

2019 NEW MEXICO STATE ACTION PLAN
For
Implementation of Department of the Interior Secretarial Order 3362: “Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors”

INTRODUCTION

The Department of the Interior Secretarial Order 3362 (SO 3362; Appendix A) directs appropriate bureaus within the Department of the Interior (DOI) to work in close partnership with the State of New Mexico to enhance and improve the quality of big-game winter range and migration corridor habitat on federal lands that are under the management jurisdiction of the DOI. These bureaus include the US Fish and Wildlife Service (USFWS), National Park Service (NPS), and Bureau of Land Management (BLM). The Secretarial Order recognizes the state’s authority to conserve and manage big-game species and respects private property rights, and 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.

The landscapes necessary to maintain ungulate winter range and migration routes are becoming increasingly fragmented across the western United States due to human encroachment from development and urban sprawl (Radeloff et al. 2005), agriculture (Donald and Evans 2006), roadway and railway expansion (White et al. 2007, Johnson 2001), natural resource extraction (Drohan et al. 2012, Hennings and Soll 2012), and fencing (Gates et al. 2012). These conditions in the broader landscape may influence the function of migration corridors and sustainability of big-game populations.

The United States Department of Agriculture (USDA), through the USDA Forest Service 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. Migration corridors will be considered in a manner that promotes the welfare of deer, elk, and pronghorn populations, as well as the ecological integrity of terrestrial ecosystems in the plan area.

With a total area of 77.3 million acres, New Mexico is the fifth largest state. Approximately 23.3 million acres is managed by the DOI and US Forest Service (USFS). Of the 23.3 million acres, almost 9.1 million acres are managed by the USFS and 14.2 million acres are managed by the DOI (Figure 1, Appendix B).

GPS collar data and movement research in New Mexico is limited, but deer, elk, and pronghorn are known to travel between general summer and winter ranges on a seasonal basis or in response to shifts in local environmental conditions. In general, big-game movements in New Mexico are shorter and less consistent than the long-distance migrations between seasonal ranges that are seen in the Rocky Mountain States. However, because data is limited, details on the timing, routes, and distances traveled are based on expert knowledge, and definitive information is generally lacking.

This incomplete understanding of wildlife movements makes it difficult to engage and provide the guidance requested for new infrastructure, development, or Resource Management Plan

updates. Certainly increased development and habitat degradation will continue to inhibit natural ungulate movement across the landscape, and the Department would like to be better equipped with information to guide development and habitat improvements in a manner that preserves important movement corridors to promote robust big-game populations.

Additional research will allow the Department, NM Department of Transportation (DOT), the BLM, and the Forest Service to revise management plans to align management prescriptions for winter range and migration corridors with conservation needs to retain and enhance the functionality of these habitats. Amendments may include, but not limited to, avoidance or exclusion overlays, mineral withdrawal recommendations, changes to travel management zones, habitat restoration and enhancement, or other plan-based management prescriptions that contribute to the long-term integrity of these critical habitats.

The Department develops partnerships and leverages funds to increase the scope and scale of wildlife habitat restoration across the state of New Mexico, including the identified priority areas. These collaborative efforts have resulted in the Department funding over \$10 million worth of restoration work since 2015, with another \$15 million secured over the next few years. Additional habitat restorations and enhancements are encouraged in the identified priority areas using best management practices and peer reviewed literature to promote healthy ecosystem functions. Projects should seek to maintain migration corridor connectivity and mitigate the effects of anthropogenic influences and habitat fragmentation on mule deer, elk, and pronghorn using published literature (Sawyer et al. 2017, 2019a, 2019b, Wyckoff et al. 2018).

NEW MEXICO'S PRIORITY LANDSCAPES FOR WINTER RANGE AND BIG-GAME MOVEMENT

The Department has identified the following highest priority landscapes for big-game movement based on available data, local knowledge, expert opinion, known barriers to movement, and projected threats. These are landscapes in which the Department believes big-game movement is being severed or at risk of being disrupted based on the best information available to date. The Department lacks finite and defensible movement data in the following priority landscapes and throughout the state. Because of this, the Department cannot narrow the focus or scale of the priority areas, and can only identify large landscapes or Game Management Units (GMUs) where big-game migration corridors or winter ranges are believed to be at risk.

We have just begun to investigate seasonal ungulate movements and have deployed collars in only a small fraction of potential areas we would like to evaluate. Additional research will provide science-based data to assist with identifying critical corridors in these landscapes, and it will narrow the focus of conservation or management activities. This list may differ from areas identified in research needs below in that some anecdotal information exists for migration in the priority landscapes whereas information in other areas of the state is lacking. As more data are assembled and analyzed and the Department identifies other corridors or winter ranges that require management attention, these priority landscapes may shift.

1) Northcentral landscape (deer, elk, pronghorn)

Although there is limited data on the exact linkages and movement corridors of mule deer, elk, and pronghorn in Northcentral New Mexico, movement occurs between Southcentral Colorado

and New Mexico. Northcentral New Mexico is a destination for hunters, with sportsmen and women spending over \$31 million annually on hunting activities in Rio Arriba and Taos counties alone. The deer herd is among the densest in the state, and it is socially important to residents and sportspeople. In addition, this area is home to one of the state's largest elk herds, the Northcentral herd. The limited data available on elk migrations in this area come from a previous study on a small segment of the population utilizing San Antonio Mountain in GMU 52. While elk in other segments of the Northcentral elk herd move across the landscape, details are not well known. This is a very important herd for both non-consumptive and consumptive public recreation with over 7,500 private and public hunting licenses issued in 2017. The Northcentral landscape also has a unique high-elevation pronghorn herd that summers at or above 10,000 feet and winters in lower elevations. Little is known about the movement corridors or exact winter ranges utilized by this pronghorn population.

Ownership on this landscape is intermixed US Forest Service, Bureau of Land Management, State Game Commission-owned Wildlife Management Areas, private, and Tribal lands. A general location map of the focus area can be found in Figure 2. Habitat types include mixed conifer-aspen woodlands at the higher elevations, oak-woodland savannahs at the mid-elevations, and sagebrush communities and agricultural lands at the lower elevations.

This area is at risk for increased habitat fragmentation from development, private subdivisions, increased human use, and road infrastructure. In addition to fragmentation, the associated roads result in a large number of wildlife-vehicle collisions annually with the majority occurring in the winter and transition periods. US Highway 64 connects Chama to Farmington and is a perennial hotspot for wildlife vehicle collisions. An 8-foot-tall fence to exclude deer and elk from accessing highway 64 and funnel them to existing drainage structures was constructed. Although the fence has reduced collisions, it risks severing an important corridor for these migratory ungulates.

The Department also has concerns about Chronic Wasting Disease (CWD) in this area, as it has been detected in close proximity to where this migratory deer herd summers in Colorado. In addition, a feral horse and burro population that resides in the area is rapidly expanding and negatively impacting the habitat on this important winter range.

Current State Agency Activities

- NMDGF has collaborated with the New Mexico Department of Transportation to implement seven wildlife-vehicle collision mitigation projects. These projects include retrofit of existing box culverts to allow passage of mule deer and 8-foot fencing at U.S. 550 north of Aztec to the Colorado border; an enlarged bridge structure and fencing to direct mule deer and elk below U.S. 64 west of Chama. A recent project was completed along U.S. 550 south of Cuba where deer and elk vehicle collisions are high. This project included construction of 4 miles of 8-foot fence to direct mule deer and elk to cross below the highway.
- The Department has collaborated with the USFS to establish several landscape-scale forest and wildlife habitat restoration project areas totaling over 200,000 acres on the Carson National Forest in the Northcentral landscape. To date, the Department has funded archeological clearances and several thousand acres of forest thinning, and has

developed a prescribed fire plan with the USFS and other partners to return historic levels and intensities of fire to larger and larger landscapes in this part of New Mexico.

Habitat and Mitigation Projects Identified:

Since preferred movement corridors of ungulates in the northcentral landscape are largely unknown currently, we cannot specifically identify priority projects for habitat work in this landscape at this time. Rather, we encourage land management agencies to implement habitat improvement projects that benefit deer and pronghorn in this landscape. We also encourage collaboration between the Department and land management agencies when considering landscape level planning.

Research conducted by Sawyer et al. (2019a) has identified major mule deer migration corridors in GMU 2B, east of Navajo Lake, NM (Figure 3). This research found that mule deer utilizing exterior migration routes (i.e. low use routes) have lower survival than mule deer using the interior routes (i.e. high use areas). When resources are limited, habitat enhancement actions should focus on the interior routes to preserve the core migration corridor which will benefit the most individuals in the population and improve fitness of individuals in the population. Additional resources could then focus on exterior routes to bolster individuals using the fringe of the corridor.

Habitat and mitigation projects within the interior migration routes that can benefit the Rosa mule deer herd are: limiting pinyon and juniper encroachment, improvement of browse within the corridors and on winter range, minimizing feral horse access to the winter range and migration corridors, modifying fences along the migration corridor to make them wildlife friendly and facilitate movement, reseeding native forbs and grasses in disturbed areas, and minimizing disturbance on oil and gas development areas including restricting the timing of activities. These projects will also benefit elk with overlapping home ranges.

General habitat and mitigation projects that will benefit deer, elk, and pronghorn in other parts of the northcentral landscape are similar to those above including: modifying fences along high use areas to make them wildlife friendly and facilitate herd movement, taking mitigation actions to reduce wildlife-vehicle collisions at high risk areas, and minimizing disturbance on oil and gas development areas including restricting the timing of activities. Projects should be focused at high use areas and pinch points based on expert knowledge of personnel at the Department and land management agencies.

2) NM Southeastern Plains landscape (pronghorn and deer)

Deer and pronghorn in this area are thought to make seasonal movements to take advantage of seasonal weather patterns. These movements are critical for the animals to meet energetic demands and complete their annual lifecycles. If their ability to move is impeded, they will not be able to acquire the necessary resources and their fitness, ability to rear young, and survival may be reduced. This ultimately could cause populations to decline or perish. The southeastern part of the state is increasingly becoming an anthropogenic landscape. As such, pronghorn and deer movements may be challenged as the landscape changes. Identifying movement corridors and removing or modifying existing fencing in select areas may allow pronghorn and deer to make necessary movements to meet their energetic demands.

Ownership in this landscape is intermixed BLM, State Land Office, US Forest Service, and private (Figure 4). Habitat types include Chihuahuan desert, riparian, shinnery oak, sand sagebrush, honey mesquite shrublands, grasslands, and agriculture. This anthropogenic landscape can result in secondary habitat loss as wildlife avoids the remaining habitat subject to elevated noise and human activity. In addition to secondary habitat loss, wildlife vehicle collisions increase with increasing traffic volume (Wakeling et al. 2015). Recently the Roswell and Carlsbad BLM offices have worked with the Department and lessees in the area to convert sheep fences to wildlife friendly fences in targeted areas. This work has improved pronghorn movement across the landscape, but more work on a larger scale is necessary to restore and more closely replicate historic movements.

Current State Agency Activities

- Since 2014, the Department has translocated 188 pronghorn to Macho Flats in southeastern New Mexico to augment a declining population. The Department continues to monitor survival of these translocated pronghorn, and survey the population to monitor population growth and herd expansion.
- The Department is working with partners including the Bureau of Land Management, NM State Land Office, National Resource Conservation Service, and CEHMM to develop an analysis to prioritize areas for mesquite removal in landscapes important to pronghorn and lesser prairie chicken habitat in SE New Mexico. This analysis will help to guide the efficient use of resources to gain regulatory compliance and implement on the ground mesquite removal and fence modification treatments.

Habitat and Mitigation Projects Identified:

Since preferred movement and seasonal areas of deer and pronghorn are largely unknown at this time, we cannot specifically identify priority areas for habitat work. The requested research will assist with identifying and focusing habitat treatments and recommending management actions or conservation areas that will keep big-game movement corridors and priority habitats intact. Similarly, any future research prioritized by the Department will help focus habitat work to maintain or improve seasonal movement corridors and use areas. We encourage land management agencies to implement habitat improvement projects that benefit deer and pronghorn in this landscape. We also encourage collaboration between the Department and land management agencies when considering landscape level planning.

General habitat and mitigation projects that will benefit deer and pronghorn are: fence modifications along high use areas to make them wildlife friendly and facilitate herd movement, taking mitigation actions to reduce wildlife-vehicle collisions at high risk areas, and minimize disturbance around development areas. Projects should be focused at high use areas and pinch points based on expert knowledge of personnel at the Department and land management agencies.

3) Northern Sangre de Cristo landscape (deer, elk, bighorn sheep)

Deer, elk, and bighorn sheep summer in the high elevations of the Northern Sangre de Cristo Mountain range. Winter conditions can force these herds to lower elevations but exact wintering

areas and movement corridors are unknown. In addition, some elk are thought to migrate south from Colorado into New Mexico in the northernmost part of the landscape, but little information is known about this migration or the corridor(s) utilized.

The landownership in the Northern Sangre de Cristo Mountains is comprised of US Forest Service, private, Department Wildlife Management Areas, and Tribal properties. Figure 5 depicts the general area of interest associated with this priority corridor. The habitat ranges from alpine tundra at the highest elevation, mixed conifer-aspen forests and oak woodlands at the mid-elevations, and sagebrush flats intermixed with agriculture and urban development at lower elevations.

Because this area is a recreational destination with an expanding human population that also has potential for mineral extraction, the risk of development and fragmentation is high. Development in this portion of the Sangre de Cristo Mountains could sever seasonal movements and prevent animals from reaching their seasonal ranges or remove wintering areas altogether. In addition, a high number of wildlife-vehicle collisions occur along NM 522 and NM 38 every year.

Current State Agency Activities

- In collaboration with the Carson National Forest and other partners, the Department initiated a concept design and restoration plan for treatments focused on reducing active degradation of streambanks and slope wetlands, reestablishing floodplain connectivity, and raising water tables within wetlands and former wetlands in the 27,430 acre Comanche Creek Watershed of north-central NM.
- The Department has partnered with the US Forest Service to promote prescribed fire activities across all districts of the Santa Fe National Forest in order to enhance wildfire habitat, improve forest health, and lessen the threat of large-scale, high-intensity wildfire.

Habitat and Mitigation Projects Identified:

Similar to the northcentral landscape, big-game movement corridors in the Northern Sangre de Cristo are largely unknown, and we cannot identify specific locations where habitat work is needed in this priority landscape at this time. Additional research will assist with identifying and focusing habitat treatments and management actions that will keep big-game movement corridors in this priority landscape intact. Rather, we encourage land management agencies to implement habitat improvement projects that benefit deer, elk, pronghorn, and bighorn sheep in this landscape. We also encourage collaboration between the Department and land management agencies when considering landscape level planning

General habitat and mitigation projects within the interior migration routes that can benefit the big-game herds in the Northern Sangre de Cristo Mountains are: limiting pinyon and juniper encroachment, improvement of browse within the anticipated corridors and on winter range, modifying fences along the migration corridor to make them wildlife friendly and facilitate movement, and taking mitigation actions to reduce wildlife-vehicle collisions at high risk areas. Projects should be focused at high use areas and pinch points based on expert knowledge of personnel at the Department and land management agencies.

4) I-25 corridor from Las Vegas, NM to the Colorado Border (pronghorn)

This corridor likely represents a historic movement corridor that was disrupted when Interstate 25 was constructed. While no data has been collected on pronghorn and other ungulate movement across this landscape, linkage east and west of the interstate is expected to be minimal, as has been observed in Arizona (Bristow et al. 2013). Landownership on this landscape is largely private with some intermixed State Land Office property (Figure 6). The habitat includes mixed conifer-aspen forests, oak woodlands, and grassland mesas.

Current State Agency Activities

- Approximately 5 miles of fencing have been constructed to direct mule deer and black bears under I-25 through Raton.
- A second project to fence I-25 to direct mule deer and elk under the interstate from Raton to the Colorado border is in the design phase. This project is being implemented primarily to address motorist safety in an area with high wildlife-vehicle collisions.

Habitat and Mitigation Projects Identified:

Interstate 25 represents the biggest impediment to pronghorn movement and migration in this identified corridor. Wildlife crossings along the interstate would improve migrations for multiple big-game species, including pronghorn. Linkage of animal movements east and west of the interstate would be improved with the construction of several wildlife crossing structures across/under I-25 between Las Vegas, NM and the Colorado border, along with fencing to make these structures effective. We also encourage collaboration between the Department and land management agencies when considering landscape level planning

Removing or modifying other barriers to movement, such as fences, in this landscape will maintain or restore necessary seasonal pronghorn movements. Projects should be focused at high use areas and pinch points based on expert knowledge of personnel at the Department and land management agencies.

Current Federal Agency Activities in all Priority Landscapes

BLM Activities:

Priority Area 1 – Northcentral landscape for deer, elk, and pronghorn.

- Rosa Mule Deer Research Project Farmington Field Office – The Rosa Mule Deer Study was initiated in 2011 to provide agencies and industry with the information needed to improve mule deer management and minimize potential impacts associated with ongoing and proposed energy development in the region. The study was specifically designed to identify the winter distribution patterns and migration routes of mule deer (Figure 3).
- Crow Mesa Research Project Farmington Field Office – The Crow Mesa Mule Deer Study started in January 2019. The research project is designed to document the seasonal distribution and migration patterns of an important deer herd in the Farmington Field Office. Similar data has been collected for mule deer herds to the northwest (Rosa and Southern Ute studies) and northeast (Jicarilla study); this work will fill in key data gaps for mule deer movements in northwest New Mexico.

- Mechanical sage and PJ treatments within the Farmington Field Office (Crow Mesa, Rattlesnake Canyon, Carracas Mesa, etc.).

Priority Area 2 – NM Southeastern Plains landscape (deer, pronghorn).

- Fence Modification programs for big-game (mule deer, elk, and pronghorn,) in Roswell and Carlsbad Field Offices – Big-game habitat expansion and movement are enhanced as opportunities arise by undertaking one or more of the practices listed below. These practices apply primarily to fences built for livestock control and highway right-of-way fences.
 - Replacing existing netwire fences with barbed wire fences to facilitate the movement of wildlife between pastures;
 - Installing pronghorn passes in netwire fences;
 - Removing netwire fences on allotments converted from sheep to cattle;
 - Lowering fences that exceed 42 inches in height;
 - Removing extra strands of barbed wire to meet BLM standard 4-strand fence specifications;
 - Removing extra top strands of barbed wire from netwire fences to prevent entanglement of mule deer;
 - Considering terrain, forb and browse diversity, and pasture size and shape, when developing or redesigning pasture configurations;
 - Disallowing the installation, or replacing of netwire fences along highway rights-of-way crossing public lands if not required for ranching operations.

Priority Area 3 – Northern Sangre de Cristo landscape (deer, elk, bighorn sheep).

- PJ mechanical sage treatments within the Taos Field Office.

US Forest Service Activities:

Priority Area 1: Carson National Forest

- Jicarilla Ranger District Big Sagebrush/Grassland Restoration – Mowing of big sagebrush and seeding of 600 – 1,000 acres with Gobernador, Ciruelas, La Jara, Cottonwood, Jaramillo, and Ahogadero Canyons to improve big-game habitat.
- Rio Tusas Lower San Antonio Restoration Project – Landscape restoration activities within a 160,000 acre project area in the Tres Piedras Ranger District in Rio Arriba County. Landscape restoration could consist of uneven-aged thinning treatments in conjunction with prescribed burning on up to 47,000 acres and prescribed burning only treatments on up to 13,000 acres, for a total treatment area of up to 60,000 acres. Approximately 20 percent of forested acres will be allocated for old growth characteristics. Partners include the Department and the Mule Deer Foundation.
- Tio Gordito Restoration Project - The restoration project area is approximately 17,000 acres in the Tres Piedras Ranger District in Rio Arriba County. The project includes both vegetation and prescribed burning treatments. Partners include the Department.
- El Rito Canyon Restoration Project – This restoration project is located on the El Rito and Canjilon Ranger Districts and is approximately 62,000 acres. The project will treat primarily ponderosa pine, PJ, mixed conifer and aspen stands with thinning, mechanical treatments, and prescribed burning. Partners include the Department and New Mexico State Forestry.

- Canjilon WUI Restoration Project – This 12,000-acre restoration project is located on the Canjilon Ranger District in Rio Arriba County. Restoration activities include thinning and prescribed burning. Partners include the Department and New Mexico State Forestry.
- Upper Rio San Antonio Riparian/Stream Restoration Project – This riparian/stream restoration project is located on the Rio San Antonio and its tributaries on the Tres Piedras Ranger District. The project will enhance or restore up to 14 stream miles of stream/riparian habitat with the primary goal of improving water quality and fish habitat and a secondary goal of improving adjacent upland/riparian habitat for terrestrial species. Partners include the New Mexico Association of Conservation Districts, and Amigos Bravos.
- Stewart Meadows Wetland Complex – Stewart Meadows is located on the Tres Piedras Ranger District in Rio Arriba County and was acquired by the Carson National Forest with Land and Water Conservation Funds in 1973. Associated with the land acquisition are approximately 190 acre-feet of water rights. This 350-acre project area is located within the historic floodplain of the Rio San Antonio. The previous owners drained and leveled the land for irrigated agriculture to grow hay for their ranching operation. The nearly flat terrain and network of irrigation ditches were converted by the USFS for wetland terrestrial, aquatic, and plant habitat. The USFS installed and maintains a bovine enclosure fence around the wetland area. Partners include Ducks Unlimited and the Department.

Priority Area 2: Carson National Forest

- La Jara Hazardous Fuels Reduction – Restoration that utilizes vegetation treatments, prescribed fire, and installed water developments for wildlife/range to improve habitat conditions across the landscape.
- Rio de las Trampas – Restoration that utilizes vegetation treatments, prescribed fire, riparian treatments (fixing springs, invasive species removal) to improve habitat conditions across the southern end of the district.
- Amole Green Fuelwood – Prescription designed in a green fuelwood area to benefit wildlife by permitting the public to remove smaller diameter trees and increase forest complexity.
- Comanche Creek Riparian and Wetland Restoration
- Rio Fernando Riparian and Wetland Restoration
- Midnight Meadows Riparian and Wetland Restoration
- Rio Trampas Riparian and Wetland Restoration
- GMU 55A – Valle Vidal: Flagship prescribed burns on the Valle Vidal Management Unit.
 - FY19 – Ring Rx Unit 4,900 acres
 - FY20 – Hart Rx Unit 6,500 acres
- GMU 53: Kiowa San Cristobal WUI –
 - Joint Chief’s Initiative: FY2018 thinning approximately 239 acres of PJ
 - Joint Chief’s Initiative: FY2019 thinning approximately 150 acres of PJ and Ponderosa Pine
 - Cerro Negro, Lenero CFRP FY19 thru FY20 thinning 100 acres per year of PJ

RESEARCH NEEDS:

1) Seasonal movement and survival of deer and pronghorn in southeastern NM.

Need: Because of the concerns identified in the “Priority Landscapes” section above, the Department desires full implementation of a project that will identify seasonal movements and survival of deer and pronghorn in an increasingly anthropogenic landscape in southeastern NM. The project will identify critical movement corridors and seasonal use areas for these biologically and socially important herds including timing and magnitude of movements, if weather patterns impact movements, and if distances moved, routes travelled and stopover areas are consistent across years.

Because of the variety of stakeholders and jurisdictions, it is imperative that the Department more fully understand deer and pronghorn movements in this area to improve management recommendations and guide landscape scale planning. As identified above, this area is home to socially and biologically important deer and pronghorn populations that cross jurisdictional boundaries on an increasingly anthropogenic landscape.

Methods: We are proposing to deploy up to 60 GPS collars on deer and up to 60 on pronghorn over 2 study areas for each species during the winter period. We propose research that will identify important seasonal use areas and movement corridors for deer and pronghorn in southeastern NM. Capture will occur using a net gun fired from a helicopter. The capture will occur over a 3-5 day period for each species. GPS collars with a fix rate of 2-3 hours will be deployed on the animals to identify detailed movements.

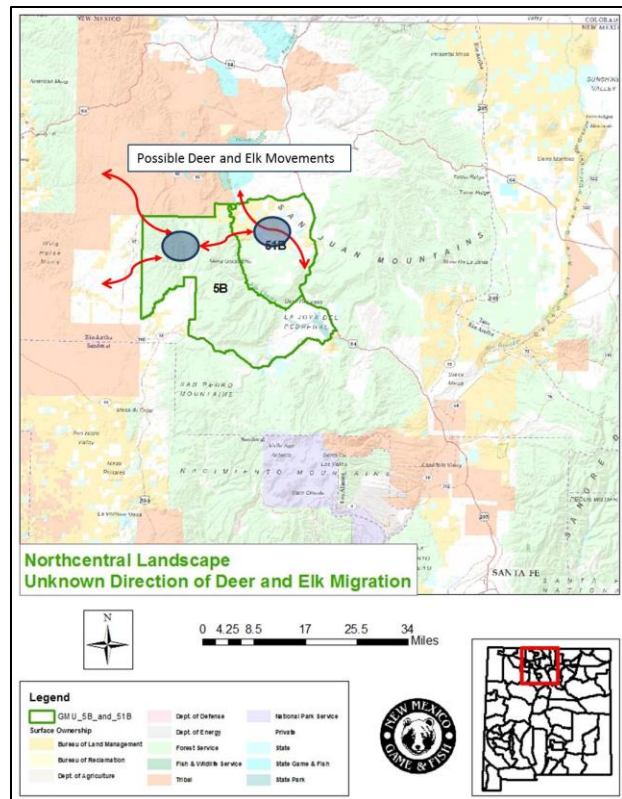
Management Implications: This research will provide an opportunity to learn about big-game movements in a landscape that is important for deer and pronghorn, but where anthropogenic factors may alter movement patterns. By identifying the specific movement corridors, overwintering areas, timing, and magnitude of migration the Department can more effectively work with stakeholders to plan for and improve deer and pronghorn movement across southeastern NM. An added benefit is that this data will also help guide the Department’s deer and pronghorn management by properly delineating biologically functional populations. This will ensure the Department collects accurate demographic data and can allocate hunting licenses appropriately. This data may also help identify areas where management agencies should consider wildlife crossings or potential wildlife fence modifications to keep movements intact.

Item/Activity	
Mule deer & pronghorn capture (120 individuals)	\$83,400
120 mule deer & pronghorn GPS collars & airtime (\$1,300 each)	\$156,000
Data analysis/report development	\$60,600
Subtotal	\$300,000

2) GMUs 5B and 51B in the Northcentral landscape for deer and elk

Need: Although it is known that deer and elk in GMUs 5B and 51B make seasonal movements in response to snowpack and seasonal conditions, the direction and magnitude of movement is largely unknown. Because the direction, magnitude, timing, and stopover areas of this population's migration are unknown, the Department desires to collar deer and elk in GMUs 5B and 51B to answer these unknowns.

Because of the variety of stakeholders and jurisdictions, higher risk for development, high densities of roads, and the relative unknown nature of wildlife movement on the landscape, it is imperative that the Department more fully understand these movements to improve management recommendations and guide landscape scale planning. Energy development is anticipated to increase in this area in future years which will negatively impact resident and migratory deer and elk populations. As identified above, this area is home to socially and biologically important deer, elk, and pronghorn populations that cross jurisdictional boundaries on an increasingly anthropogenic landscape. Further, the Department has received requests from NM DOT to identify wildlife crossings and potential hotspots for vehicle collisions.



Methods: We are proposing to deploy 30 GPS collars on deer and 30 on elk when animals are on winter range in GMUs 5B and 51B. Capture will occur over a 3-5 day period for each species using a net gun fired from a helicopter. GPS collars with a fix rate of 2-3 hours will be deployed on the animals to identify detailed movements.

Management Implications: By identifying the specific movement corridors, overwintering areas, timing, and magnitude of migration the Department can more effectively work with stakeholders to plan for and improve deer and elk movement across the Northcentral landscape. An added benefit is that this data will also help guide the Department's deer and elk management by properly delineating biologically functional populations. This will ensure the Department collects accurate survey data and can allocate hunting licenses appropriately. This data may also help identify areas where the Department of Transportation should consider wildlife crossings or potential wildlife fencing to keep movements intact, and where land management agencies may place development restrictions to maintain intact corridors and big-game movement activities.

Item/Activity	
Mule deer & elk capture (60 individuals @ \$750 each)	\$45,000
60 mule deer, elk, & pronghorn GPS collars & airtime (\$1,300 each)	\$78,000
Data analysis/report development	\$60,600
Subtotal	\$183,600

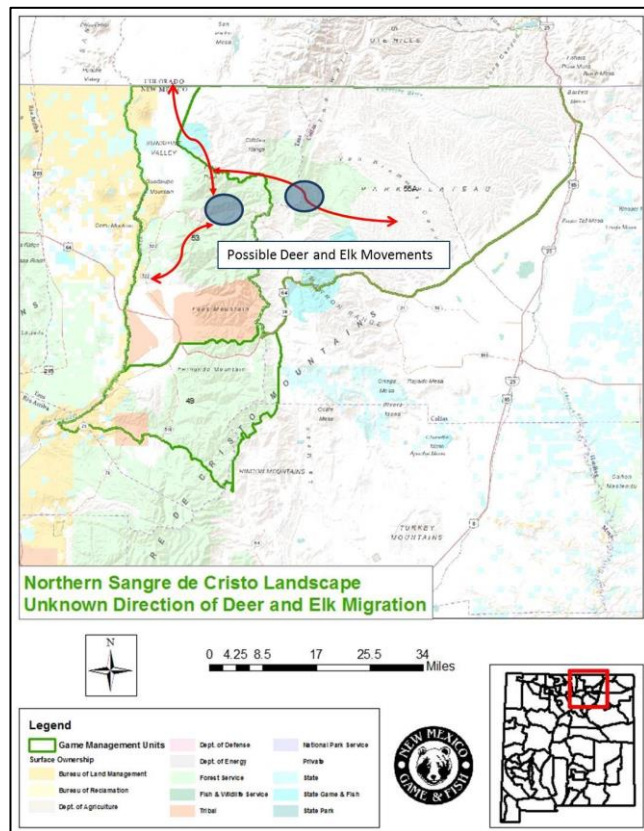
3) Northern Sangre de Cristo (deer, elk)

Need: Deer and elk in the northern Sangre de Cristo Mountain Range are thought to complete elevational migrations in response to winter snowpack; there is also evidence that portions of these herds migrate south from Colorado into New Mexico in the northernmost part of the landscape. However, the direction, magnitude, and timing of migration are largely unknown. Because of the unknown movements associated with this deer and elk herd, the Department desires to collar deer and elk to answer these movement questions.

Because of the variety of stakeholders and jurisdictions, higher risk for development, high densities of roads, and the relative unknown nature of wildlife movement on the landscape, it is imperative that the Department more fully understand these movements to improve management recommendations and guide landscape scale planning.

Residential development has increased in recent years and is expected to rise as this area continues to become a more popular destination for tourists, vacation homes, and new residents. As identified above, this area is home to socially and biologically important deer and elk populations that cross jurisdictional boundaries on an increasingly anthropogenic landscape. Further, the Department has received requests from NM DOT to identify wildlife crossings and potential hotspots for vehicle collisions.

Methods: We are proposing to deploy 30 GPS collars on deer and 30 on elk during the winter. Capture will occur over a 3-5 day period for each species using a net gun fired from a helicopter. GPS collars with a fix rate of 2-3 hours will be deployed on the animals to identify detailed movements.



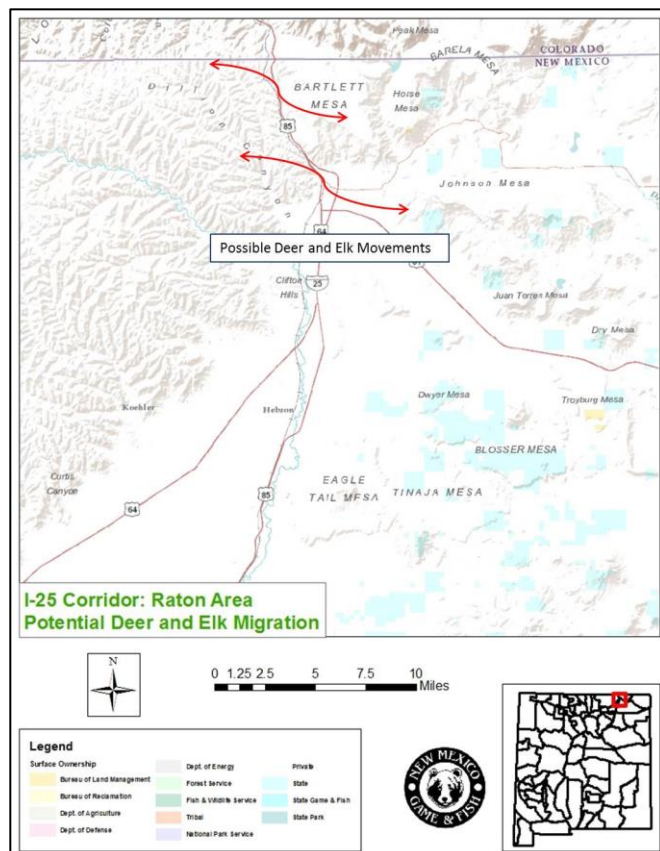
Management Implications: By identifying the specific movement corridors, stopover and overwintering areas, and timing and magnitude of migration the Department can more effectively work with stakeholders to plan for and improve deer and elk migration in the northern Sangre de Cristo Mountains. An added benefit is that this data will also help guide the Department's deer and elk management by properly delineating biologically functional populations. This will ensure the Department collects accurate survey data and can allocate hunting licenses appropriately. This data may also help identify areas where the Department of Transportation should consider wildlife crossings or potential wildlife fencing to keep movements intact.

Item/Activity	
Mule deer & elk capture (60 individuals @ \$750 each)	\$45,000
60 mule deer & elk GPS collars & airtime (\$1,300 each)	\$78,000
Data analysis/report development	\$60,600
Subtotal	\$183,600

4) Raton Pass Deer and Elk Movement

Need: The seasonal movements of deer and elk north of Raton are largely unknown, but these herds are thought to move in response to seasonal conditions. I-25 likely bisects east-west movements and poses threats to animals crossing the interstate. The animals crossing the interstate simultaneously pose a public safety issue as motorists using the interstate frequently collide with deer and elk in this area. Because of the frequent wildlife vehicle collisions, a 6 mile long wildlife fence and a single crossing was constructed to reduce deer and elk access to the interstate, and thus reduce collisions. This infrastructure, while reducing wildlife vehicle collisions and improving public safety, risks severing big-game migration routes.

Methods: We are proposing to deploy 30 GPS collars on deer and 30 on elk when animals are on winter range on both sides of the interstate. Capture will occur over a 3-5 day period for each species using a net gun fired from a helicopter. GPS collars with a fix rate of 2-3 hours will be deployed on the animals to identify detailed movements.



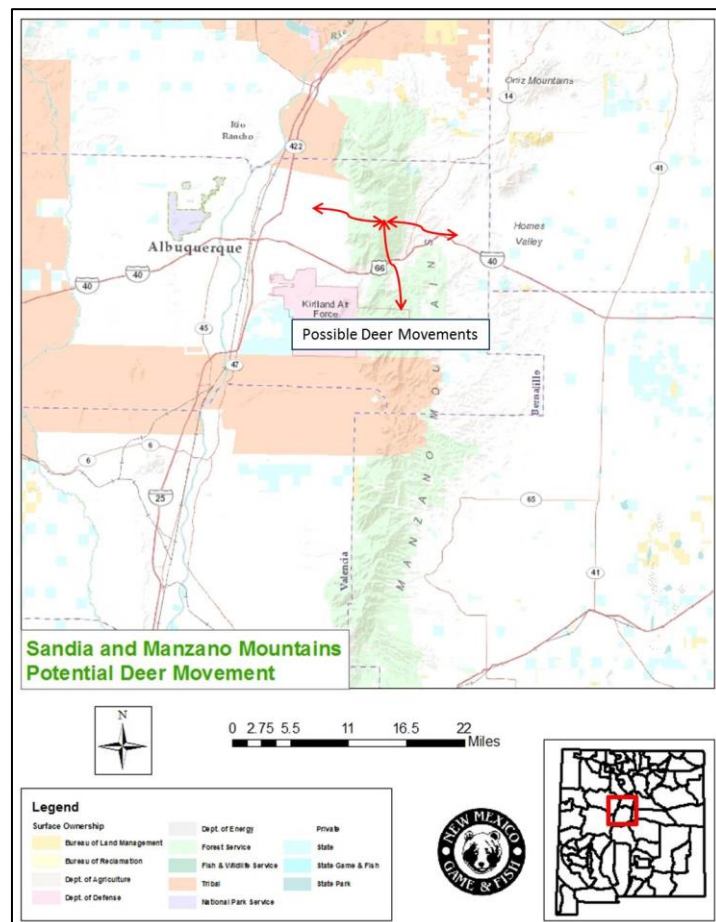
Management Implications: This research will help the Department identify movement corridors, stopover and overwintering areas, and timing and magnitude of migration. It will also help the Department and NM DOT determine whether the single wildlife crossing is sufficient for ungulate passage, or whether additional crossings should be constructed to preserve big game migrations in this area and could provide insights into future wildlife crossing construction projects. An added benefit is that this data will also help guide the Department's deer and elk management by properly delineating biologically functional populations. This will ensure the Department collects accurate survey data and can allocate hunting licenses appropriately.

Item/Activity	
Mule deer & elk capture (60 individuals @ \$750 each)	\$45,000
60 mule deer & elk GPS collars & airtime (\$1,300 each)	\$78,000
Data analysis/report development	\$
Subtotal	\$123,000

5) Deer Movement in Sandia and Manzano Mountains

Need: Although not thought to be a migratory population, movements from high elevation to the towns and cities at lower elevations are documented as deer frequently move into the foothills in Albuquerque to the west of the mountain range, and Cedar Crest and Sandia Park to the east. These cities and towns are expanding rapidly as human populations grow.

Interstate 40 and Highways 14 are busy routes as commuters from Cedar Crest, Sandia Park, and towns further east commute to work in Albuquerque daily. Highway 14 and I-40 may sever natural deer movements north/south in the mountain range as well as deer movement in the foothills to the east. Movement across I-40 has been documented and a wildlife crossing has been installed in the Tijeras Canyon. Trail camera monitoring has indicated that this crossing is used regularly by deer crossing the interstate.



Methods: We are proposing to deploy 30 GPS collars on deer during the winter. Capture will occur over a 3-5 day period using a net gun fired from a helicopter. GPS collars with a fix rate of 2-3 hours will be deployed on the animals to identify detailed movements.

Management Implications: Collaring deer in this area will inform NMDGF and NMDOT on where additional wildlife crossings or mitigation efforts and conservation easements should be considered. Such mitigation efforts and easements may help reduce wildlife vehicle collisions, improve public safety, and conserve natural deer movements throughout the mountain range and foothills.

Item/Activity	
Mule deer & elk capture (30 individuals @ \$750 each)	\$22,500
30 mule deer GPS collars & airtime (\$1,300 each)	\$39,000
Data analysis/report development	\$
Subtotal	\$61,500

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Appendix A - Secretarial Order 3362

SECRETARIAL 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:

Appendix B – New Mexico Landscape Maps

Figure 1 – New Mexico Land Ownership

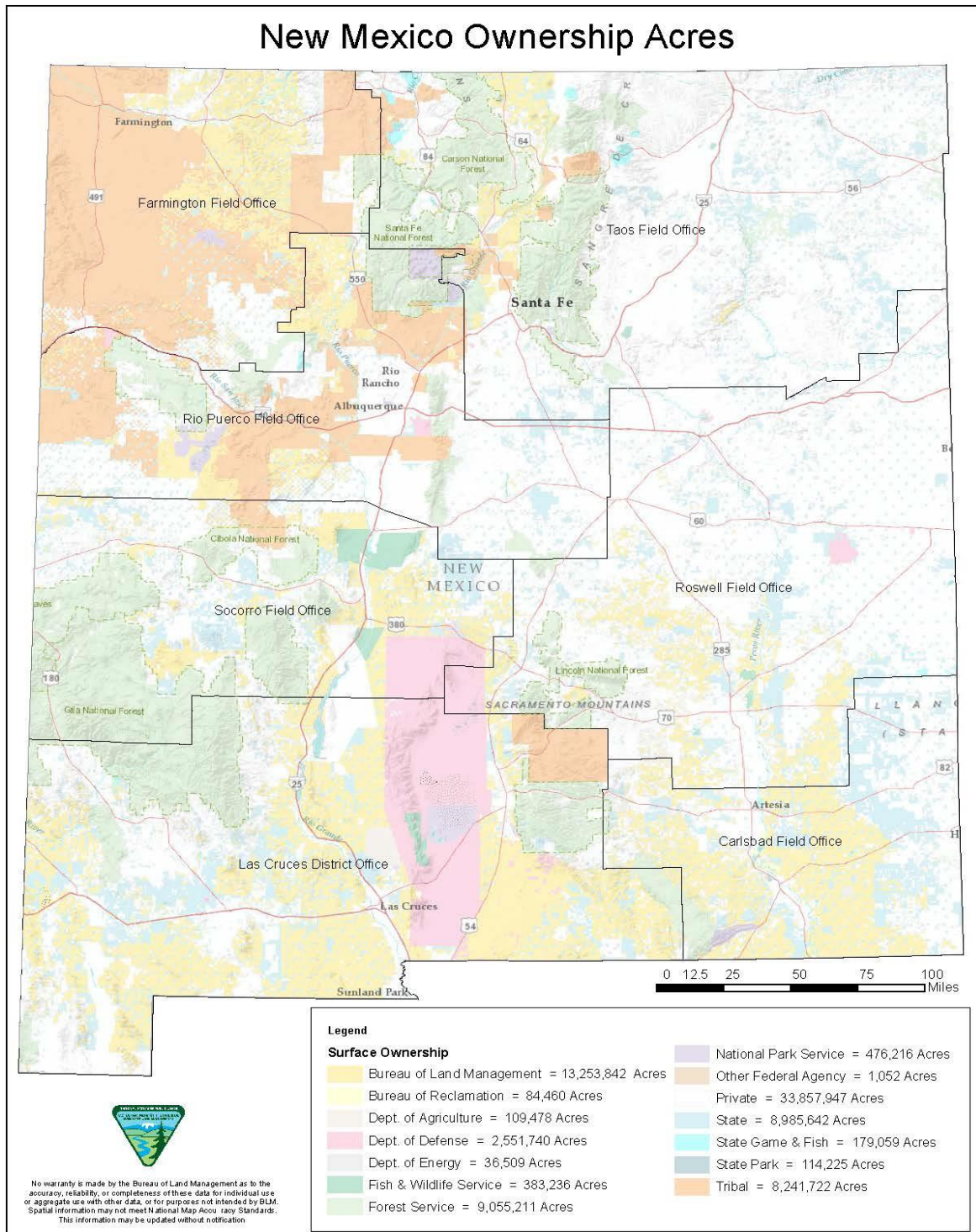


Figure 2 – Priority Area 1 – Northcentral Landscape

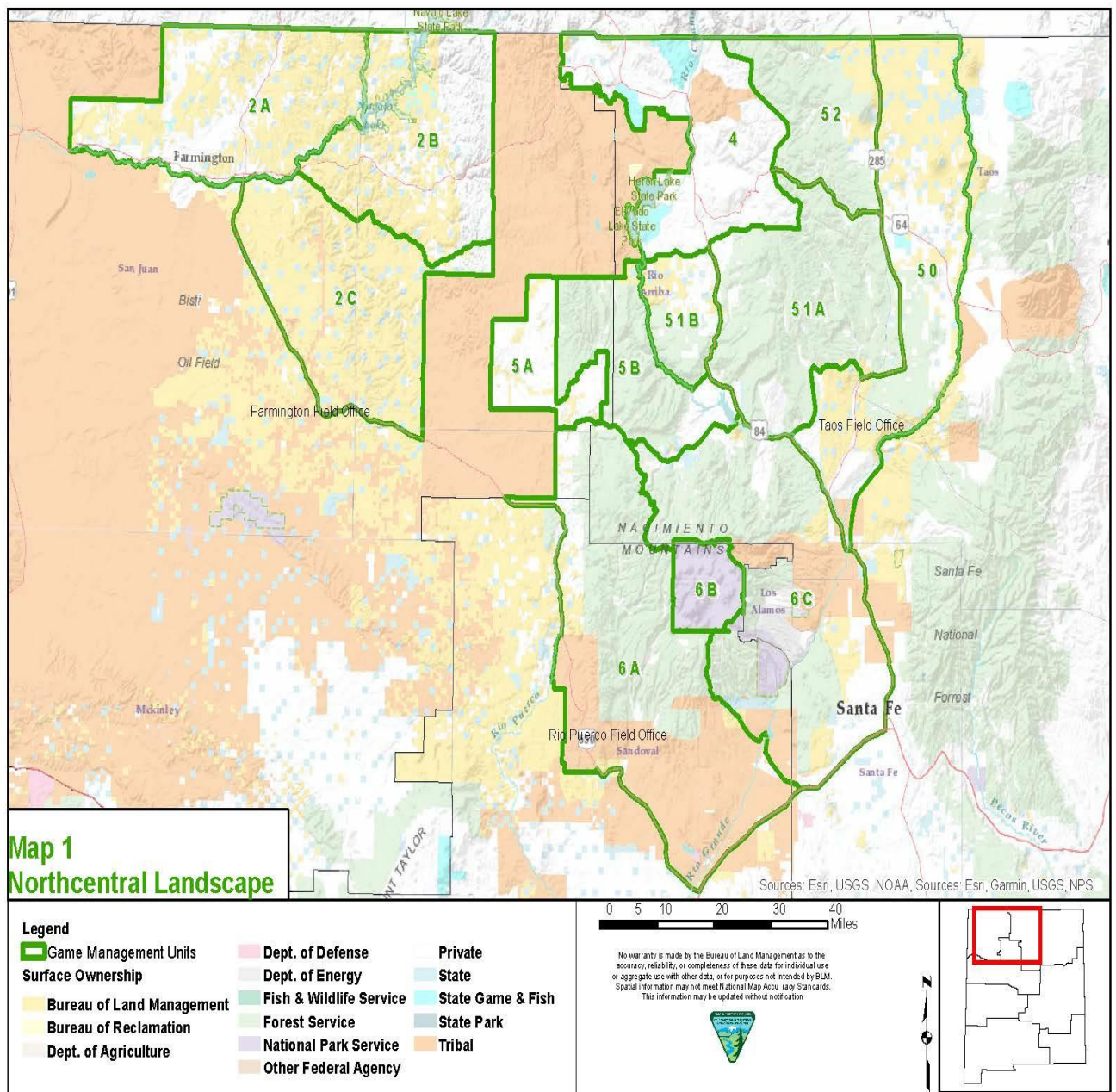


Figure 3 – Location of common winter range and the North San Juan, South San Juan and Valle Seco summer ranges relative to low-use and high-use migratory routes used by mule deer in northern New Mexico and southern Colorado, USA 2011–2017. Sawyer et al. 2019a.

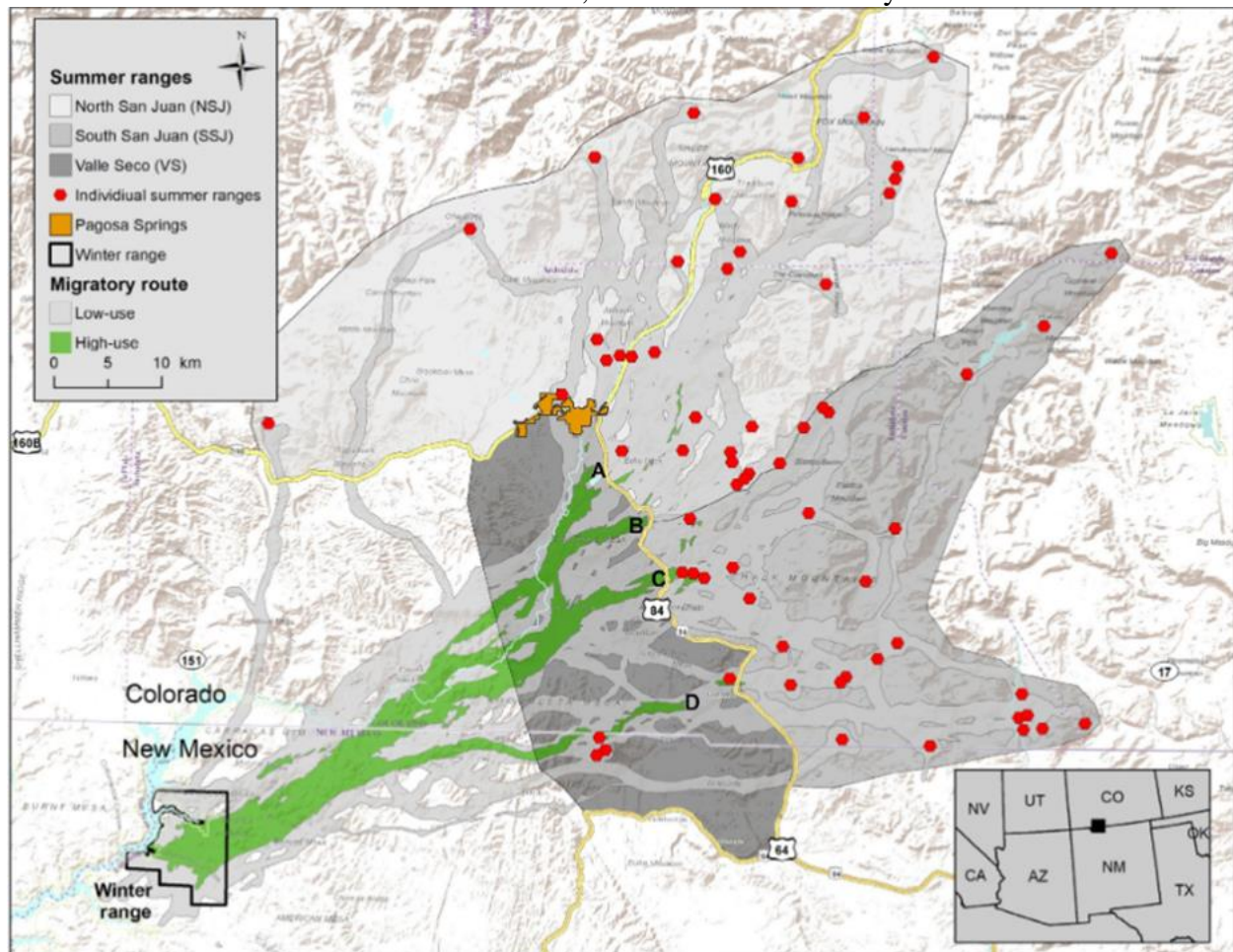


Figure 4 – Priority Area 2 – Southeastern New Mexico

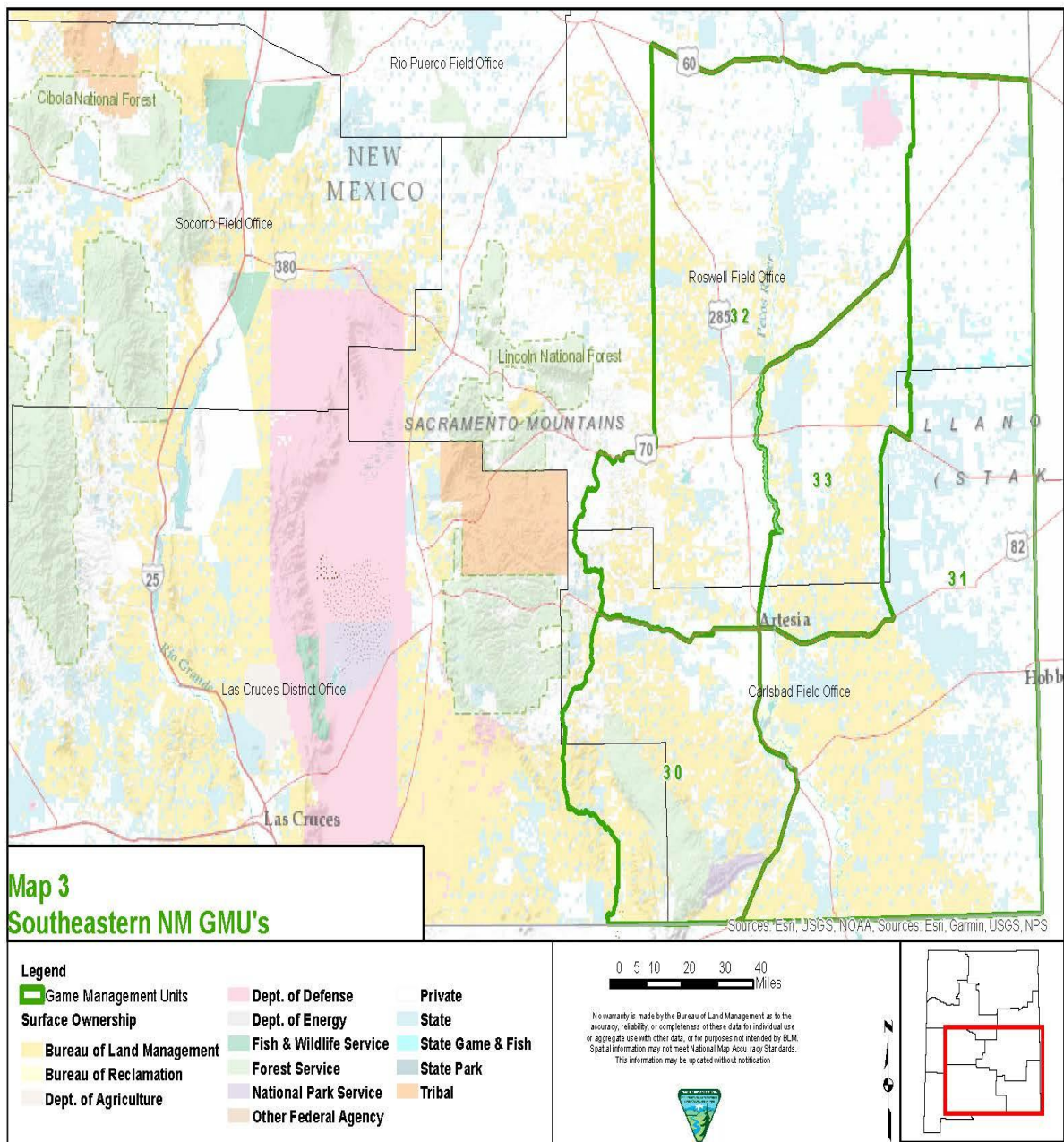


Figure 5 – Priority Area 3 – Northern Sangre de Cristo Landscape

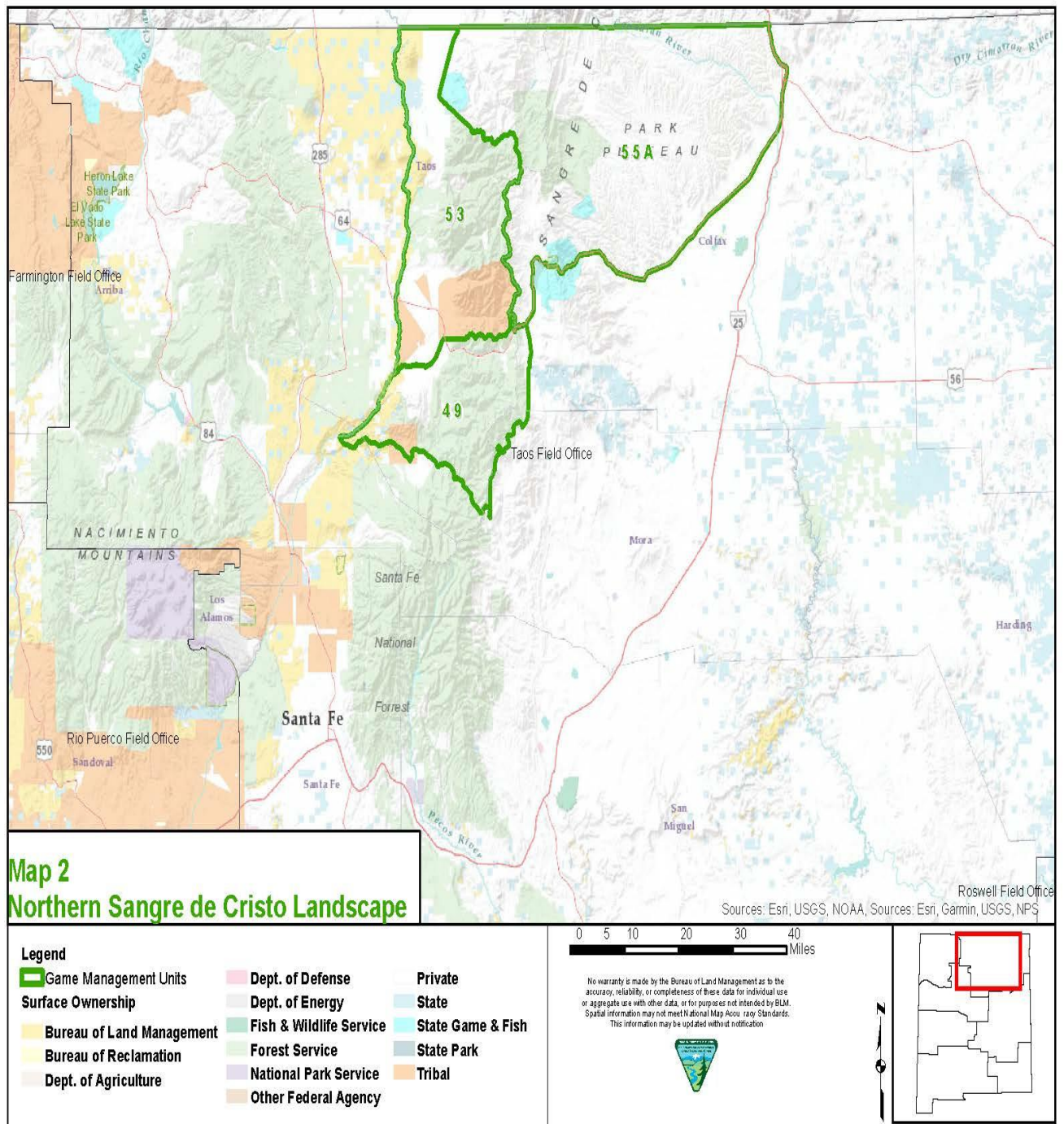


Figure 6 – Priority Area 4 – I-25 Corridor from Las Vegas, NM to the Colorado Border

