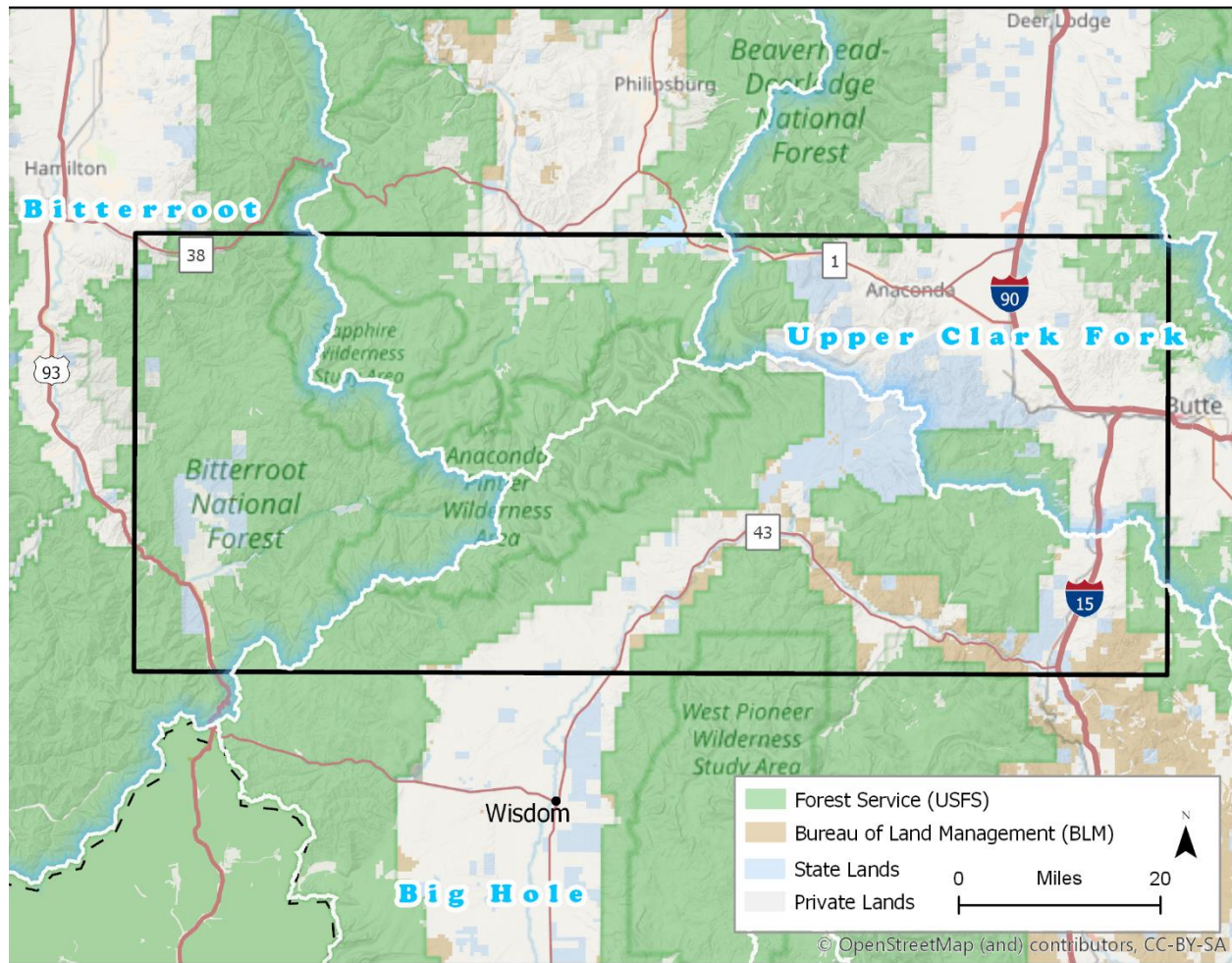




**Figure 3: Montana Fish, Wildlife and Parks Priority Migration Corridor B, *Yellowstone National Park to Paradise Valley*. Note: this general area depiction does not represent any specific winter range or big game corridor.**

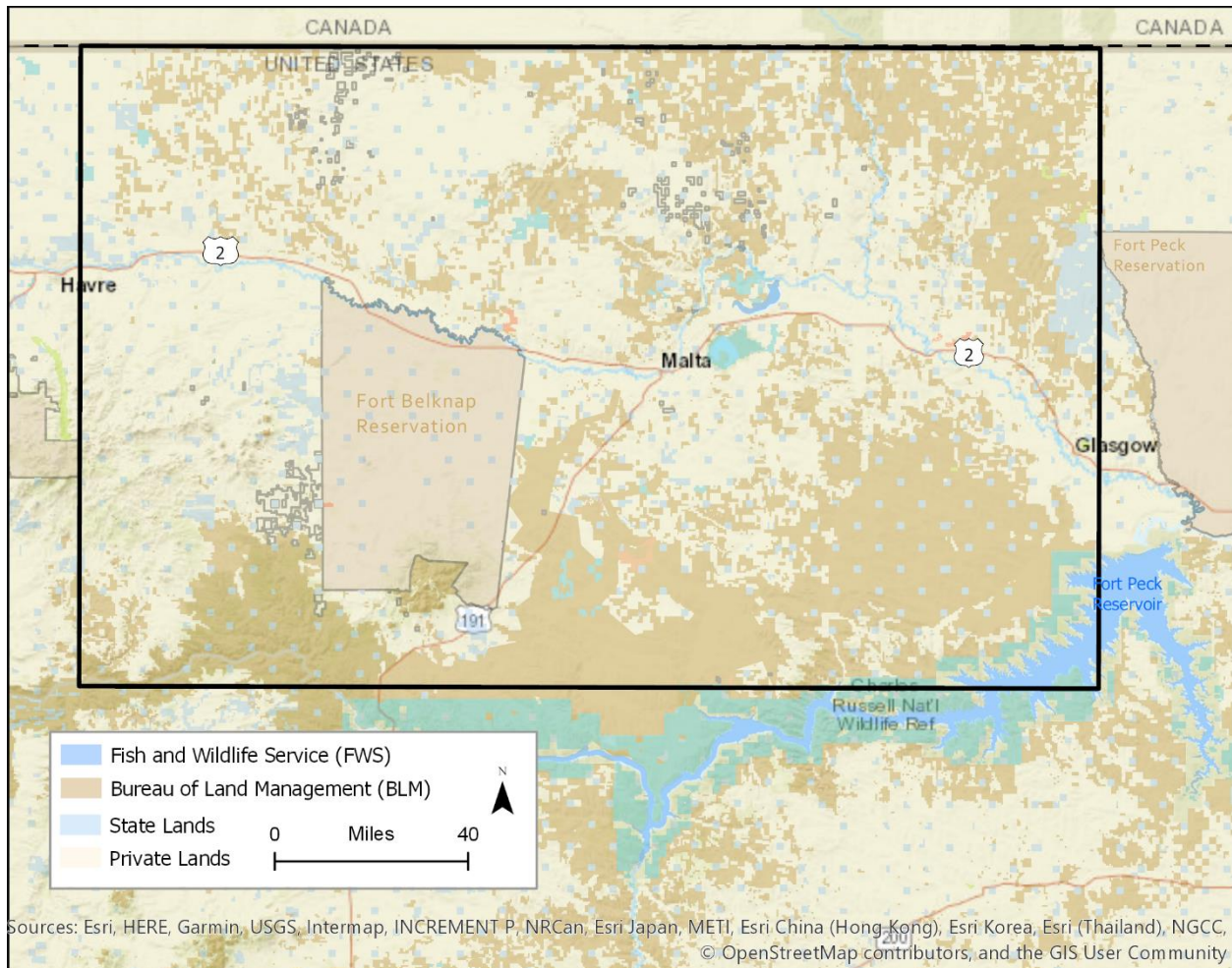


**Figure 4: Montana Fish, Wildlife and Parks Priority Migration Corridor C, Anaconda Range to Big Hole, Bitterroot, and Upper Clark Fork Watersheds. Note: this general area depiction does not represent any specific winter range or big game corridor.**





**Figure 5: Montana Fish, Wildlife and Parks Priority Migration Corridor D, *Canadian Border to Fort Peck Reservoir*. Note: this general area depiction does not represent any specific winter range or big game corridor.**



## **RESEARCH NEEDS**

A top research priority for MFWP is a better understanding of the seasonal ranges and migration corridors of elk, mule deer, and pronghorn antelope. MFWP has conducted elk, mule deer, and pronghorn antelope movement studies for several decades and mapped seasonal ranges and movement corridors. However, technology has evolved from home-built animal identification collars to remote upload global positioning system (GPS) radio collars resulting in variable data collection intensity and analysis procedures. Additionally, analytic tools for delineating seasonal ranges and migration corridors have also evolved for assessing GPS-based wildlife movement data. MFWP proposes to initiate efforts to assemble past and present ungulate movement datasets, delineate seasonal ranges and migration corridors of elk, mule deer and pronghorn using the best available techniques applicable to each dataset, and map seasonal ranges and migration corridors. Our focus will be on building the internal capacity for seasonal and migration habitat delineation to ensure the program is successful over the long term, developing and refining methodology to meet the needs of our existing wildlife movement data and delivering maps of movement data in a way that works for landowners and managers for use in local decision making. MFWP will continue efforts to collect elk and mule deer movement datasets within priority areas and other areas of Montana as part of ongoing and existing research efforts. Additionally, MFWP will initiate a pronghorn antelope collaring effort to delineate seasonal ranges and migration corridors within the Madison Valley area, where information is currently insufficient to estimate important pronghorn seasonal ranges, migration routes, and stopover sites.

***Project: Delineation of seasonal ranges and migratory corridors of Madison Valley pronghorn and identification of gaps in statewide knowledge of pronghorn, elk and mule deer seasonal core use areas and migration corridors.***

### ***Staff***

Kelly Proffitt, Nick DeCesare, Justin Gude, Julie Cunningham, Dean Waltee, and Howard Burt (MFWP)

### ***In collaboration with:***

Josh Hemenway – U.S. Forest Service, Custer-Gallatin National Forest Wildlife Biologist  
Andrew Jakes – National Wildlife Federation and U.M. Faculty Affiliate, College of Forestry and Conservation

### ***Project Need and Purpose***

Recognizing the need for big-game winter range, stopover, and migration corridors to be protected, conserved, and well-managed to sustain robust herds across Montana, MFWP proposes to initiate efforts to delineate seasonal ranges and migration corridors of elk, mule deer and pronghorn. Our focus will be on building the internal capacity for this work and the focus on seasonal and migration habitat delineation and conservation within MFWP, to ensure the program is successful over the long term.

To build capacity, we plan to hire a research associate that can focus on analyses of existing datasets, development of methodologies to delineate seasonal ranges and migratory routes, analyses of existing datasets, and mapping of seasonal ranges and migratory routes. Our first goal is to use existing GPS location data collected from elk, mule deer and pronghorn to identify

and map seasonal ranges and migration corridors. GPS location data currently exist for more than 20 populations in Montana. The research associate will develop analysis tools for GPS location data from herds of different migratory habits and that inhabit vastly different landscapes, coordinate with the USGS corridor mapping team, analyze existing GPS location datasets, and develop maps of current seasonal ranges and migration corridors for populations with existing GPS location datasets.

Recently, the MFWP Statewide and Regional Wildlife Program Managers identified the need for more, fine-scale information on seasonal ranges and migration routes of big game herds as research priority for the coming years. Following up on this need, MFWP research staff are currently devising a way to identify and prioritize herds for GPS collar deployment, and this effort will take staff time to implement. The research associate, in conjunction with other wildlife research staff, will work with statewide and regional staff to prioritize new populations for inclusion in GPS collaring projects designed to inform elk, mule deer and pronghorn population and habitat conservation and management goals. Priorities identified through this process will be documented and will be the basis of future funding proposals to this and other programs, and the research associate will continue to aid in implementation of field and analysis work in the identified priority areas as funding is secured.

At present, statewide and regional MFWP wildlife staff have identified a single priority area for new data collection and research. Madison Valley pronghorn seasonal ranges and migratory corridors are largely unknown, and there is considerable community and agency interest in mapping these areas so that actions can be taken to conserve the herd and its habitats. We propose to implement a GPS collaring effort to meet this information need. The objectives are to delineate current seasonal ranges and migratory corridors to better inform conservation and management of pronghorn in this region. The Madison Valley supports one of the largest wintering pronghorn populations in southwest Montana; up to 2,480 have been counted during annual winter trend surveys. Recently, total counts have also been completed during summer production surveys. Relative to winter population counts, summer population counts suggests approximately 50% of the herd are seasonal migrants, with the remainder remaining residential in the Madison Valley throughout the year. Little is known about their migratory movements or seasonal ranges.

Local knowledge suggests Madison Valley pronghorn may have long-distance migratory strategies, but no radio or GPS collars have been deployed within this population. Historically, pronghorn may have migrated into Yellowstone Park as far as the Hayden Valley via the Madison River to the Firehole River to Nez Perce Creek. Recent pronghorn sightings suggest summer ranges may extend as far as West Yellowstone, the Henry's Lake Basin in Idaho, the Gravelly Mountain Range, and the Centennial Valley.

The Madison Valley has experienced population growth resulting in expanded subdivisions, increased demand for outdoor recreation, and higher levels of vehicle traffic along US Highway 287. In spite of these ecological stressors, the Madison Valley has maintained open spaces that support abundant outdoor recreation, ranchland, farmland, and wildlife. This has been achieved through collaborative partnerships driven by scientific understanding of the Madison Valley and its natural resources. Yet, pronghorn ecology remains poorly understood. Pronghorn movement from winter to summer range could be confounded by fences, highway crossings, or other barriers. A recent study detailing wildlife mortality on Highway 287 enumerated 16 pronghorn collisions, and a "hot-spot" for pronghorn mortalities south of Ennis (Kociolek et al. 2012).

There are many conservation groups and conservation-minded landowners in the Madison Valley interested in improved understanding of local pronghorn ecology. Understanding pronghorn seasonal ranges and migratory corridors will allow public land management agencies and private landowners to help protect and improve migratory corridors and seasonal habitats through management decisions and project planning. Thus, as part of our effort to identify important seasonal ranges and migratory corridors of big-game in Montana, we propose to focus our initial data collection efforts on pronghorn in the Madison Valley.

## ***Methods***

### **Analysis of existing GPS location data**

We will develop R code to standardize analyses of seasonal range and migration corridor delineation for all of our existing elk, mule deer, and pronghorn movement datasets. We anticipate coordinating with the USGS corridor mapping team and with staff from WAFWA member agencies to develop and apply spatial analyses to existing GPS location datasets. We will estimate seasonal core use areas during winter (Dec 15 – March 1), calving (May 25-June 10), summer (July 1- August 31), and hunting seasons (approx. Sept 1 – Nov 30), and summarize the attributes of seasonal ranges. We will assess migration behaviors and timing using the relative net squared displacement model of behavior for each individual, or similar methodologies (Bunnefeld et al. 2011, Spitz 2017). We will identify important movement corridors by estimating population-level migration routes (e.g., Horne et al. 2007, Kranstauber et al. 2012, Thurfjell et al. 2014, Avgar et al. 2016). Movement-based models are useful for mapping population-level movement corridors and identifying corridors with the highest levels of use. Summaries and maps of location and movement data will be presented in a document designed for landowners and managers that is intended for use in local decision making.

We will hire a research associate (RA) for two-years to lead this portion of the project. The RA will also work closely with the USGS corridor mapping team and with staff from WAFWA member agencies to design methods for analyzing ungulate movement data in a coordinated manner across jurisdictions. We anticipate the RA will work on code development for 6-months, analyze existing telemetry data for 12-months, interface and coordinate with MFWP Geographic Data Services and Land Use Planning staff to develop useful methods of delivering maps and results to local decision-makers, and work with MFWP Communication and Education Division staff to develop a public-oriented document summarizing this information during the last 6-months. Additionally, the RA will analyze the new pronghorn dataset (described below), and develop a final report for the pronghorn project during the last 6-months. MFWP

### **New data collection**

We will capture and radio collar 40 adult pronghorn in the Madison Valley, MT (Figure 1) to delineate seasonal ranges and migratory corridors to improve the management of the species, inform land use planning decisions, and ensure the long-term conservation of the population and its critical seasonal ranges and migratory corridors. The collars will be satellite-linked to allow location and mortality data to be collected remotely. Collars will be programmed to have high location interval frequency during spring and fall migrations, low location interval frequency during summer and winter, and collect a minimum of 2-years of data. The project may also evaluate movements across known barriers such as rivers, highways, fences and identify potential conservation concerns within seasonal ranges or along movement corridors.



### ***Timeline and Budget***

Item	Year 1 FY19	Year 2 FY20	Year 3 FY21	Year 4 FY22	Total
Capture/sample 40 pronghorn	\$ 45,000				\$ 45,000
Capture/sample 10 pronghorn		\$ 12,500			\$ 12,500
Purchase 40 collars w/ drop and 2-year subscription	\$ 80,000				\$ 80,000
Research associate	\$ 10,000	\$ 65,000	\$ 65,000		\$ 140,000
Travel and misc. equip	\$ 5,000	\$ 5,000	\$ 6,500		\$ 16,500
Publications and printing			\$ 3,000	\$ 3,000	\$ 6,000
Total	\$140,000	\$ 82,500	\$ 74,500	\$ 3,000	\$ 300,000

January 2019 – Deploy pronghorn collars and collect movement information through January 2021

June 2019 – Hire research associate to develop code to delineate seasonal ranges and movement corridors (June 2019 – Dec 2019), delineate seasonal core use areas and movement corridors of existing ungulate telemetry datasets (Jan 2020 – Dec 2020), delineate Madison Valley pronghorn seasonal core use areas and movement corridors (Jan 2021 – June 2021).

*(Note: This research priority project will be funded using USFWS funds as a result of S03362)*

### **CURRENT ACTIVITIES -**

#### **Priority area A: Continental Divide to Rocky Mountain East Front**

- MTWP is utilizing GPS collar technology to produce fine-scale maps of seasonal ranges and migration routes of southern Rocky Mountain Front mule deer, and examine the quality of their seasonal forage (DeCesare et al. 2017).
- The FWS is working in collaboration with many partners including MFWP, The Nature Conservancy, and the Conservation Fund, acquiring perpetual conservation easement along the Rocky MTN Front. Landscape conservation at this scale will have significant benefits to big game corridors. The FWS seeks to acquire conservation easements on up to 295,000 acres of private land in the Rocky Mountain Front to protect elk, mule deer, and pronghorn migration corridors.

#### **Priority area B: Yellowstone National Park to Paradise Valley**

- The NPS and the US Forest Service have been working since 2006 with the National Parks Conservation Association, Montana FWP, and private landowners to improve/re-establish long-distance migration routes for pronghorn from Yellowstone into Montana.
- MFWP, working with the RMEF and the Conservation Fund, are pursuing a potential land acquisition that could expand the Dome Mountain Wildlife Management Area and

ensure the protection of additional wintering habitat for the Northern Yellowstone elk herd.

- The Gallatin-Custer National Forest is partnering with the Center for Large Landscape Conservation to model connectivity within a 100-mile buffer of the forest boundary as part of the Forest Plan revision. These generalized connectivity models will need to be compared to specific big-game migration information to determine their utility for representing big-game migration or movement.

**Priority area C: *Anaconda Range to Big Hole, Bitterroot, and Upper Clark Fork Watersheds***

- MFWP has ongoing efforts to identify private properties upon remaining blocks of open lands for potential conservation easements that would leave the land under private ownership and management, while remaining open and undeveloped for migratory deer and elk, in collaboration with Five Valleys Land Trust, the Bitterroot Land Trust, the Montana Department of Justice Natural Resource Damage Program, Department of Natural Resources and Conservation and county governments.
- MFWP and USFS biologists collaborate to identify forest management prescriptions that will manage forests in ways conducive to continued use by large numbers of migratory elk and deer. The landscape is a natural and evolving landscape for wildfires and the value of pre-emptive forest management for desired post-fire effects, as well as rehabilitation efforts after fires are important and ongoing.
- Recent action by the MT legislature has established a program and funding source for landscape-scale weed management across property boundaries, bringing funding together with multiple neighboring agencies and private landowners, which has potential to address weed distribution in this area.
- MFWP advises a need for more sustainable highway signage and opportunity for big game highway crossings in this ecosystem, pertaining especially to bighorn sheep as well as deer and elk. Highway crossings/underpasses are being built and proposed in key locations around the perimeter of this important area, and need to be addressed within it. In addition to main highways, the USFS are working on Forest and Travel Plans to guide vehicular traffic and distribution within this migration landscape, where support is needed for planning processes, implementation and information/enforcement. The Montana Department of Transportation is sponsoring a wildlife-highway summit in December 2018.
- The BLM Butte Field Office was recently awarded funding from the RMEF for the Whiskey Gulch/ Pole Canyon Wildlife Habitat Restoration. Working in collaboration with MFWP, the project would focus on areas of heavy conifer encroachment to restore historic conditions while enhancing: riparian areas, aspen stand resilience and densities, water sources, and sagebrush parks. This will in part address improving big game winter range.
- The FWS MT Partners for Fish and Wildlife Program (PFW) is collaborating with numerous partners including MFWP and the National Wildlife Federation on studies to better understand connectivity and corridors for antelope, greater sage grouse and grizzly bears in the Big Hole Valley of this landscape. This prioritization will lead to strategic conservation for on-the-ground projects.

- The FWS and MFWP has been working in the Big Hole Watershed for over 25 years, starting with work on arctic grayling and now expanding to greater sage grouse, antelope and grizzly bears. On-the-ground projects include riparian restoration, fence modifications, grazing systems, conservation easements and invasive species management. Projects are completed in cooperation with many partners and benefit many big game species.
- USFS is undertaking the Pinter Face project to meet multiple objectives, including improving wildlife habitat goals such as promoting elk use of the area during the summer and fall.
- The RMEF, the University of Montana, and MFWP are collaborating to evaluate the effects of elk habitat treatments funded by the RMEF on elk forage and distribution. In addition, MFWP is launching a new, long-term mule deer and elk research program that will address the effectiveness of such habitat treatments on seasonal distribution and migration, as well as forage and population dynamics, over the coming decade.
- MFWP and MPG Ranch initiated a mule deer GPS collaring study in 2015 to delineate mule deer seasonal ranges and movement corridors, and investigate spatial and diet overlap with elk in the northern and southern Bitterroot Valley to help understand causes of mule deer decline (MFWP 2017, 2018).

**Priority area D: Canadian Border to Fort Peck Reservoir**

- MFWP is working to minimizing 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 priority areas, much work is yet to be done and additional resources would advance this conservation action.
- MTFWP continues to work with transportation (highway department and railroad) to facilitate wildlife passage is needed. The Montana Department of Transportation is sponsoring a wildlife-highway summit in December 2018.
- The FWS Charles M. Russel National Wildlife Refuge is using best available science and restoration techniques to enhance and restore pronghorn migration corridors north of the refuge.
- The BLM Malta Field Office works with the MFWP, BLM permittees, and private landowners to maintain wildlife-friendly fencing and keep fence gates open during the winter, where possible, within wildlife migration corridors.
- The FWS is collaborating with numerous partners including MFWP and the National Wildlife Federation on studies to better understand connectivity and corridors for antelope, greater sage grouse and mule deer in this Northern Great Plains Landscape.
- The FWS has a very active conservation easement program across this landscape. Perpetual landscape protection is based off of biological priorities.
- The FWS 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 antelope and other big game species. Key partners are The Nature Conservancy, BLM and many private landowners.

- The BLM Malta Field Office 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 MFWP to improve wildlife habitat, stream restoration and wildfire suppression.
- The 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 antelope, mule and white-tailed deer, and elk populations.
- Since 2008, the 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.
- 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 throughout the field office. Identified ways to improve game species' habitat throughout the Miles City Field Office by focusing on big game crucial winter range and game bird winter range, breeding, and nesting habitat

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## **APPENDIX A: Department of the Interior Secretarial Order 3362: Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors**

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 Antelope (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:

- a. Federal Land Policy and Management Act of 1976, as amended, 43 U.S.C. 1701, *et seq.*;
- b. U.S. Geological Survey Organic Act, as amended, 43 U.S.C. 31, *et seq.*;
- c. National Wildlife Refuge System Improvement Act of 1997, as amended, 16 U.S.C. 668dd *et seq.*; and
- d. 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:

- a. 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;
- b. 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;
- c. 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
- d. 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:

a. 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:

(i) Past and current bureau conservation/restoration efforts on winter range and migration corridors;

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

(iii) Bureau management actions used to accomplish habitat objectives in these areas;

(iv) The location of areas that have been identified as a priority for conservation and habitat treatments; and

(v) 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:

(i) Habitat management goals and associated actions as they are associated with big game winter range and migration corridors;

(ii) Measurable outcomes; and

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

b. With respect to activities at the State level, 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:

(i) 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;

(ii) 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;

(iii) 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;

(iv) avoiding development in the most crucial winter range or migration corridors during sensitive seasons;

(v) minimizing development that would fragment winter range and primary migration corridors;

(vi) limiting disturbance of big game on winter range; and

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

c. 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.

d. 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.

e. 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.

Secretary of the Interior

Date: