

**ARIZONA STATE ACTION PLAN
UPDATED September 2022**

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



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INTRODUCTION

Conditions in the broader landscape influence the function of ungulate migration corridors and the sustainability of their populations (Sawyer et al. 2017, Middleton et al. 2019). 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 agriculture (Donald and Evans 2006), development and urban sprawl (Johnson et al. 2017), roadway and railway expansion (Coe et al. 2015), energy development (Sawyer et al. 2020, 2022), and barrier fences (Jakes et al. 2018).

In response to changing landscape conditions, Secretarial Order 3362 (SO3362; Appendix A) directs appropriate agencies including the US Fish and Wildlife Service (USFWS), National Park Service (NPS), United States Geological Survey (USGS), and Bureau of Land Management (BLM) within the United States Department of the Interior (USDI) to work in close partnership with the State of Arizona to enhance and improve the quality of big game winter range and migration corridor habitat on Federal lands under the management jurisdiction of the USDI 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 (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), and many other species will benefit.

The United States Department of Agriculture (USDA), through the USDA Forest Service (USFS) and USDA Natural Resource Conservation Service (NRCS), will collaborate with USDI, the states, and other natural resource managers across the broader landscape. This collaboration will strive for an all-lands approach to research, mapping, planning, and management for ecological resources, to include migration corridors in a manner that promotes the welfare and populations of elk, mule deer, and pronghorn, as well as the ecological integrity of terrestrial ecosystems in the plan area. There are nearly 73 million acres of land in Arizona. Among these lands, approximately 38% are managed by two Federal Departments: 17 million acres by USDI and 11 million acres by USDA (Figure 1).

Ungulate species have significant economic, social, and ecosystem value. A 2016 survey of wildlife-related recreation conducted by the USFWS indicated that 2.9 million people hunted big game in the 19 western states and spent \$8.7 billion on hunting-related expenses (U. S. Fish and

Wildlife Service 2016). Ecologically, migratory ungulate populations are a crucial component in the food chain which supports terrestrial biodiversity (Kauffman et al. 2021). Considering these values, it is critical that wildlife habitat requirements are fully considered and appropriately addressed in landscape planning decisions. In addition to the monetary value of big game species, protecting these species will contribute to a healthy ecosystem and enjoyment by all wildlife enthusiasts.

Recent advances in Global Positioning Systems (GPS) radio collar technology are now allowing researchers to identify and map important ungulate migration corridors, winter range, and stopover sites at high resolutions (Kauffman et al. 2020, 2022). This new research has led to some important discoveries, such as a 240-mile mule deer migration in southwest Wyoming, which is the longest recorded for that species. Similar research has documented the migration corridors of nine separate elk herds that winter on habitats managed by three different states (Montana, Wyoming, and Idaho), but all migrate to shared summer range within Yellowstone National Park.

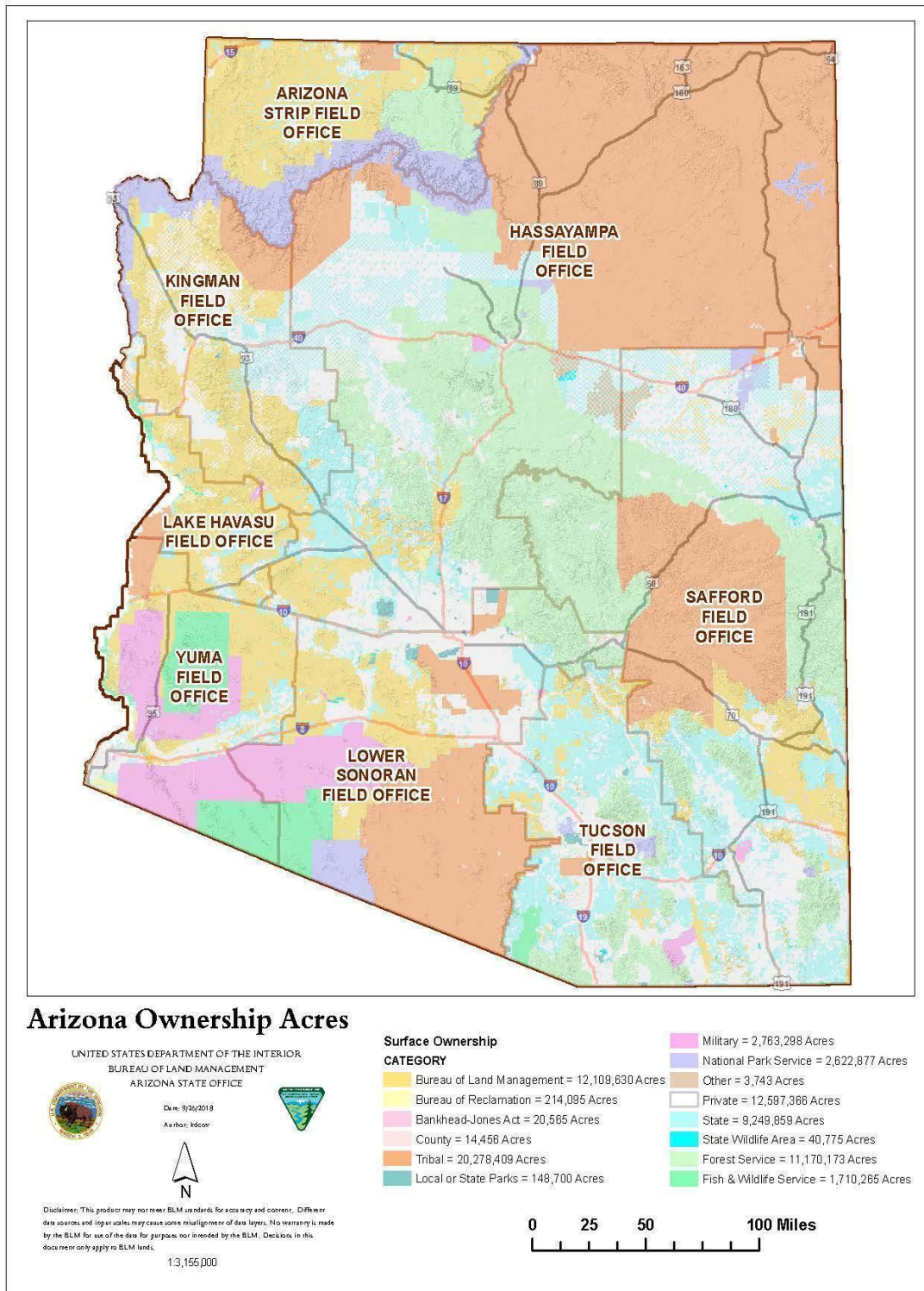
Several lessons important to modern wildlife management are emerging from migration research. New detailed information is showing wildlife managers that the corridors used during seasonal migration are crucial for conservation of big game herds in the West. This recent and ongoing accumulation of large amounts of accurate movement data provides an excellent opportunity to use science to identify best practices in various kinds of development scenarios to minimize conflicts and maximize the availability of habitat. Some migration corridors that are identified from fine scale movement data are quite narrow (1-2 miles in width) and thus allow managers to prioritize migration and movement habitat. Science-based prioritization of these linear strips of habitat and winter range areas, which represent a small area of habitat but a large benefit to wildlife, will help plan for long-term landscape conservation.

Through SO3362, the Arizona Game and Fish Department (AZGFD) was provided with a total of \$646,000 to support ongoing ungulate migration research. Funds procured for research priorities have allowed AZGFD to deploy GPS collars on 196 mule deer and 35 elk to identify migration corridors. Additionally, AZGFD was awarded funding for mapping support and partnered with the USGS and the Mule Deer Foundation (MDF) to fund a partner biologist. Complementary habitat enhancement funds included \$549,620 on private land through USFWS

Partners for Wildlife (PFW), and \$829,000 through the National Fish and Wildlife Foundation (NFWF). Along with non-Federal matching and leveraged funds, this has allowed a total of over \$2.4 million towards migration corridor and winter range habitat improvements. These habitat improvements are ongoing, and aim to enhance over 18,000 acres in Arizona.

Within this Action Plan are AZGFD's highest priority movement corridors and winter range areas based on the best available science. Also included are AZGFD's priority research needs for ungulate movement and migration research.

Figure 1. Overview of land management in Arizona.



ARIZONA GAME AND FISH DEPARTMENT'S PRIORITY BIG GAME CORRIDORS

1) Grand Canyon to Prescott Corridor Complex (mule deer, elk, and pronghorn)

This corridor complex contains high variation in elevation, ranging from 12,600 feet near Flagstaff, to as low as 3,100 feet in the Verde River Valley. Inhospitable winter conditions in the high country induce migration for mule deer, elk, and pronghorn to lower elevations. Ongoing research and mapping efforts have revealed several important migration corridors for mule deer, elk, and pronghorn (Figure 2). For example, since 2019 AZGFD has placed GPS collars on 62 mule deer near the San Francisco Peaks (Game Management Units 7&9). With this information, AZGFD has identified distinct migration corridors, stopovers, and winter range along the south rim of the Grand Canyon (Figure 2). Some individuals travel distances up to 80 miles to reach winter range. This migratory population must cross highways such as US Highway (US) 180, US 89, and State Route (SR) 64. A recent Wildlife Vehicle Conflict Study released by the Arizona Department of Transportation (ADOT) identified the stretch on SR 64 from milepost 227.0-237.4 as the #2 hotspot in Arizona for wildlife-vehicle collisions (Williams et al. 2021). This hotspot is crossed by mule deer during migration.

Pronghorn data within this corridor complex suggests strong human influences directing seasonal movement and habitat selection. GPS locations of pronghorn on the south side of I-40 documented movement north from their wintering grounds near the Verde River Valley until they encounter the interstate and abruptly turn eastward and parallel I-40 until they reach summer habitat near Garland Prairie. Many pronghorn north of I-40 are also migratory. Migration strategies both north and south of I-40 suggest that the interstate became a barrier to north-south migrations from the Grand Canyon south to the Prescott area. In addition to the effect of I-40, US 89 is a barrier to pronghorn north of Flagstaff. Northern Arizona University and AZGFD documented genetic differences between pronghorn populations separated by US 89 and SR 64, indicating movement has been substantially restricted by these highways (Theimer et al. 2012).

This corridor contains several high volume transportation routes in Arizona, including US 89, I-17, and I-40 where traffic volumes can exceed 20,000 vehicles/day. ADOT is aware of the need for wildlife crossings in this corridor but currently lacks specific funding to construct such

features. Efforts are currently underway between ADOT and AZGFD to begin the scoping (i.e., design) process for three overpasses (two on I-17, and one on I-40).

The land ownership/management in this corridor ranges from NPS at the Grand Canyon on the north end through USFS, BLM, and state-owned and private land (Figure 3, Table 1). Current threats are wildlife vehicle collisions, exurban and suburban development, pinyon-juniper (PJ) encroachment, shifts in vegetation and available resources, and livestock fencing.

Table 1. Land ownership/management for the Grand Canyon to Prescott Corridor Complex.

| Category | Area (acres) | % |
|---------------------------|---------------------|----------|
| US Forest Service | 1,953,023 | 43.48 |
| Private | 1,551,696 | 34.55 |
| State Trust Land | 903,000 | 20.10 |
| National Park Service | 38,934 | 0.87 |
| Department of Defense | 28,873 | 0.64 |
| Bureau of Land Management | 5,646 | 0.13 |
| Tribal Lands | 4,552 | 0.10 |
| Bureau of Reclamation | 4,064 | 0.09 |
| State and Regional Parks | 1,173 | 0.03 |

Figure 2. Mule deer, elk, and pronghorn migration corridors within the Grand Canyon to Prescott Corridor Complex. Low use, medium use, and high use corridors are based on the relative number of individuals using the same migration corridor.

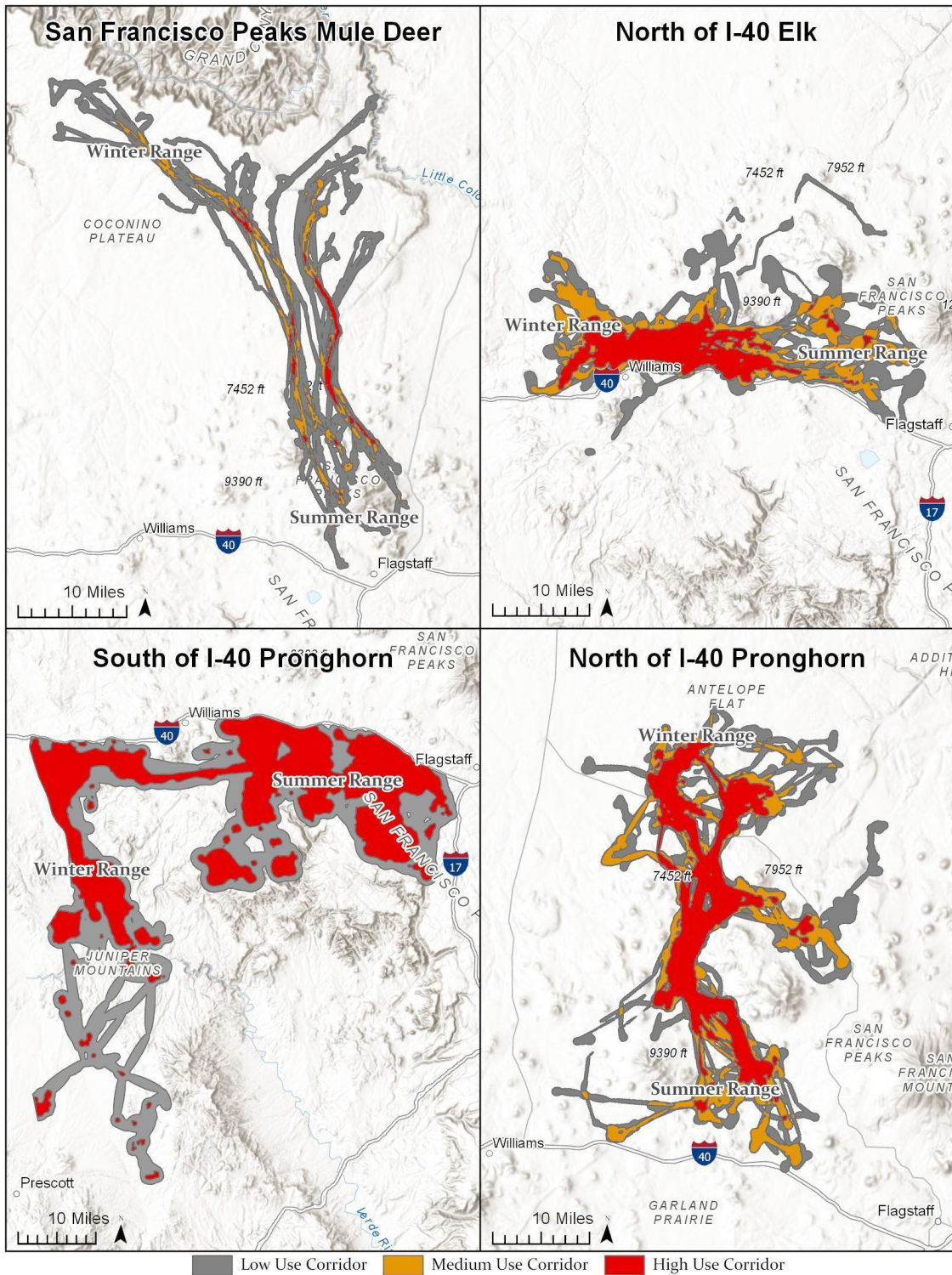
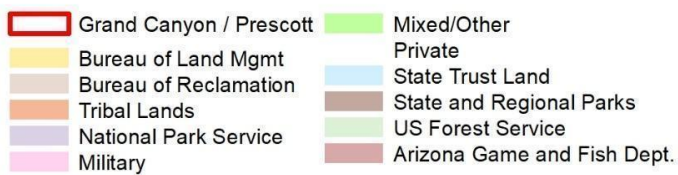
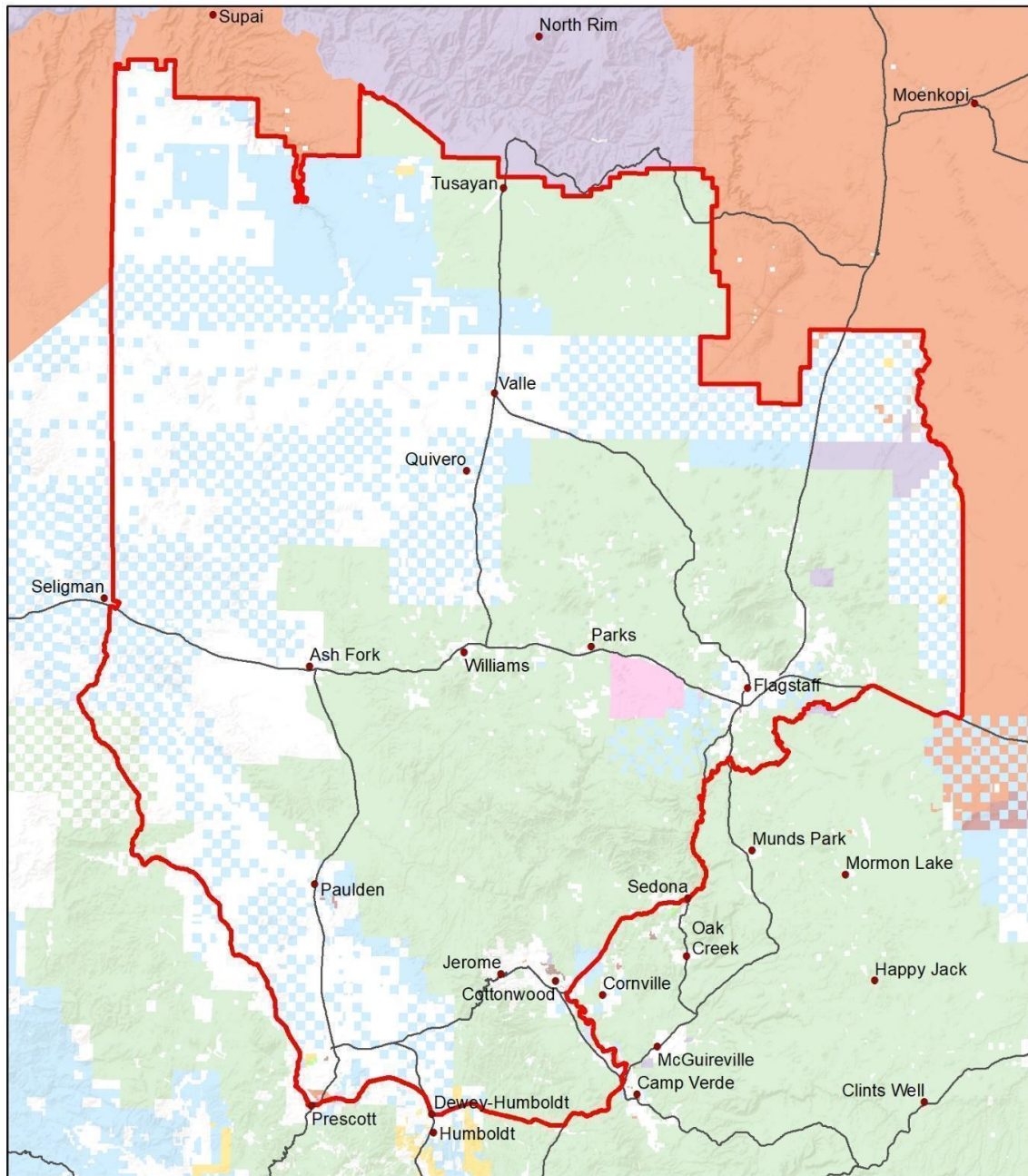


Figure 3. Land ownership/management within the Grand Canyon to Prescott Corridor Complex.



Grand Canyon to Prescott Corridor with Land Ownership



Current State Agency Activities

Vegetation Management Treatments

Vegetation management treatment of public and private lands – Juniper encroachment into savannas and grasslands over the last 100 years has caused habitat deterioration within the Grand Canyon to Prescott Corridor Complex. Mastication, thinning and prescribed fire efforts are ongoing on both private and public land to restore historic migration patterns and habitat, especially for pronghorn. Multiple state and federal initiatives are currently underway to restore these ecosystems. From 2018-2021, AZGFD, along with private and public partners, has restored over 13,000 acres of grassland for pronghorn and mule deer within the corridor. Restoration projects completed and ongoing include:

- In 2019, the Piedra Project was completed, totaling 876 acres of habitat restoration for pronghorn.
- From 2020-2022, over 1,500 acres of treatments in the Boyd Knoll Grassland Restoration Project were completed in pronghorn migration habitat.
- From 2020-2022, over 2,550 acres of grassland restoration were completed on the CO Bar ranch.
- From 2020-2022, 3,450 acres of grassland restoration were completed on the Slate Mountain allotment.
- From 2020-2022 4,584 acres of grassland restoration were completed on the Perrin Ranch 984 acres of grassland restoration funded by USDA NRCS through the EQIP program will be completed in 2022.
- Over the last five years, HPC provided \$137,000 to the 10X project on the Kaibab National Forest (KNF) for 772 acres of browse release which was completed in May of 2022.

Barrier/Fragmentation Mitigation Efforts

Highway-related elk, deer, and pronghorn movement studies – AZGFD performed ADOT-funded wildlife movement studies along I-40, I-17, US 89, and SR 64 and identified wildlife crossing locations for future implementation during road improvement efforts.

Landscape level pronghorn movement studies – AZGFD has deployed GPS collars on over 120 pronghorn south of I-40 to identify how individuals are accessing seasonally important ranges across the landscape between Flagstaff and Prescott Valley.

Wildlife-Friendly Fence Modifications – Over the past 10 years, AZGFD has worked with the NPS, USFS, ADOT, wildlife conservation organizations (WCO), and local ranchers to inventory and modify or remove barrier fences which are used to control livestock grazing. Full cooperation with the landowner/lessee is received prior to any fences being modified or removed. In 2018 and 2019, the Arizona Antelope Foundation and volunteers from across the state modified five miles of fences in critical locations to allow pronghorn movement within the corridor. In total 99 miles of fence have been removed or modified both north and south of I-40. AZGFD has worked with the KNF and ADOT to set back 3.1 miles of Right-of-Way fence on US-89 near Meath Wash. That project was completed in August 2022.

Wildlife overpass along I-40 – Along I-40 (mileposts 171-175), AZGFD, ADOT, Coconino National Forest (CNF), and KNF are in the preliminary planning stages of a wildlife overpass. The design phase of this project was partially funded by AZGFD. Once constructed, and connected with 8’ woven-wire fencing, will allow large and small wildlife to safely traverse I-40 and provide a safer roadway for the traveling public.

Wildlife Water Resources

Wetland/Riparian Restoration – Wetland and riparian habitats are rare in northern Arizona and provide key habitat within big game migration corridors and winter range. Many of these riparian areas are impacted by livestock and/or have been hydrologically altered and are in need of restoration. In 2018 and 2019, AZGFD protected 245 acres of wetland and riparian habitat across two lakes, one river, and one spring by excluding harmful livestock grazing from these areas with wildlife-friendly fencing. AZGFD worked with federal and WCO partners in 2021 to arrest erosion in McDougal Meadow, which feeds an important spring for wildlife on the KNF.

Habitat Projects Identified

Vegetation Management Treatments

Vegetation management treatment of public and private lands – 10,000 acres of private and State Trust land and 20,000 acres of Kaibab and Prescott National Forest land are in need of treatment

within the Grand Canyon to Prescott Corridor. AZGFD will work with partners to focus efforts within and adjacent to the corridor in order to allow for a landscape-level improvement for ungulates.

Drake pronghorn corridor vegetation treatment - The Prescott National Forest (PNF) and AZGFD are planning the Drake Area Pronghorn Corridor Project on 15,950 acres within the Chino Valley Ranger District (CVRD). The purpose of this project is to create a suitable travel corridor for pronghorn between the Prescott and Kaibab national forests. The project will reduce overstocked juniper through a combination of masticator, hydraulic shears, hand thinning, and piling and burning.

Currently the AZGFD is working to contract cultural surveys on 9,630 acres and is part of the Chino Landscape NEPA completed by PNF. Completion of cultural surveys will lead to the project activities that would consist of; utilizing mechanical mastication equipment, which may be rubber-tired or tracked. Slash resulting from mastication activities may be scattered and left on the ground, burned, or removed as a biomass product. Follow-up treatment in these areas might involve prescribed burning to maintain the desired conditions.

Barrier/Fragmentation Mitigation Projects Identified

Habitat conservation through land acquisition and easements – Specific tracts of land within the Grand Canyon to Prescott Corridor are at risk of significant land use changes that would have an impact on the long-term viability of the corridor for wildlife movement. AZGFD will work with partners to 1) identify key parcels, and 2) support partners in securing funding for key parcels that could be protected via conservation easements, land transfers, and land purchases for long-term conservation and habitat connectivity.

Wildlife Crossings along I-40 – I-40 represents the biggest impediment to migration within the Grand Canyon to Prescott Corridor Complex. A study of elk movements and wildlife-vehicle collisions identified the best locations for wildlife crossings and fencing for future I-40 upgrades. Although wildlife underpasses facilitate elk and deer crossing, wildlife overpasses are the only crossing design proven to accommodate pronghorn, so a network of I-40 crossings that includes overpasses as well as underpasses are needed to connect all three species from the Grand Canyon to Prescott. These wildlife crossings would improve migrations for multiple big game species across/under I-40 in the area between Flagstaff and Ash Fork (Figure 4). An ADOT funded

research project and subsequent Wildlife Accident Reduction Plan was created for this section of I-40 that includes all of the recommended wildlife crossing locations and fencing (Gagnon et al. 2012).

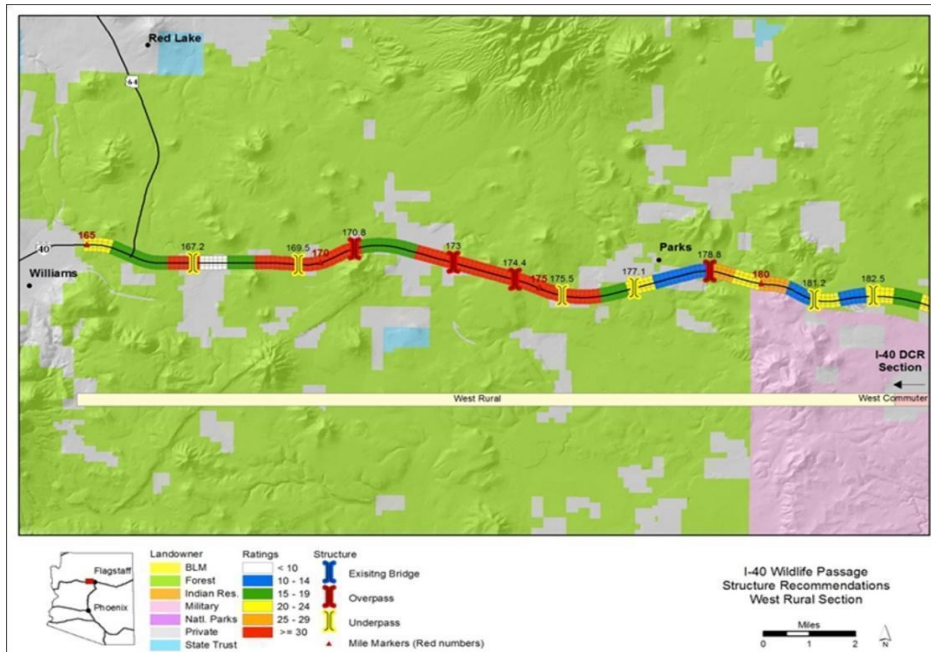
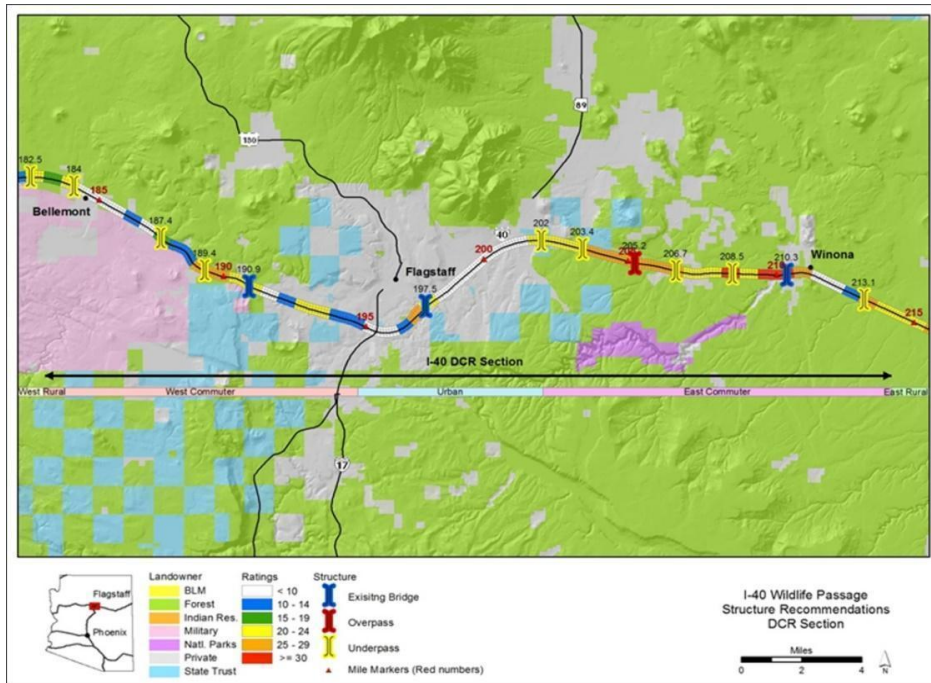
Wildlife Crossings of US 89, SR 64, and US 180 – Additional wildlife crossings, including at least some overpasses on US 89, SR 64, and US 180 would also serve to connect these fragmented populations leading to more robust population growth and resilience to stressors such as climate change and development. AZGFD has conducted wildlife movement studies and provided similar recommendations as I-40 to wildlife crossings along US 89 for pronghorn and SR 64 for pronghorn, elk, and mule deer (Dodd et al. 2011, Dodd et al. 2012).

Wildlife-Friendly Fence Modifications South of I-40 – Cooperative efforts between AZGFD, USFS, WCO's, nonprofit conservation organizations, and local ranchers to inventory and modify or remove barrier fences are targeted for expansion south of I-40. Fence inventories are a tool to help obtain a better estimate of problem fence locations, and help prioritize necessary areas for wildlife-friendly modifications. Full cooperation with the landowner/lessee is received prior to any fences being modified or removed. It is estimated that approximately 75 miles of fence modifications are needed in order to facilitate migratory pronghorn movement south of I-40.

Wildlife Water Resources

New wildlife water developments and redevelopments in the corridor – AZGFD has identified several wildlife water developments to be built or redeveloped to provide the necessary water to support big game corridor movements during drought periods. Water redevelopments restore functionality on an existing water development that no longer provides year round water. Typically this involves the replacement of the old system with a newer, higher capacity system.

Figure 4. Example of recommendations for highway crossings in the Grand Canyon to Prescott Corridor Complex. Ratings are based on elk highway crossings, weighted elk approaches, elk-vehicle collisions, deer-vehicle collisions, human activity, terrain, land status, and railroad proximity. Similar recommendations exist for US 89 and SR 64.



2) Flagstaff to Sedona Corridor (mule deer and elk)

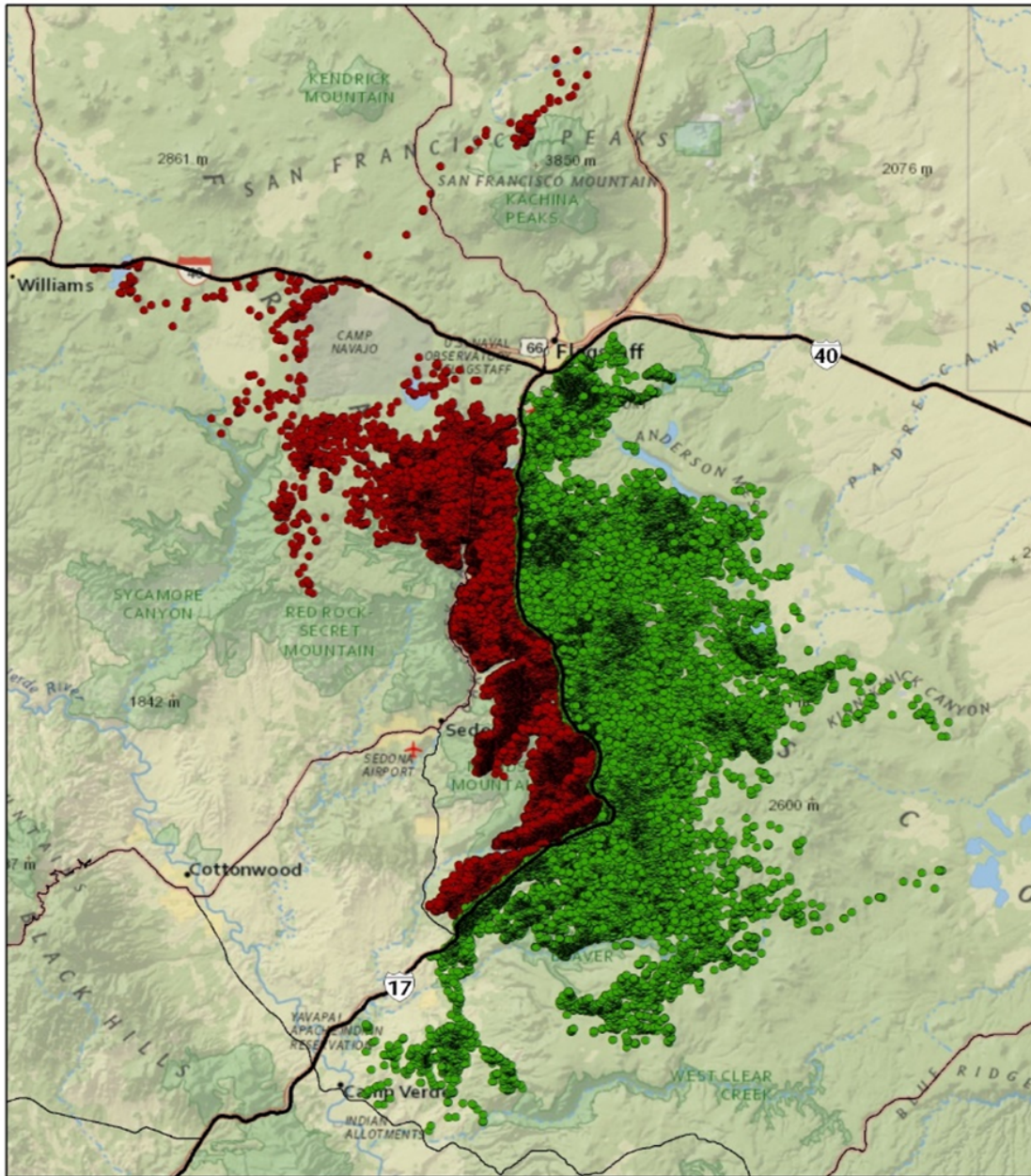
This corridor contains 50 miles of I-17 which is a four lane divided highway that connects Phoenix and Flagstaff. I-17 is traveled by millions of people each year (>20,000 vehicles/day in some sections). The northernmost 31-mile section connecting the Verde Valley and Flagstaff changes quickly in elevation and passes through both summer and winter range for mule deer and elk. Numerous wet meadow-riparian habitats found adjacent to or near the highway corridor and a local golf course provide food and water sources influencing elk distribution and movements (Gagnon et al. 2015). Along this segment of I-17, elk account for 75% of all wildlife–vehicle collisions with >85 elk mortalities per year (Gagnon et al. 2013). Despite high incidence of elk-vehicle collisions along I-17, the highway’s high traffic volumes generally prevent crossing attempts (Figure 5). Gagnon et al. (2015) found a mean passage rate across I-17 (crossings/approach) of <0.07 for 64 GPS collared elk, showing the interstate’s effectiveness as a barrier. Analysis of GPS collar data show elk migration and winter range availability is highly influenced by I-17 (Figure 6). When winter conditions push elk out of summer range, they face the choice of crossing I-17, or following the interstate south to lower elevation winter range. Therefore, AZGFD recognizes this area as a priority to focus efforts on mitigation to enhance connectivity of critical migration patterns and reduce wildlife-vehicle collisions (WVC).

The land management in this corridor is primarily USFS, with small private parcels (Figure 7, Table 2). Vegetation is primarily Petran Montane Coniferous Forest biotic community dominated by Ponderosa pine (*Pinus ponderosa*).

Table 2. Land ownership/management for the Flagstaff to Sedona Corridor.

| Category | Area (acres) | % |
|-----------------------------|--------------|-------|
| US Forest Service | 686,040 | 93.62 |
| Private | 39,470 | 5.39 |
| State Trust Land | 4,821 | 0.66 |
| National Park Service | 995 | 0.14 |
| Tribal Lands | 630 | 0.09 |
| State and Regional Parks | 296 | 0.04 |
| Mixed/Other | 238 | 0.03 |
| Arizona Game and Fish Dept. | 199 | 0.03 |

Figure 5. Elk locations associated with I-17 highway crossing study illustrate that 70% of the GPS collared population (represented here) were never located on the opposite side of I-17 from where they were collared.



Elk Captured that Did Not Cross Interstate 17
 ● Elk Captured East of Interstate
 ● Elk Captured West of Interstate
 n = 50, locations taken every 2 hours

Elk Locations along I-17
 in Arizona



Figure 6. Flagstaff to Sedona elk migration corridor, stopover, and winter range model from *Ungulate Migrations of the Western United States, Volume I* (Kauffman et al. 2020). The model is based on GPS collar data collected from 47 elk from 2006-2014 (Gagnon et al. 2015). Low use, medium use, and high use corridors are based on the relative number of individuals using the same migration corridor.

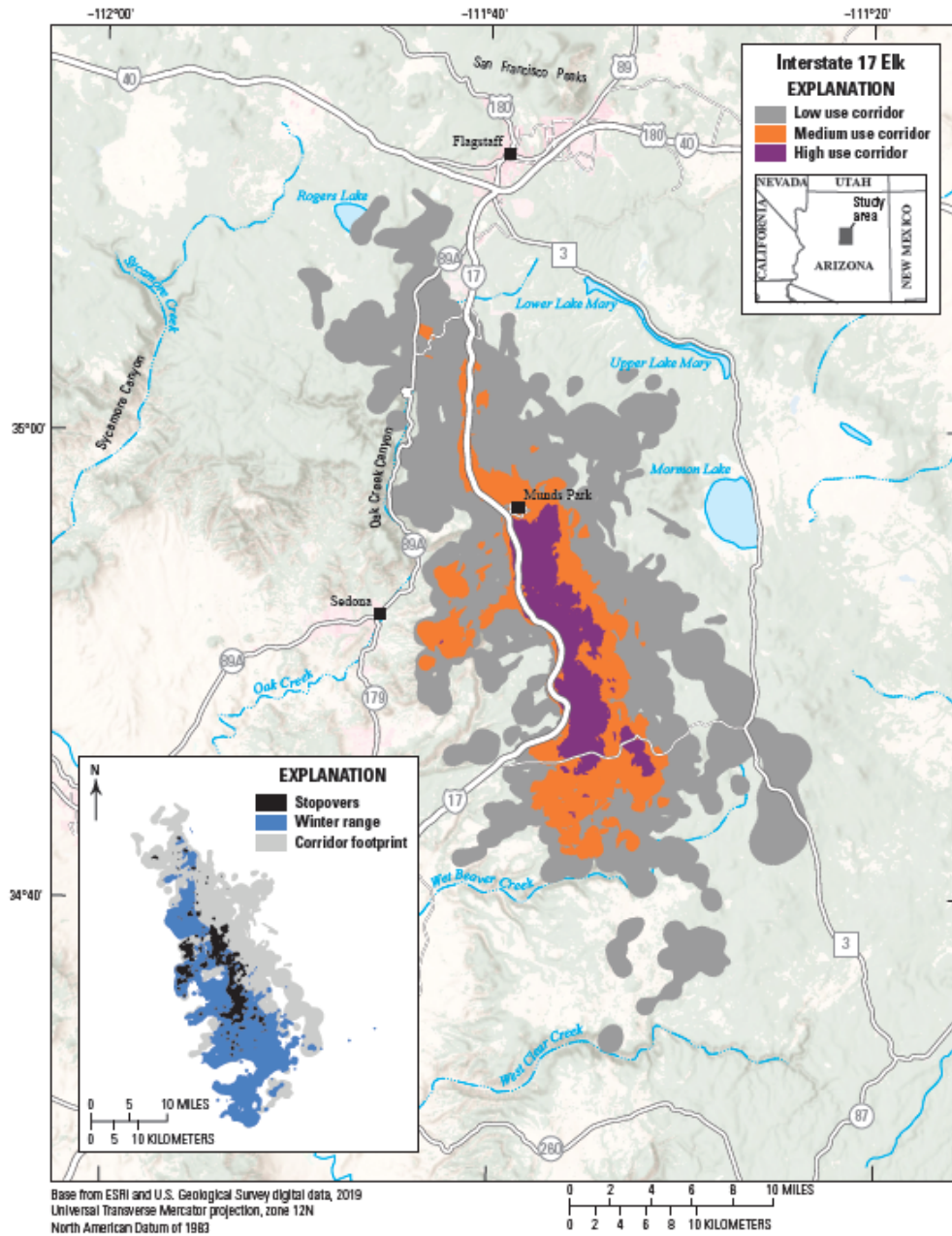
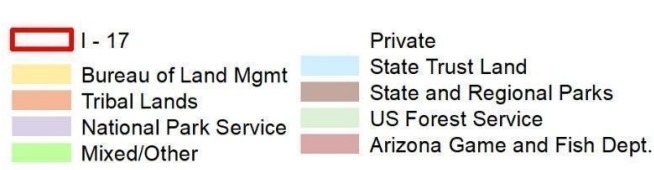
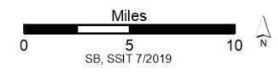


Figure 7. Land ownership/management within the Flagstaff to Sedona Corridor.



I - 17 Corridor
with Land Ownership



Current State Agency Activities

Barrier/Fragmentation Mitigation Efforts

I-17 study on wildlife movements and fencing/crossing needs – In 2007, ADOT commissioned AZGFD to conduct a study on wildlife movements and determine needs for wildlife crossings and fencing. AZGFD recommended 19 locations where new or modified crossing structures should be incorporated with future highway upgrades to improve wildlife movement across I-17 (Figure 8). These suggested crossing structures have already been prioritized based on elk movement and roadkill data and discussions with ADOT have garnered their support and commitment, in concept, to contribute funds to a collaborative project to implement these improvements. The report from this project was included in ADOT's package of planning materials for the future upgrade of the northern section of I-17 (Gagnon et al. 2013). That package includes an EA, DCR, an Accident Reduction Plan, and AZGFD report to ADOT's Research Center.

I-17 Woods Canyon to Munds Canyon fencing retrofit – To address concerns with the high wildlife-vehicle collision rate in a shorter timeline than future roadway upgrades would allow, AZGFD worked with ADOT to retrofit a 6-mile section of highway from Woods Canyon to Munds Park with elk exclusionary fencing. This guides animals to existing drainage structures where they can safely cross under I-17. Collisions with elk were reduced by 97% and use of the drainage structures increased by >100%. GPS movement data showed no significant change in the ability of elk to cross I-17 with the retrofitted fences guiding animals to existing crossings. Although these structures reduced collisions while allowing some animals to cross, the low success of crossing attempts indicated by the GPS data (prior to and after the retro-fit) underscores the need to transition to properly designed wildlife crossing structures and standard woven-wire, ungulate-proof fencing on a comprehensive scale.

Wildlife overpasses along I-17 - Along I-17 (mileposts 222-338), AZGFD, ADOT, and the CNF are in the planning stages of two wildlife overpasses. The design phase of this project has been partially funded by AZGFD. Once constructed, these overpasses, when combined with the existing culverts and connected with 8' woven-wire fencing, will allow large and small wildlife to safely traverse I-17 and increase motorist safety.

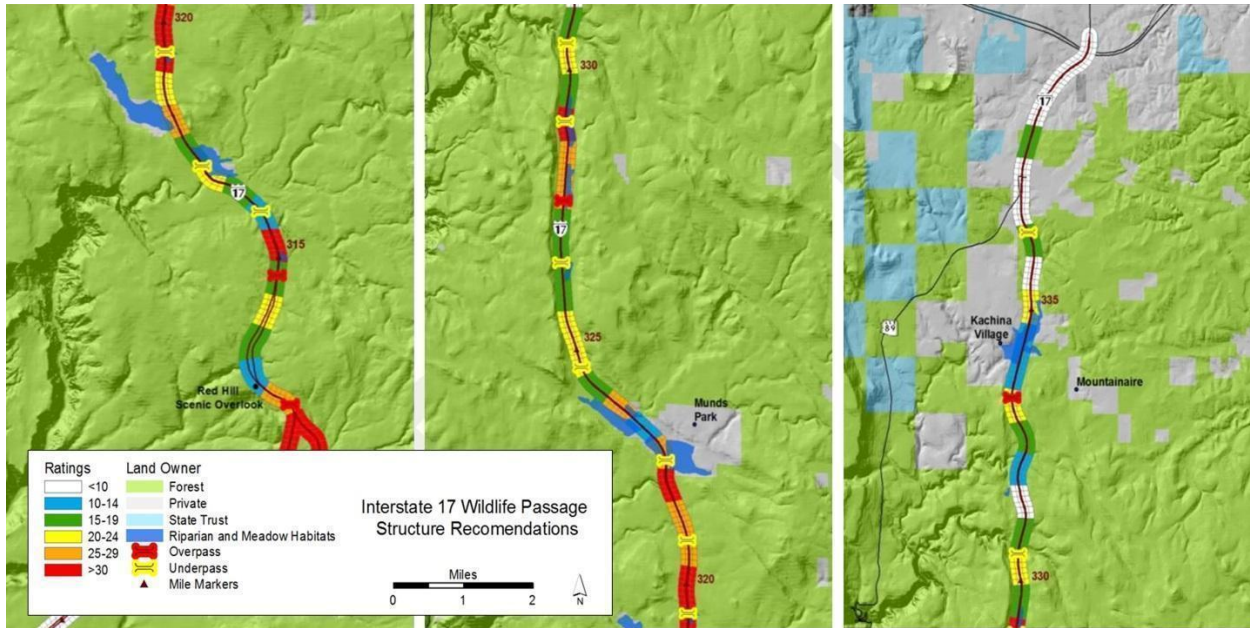
Habitat Projects Identified

Barrier/Fragmentation Mitigation Projects Identified

Fence Upgrades – Although effective at reducing WVC at first, the retrofit fences along I-17 have seen degradation over time and WVC's are becoming an issue again in areas where breeches in the fence have become common. The exclusionary fences (ex. I-17 Woods Canyon to Munds Canyon fencing retrofit) installed over 10 years ago are in need of a permanent solution. ADOT has identified this project as a priority to install a permanent woven-wire fence along the stretch of I-17 from mile marker 316-322. The upgrade of this fence will be an integral part of the entire I-17 wildlife crossing project to effectively and permanently reduce deer and elk collisions within this priority corridor.

Wildlife Crossings along I-17 – I-17 represents the biggest impediment to migration in this corridor. Gagnon et al. (2013) investigated elk movements and wildlife-vehicle collisions to identify the best locations for wildlife crossings and fencing for future I-17 upgrades (Figure 8). These wildlife crossings would improve migrations for multiple big game species. A priority for this linkage is the design and construction of several wildlife crossing structures across/under I-17 in the area between Flagstaff and Sedona, along with wildlife exclusionary fencing to make these crossing structures effective. ADOT and USFS have coordinated closely with AZGFD to plan for crossings, likely two overpasses, in key areas defined as wildlife crossing locations through the I-17 Elk Movement Studies (see far right panel of Figure 8 and Gagnon et al. 2015) until a complete rebuild is funded. The largest hurdle for this project is funding. Recently, ADOT completed the Arizona Statewide Wildlife-Vehicle Conflict Study (Williams et al. 2021) to determine priority areas for mitigation projects. I-17 was identified as a priority hotspot which will likely provide additional funding opportunities. As part of the recommendations, ADOT concurred that two overpasses and fencing north of I-17, when combined with existing drainage structures, would mitigate collisions with elk and other wildlife while providing habitat connectivity for local species. ADOT, AZGFD, and USFS will continue to work with partners and stakeholders to seek and obtain available funding to complete the project.

Figure 8. Recommended wildlife crossings for I-17 for the Flagstaff to Sedona Corridor. Ratings are based on elk highway crossings, weighted elk approaches, elk-vehicle collisions, deer-vehicle collisions, human activity, and topography.



3) Paunsaugunt to Kaibab Plateau Corridor and Winter Range (mule deer)

The mule deer herds of the North Kaibab Plateau (Arizona) and Paunsaugunt Plateau (Utah) are among the most treasured big game in North America. Some of the earliest research on deer population dynamics occurred on the North Kaibab herd (Russo 1964). The North Kaibab herd represents the densest mule deer herd in Arizona, enjoyed by hunters and tourists alike. Mule deer of the North Kaibab and Paunsaugunt are representative migrants, traveling documented distances over 65 miles between summer and winter range. Three mule deer research studies on movement around the Kaibab Plateau, Paunsaugunt Plateau, and surrounding lowlands have shown high amounts of movement between the AZ-UT border. GPS data collected from 48 mule deer on the North Kaibab has allowed AZGFD to identify migration corridors and winter range on the west and north sides of the plateau (Figure 9). Beginning in 2017, the Utah Division of Wildlife Resources deployed GPS collars on around 200 mule deer from both the Paunsaugunt and North Kaibab herd. The general patterns of mule deer locations have indicated that the lower elevation area between the Kaibab Plateau and the Paunsaugunt Plateau is critical wintering range for herds migrating from summer range in both states (Figure 9). Maintaining and enhancing migration corridors and winter range is vital to the health and persistence of these populations.

Water availability is a limiting factor for mule deer populations across the corridor. On the North Kaibab for example, large tracts of mule deer winter range contain limited water sources as a result of the complete lack of natural water, prolonged drought, and unreliable existing dirt tanks within the corridor. As in much of Arizona's mid-elevation mule deer winter range, an increase in the representation of PJ as a result of fire suppression, grazing practices, and climatic changes has led to large expanses of monotypic high density PJ stands on migration corridors and winter range. The effect of PJ encroachment has resulted in a decrease in browse quality and quantity resulting in a corresponding decrease in carrying capacity for wintering mule deer. Mastication of existing PJ stands has been shown to be effective at increasing browse production for wintering mule deer. The winter range of the Kaibab Plateau, and BLM lands currently faces threats of increased fire cycles and aggressive invasion of cheatgrass (*Bromus tectorum*).

The higher elevation areas are NPS and USFS lands with oaks (*Quercus spp.*), ponderosa pine and mixed conifer, and the surrounding lowlands are dominated by sagebrush (*Artemisia*

tridentata) and cliffrose (*Purshia stansburiana*) on BLM, National Monument (Vermillion Cliffs), and some tribal lands (Figure 10, Table 3).

Table 3. Land ownership/management for the Paunsaugunt to Kaibab Plateau Corridor.

| Category | Area (acres) | % in Utah | % in Arizona | % of Total |
|---------------------------|---------------------|------------------|---------------------|-------------------|
| Bureau of Land Management | 735,271 | 25.57 | 20.98 | 46.55 |
| US Forest Service | 423,957 | 14.74 | 22.61 | 37.35 |
| Private | 285,369 | 9.38 | 0.54 | 9.92 |
| State Trust Land | 48,112 | 1.50 | 1.67 | 3.17 |
| National Park Service | 28,148 | 1.35 | 0.98 | 2.32 |
| Tribal Lands | 13,370 | 0.00 | 0.46 | 0.46 |

Figure 9. Migration corridors and winter range for the Kaibab Plateau and Paunsaugunt Plateau mule deer herds based on GPS locations collected from two research studies. Low, medium and high use represent the relative number of individuals using the same migration corridor.

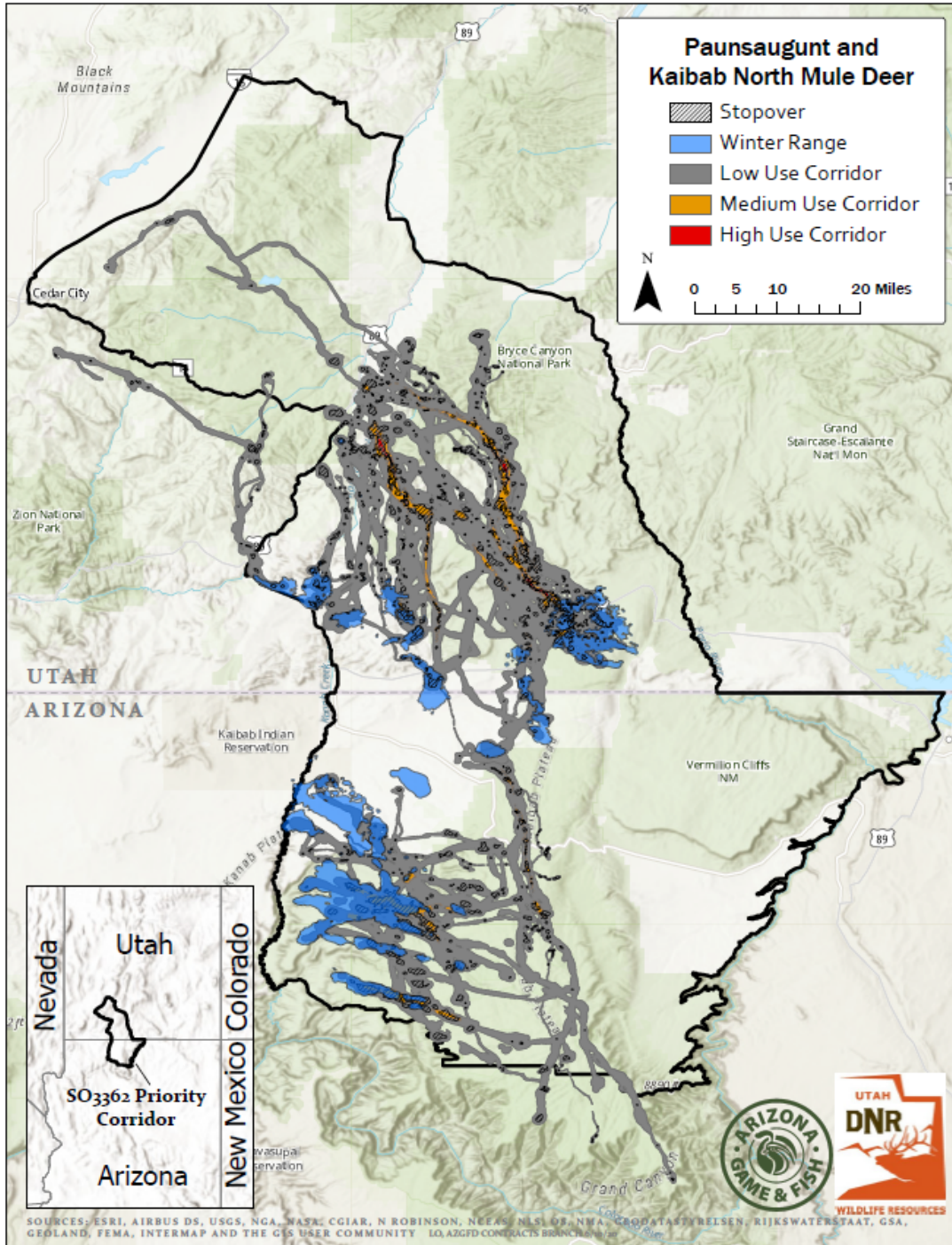
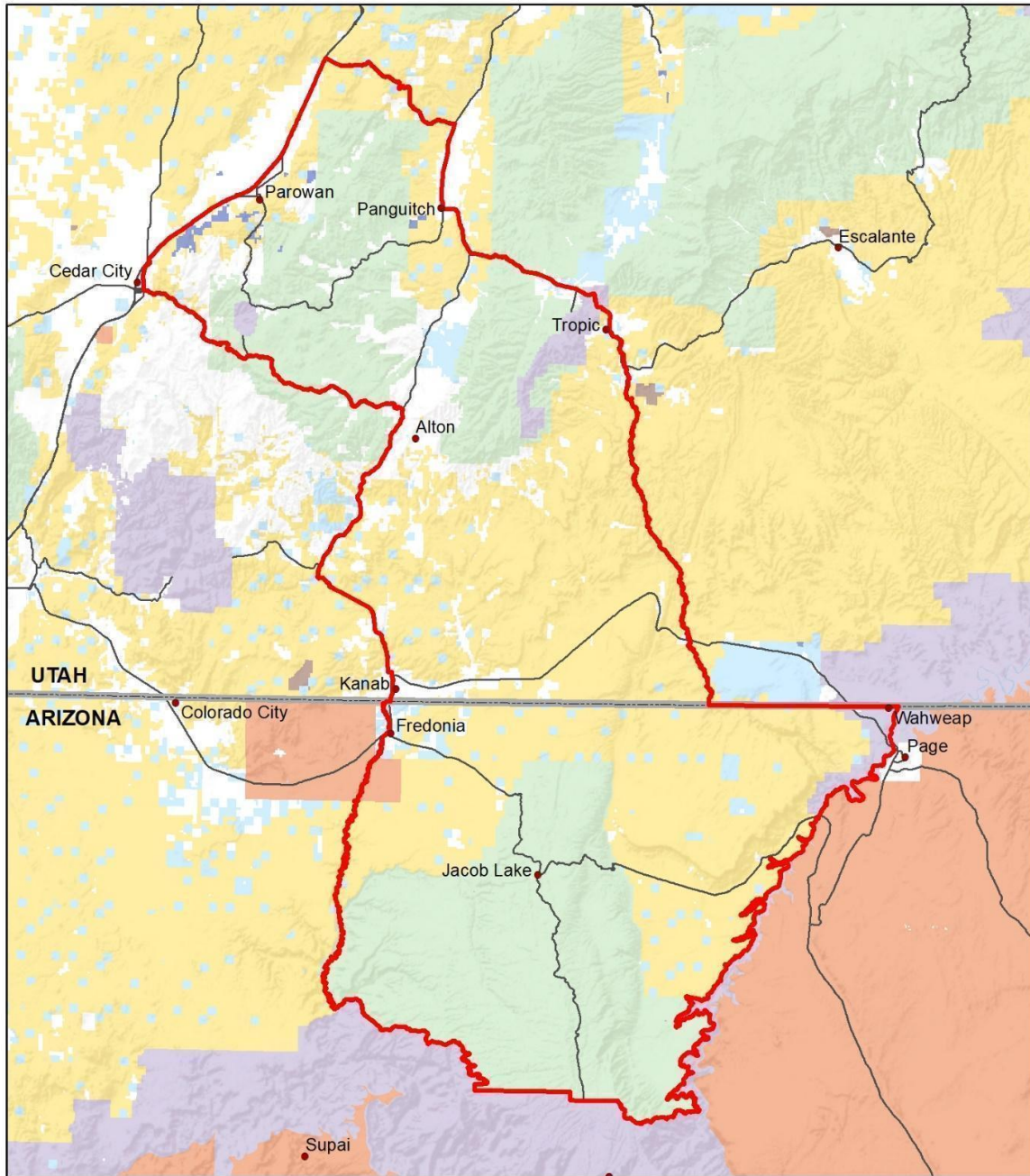


Figure 10. Land ownership/management within the Paunsaugunt to Kaibab Plateau Corridor.



- | | |
|-----------------------|---------------------------------------|
| Kaibab / Paunsaugunt | Private |
| Bureau of Land Mgmt | State Trust Land |
| Tribal Lands | State and Regional Parks |
| National Park Service | US Forest Service |
| Mixed/Other | Utah Department of Natural Resources |
| | Utah Department of Wildlife Resources |

Kaibab / Paunsaugunt Corridor with Land Ownership



Current State Agency Activities

Vegetation Management Treatments

Habitat restoration work to enhance the corridor and wintering range has been ongoing with numerous habitat treatments, water projects, and wildlife friendly fence modifications. Most efforts have been cooperative projects between the BLM, AZGFD, and livestock permittees.

In 2018-19, along the north-eastern boundary of BLM and USFS lands, nearly 900 acres of PJ mule deer winter range habitat was masticated to improve browse production for wintering mule deer. This project specifically addressed habitat improvement for mule deer within the corridor.

A diverse set of habitat enhancement tools are being assessed by the Kaibab Plateau Ecological Restoration Project (KPERP) to treat approximately 518,000 acres within the North Kaibab Forest, including approximately 30,000 acres of mule deer winter range within the corridor. In early July 2020, the Kaibab National Forest issued the Final Environmental Assessment for the project and began a 45-day protest period. In October of 2020, the KNF released a Decision Notice and Finding of No Significant Impact for the final Environmental Assessment. This clearance covers a substantial portion of the Paunsaugunt to Kaibab Corridor and will facilitate future enhancement projects.

AZGFD has been actively involved in the completion of the Burnt Corral Environmental Assessment. This assessment will cover 28,090 acres of vegetation management within the North Kaibab National Forest. In May 2020, the Kaibab National Forest had an open public comment period on the EA. This project will facilitate habitat enhancement opportunities within the corridor.

AZGFD has provided financial support for ongoing research on controlling cheatgrass invasion on mule deer winter range.

In June-July 2020, approximately 84,000 acres of mule deer habitat experienced wildfire within the corridor. Of those, approximately 80,000 acres were within Arizona. The Mangum Fire (~71,400 acres), Pine Hollow Fire (~11,400 acres), and Wire Pass Fire (~1,500 acres) burned across summer, transition, and core winter range habitats, at varying degrees of intensity. The fires were essentially contiguous from Arizona to Utah impacting approximately 34 miles north to south within the central portion of the corridor. Many of the areas of the fire burned on steep

slopes with high intensity, leaving areas completely void of vegetation and habitat at risk for substantial soil loss following monsoon rain events. Concerns of non-native cheatgrass establishment, and degradation of migration corridor habitat were immediately identified. In addition, in Arizona, 11 wildlife and cooperative wildlife/livestock water catchment facilities were damaged or destroyed during these fires. AZGFD has been closely involved with the USFS, BLM, NRCS, and the livestock ranching community in identifying immediate needs for native plant reestablishment through seeding, soil stabilization and erosion control, and replacement/maintenance of infrastructure damaged in the fires.

Barrier/Fragmentation Mitigation Treatments

Wildlife-Friendly Fence Modifications – From 2016 through 2019, approximately six miles of fence was modified in House Rock Valley to improve pronghorn connectivity. Replacing bottom barbed wire with smooth wire and raising it to 18-20” also reduced fencing barrier effects for juvenile deer movements.

North of the Arizona/Utah border, Utah has added eight foot tall fencing to exclude deer from accessing US 89 and funnel them to a network of seven existing drainage structures and new wildlife crossings on the east-west stretch of US 89, east of Kanab, Utah. These measures have reduced deer-vehicle collisions substantially and cameras placed at the crossings recorded >78,000 deer crossings during fall and spring migrations (Cramer and Hamlin 2019). There are ongoing efforts to monitor movements in this corridor with GPS collars led by the Utah Division of Wildlife Resources in collaboration with AZGFD.

Wildlife Water Developments

On USFS lands over the past five years, eight new wildlife water developments have been constructed in mule deer winter range within the corridor. Twenty-four (24) water developments have been identified for redevelopment or new construction including: 12 redevelopments of under capacity water developments within winter range transition habitat; 6 redevelopments of cooperative water developments in mule deer winter range habitat; 6 new water developments in mule deer winter range habitat. These projects will help ensure water availability for mule deer on over 100 square miles of migratory, transition, and winter range habitats within the corridor.

On BLM lands, 14 miles of water pipeline have been installed along the Arizona/Utah border within the corridor and winter range habitat for mule deer. In addition, over the past two years seven cooperative water projects have been completed by AZGFD, BLM, and livestock permittees within GMU 12B. All of these projects occurred within mule deer winter range. Actions included replacement of worn water collection aprons, installation of additional storage tanks to extend the duration of water availability, and the addition of tank lids to prevent entrapment of wildlife and limit evaporation. Additionally, AZGFD and BLM have secured funding for the redevelopment of two wildlife water developments in the Buckskin Mountains. All environmental review is completed (USDI-BLM-AZ-A010-2016-0004-EA).

Habitat Projects Identified

Vegetation Management Projects Identified

Vegetation management of the Shuttleworth-Suicide Wildlife Habitat (BLM Lands) – In April 2019, BLM signed a Decision Record for this project. The treatments of Shuttleworth-Suicide Wildlife Habitat Project will enhance production of browse species for wintering mule deer in this priority area. This project will treat approximately 14,267 acres of PJ with a mix of mastication, lop and scatter methods, and seeding. The estimated overall project cost is estimated to be \$2 Million dollars. NFWF funding through SO3362 provided \$200,000 towards vegetation treatments on this project. That work began in October of 2020. The AZGFD oversaw the successful implementation of 1,661 acres of PJ mastication as a portion of the Shuttleworth-Suicide Wildlife Habitat Project.

Vegetation management for West Side Habitat Improvement (Kaibab National Forest USFS) – Archeological clearances are required prior to implementation of PJ overstory removal on 7,000 – 10,000 acres of mule deer winter range that is otherwise authorized under the Environmental Assessment for West Side Habitat Improvement. As clearances and funding for treatments are secured, grinding equipment will be used for strategic mastication of PJ over-story in order to increase forage production for mule deer.

Vegetation management in Game Management Unit 12B – PJ thinning and removal in the Buckskin Mountains and on the west side of the Kaibab Plateau along the Buck Pasture and the Old AZ Catchment area would open up heavily encroached areas. Seeding these areas would

allow for improved understory growth. This area is heavily used by mule deer during fall and spring migrations and all winter months.

Vegetation management on the North Kaibab Forest – Upon the completion of the compliance process for the KPERP, AZGFD has identified 19 polygons, totaling approximately 30,000 acres of mule deer winter range habitat within the corridor for mechanical treatment of pinyon juniper habitats to enhance browse and undergrowth species within the corridor.

Westside cliffrose rejuvenation treatment – Cliffrose rejuvenation treatment consists of treating all cliffrose within the treatment area (1,940 acres) by cutting cliffrose to breast height with hand-lopers and chainsaws. Hand crews will also treat small junipers at 4-8 inches above the ground. This project is to stimulate sprouting and continue growth at a height that can be reached by mule deer. It is also to reduce the density of young junipers in order to reduce competition with native grasses, forbs and shrubs that provide forage for mule deer. These activities are part of a suite of projects aimed at improving winter browse for mule deer following recent fires and the subsequent spread of invasive cheatgrass. All clearances have been completed for this project (KNF & AZGFD). A total of approximately 800 acres of this project has been completed. The areas treated showed great response to new growth within the treatment area. There are approximately 1140 acres left to treat in the area.

Vegetation management on the North Kaibab Forest (Burnt Corral) – A combination of mechanical treatment in pinyon juniper habitats, and application of prescribed fire to ponderosa pine habitats has been identified within the 28,060 acres included in the North Kaibab Forest Burnt Corral Environmental Assessment. The Kaibab National Forest is currently working through public comments on the EA. These projects will enhance undergrowth species for wintering and migrating mule deer within the corridor.

East Kanab Creek/Buckskin Mountain Strategic Focus Area – This project is within the larger Kanab Creek Healthy Lands Project Area which comprises 265,000 total acres; 213,900 on BLM lands, as well as 12,400 on private lands. Part of this project is to prioritize where management efforts are needed to improve ecosystem function for the Paunsaugunt and North Kaibab mule deer herds. The BLM is in the data gathering stage and the NEPA has not yet been completed.

Barrier/Fragmentation Mitigation Projects Identified

Habitat conservation through land acquisition and easements – The area east and south of Kanab, Utah continues to grow and be developed with subdivisions along the Arizona/Utah border and Johnson Wash. Mule deer from Utah use this area for migration. Within this area, a new water pipeline from Lake Powell may be constructed. Long term projects to protect this corridor from unmitigated development include: close coordination with the Utah Division of Wildlife Resources concerning mitigation strategies on developments that leave the integrity of this corridor intact, and potential land acquisitions/conservation easements of identified critical core usage zones within the corridor. Fence modifications in this corridor east of Fredonia would also make them more permeable for the pronghorn population in that area.

Wildlife Water Developments Identified

Development of wildlife waters in Game Management Unit (GMU) 12A – Several efforts are currently ongoing in GMU 12A regarding wildlife water developments.

- Twelve wildlife waters on migratory transition range habitat within the corridor have been identified for redevelopment. NEPA, in the form of a Categorical Exclusion, for the 12 waters has been completed in addition to an internal AZGFD Environmental Assessment Checklist (EAC). Cost for redevelopment of these wildlife waters would be approximately \$1.2 Million dollars. The first of these waters, Sowats Apron, has been redeveloped increasing capacity at this location from 1,500 gallons to 10,000 gallons.
- An emergency response to the Mangum Fire has been completed for 4 wildlife waters, 7 wildlife water fence projects, 3 cooperative livestock water projects, and 17,000 acres of aerial seeding. An additional 2 wildlife waters and 4 cooperative livestock projects have been funded with completion anticipated by July of 2022.
- A NEPA document, the Eastside Wildlife Waters Development (and redevelopment) Project Categorical Exclusion (2015), has been completed. Overall 6 of the 9 wildlife waters identified under this Categorical Exclusion for development/redevelopment have been completed. As a result of reprioritization, the remaining three wildlife waters will not be completed.
- Four cooperative wildlife and livestock water developments (Ranger Pass Trick Tank, Kwangunt Trick Tank, Pine Hollow Trick Tank, and Rice Hollow Trick Tank) have been

completed with an additional cooperative wildlife and livestock water (House Rock Trick Tank) having been funded in 2021. Horse Springs has also been added to the list as it has begun to fail. NEPA compliance is complete for both of these projects.

- The Cutler pockets and Jacob Canyon wildlife development fences have been redeveloped in 12AW, replacing the old dilapidated barbed wire fences that were getting knocked down constantly by livestock and wildlife with a pipe-rail fence. These repairs occurred in the fall of 2022 and will help prevent the need for water hauling to these waters and prevent livestock from using these wildlife developments.
- Three cooperative wildlife and livestock waters have been identified for new development in mule deer winter range within the corridor. No NEPA has been completed for these projects.

Redevelopment of two wildlife waters on USDI lands in the Buckskin Mountains – Two water developments were recently completed, directly benefiting migrating mule deer within winter range identified in the corridor. Buckskin 2 was completed in July 2019, and Buckskin 1 was completed March 2020.

Development of new wildlife water developments on USDI lands in GMU 12B – On USDI lands within GMU 12B, and within winter range habitats identified within the corridor, 14 new wildlife water developments have been identified. These wildlife water developments will enhance water availability and distribution for all wildlife species within the corridor.

Fence modifications at cooperative-wildlife waters – Fencing around the wildlife-only water troughs of cooperative wildlife waters receives heavy use by wintering mule deer and requires regular maintenance from AZGFD and the permittee. Replacement of these barbed-wire fences with pipe-rail fences would eliminate or substantially reduce the maintenance requirements and improve long-term functionality and deer access to the waters.

4) Proposed Interstate 11 Corridor of Obstruction and Opportunity (mule deer)

As human populations and economies expand in the West, the demand for high volume transportation corridors, such as interstate highways, has increased. Unfortunately, high volume transportation corridors often serve as impermeable barriers to migrating ungulates (Gagnon et al. 2013) and may constrain their set of possible routes and seasonal ranges, ultimately leading to loss of access to productive habitats (Sawyer et al. 2013). In addition to the barrier effect of high traffic volumes, these transportation corridors are typically associated with increased human disturbance which may lead to changes in wildlife behavior and habitat use (Sawyer et al. 2020).

Congress recognized and designated I-11 as a critical piece of new infrastructure that would support and connect the economies of Arizona and Nevada under the Moving Ahead for Progress in the 21st Century Act (MAP-21). In 2014, Arizona and Nevada Departments of Transportation completed the I-11 & Intermountain West Corridor Study. The study report identified co-location with US 93 as the only “Recommended Corridor Alternative” to be carried forward for a potential I-11 from Wickenburg, AZ to the Nevada border. Subsequently, ADOT began to work on a multi-tiered Environmental Impact Statement (EIS) process for the portion of the potential I-11 roadway from Nogales, AZ to Wickenburg, AZ.

The Tier 1 EIS considers a 2,000 foot wide transportation corridor where road construction may be located (Arizona Department of Transportation 2019). The Final Tier 1 EIS was released in July of 2021, which identified the I-11 Preferred Corridor Alternative. The subsequent Record of Decision was released in November 2021. A “Build Corridor Alternative” was selected, so the process now requires a Tier 2 EIS (for each component project falling under the Tier 1 EIS) to determine the specific I-11 transportation corridor alignment. The Tier 2 EIS will consider traffic interchange locations, specific project-level issues, such as individual property impacts, and specific mitigation measures.

AZGFD recognizes the potential for future research and conservation opportunities within the I-11 study area. For example, understanding mule deer movement pathways that would be impacted by I-11. AZGFD is a Cooperating Agency for ADOT’s tiered impact study for I-11 and has been working with ADOT to understand the potential impacts that the proposed I-11 highway would have on wildlife. This gives AZGFD the opportunity to bring research to the table throughout the NEPA process, and provide input on routing and design considerations that

would conserve important ungulate movement corridors. As of July 2022, there has been no announcement of the Tier 2 process being initiated for any component segment of Interstate-11 covered by the Tier 1 EIS. However, given the prioritization of the Interstate-11 effort along with the billions of dollars of funding made available for major infrastructure projects of regional or national significance beginning in March of 2022, there is a possibility that the Tier 2 process could be forthcoming.

The ecosystem in this corridor is Sonoran Desert, with vegetation types dominated by saguaro cactus (*Carnegiea gigantea*), palo verde (*Parkinsonia florida*), mesquite (*Prosopis glandulosa*), ocotillo (*Fouquieria splendens*), and various other cacti. Land ownership and management is primarily BLM, Private, and State Trust Land (Figure 12, Table 4).

Current State Agency Activities

Barrier/Fragmentation Mitigation Efforts

Highway-related deer movement studies – Since February of 2019, with funding from the USDI as part of SO3362 implementation, AZGFD has collared 117 mule deer across five study areas to begin accumulating movement data along a portion of the I-11 Preferred Corridor Alternative. In February of 2022, AZGFD completed the initial 3-year research project covering 3 of the 5 study areas. The research project crosses three BLM field offices with the objective to collect, analyze, and map mule deer movement corridors. Several important connections between mountain ranges have been discovered, such as across the Rainbow Valley between the North Maricopa and Sierra Estrella Mountains (Figure 11). The timelines associated with ongoing movement studies and road design will allow AZGFD to analyze current data, and provide ADOT with robust input on movement routes to aid in the design of specific mitigation measures and improvements for wildlife connectivity.

Habitat Projects Identified

Barrier/Fragmentation Mitigation Projects Identified

Fence inventories and removal/modifications within important movement areas – GPS collar data along the I-11 proposed corridor alternative has allowed AZGFD to gain an understanding of several movement corridors, where it is not uncommon for mule deer to travel distances over 10 miles between and within habitat patches (Figure 11). Within these areas AZGFD intends to

seek funding for fence inventories that would aid in understanding the existing barriers to movement, and to strategize for possible mitigation measures that would support mule deer movement.

During the summer of 2021, a working group composed of partners from AZGFD, Friends of Ironwood Forest National Monument, Mule Deer Foundation, City of Tucson property owners, National Park Service (Saguaro NP), Bureau of Reclamation, Coalition for Sonoran Desert Protection, and the Tohono O'odham Nation identified several problematic barrier fences within the Avra Valley west of the Tucson Mountains. In December of 2021, three miles of problematic barrier fences were removed or modified to increase habitat connectivity for mule deer and other wildlife.

Table 4. Land ownership/management for the Proposed Interstate 11 Corridor of Obstruction and Opportunity.

| Category | Area (acres) | % |
|-----------------------------|---------------------|----------|
| Bureau of Land Management | 1,490,903 | 34.96 |
| Private | 1,405,478 | 32.96 |
| State Trust Land | 1,061,015 | 24.88 |
| US Forest Service | 175,288 | 4.11 |
| State and Regional Parks | 75,574 | 1.77 |
| National Park Service | 21,736 | 0.51 |
| Department of Defense | 14,355 | 0.34 |
| Bureau of Reclamation | 12,835 | 0.30 |
| Arizona Game and Fish Dept. | 4,973 | 0.12 |
| Tribal Lands | 1,273 | 0.03 |

Figure 11. Rainbow Valley mule deer movements and the Interstate 11 Preferred Alternative.

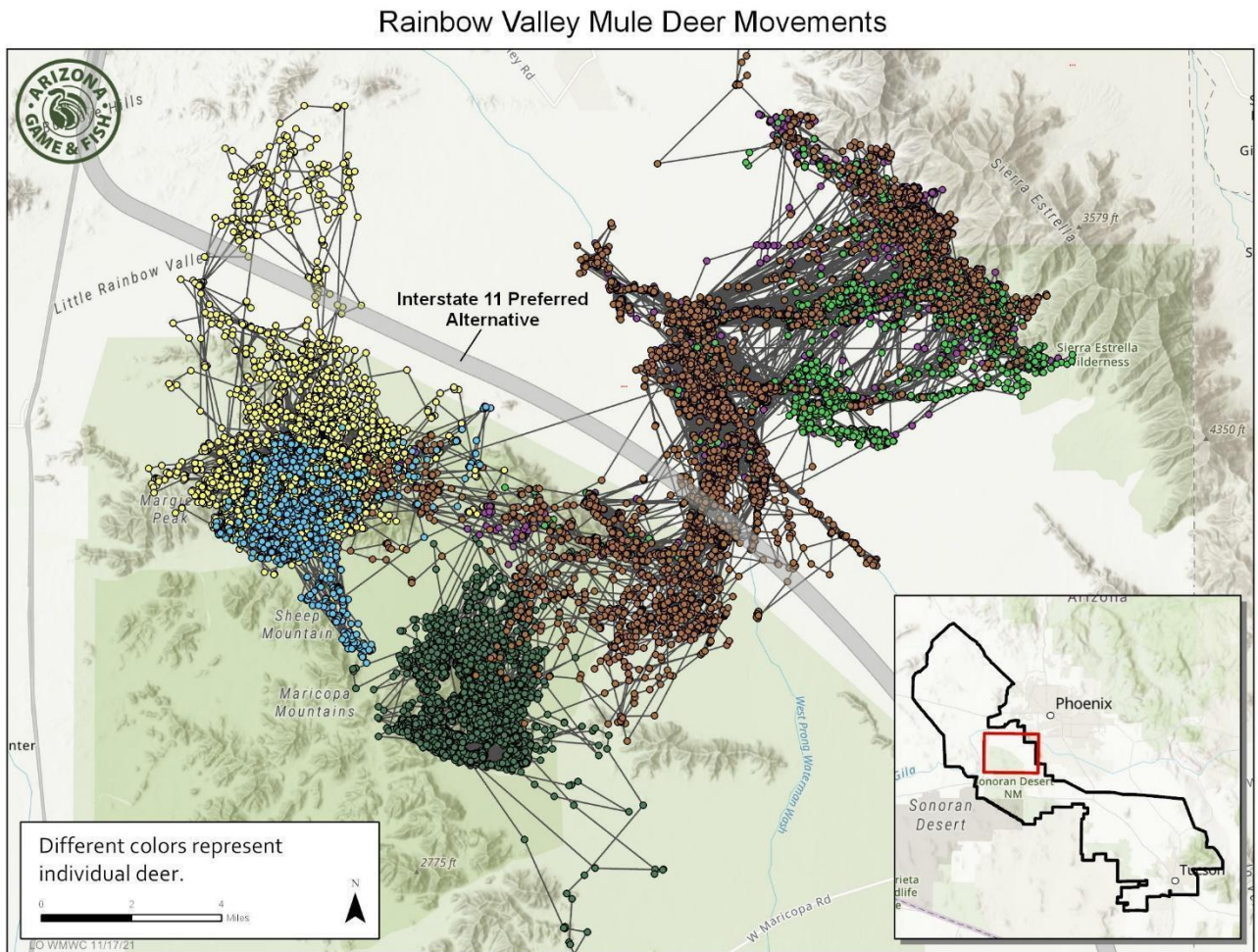
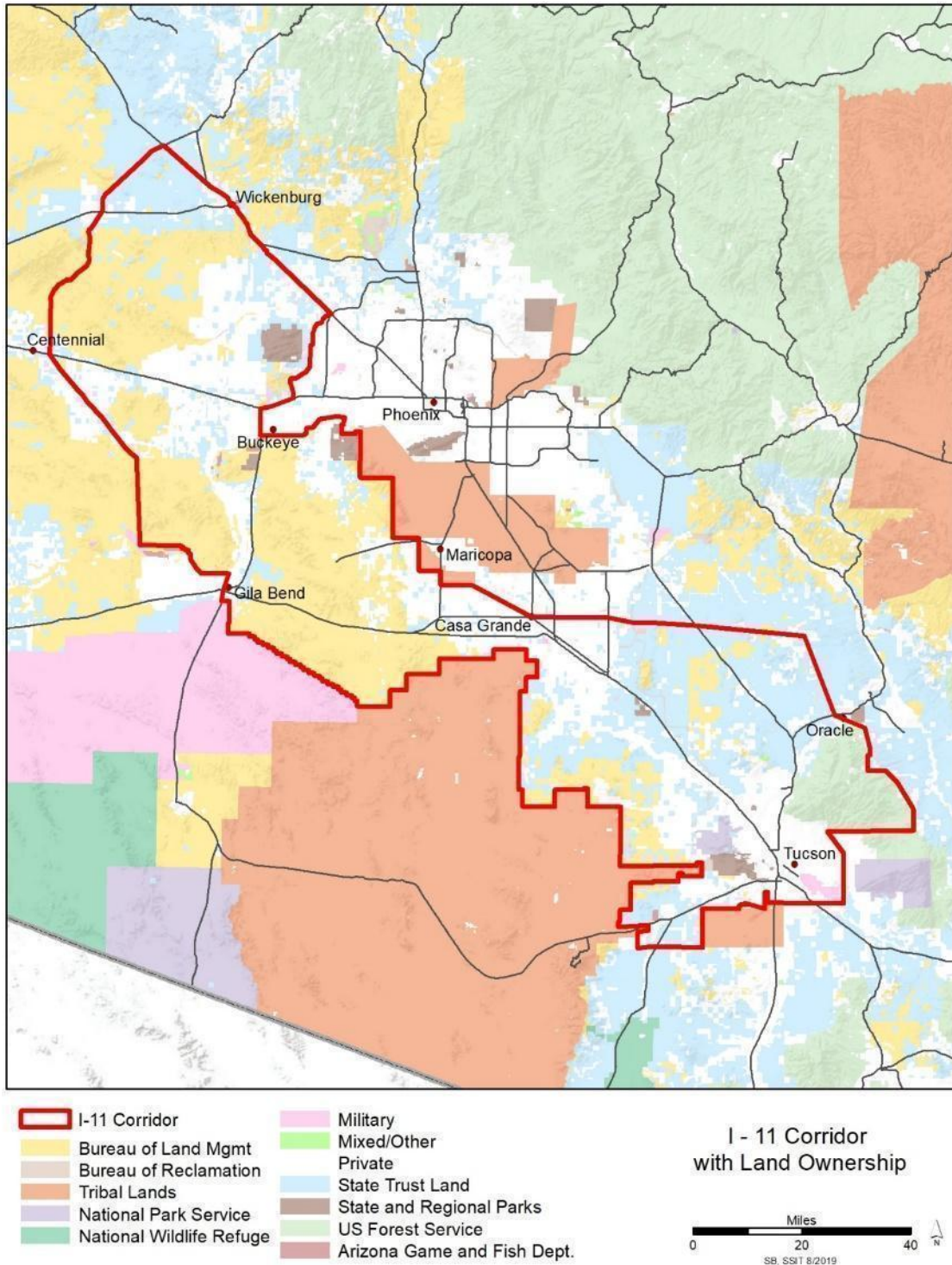


Figure 12. Land ownership/management within the Proposed I-11 Corridor of Obstruction and Opportunity.



5) Game Management Unit 18A (mule deer, elk, and pronghorn)

GMU 18A has been a focus of AZGFD to increase habitat quality and availability for multiple wildlife species including mule deer, elk, and pronghorn. It is located between Kingman and Seligman, extending both north and south of Interstate 40 (Figure 13). Mule deer and pronghorn populations in GMU 18A have declined for decades due to many factors including human disturbance, livestock grazing, fence design and densities, reduction of habitat, and drought. The combination of these factors has led to a reduction in habitat availability and quality, a substantial decline in fawn recruitment rates, and a decrease in total population numbers.

GMU 18A is composed of a mix of grassland, pinyon/juniper, chaparral, and lower desert habitat types. Elevations range from about 2,380 to 6,742 feet, but most of the GMU lies between 4,300 and 5,300 feet. Landforms include open plains, rolling hills, plateaus, and mountains. Natural surface water is very scarce throughout the area. Most water is supplied by earthen tanks and well-fed pipelines designed to support livestock grazing operations. Hundreds of miles of pasture fences exist which can inhibit movement of wildlife, especially pronghorn. These fences need to be converted to AZGFD's wildlife friendly standards for enhanced wildlife permeability.

AZGFD has prioritized collection of movement data for mule deer and pronghorn within GMU 18A to evaluate movement corridors and the effectiveness of current and future habitat treatments. During the fall of 2019, 17 pronghorn were collared within the north-central portions of GMU 18A; the data collected will guide habitat treatment implementation in years 2021-2024 (Figure 14). Several collars were placed on the southern boundary of the study area and data collected will also tell us if current treatments are being used as the projects progress. The restored ability of pronghorn to move throughout its range will provide them an opportunity to adapt and increase its resilience.

GMU 18A covers about 1,236 mi² in northwest Arizona. Land ownership is complex and includes checker-boarded lands with 40% Arizona State Land Department (ASLD) lands, 49% private lands, and 11% BLM lands (Table 5, Figure 15). Much of the GMU has existing grazing leases for livestock managed by 10 different ranches.

Current State Agency Activities

Early project efforts for GMU 18A restoration included coordination meetings with ranches, applying for and obtaining a Regional Conservation Partnership Program (RCPP) in coordination with the NRCS, obtaining permits for treatments from ASLD and additional funding from Arizona Department of Forest and Fire Management, USFWS Partners Program and Rocky Mountain Elk Foundation. Additional cooperating organization support includes the Arizona Antelope Foundation, the Arizona Deer Association, the Arizona Elk Society, the Mule Deer Foundation, and the Arizona Mule Deer Organization. Management efforts within GMU 18A include:

- 3,300 acres of browse treatments.
- 23 pronghorn have been collared since October 2019. Treatment clearances are underway for the northern migration corridor for FY22-24 from the central portion of the GMU up to the north and then across westward to the BLM lands.
- 15 mule deer GPS collars were deployed November 2020.
- 33 pronghorn were translocated from Utah in February 2022.
- In October of 2022, AZGFD will deploy GPS collars on 33 pronghorn and 33 mule deer.

Habitat Projects Identified

7,000 acres of grassland and browse treatments are planned in FY23 with the potential for more depending on contractors, rancher permits and matching funds. In FY20, FY21, and FY22 a total of 18,832 acres of juniper mastication were completed for the restoration of grasslands and/or the enhancement of browse communities.

Vegetation Management Treatments

Grassland Habitat Treatment - The treatment prescription in grassland habitat is to remove a majority of recent juniper trees while retaining large old growth junipers, with a diameter of 16 inches or greater at 12 inches above the root collar. The treatment will be completed using a drum grinder attached to rubber tired equipment with less than 4 psi ground pressure. The drum grinder will chip up the trunk of the trees, leaving the branches that will retain more soil moisture, creating a microclimate that is conducive to the production of cool season grasses and

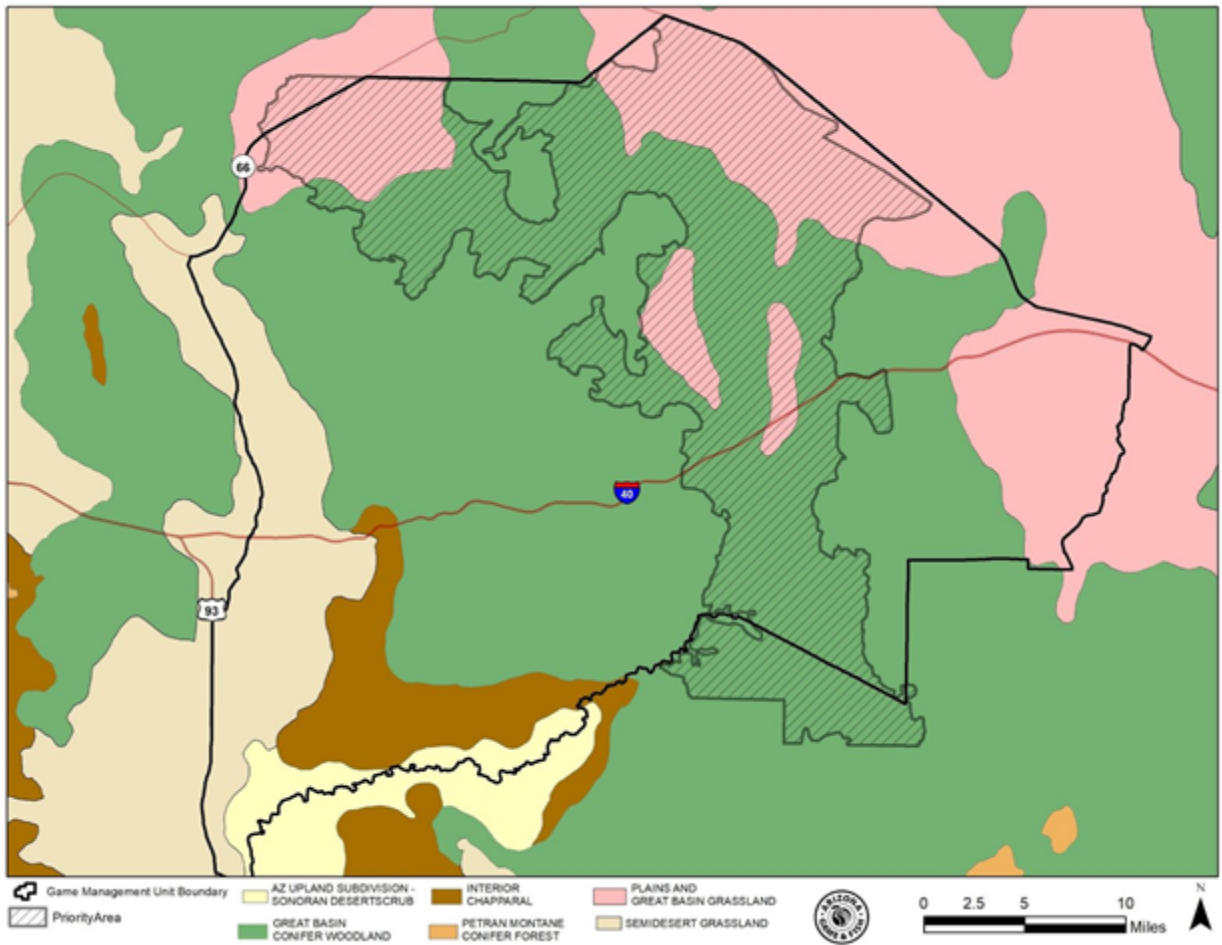
forbs. In areas that contain deeper soils associated with flat topography the majority of the trees will be removed, with the exception of obvious bedding trees which will result in approximately one mature tree left per acre. Work will be performed year round with precaution given to avoiding wet roads and rutting conditions. Number of acres that will be treated is difficult to determine due to unsecured funding and actual treatment costs. Impacts to grassland birds may be monitored.

Pinyon/Juniper Habitat Treatments - There are approximately 280,000 acres of treatments that fall within the priority area shown on the proposals map. Based on land ownership the majority of the project will be completed on ASLD land. AZGFD has been working closely with the ASLD’s Range Unit Manager toward the implementation of this project, whenever possible funding will be placed adjacent to areas previously treated. Some additional projects will be completed on private and BLM lands. AZGFD has been working with the Colorado River District BLM Fuels Unit Manager toward completion of the environmental compliance needed for these treatments (Figure 13).

Table 5. Land ownership/management for the Game Management Unit 18A Corridor.

| Category | Area (acres) | % |
|----------------------|---------------------|----------|
| Private | 377,542 | 48.07 |
| State Trust Land | 317,542 | 40.43 |
| Bureau of Land Mgmt. | 89,214 | 11.38 |

Figure 13. Habitat types and project priority area in GMU 18A.



Barrier/Fragmentation Mitigation Efforts

Wildlife-Friendly Fence Assessments and Modifications - There are approximately 36 miles of woven wire boundary fence and 6 miles of interior pasture fence on the Cross Mountain Ranch which is the priority focus. The ranch will work with Arizona Antelope Foundation and NRCS to remove and replace the existing fence, with wildlife friendly fencing, starting with the boundary fences and then moving to interior pasture fences that would better facilitate proper livestock management and pronghorn connectivity. AZGFD also intends to seek funding for fence inventories that would aid in understanding the existing barriers to movement, and to strategize for possible mitigation measures that would support ungulate movement. By modifying the fences, we hope to reduce barriers for pronghorn and improve their use of suitable habitat throughout GMU 18A.

Removal of woven wire fencing will be completed using volunteers provided by WCO's. Boundary fencing material provided to lease holders and installation expenses shared between ranches. Cross Mountain Ranch will be applying for NRCS (EQIP) assistance to realign and replace interior pasture fencing to allow for more managed livestock rotation. With the approval of the "Linking the CAGCS and NAGI RCPP," practices like this will also be allowed under that program.

To date four miles of woven wire ranch boundary fencing have been replaced with wildlife friendly fence using a 50 percent cost share with the ranchers. Another three miles of pasture woven wire fence was removed using volunteers.

Wildlife Water Resources

Wildlife water developments - AZGFD Region III has identified the need for as many as 20 new or redeveloped water sources within GMU 18A. These waters are in various stages of development ranging from planning to implementation. The region will focus its efforts on the redevelopment of range improvements, after the wildlife waters currently planned are built.

Figure 14. Pronghorn movements in GMU 18A.

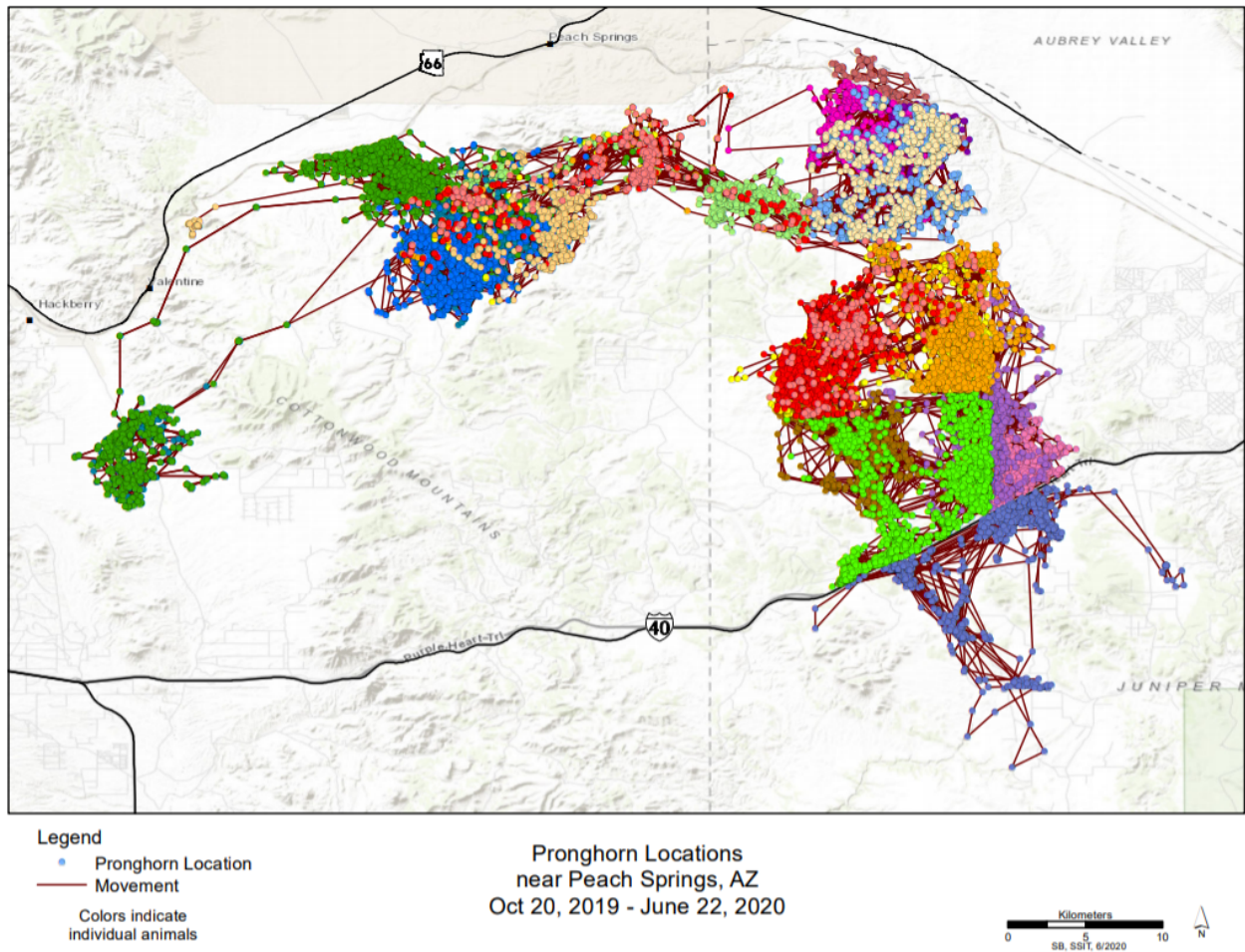
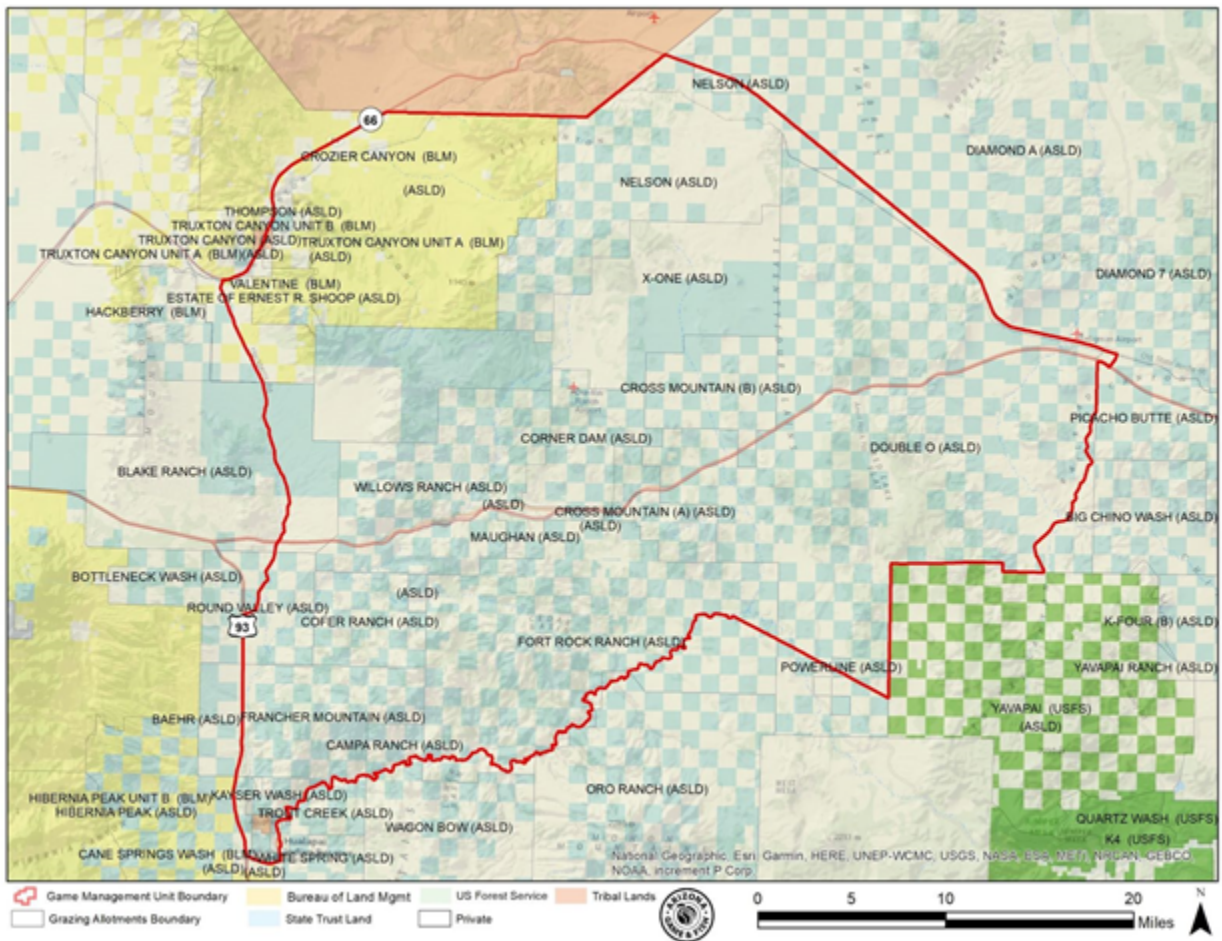


Figure 15. Land ownership/management within the Game Management Unit 18A Corridor.



CURRENT FEDERAL AGENCY ACTIVITIES IN ALL PRIORITY CORRIDORS

BLM Activities

- The Arizona Strip District continues to focus on an Integrated Vegetation Management process to align implementation of vegetation treatments in cooperation with our partners. In FY2022, work continued in the Paunsaugunt to Kaibab Plateau Priority Corridor and Winter Range, within the Kanab Creek Landscape Planning area. This area covers the Shuttleworth and Suicide Allotments Vegetation Treatment, Buck Pasture Canyon Treatment, Buckskin Chain and Burn Treatment, Kanab Creek Riparian Restoration Project, and the Pine Hollow Emergency Stabilization, and Restoration (ES&R) project areas.
- On the Shuttleworth-Suicide Project 449 acres of pinyon-juniper have been treated. The remaining 1,365 acres of mastication are expected to be completed by the end of FY2022. The remaining 255 acres of lop-and-scatter are expected to be completed in FY2023.
- The Buck Pasture Canyon and Buckskin Chain and Burn treatments were maintained in FY2022 by removing encroaching pinyon and juniper trees in the treatment areas by the lop-and-scatter method. In total a 3,230-acre project area was retreated.
- The Kanab Creek Riparian Restoration project is a multi-year restoration project which treats 10 acres of invasive Saltcedar and Russian Olive per year by cutting and piling the debris for prescribed fire. Stumps are treated with herbicide to prevent re-sprouting of the invasive species. As of FY2022 40 acres in the riparian corridor have been treated and 10 more acres are planned for FY2023.
- On the Pine Hollow ES&R project 6,212 acres of aerial seeding were completed. One range improvement project (fence modification) associated with current treatments is expected to be completed in FY2023. This project is being monitored for treatment effectiveness using the Assessment, Inventory, and Monitoring (AIM) Strategy and other resource trend data collection.
- The Arizona Strip District is working on an Environmental Assessment (EA) that will include approximately 9,535 acres of pinyon-juniper and cliffrose treatments within a 35,411-acre project area on the Buckskin Mountain within the Paunsaugunt to Kaibab Plateau Corridor and Winter Range priority area. Completion of the EA is expected in

FY2023. Archeological inventories have begun within the proposed treatments to help inform the planning process.

- BLM- Kingman Field Office is working with AZGFD to complete pinyon-juniper treatment in the GMU 18A project area. AZGFD was successful in being awarded a National Fish and Wildlife Foundation Grant for this project in the last cycle.

US Forest Service Activities

- In July of 2020, the USDA and State of Arizona signed a Shared Stewardship Memorandum of Understanding to increase coordination and cooperation for work addressing forest health risks and wildfire across the state.

Kaibab National Forest

- The Kaibab National Forest (KNF) in partnership with Coconino/Prescott National Forests, the Southwestern regional office, Rocky Mountain Research Station and AZGFD developed a working group called the Northern Arizona Landscape Connectivity Alliance (or NALCA) focused on gaining efficiencies and identifying opportunities for improved coordination on planning, implementing, and monitoring projects for wildlife connectivity. After the NALCA Letter of Intent was signed by the three Forest Supervisors and the Charter was completed in 2021, NALCA is now completing an Action Plan for the next several years. In the coming year, NALCA will collaborate closely with partners to realize the extensive benefits from landscape connectivity for the Southwestern Region's valuable natural resources.
- KNF is developing a geodatabase to better track project implementation. The project is starting on the SZ Grassland (SZGR) Rx footprint and hoping to expand this effort forest-wide.
- The Kaibab Plateau Ecological Restoration Project (KPERP) decision was signed on 11/18/2020. The Mule Deer Foundation will begin contracting for hand thinning work within the KPERP area. KNF and MDF are working to identify specific treatment polygons using previously identified AZGFD recommendations. The KNF will oversee arch compliance for the project.
- AZGFD has been repairing and replacing constructed waters which have been NEPA cleared. For many of those waters the North Kaibab Ranger District continues to provide

NEPA support/clearance. For six of the wildlife waters destroyed in Mangum fire (2020), the KNF purchased the materials and supplies and AZGFD oversaw implementation. The North Kaibab Ranger District is currently waiting on supplies for the last 2 of the 6. The KNF is working on getting AZGFD clearance to replace the Horse Springs Trick Tank. Two additional waters have been identified to be replaced on mule deer summer range.

- ES+R activities within the footprint of the Mangum Fire (July 2020, ~71,400 acres), are being explored and will likely include: a phased seeding application of plant species along with soil stabilization efforts, and redevelopment of damaged wildlife and joint resource wildlife/livestock catchment infrastructure.
- In partnership with AZGFD, HPC, NRCS and permittees, FS has continued to mechanically treat 4,000 to 5,000 acres annually under the SZ Grassland NEPA. Treatment methods include using agra-axe, mastication, fuel wood sales and dozer piling. The past couple years FS has been targeting improvements on the pronghorn corridor south of I-40. The FS is investing funding to complete cultural clearance north of I-40 in Tusayan (GMU 9) and intend to begin implementation within 2 years.
- The KNF and AZGFD were awarded funds via Rocky Mountain Elk Foundation to rebuild Rain Tank, an important wildlife water source in the Sycamore Canyon Area affected by the 2021 Rafael fire. Completion is expected in 2024.
- A categorical exclusion was signed in the spring of 2022 to improve habitat connectivity along Highway 89 south of Ash Fork with Right-of-Way fence setbacks. Kaibab National Forest staff took care of NEPA, arch clearances, etc. The fence setbacks were completed on 8/6/2022 in collaboration with AZGFD, KNF staff, and about 60 Arizona Antelope Foundation volunteers.
- AZGFD entered into two new agreements with the Kaibab NF this year focused on connectivity. One is primarily fence improvements/passage and inventory/monitoring for wildlife friendly fence using a standardized approach. The other agreement is specific to joint chiefs funding the forest received via a competitive funding process last year.. AZGFD will take a lead role in helping the forest implement work on the ground. Both supplemental project agreements tier to the Master Good Neighbor Authority Agreement between the USFS Southwestern Region and the AZGFD signed in 2020 (which is good for 10 years).

Coconino NF - Flagstaff & Red Rock Ranger Districts

- NEPA was completed for the approximately 23,136 acre North Forest Grassland Restoration project on the Flagstaff RD in September 2019. This project is located in the northwest corner of the Forest east of US 180 and is intended to improve movement corridors for pronghorn and other big game through removal of juniper that has encroached into grasslands using mechanical removal and prescribed fire. Phase 1 of the project began in April 2020 with mastication of juniper scheduled to occur on approximately 2,454 acres. Phase 1 was funded through an agreement between AZGFD and the Babbitt Ranch, the grazing allotment permit holder in the project area.
- Additional grassland restoration work is on-going on the Red Rock RD on both the Windmill West and Fossil Creek range allotments. In FY19, approximately 2,924 of juniper removal occurred in these projects.
- The Forest also continues to improve big game habitat in this corridor through prescribed burning and wildfires managed for multiple resource objectives. In FY19, approximately 18,778 acres were treated through planned prescribed fires as well as unplanned lightning-ignited wildfires. These fires helped remove downed logs and woody debris as well as smaller trees that can inhibit big game movement. They also created openings in the canopy through single and group tree torching that will promote shrub, grass, and forb growth in the future.
- Removal of old, dilapidated fence continues across the Forest to reduce potential effects these hazards pose to big game and other wildlife. In FY19, 1.5 miles of fence were removed on the Flagstaff RD near Sunset Crater National Monument.
- The Forest is working on NEPA clearance for improvements of 8 trick tanks to be completed by AZGFD and partners including Arizona Elk Society and Mule Deer Foundation. Most of them are located along US 180 with one located east of US 89. Old vaults will be removed and replaced with a new storage tank and drink to increase water availability for big game. Clearances are anticipated to be completed in September 2020 with implementation expected to begin shortly thereafter.

Coconino NF - Mogollon Rim District

- The district will work on NEPA clearance in the winter of FY21 for construction of 2 new trick tanks to be completed by AZGFD. Both sites are north of Highway 87 and east of Tremaine Lake.
- Grassland restoration work (funded through an HPC grant) is ongoing at the Bar T Bar allotment.
- Removal of old, dilapidated barbed-wire fencing continues on the district. In FY20, 1.25 miles of fence were removed within the Buck Springs Allotment.
- The district also continues to improve ungulate habitat through prescribed burning and wildfires managed for multiple resource objectives. In FY19, approximately 27,025 acres were treated through planned prescribed fires as well as unplanned lightning-ignited wildfires. These fires helped remove downed logs and woody debris as well as smaller trees that can inhibit ungulate movement. They also created openings in the canopy through single and group tree torching that will promote grass and forb growth in the future.

Prescott National Forest

- The Prescott National Forest has several landscape scale projects that include project design features to improve habitat and connectivity for mule deer, elk, and/or pronghorn. In the Flagstaff to Sedona Corridor is the Black Hills Vegetation Management Project (decision 2011) and the Agua Fria Grasslands Project (decision 2015). In the Grand Canyon to Prescott Corridor Complex is the Chino Landscape Restoration Project. The Chino Landscape Restoration Project was signed in November 2019 covers over half a million acres of wildlife habitat including key migration corridors for pronghorn and year-round habitat for mule deer and elk.
- The Black Hills project is in the Flagstaff to Sedona Corridor, north and west of the I-17 corridor and stretches from just west of Clarkdale in the north going south to where I-17 bisects the Prescott National Forest, and west to the Prescott National Forest. The main purpose of this project is to improve vegetation conditions in the project area which would improve habitat and forage for both mule deer and elk. Treatments include mechanical thinning, hand thinning, and prescribed fire. Work on this project is ongoing.

- The Agua Fria Grasslands project is in the Flagstaff to Sedona Corridor and is south of where I-17 bisects the Prescott National Forest to the boundary with the Tonto National Forest to the south. This project focuses primarily on pronghorn habitat, although there are also mule deer in the area. The project is to thin juniper and reduce thickets of catclaw and mesquite to improve grassland habitat and forage and to improve habitat connectivity for pronghorn. This area is also part of the Central Arizona Grasslands Strategy project area. This is a project by AZGFD, working with partners to improve pronghorn habitat and connectivity. Work on this project is ongoing.
- The Chino Landscape Restoration project is in priority area 1 and encompasses most of the Chino Valley Ranger District which is the northern portion of the Prescott National Forest on both the east and west zones. The vegetation in this area is primarily juniper woodland and juniper grassland with some pine stringers scattered about. The project will focus on watershed restoration which will include juniper thinning. In many places, reduction in juniper will increase and improve grasslands and therefore pronghorn and mule deer habitat and forage. A portion of this project area is also within the Central Arizona Grasslands Strategy project area and is contiguous with grasslands projects to the north on the Kaibab National Forest. The Chino analysis used AZGFD's pronghorn telemetry data to identify locations for vegetation treatments within corridors to improve and connect areas of pronghorn habitat use and movements.

RESEARCH NEEDS

1) Interstate 11 Mule Deer Research

In July of 2021, ADOT released the Final Tier 1 EIS which identified the I-11 Preferred Corridor Alternative. The subsequent Record of Decision was released in November 2021, where a “Build Corridor Alternative” was selected. The process now requires a Tier 2 EIS (for each component project falling under the Tier 1 EIS) to determine the specific I-11 transportation corridor alignment. The Tier 2 EIS will consider traffic interchange locations, specific project-level issues, such as individual property impacts, and specific mitigation measures. AZGFD is a Cooperating Agency for ADOT’s tiered impact study for I-11 and has been working with ADOT to understand the potential impacts that the proposed I-11 highway would have on wildlife, if constructed. This gives AZGFD the opportunity to bring research to the table throughout the NEPA process, and provide input on routing and design considerations that will conserve important ungulate movement corridors.

Since 2019, AZGFD has initiated a large-scale research project along the I-11 proposed route. Research efforts have included individually tagging and GPS tracking of 124 mule deer and 24 bighorn sheep in 5 study areas (i.e., north, north central, central, south central, and south). Within the 3 central study areas, the GPS collars have reached the end of their battery life. However, data collection will continue within the North and South study areas through October of 2023. This data has highlighted several important areas for continued research. For mule deer, and in order of priority, these areas include 1) the Hassayampa Plains, 2) Tucson Mountains, 3) Rainbow Valley and 4) Buckeye Hills.

We propose to deploy 80 mule deer GPS collars using a prioritized phased approach. The timing of each phase will depend on available funds and capture windows. Ideal timing for Phase 1 collar deployment is January/February of 2023. Collecting additional movement data will allow AZGFD to have a more complete picture of mule deer movements along a gradient of habitats prior to I-11 construction. Ultimately, the goal is to be as prepared as possible for the Tier 2 EIS process, giving the opportunity to provide data-driven recommendations for cost effective mitigation options to include in any designs that move forward.

Project Budget:

Phase 1: Hassayampa Plains and Tucson Mountains Mule Deer

| Item/Activity | # of Individuals | Cost per Individual | Total |
|------------------------|-----------------------------|--------------------------------|--------------|
| Capture Costs | 40 | \$1,250 | \$50,000 |
| Collars and Airtime | 40 | \$1,500 | \$60,000 |
| Personnel | | | \$40,000 |
| | | Project Total: | \$150,000 |

Phase 2: Rainbow Valley and Buckeye Hills Mule Deer

| Item/Activity | # of Individuals | Cost per Individual | Total |
|------------------------|-----------------------------|--------------------------------|--------------|
| Capture Costs | 40 | \$1,250 | \$50,000 |
| Collars and Airtime | 40 | \$1,500 | \$60,000 |
| Personnel | | | \$40,000 |
| | | Project Total: | \$150,000 |

2) Spatial and Temporal Distribution of Mule Deer in Game Management Units 1 and 27

In recent years, managers of Arizona's GMUs 1 and 27 have noticed apparent deer density fluctuations on a seasonal basis. The annual variation in detection of mule deer during the December-January survey period suggests immigration and/or emigration is affecting the variance in numbers of animals seen rather than demographic processes such as recruitment and mortality. Also, the hunter success rate in the fall general hunt seems to be correlated with the timing of that hunt each year, because deer seem much more abundant if the hunt is earlier in this area. This all further supports the idea that a segment of the mule deer population is migrating to some other location. Despite the importance of this herd, AZGFD currently lacks information on seasonal movements to identify important winter range and migration corridors for mule deer in this area.

GMUs 1 and 27 are located in eastern Arizona (Figure 16). They are flanked by New Mexico (New Mexico GMUs 15 and 23) on the east and by the Fort Apache and San Carlos Apache Reservations on the west. Primary land ownership/management in this area is the USFS and ASLD land. AZGFD's current understanding suggests that a portion of the GMUs 1 and 27 mule deer population may be migrating into New Mexico, adjacent Tribal lands, and/or neighboring GMUs (2B, 2C, 3B, and 28). The goal of AZGFD is to improve the understanding of this seasonal movement with fine-scale GPS collar data. This will allow AZGFD to identify important winter range and migration corridors, and provide direction regarding land management actions to improve habitat quality for mule deer.

There are numerous state and federal highways traversing and adjacent to GMUs 1 and 27: US Highways 60, 180, and 191 and Arizona State Routes 260, 261, 273, and 373. These roads currently all have an Average Annual Daily Traffic (AADT) <3,000 vehicles/day. These traffic volumes are unlikely to impose substantial restrictions on deer movements except in areas where their associated fences have problematic designs. However, potential growth and development in surrounding areas would bring increases to traffic volumes that could inhibit important deer movements. If critical pathways from movement data are identified now, then as the local highways are upgraded to accommodate the increasing vehicle traffic, targeted deer permeability mitigations can be incorporated to ensure persistence of the population across the landscape. Without robust movement data it can be difficult to justify the expense of transportation infrastructure that accommodates wildlife permeability.

Understanding movement patterns is essential to deriving effective management strategies. Regular deer movements across these boundaries could have serious implications on the effectiveness of the management strategies for this deer population. Knowledge of movement patterns for a migratory portion of the population are critical to developing a survey approach that reflects the dynamics and trends of the overall population. Without such considerations, harvest recommendations based on incomplete knowledge of population movements could result in unpredictable hunter success rates and undesirable impacts on population dynamics.

In addition to the nuanced influence of migration on population dynamics, there is also an important disease risk we must manage in this area. To date, Chronic Wasting Disease (CWD) has not been detected in Arizona. However, 59 free-ranging elk and deer in New Mexico have tested positive for CWD. Although the closest detection is over 100 miles east of the Arizona/New Mexico border, at least one radio-collared deer from New Mexico has crossed over into Arizona (approximately 70 miles from point of origin). This is a concern for AZGFD and knowing more about interstate deer movements in this area will help inform disease management.

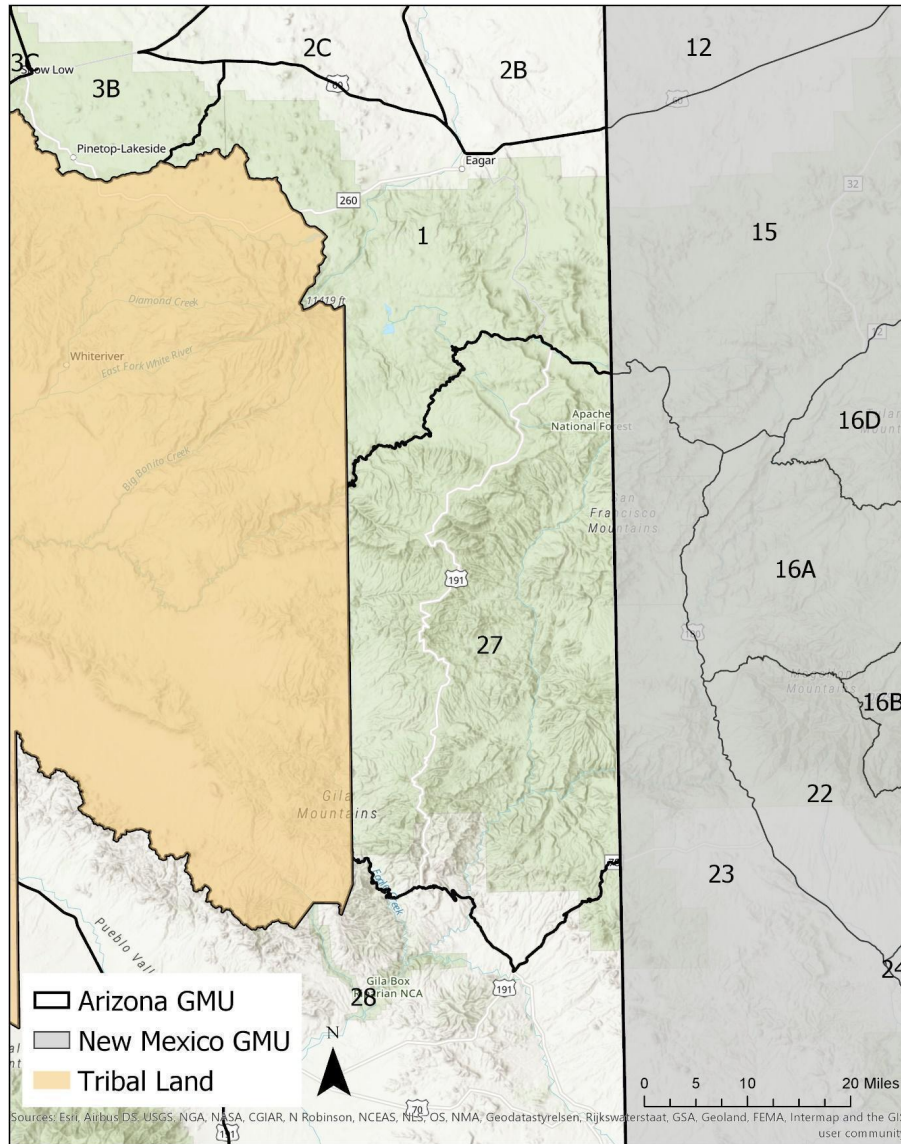
Knowledge of seasonal movement patterns for the GMUs 1 and 27 mule deer population would:

- 1) serve as a foundation for directing efforts to maintain and improve priority winter range and migration corridors,
- 2) allow AZGFD to provide recommendations for transportation infrastructure to improve wildlife permeability,
- 3) allow wildlife managers to prescribe season dates and permit levels that are appropriate for the portion of the population in those GMUs during the fall hunts, and
- 4) give AZGFD an understanding of interstate deer movement patterns to better manage risks associated with CWD.

Project Budget:

| Item/Activity | # of Individuals | Cost per Individual | Total |
|------------------------|-----------------------------|--------------------------------|--------------|
| Mule Deer Capture | 25 | \$1,250 | \$31,250 |
| Collars and Airtime | 25 | \$1,500 | \$37,500 |
| Personnel | | | \$30,000 |
| | | Project Total: | \$98,750 |

Figure 16. Priority research area in GMUs 1 and 27.



3) Impacts of Alternative Energy on Big Game Movements

Alternative energy sources such as solar and wind are being deployed rapidly across the United States. Arizona has been a focus for solar developers, ranking second in the nation in solar energy potential, and fourth in net generation from solar. Unfortunately, with rapid deployment of solar and wind energy comes challenges to habitats used by big game (Sawyer et al., 2022). For example, solar facilities require security fences around project perimeters that completely prevent entry for large animals such as elk, pronghorn, and mule deer. Thus, habitat loss and connectivity is diminished or lost. Agencies tasked with management and conservation of migratory ungulate populations are faced with a current lack of information on appropriate layout designs, placement, and corridor widths of alternative energy sources. There are several alternative energy projects in the planning stages in Arizona that will overlap with ungulate habitat. AZGFD is working with alternative energy developers to design and mitigate impacts to ungulate movements. There is a unique opportunity to learn about project design and ungulate movements. Research using GPS collars and remote cameras will allow AZGFD to provide quantitative data on effective corridor widths and inform future layout designs and mitigation for alternative energy projects that overlap with ungulate habitat.

Project Budget (Species TBD):

| Item/Activity | # of Individuals | Cost per Individual | Total |
|----------------------|-------------------------|----------------------------|--------------|
| Capture Costs | 40 | \$1,250 | \$50,000 |
| Collars and Airtime | 40 | \$1,500 | \$60,000 |
| Personnel | | | \$40,000 |
| | | Project Total: | \$150,000 |

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APPENDIX A - SECRETARIAL ORDER 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.