ARIZONA STATE ACTION PLAN

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

INTRODUCTION

Secretarial Order 3362 (Appendix A) directs appropriate bureaus (US Fish and Wildlife Service (USFWS), National Park Service (NPS), and Bureau of Land Management (BLM)) within the Department of the Interior (DOI) 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 DOI 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.

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

There are nearly 73 million acres of land in Arizona (Map 1, Appendix B), of which approximately 38% (28 million) is both DOI and Forest Service (USFS) managed. The DOI manages 17 million acres with the USFS managing the remaining 11 million acres. 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 (Radeloff et al. 2005), roadway and railway expansion (White et al. 2007, Johnson 2001), natural resource extraction (Drohan et al. 2012, Hennings and Soll 2012) and fencing (Gates et al. 2012)

Big game species have significant economic and social value. A survey of wildlife-related recreation conducted by the U. S. Fish and Wildlife Service indicated that 2.9 million people hunted big game in the 19 western states and spent $8.7 billion on hunting-related expenses. Considering this value, it is critical that wildlife habitat requirements are fully considered and appropriately addressed in landscape planning decisions.

Ungulate winter and summer ranges have been studied and mapped over the decades, but recent advances in radio collars containing more affordable Global Positioning Systems (GPS) technology are now allowing researchers to identify and map important migration corridors and stopover sites used by these animals. This new research has led to some amazing discoveries, such as a 150-mile mule deer (*Odocoileus hemionus*) migration corridor in southwest Wyoming

that is the longest recorded for that species to date. Similar work has now documented the migration corridors of nine separate elk (*Cervus elaphus*) herds that winter on habitats managed by three different states (Montana, Wyoming, and Idaho), but all migrate into shared summer range of Yellowstone National Park. Work such as this has revealed some barriers to ungulate movements and this allows managers to work on specific problematic areas.

Several lessons important to modern wildlife management are emerging from this migration and movement work. First, this new detailed information is showing wildlife managers that the corridors used during seasonal migration are crucial for many big game herds in the West. This recent and ongoing accumulation of large amounts of reliable 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. Often, the corridors that are identified are quite narrow (1-2 miles in width) and thus allow us to prioritize migration and movement habitat. Science-based prioritization of these linear strips of habitat, which represent a small area of habitat but a large benefit to wildlife, will help plan for long-term landscape management.

ARIZONA'S PRIORITY CORRIDORS FOR WINTER RANGE AND BIG GAME MOVEMENT

The list below includes Arizona Game and Fish Department's **(**AGFD) highest priority movement corridors and winter range areas, based on our review of existing GPS collar data. We consider these as priority areas that need to be protected from activities that would impede connectivity. This list differs from the list of *Research Needs* below in that we have data to identify these corridors versus other areas of the state that lack data.

The Western Association of Fish and Wildlife Agencies Mule Deer Working Group has been collaborating with personnel from the Departments of Interior and Agriculture, Nongovernmental Organizations, and other diverse stakeholders to identify and map big game migration corridors and stopover sites so the best science can inform land-use policy decisions. Some states have more information already assembled than others. Southwestern states, like Arizona, do not have the long-distance migrations between seasonal ranges we see in the Rocky Mountain States, but rather shorter and less consistent movements between areas, usually on a seasonal basis or in response to shifts in environmental conditions. Regardless, Arizona has been involved in research to identify ungulate movements and corridors for many years, with most of this focused on highway crossings in specific areas. Through this research we have been able to identify a few corridors we consider priorities to manage and protect. We consider these the best information available to date but emphasize that other than a few highway projects in the past, we have just begun to investigate seasonal ungulate movements and have deployed collars in only a small fraction of potential areas we need to evaluate. As more data are assembled and analyzed we expect these corridor priorities to shift as we identify other corridors or winter range that require management attention.

1) <u>Grand Canyon to Prescott Pronghorn Corridor Complex (pronghorn, mule deer, & elk)</u>
This corridor complex likely represents an historical movement corridor that has been disrupted. Some pronghorn south side of I-40 (i.e., green dots in Map 2A – Appendix B) are shown moving north from their wintering grounds near Paulden, AZ until they encounter the interstate and turn eastward and parallel I-40 until they reach their acceptable summer habitat. This abrupt directional change in conjunction with the highway suggests strong anthropogenic influences on their current movement pattern. There is evidence this area served as a north-south corridor complex from the Grand Canyon south to the Prescott area. GPS collar data show I-40 is acting as a barrier to movements on the south (green and blue) and on the north (purple). In addition, US 89 is a barrier to pronghorn north of Flagstaff as illustrated by the animals collared on the west side of the highway (light blue) and the east side of the highway (darker blue). Northern Arizona University and AGFD documented detectible genetic differences between pronghorn populations separated by US 89 and State Route (SR) 64 indicating movement has been substantially restricted by these highways. These movement studies were focused on investigating highway permeability and not long-distance movements, so the full extent of movements in this corridor is probably yet to be documented. This is most pointedly a pronghorn issue, but data on mule deer and elk show similar movement in this corridor complex with I-40 acting as a barrier for those species' movements as well. The land ownership ranges from NPS at the Grand Canyon on the north end through USFS, BLM, and state-owned and private checkerboard land. Current threats are transportation corridors, future exurban and suburban development, pinyon-juniper (PJ) encroachment, shifts in vegetation and available resources due to the altering climate regime, and livestock fencing.

Arizona Department of Transportation (ADOT) is aware of the need for wildlife crossings in this corridor but lacks funding to allocate for such features. USFS and the *Four Forest Restoration Initiative (4FRI*) are adjusting forest treatment/thinning efforts within prescription parameters to provide better connectivity associated with locations for future targeted crossing structures, particularly in an area west of Parks, AZ where a recommended overpass would simultaneously serve as a safe crossing for pronghorn, elk, and mule deer.

Current State Agency Activities

<u>Wildlife Water Resources</u>
New wildlife water developments and redevelopments in corridor - Water catchment systems have been installed in a number of locations within the corridor to support big game movement and utilization. AGFD has currently identified four additional wildlife waters that need to be built or rehabilitated over the next 10 years to provide the necessary water to support big game movement within the Corridor during drought periods.

Wetland/Riparian Restoration – Wetland and riparian habitats are rare in northern Arizona and provide key habitat to big game, especially during the fawning season when conditions are typically dry. Many of these riparian areas are impacted by livestock and/or have been hydrologically altered and are in need of restoration. AGFD is working with the Kaibab National Forest to fund and restore many of these wetlands.

Vegetation Management Treatments

Vegetation management treatment of public and private lands - Juniper encroachment into savannas and grasslands over the last 100 years has been a major cause of habitat deterioration within the Grand Canyon to Prescott Corridor. Tree 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.

Barrier/Fragmentation Mitigation Efforts

Highway-related elk, deer, and pronghorn movement studies – AGFD-executed ADOT-funded wildlife movement studies along I-40, US 89, and SR 64 and identified wildlife crossing locations for future implementation during road improvement efforts. Map 2A in Appendix B depicts Pronghorn movement data from several highway projects.

Landscape level pronghorn movement studies – AGFD is deploying 60 GPS collars on pronghorn south of I-40 to identify how individuals are accessing seasonally important ranges across the landscape.

Wildlife-Friendly Fence Modifications north of I-40 - Over the past 10 years, AGFD has worked with the National Park Service, US Forest Service, Arizona Department of Transportation, sportsman's groups, and local ranchers to inventory and modify or remove barrier fences. Thus far, these efforts have focused on areas north of Interstate 40 and collar data indicate that pronghorn are responding positively.

Habitat Projects Identified

Wildlife Water Resources

New wildlife water developments and redevelopments in corridor - AGFD has identified four additional wildlife water developments to be built or rehabilitated to provide the necessary water to support big game corridor movements during drought periods which are becoming more frequent and prolonged in Arizona as climate regimes are altered.

Wetland/Riparian Restoration – Corridor wetlands and riparian habitats outside the scope of current AGFD and Kaibab National Forest work are in need of restoration efforts.

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. AGFD will work with partners to focus efforts within and adjacent to the Corridor in order to allow for a landscape-level improvement for big game.

Barrier/Fragmentation Mitigation Projects Identified

Habitat conservation through land acquisition and easements – Specific tracts of private and State Trust land within the Grand Canyon to Prescott Corridor are at risk for development. In these cases, development would have a significant impact on the long-term viability of the

corridor for wildlife movement. AGFD is currently working with partners to identify these key parcels and secure funding for their long-term conservation. Tools such as conservation easements, land transfers, and land purchases would ensure long-term habitat connectivity.

Wildlife Crossings over Interstate 40 – Interstate-40 represents the biggest impediment to migration within the Grand Canyon to Prescott Corridor. A study of elk movements and wildlife-vehicle collisions identified the best locations for wildlife crossings and fencing for future I-40 upgrades. Wildlife overpasses are the only crossing design proven to accommodate pronghorn, so overpasses across I-40 are needed to connect animals 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 (Appendix B, Map 2B & 2C).

Wildlife Crossings of US 89, SR 64, and US 180 – Additional 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.

Wildlife-Friendly Fence Modifications south of I-40 – Cooperative efforts between AGFD, National Park Service, US Forest Service, Arizona Department of Transportation, sportsman's groups, nonprofit conservation organizations, and local ranchers to inventory and modify or remove barrier fences are targeted for expansion south of Interstate-40. Approximately 75 miles of fence modifications are needed in order to facilitate migratory pronghorn movement south of I-40.

An Environmental Assessment, Design Concept Report, and Wildlife Accident Reduction Plan were all created for this section of I-40 that includes all of the recommended wildlife crossing locations and fencing. In discussions with ADOT recently it was stated these documents would greatly streamline the NEPA process.

2) <u>I-17 from Camp Verde to Flagstaff Corridor (Elk/mule deer)</u>

This section of I-17 is a 146-mile 4-lane divided highway that connects Phoenix and Flagstaff (Map 3A in Appendix B). Interstate 17 is travelled by millions of people each year who visit the Grand Canyon and other Arizona parks and recreation areas. The northernmost 31-mile section immediately south of Flagstaff changes quickly in elevation and passes through both lower and higher elevation habitats, which elk use for summer and winter range. Numerous wet meadow-riparian habitats found adjacent to or near the highway corridor and a local golf course provide preferred food and water sources influencing elk distribution and movements. Along this 31-mile segment, elk account for 75% of all wildlife–vehicle collisions with >85 elk mortalities per year. Although there is a high incidence of elk–vehicle collision along I-17, relatively few elk attempted to cross I-17, due to the highway's high traffic volumes (approximately 17,000 vehicles/day in 2013). Although about 30% of the collared elk crossed I-17, there were about 70% that were captured and collared on the east or west side of the road that never crossed showing how effective I-17 was as movement barrier (as illustrated by the green and red locations in Map 3A representing elk captured on one side and not crossing I-17). We have GPS collar data showing elk on the east side of the interstate often follow the interstate south to lower elevation rather than cutting diagonally across I-17 to the southwest as they may have historically.

Previous research focused on higher elevation summer range between mileposts 306 and 338 of I-17. The adjacent land is mostly U.S. Forest Service, with small private parcels. Vegetation is Petran Montane Coniferous Forest biotic community dominated by Ponderosa pine (*Pinus ponderosa*).

It is an important corridor to protect and enhance not only for landscape connectivity but for the obvious human safety issue created by having elk in the roadway.

Current State Agency Activities

Barrier/Fragmentation Mitigation Efforts

Interstate-17 study on wildlife movements and fencing/crossing needs – In 2007, the Arizona Department of Transportation (ADOT) commissioned AGFD to conduct a study on wildlife movements and determine needs for wildlife crossings and fencing. AGFD recommended 19 locations where new or modified crossing structures should be incorporated with future highway upgrades to improve wildlife movement across I-17 (Map 3B). These suggested crossing structures have already been prioritized based on elk movement and roadkill data and discussions with ADOT has 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 ADOTs package of planning materials for the future upgrade of the northern section of Interstate-17. That package includes an Environmental Assessment, a Design Concept Report, an Accident Reduction Plan, and the AGFD report to ADOT's Research Center. These documents will help to streamline the NEPA process.

Interstate-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, AGFD worked with ADOT to retrofit a 6-mile section of highway from Woods Canyon to Munds Park with fencing. This guides animals to existing drainage structures where they can safely cross under the Interstate. 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.

Habitat Projects Identified

Barrier/Fragmentation Mitigation Project Identified

Wildlife Crossings along Interstate 17 – Interstate 17 represents the biggest impediment to migration in this identified corridor. The study described above investigated elk movements and wildlife-vehicle collisions to identify the best locations for wildlife crossings and fencing for future I-17 upgrades (Appendix B, Map 3B). 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 Sedona and Flagstaff, along with wildlife ROW fencing to make these crossing structures effective.

3) Paunsaugunt- Kaibab Plateau Corridor and Winter Range (Mule Deer)

Three mule deer collaring studies (2 GPS and 1 VHF) around the Kaibab Plateau (AZ), Paunsaugunt Plateau (UT), and surrounding lowlands have resulted in location data on the AZ-UT border. (See Map 4A and 4B in Appendix B). These projects were done for several different reasons, not specifically to identify corridors. Regardless, the point locations amassed have allowed us to identify general movement corridors on the west side of the Kaibab Plateau and to the north towards, and into, Utah. These studies have also identified the area between the Kaibab Plateau in Arizona and the Paunsaugunt Plateau in Utah as critical wintering grounds for herds migrating from summer grounds on both plateaus.

The higher elevation areas are National Park Service (NPS) and US Forest Service (USFS) lands with oaks, ponderosa pine and mixed conifer, and the surrounding lowlands are dominated by sagebrush and cliffrose on Bureau of Land Management (BLM), National Monument, and some Tribal land. The Kaibab Plateau is Arizona's only known consistently migrating mule deer herd that uses separate winter and summer ranges annually. This herd is our densest mule deer herd in the state and is historically and socially very important. In recent years, auction tags in this area and adjacent units along the Utah border typically brought more than $200,000 at the Western Hunting and Conservation Expo in Salt Lake City. Likewise, Utah has auctioned mule deer tags in the Paunsaugunt area for approximately the same amounts. The Kaibab Plateau westside winter range faces threats of increased fire cycles and aggressive invasion of cheatgrass.

Currently large tracts of the Kaibab winter range are without perennial water sources as a result of the complete lack of natural water, prolonged drought, and the unreliable nature of existing dirt tanks, which lie within the identified Paunsaugunt/Kaibab Corridor. Essentially all dirt tanks within the 12A winter range have been dry during the winter months for the past 10 years. As a result of this substantial decrease in reliable water sources the deer distribution had become very concentrated around the few water developments which are providing water. This issue has substantially decreased the carrying capacity of the Kaibab winter range.

As in much of Arizona's mid-elevation Mule Deer Winter range, an increase in the representation of Pinyon/Juniper (PJ) in as a result of fire suppression, grazing practices, and climatic changes has led to large expanses of monotypic high density PJ stands on the Paunsaugunt/Kaibab migratory and Mule Deer winter range. This 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.

Connections between the high elevation summer range on the Kaibab Plateau and winter range to the north, east, and west are vital to the health and persistence of this population.

Current State Agency Activities

Wildlife Water Developments

In an effort to mitigate concerns over dispersed access to water sources, a Comprehensive Water Development Plan for GMU 12A was developed. The plan identifies 17 existing waters sources for expansion of capacity or increased reliability and 19 locations for new water developments. The comprehensive execution of this plan will insure water availability for wintering mule deer over 112 square miles of migratory and winter range habitat. Of the improvements identified in the plan, funding has been allocated for all 19 new waters and 1 of the 17 redevelopments. Implementation of these new waters is underway.

Several cooperative water projects have been completed by AGFD, BLM, and livestock permittees within GMU 12B. AGFD has provided funding for materials, BLM provided the NEPA clearance and documentation, and livestock permittees provided the labor. Many of these projects focused on the refurbishment of existing waters and included actions such as replacement of worn water collection aprons, installation of additional storage tanks to extend duration of water availability, and the addition of tank lids prevent entrapment and limit evaporation.

AGFD and NRCS have allocated funding for materials and construction of a new cooperative lined pond water development near Gunsight. This water is currently being constructed.

Redevelopments of two wildlife water catchments in the Buckskin Mountains are cleared in an environmental assessment: DOI-BLM-AZ-A010-2016-0004-EA.

Vegetation Management Treatments

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

From 2016 through 2018, 4-6 miles of fence was modified in House Rock Valley to improve pronghorn connectivity. Replacing bottom barbed wires with smooth wire and raising it to 18-20” also reduces fencing barrier effects to juvenile deer movements.

A diverse set of habitat enhancement tools are being assessed by the North Kaibab Ecological Restoration Project (KPEP) to treat up to 526,000 acres within the North Kaibab Forest. This project is expected to enter the public scoping phase in late 2018, with a targeted NEPA completion date in 2020. This clearance process will cover a substantial portion of the Paunsaugunt/Kaibab Corridor and would facilitate future enhancement projects within the corridor.

Completion of the Burnt Corral Environmental Assessment, which covers 28,060 acres of vegetation management within the North Kaibab Forest, is anticipated by the end of 2018 and will facilitate habitat enhancement opportunities within the corridor.

BLM has initiated scoping for the Shuttleworth-Suicide Wildlife Habitat. This project will clear treatments of approximately 8,000 acres by a mixture of mastication and lop and scatter methods, to open up PJ habitat to enhance undergrowth species for wintering mule deer.

AGFD has provided financial support of ongoing research on controlling cheatgrass invasion on the winter range.

Barrier/Fragmentation Mitigation Treatments

North of the AZ/UT border, Utah has added 8-foot-tall fencing to exclude deer from accessing US Highway (US) 89 and funnel them to a network of 7 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 have recorded >55,000 deer crossings during fall and spring migrations. There are ongoing efforts to monitor movements in this corridor with GPS collars lead by Utah Division of Wildlife Resources in collaboration with AGFD.

Habitat Projects Identified

Wildlife Water Developments

Redevelopment of 16 waters in Game Management Unit 12A - The GMU 12A Comprehensive Water Development Plan includes the redevelopment of 16 waters without current funding allocation. These redevelopments will consist of demolishing existing under-capacity and failing water developments and construction of new 10,000 gallon wildlife water developments at the existing sites. Total cost for the redevelopment of these 16 waters would be in the vicinity of $1.35 million dollars. A NEPA document, the Eastside Wildlife Waters Development (and Redevelopment) Project Categorical Exclusion (2015), has been completed for the redevelopment of 3 of these waters and implementation could begin as soon as funding is secured. NEPA, in the form of a Categorical Exclusion, for the additional 13 waters had been initiated. Implementation on these 13 waters could begin following completion of the NEPA process, which is anticipated in January 2019, and the allocation of funding to cover these actions.

Redevelopment of 2 wildlife waters in the Buckskin Mountains - (Buckskin #1 and #2) are cleared and targeted for implementation as soon as funding and labor are allocated. These water sources cost approximately $50,000 because we only use reliable, long-lasting designs to avoid costly future maintenance.

New wildlife water developments in wintering habitat - Within the mule deer wintering grounds along Kanab Creek, in the north-central Buckskin Mountains, and in northern House Rock Valley new wildlife waters would improve water availability for wintering mule deer.

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

Vegetation Management Projects Identified

Vegetation management for West Side Habitat Improvement – Archeological clearances are required prior to implementation of PJ over-story 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 utilized 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 during fall and spring migrations and all winter months.

Vegetation management on the North Kaibab Forest (Ecological Restoration Project) – Upon the completion of the compliance process, the North Kaibab Ecological Restoration Project (KPEP) up to 526,000 acres of the North Kaibab Forest would be eligible for PJ removal treatments to enhance undergrowth species for wintering and migrating mule deer in this priority area.

Vegetation management on the North Kaibab Forest (Burnt Corral) – Vegetation treatments of the 28,060 acres included in the North Kaibab Forest Burnt Corral Environmental Assessment would enhance undergrowth species for wintering and migrating mule deer in this priority area through the removal of PJ.

Vegetation management of the Shuttleworth-Suicide Wildlife Habitat – Upon the completion of the compliance process, the treatment of Shuttleworth-Suicide Wildlife Habitat would enhance undergrowth species for wintering mule deer in this priority area. This project will treat approximately 8,000 acres of PJ with a mix of mastication and lop and scatter methods.

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 sub-divisions along the AZ/UT border and Johnson Wash. Mule deer from Utah utilize this area for migration. Within this area, a new water pipeline from Lake Powell is set to be constructed in the mid-2020s. 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.

Current Federal Agency Activities in all Priority Corridors

BLM Activities –

We did not receive information from BLM in time to meet the Plan deadline.

US Forest Service Activities -

Kaibab National Forest - North Kaibab Ranger District

- 1000 acre mastication project (pinyon-juniper thinning);
- Working with AZGFD have installed trick tanks/guzzlers-13 are in winter range;
- Planning stages for another 13 watering units, although these are more "transitional" range.

Coconino National Forest - Flagstaff Ranger District

- Significant efforts have been made in the last decade to support healthy pronghorn populations in the Priority Area 1 – Grand Canyon to Prescott Pronghorn Corridor Complex by wildlife biologists, land managers, local volunteers, NGOs, and partners on the Flagstaff District. Monitoring of GPS-collared animals indicates that without intervention, pronghorn movements continue to be restricted by meadow encroachment, fences and highways.
- Upgrading 55 miles of fences to meet wildlife standards, removing unnecessary fencing. This included replacing the bottom barbed wire with smooth wire, raising the bottom wire to a height of at least 18", in some cases removing or replacing sheep fence with a more wildlife friendly fence.
- Integrated management of right-of-way fences is critical to the success of promoting permeability. Two projects informed by the 2011 AZGFD Assessment of Pronghorn Movements and Strategies to Promote Highway Permeability. We relocated three sections of right-of-way fence along Highway 180 and along Highway 89 North to allow for movement of pronghorn. We used two new approaches to fence design. First we increased the distance between the highway and fence lines in locations where sight distance for both motorists and wildlife is sufficient to insure that animals (pronghorn in particular) could cross more safely. We also utilized an undulating fence design to promote pronghorn use of the right-of-way. Both designs will work as a test pilot for its effectiveness.
- We have implemented 3,006 acres of grassland restoration in pronghorn habitat.
- We are currently working with AZGFD to develop an archeological survey strategy for 57,600 acres of grassland restoration treatments within this corridor.
- We are in the process of contracting archeological surveys for approximately 4,000 acres of grassland restoration treatments in high priority areas identified by AZGFD.
- We have identified an approximately 57,600 acres area within this corridor for NEPA analysis that would provide for grassland and pinyon-juniper treatments that would improve pronghorn movements and winter and reproductive habitats. This project currently lacks funding.
- Tailoring forest treatments to promote connectivity - Through the 4FRI first EIS planning, USFS and the *Four Forest Restoration Initiative (4FRI*) are adjusting forest treatment/thinning efforts within prescription parameters to provide better connectivity associated with locations for future targeted crossing structures, particularly in an area west of Parks, AZ where a recommended overpass would simultaneously serve as a safe crossing for pronghorn, elk, and mule deer. This will move us toward desired conditions for identified priority corridors, including priority area 1.

- The Flagstaff and Mogollon Rim RDs fire programs have been doing grassland restoration work on Anderson Mesa (removal of juniper by hand and with equipment as well as some prescribed fire). They've largely used Habitat Partnership Committee (HPC) funds to conduct the work in-house or via contract. The Forest (fire, range, and wildlife) has worked in conjunction with AZGFD on prioritizing areas for treatment based on known movement corridors for pronghorn and other wild ungulates and work that has been completed on adjacent state, private and tribal lands by AZGFD.

Prescott National Forest

- We have three landscape scale projects in priority area 2 (I-17 Flagstaff to Camp Verde) and one in priority area 1 (Grand Canyon to Prescott) that include project design features to improve habitat and connectivity for mule deer, elk, and/or pronghorn. These are the Black Hills Vegetation Management Project (decision 2011), the Agua Fria Grasslands Project (decision 2015), the Hassayampa Landscape Restoration Project (decision anticipated Oct/Nov 2018), and the Chino Landscape Restoration Project (decision anticipated Nov 2018).
- The Black Hills project is in priority area 2 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 also in priority area 2 and is south of where I-17 bisects the Prescott National Forest to the boundary with the Tonto National Forest to the south (map attached). 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 Arizona Department of Fish and Game, working with partners to improve pronghorn habitat and connectivity. Work on this project is ongoing.
- The Hassayampa Landscape Restoration project is in priority area 2 and encompasses most of the Bradshaw Ranger District from a bit south and west of Prescott to the forest boundary in the south, excluding Sonoran desert areas around Cleator and the wildland-urban interface immediately surrounding Prescott. This project is to restore a natural fire regime, where possible, reduce tree densities where they are overly dense, and reduce hazardous fuels. The primary vegetation types include mixed conifer, Ponderosa pine, and chaparral. The treatments will include thinning by hand thinning, mechanical, and prescribed fire. This will result in increased forage and an overall healthier forest. Work on this project should commence next year.
- The Chino Landscape Restoration project is in priority area 1Cand 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

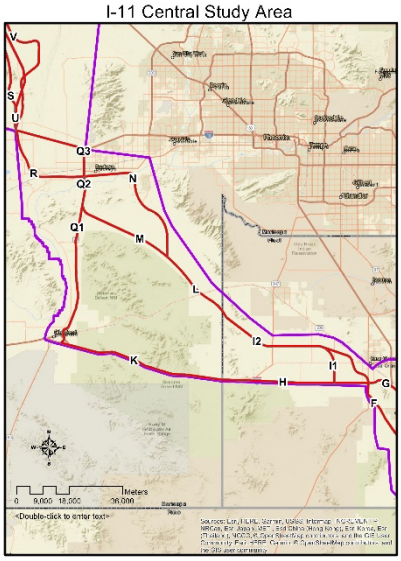
Arizona Grasslands Strategy project area. Work on this project should commence next year.

RESEARCH NEEDS

1) Proposed Path of a New Interstate 11 (I-11).

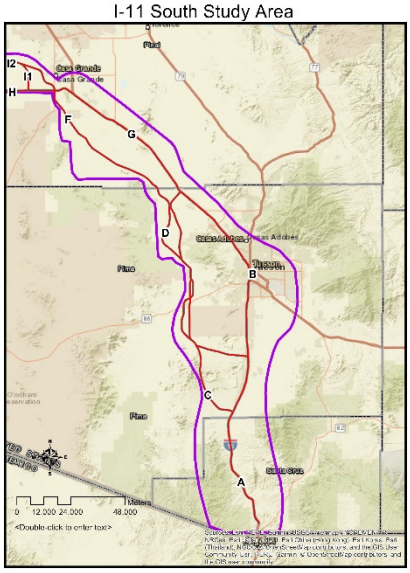
Need: As a Cooperating Agency for the ADOT's Tier 1 EIS for the Interstate 11 (I-11 Corridor), AZGFD has been working with ADOT to prepare for this new interstate highway which will traverse much of the state from the northwest to southeast. We know the impact interstate highways have on wildlife movement corridors and we now have a unique opportunity to learn about animal movements before the highway is built or improved and be able to plan for landscape permeability in places where wildlife has traditionally crossed the proposed I-11 route.

I-11 Central Study Area

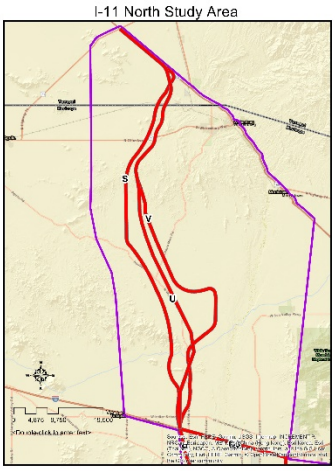


Central Study Area: Rainbow Valley area and connectivity between Estrella Mountains and Sonoran Desert National Monument (Game Management Units [GMUs] 26M and 39). **20 radio collared mule deer.**

I-11 South Study Area



South Study Area: West of Tucson Mountains, Tucson Mitigation Corridor, and connectivity between Ironwood National Monument, Tucson Mountain Park, and surrounding habitat including previous Central Arizona Project mitigation crossings (Game Management Units 37M and 37A). **20 radio-collared mule deer.**



North Study Area: West of the White Tank Mountains, west of New Valley Parkway and movement between the Vulture and White Tank Mountains (GMUs 25M and 42). **20 radio-collared mule deer.**

Methods

These deer can be captured efficiently and effectively with netgun and helicopter as we have in open desert areas and winter range in the past. This method is proven to be the most efficient in these environments. Each of these 3 segments of 20 collars each could be accomplished in a 3-day capture. Animals will be affixed with a satellite capable collar (iridium or spread spectrum) GPS collar with a fix rate of 2-3 hours to identify detailed movements to better plan for accommodating movements of deer and other wildlife.

Management Implications

Acquiring this movement information won't affect I-11 alignment, but we have the opportunity to influence the design and permeability for wildlife. This is a unique case where AZGFD is already involved in the planning process and has a "seat at the table" to influence design decisions if we have the data. Information on deer movements can be fed directly into the planning of this new Interstate and in so doing, avoid the problems associated with corridor disruption that we are trying to retrofit elsewhere.

- North Study Area: All of the potential alignments within the North Study Area would result in a barrier between the White Tank Mountains and Belmont Mountains, as well as fragmenting the Hassayampa Plain. The White Tanks Conservancy has worked to identify critical linkages and corridors needed to maintain connectivity between the White Tank Mountains and adjacent lands; this effort would complement existing planning efforts and provide the necessary data to advocate for habitat and linkage preservation and permeable roadway design features. This is the highest study priority for I-11, as this north section is expected to be the first to go through Tier 2 NEPA analysis and design.
- South Study Area: Two of the three proposed alignments in the South Study Area would go through Avra Valley, which would effectively isolate the Tucson Mountains. Additionally, it would impact the Tucson Mitigation Corridor, which is a parcel set aside to protect wildlife connectivity between the Tucson Mountains and nearby Roskruge Mountains. For I-11, this area is the second highest priority, in order to develop the necessary proactive mitigation strategies for Avra Valley.
- Central Study Area: Two of the proposed alignments would go through the Rainbow Valley, effectively isolating both the Estrella and Maricopa Mountains. In order to maintain connectivity between these two ranges, identifying current movement patterns through the Rainbow Valley is a top study priority.

Budget for Research Priority: I-11 Alignment

Item/Activity	
Mule Deer Capture (60 x $1000 each)	60,000
60 Mule Deer Radio Collars & Airtime ($1,800 each)	108,000
Field Equipment: **1 Communications Specialist R-1000 telemetry receiver** **1 handheld antenna**	$1,000
Sub-Total	$169,000

(Note: This project is funded using BLM funds as a result of SO3362)

2) SR 77 Overpass between Catalina Mountains and Tortolita Mountains.

Need: A highway overpass between the Catalina and Tortolita mountains was built across SR 77 in 2014. This structure appears to be successful in moving mule deer and other wildlife across the roadway based on cameras deployed there. However, we could gain important knowledge about planning effective highway crossing structures by evaluating if animals are using the whole corridor as intended and moving between mountain ranges. More importantly we can learn about how animals are using the land near the overpass to better inform decisions about how much land must be protected on both sides and to help us secure parcels near this crossing structure that are still in jeopardy of being sold which could close off this corridor.

Budget for Research Priority: Catalina-Tortolita overpass

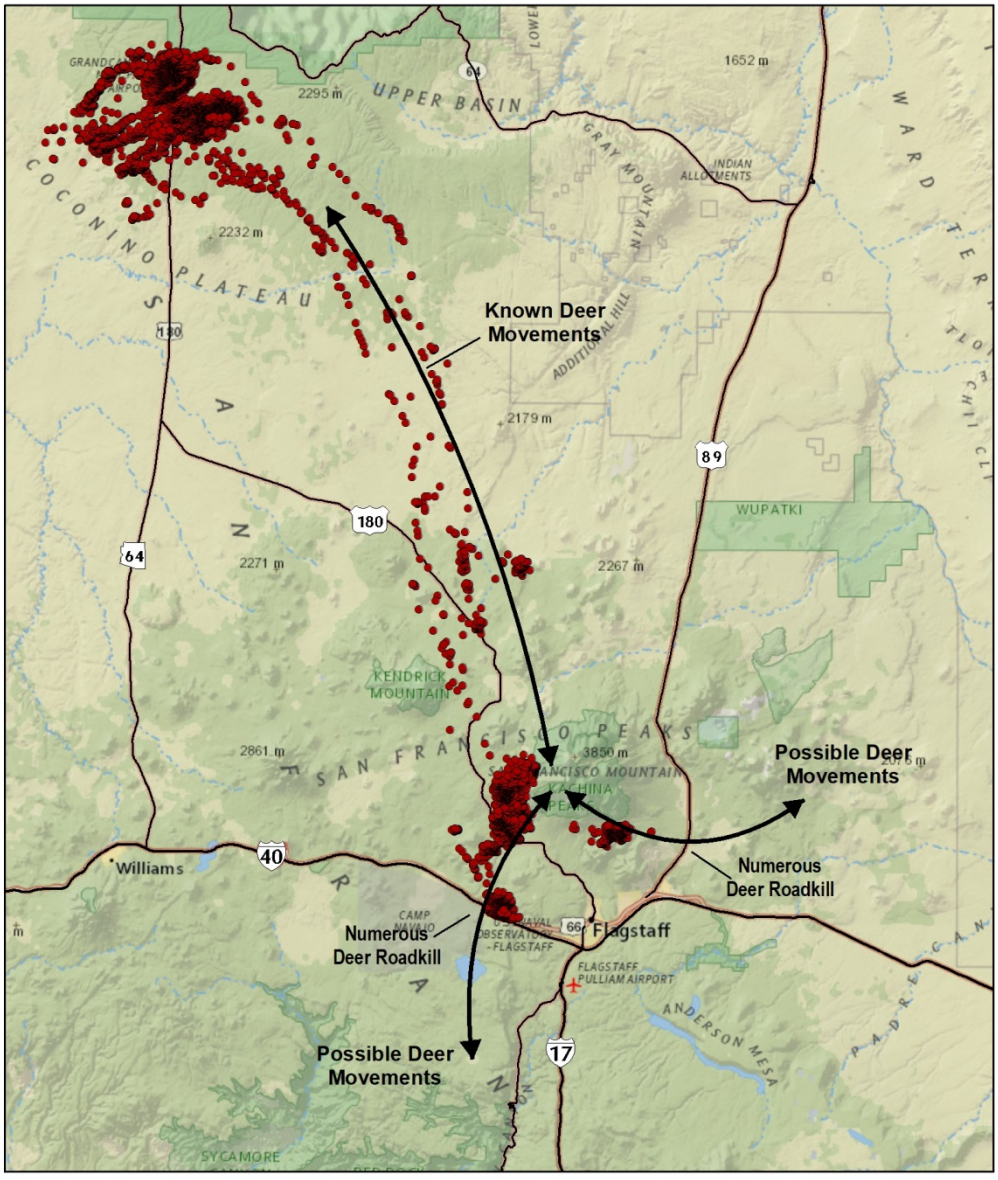
Item/Activity	
Mule Deer Capture (20 x $1000 each)	20,000
20 Mule Deer Radio Collars & Airtime ($1,800 each)	36,000
Sub-Total	$56,000

(Note: This research priority project will be funded using USFWS funds as a result of SO3362)

3) San Francisco Peaks Seasonal Movement.

Need: No mule deer have been collared on the San Francisco Peaks, but several that were collared at Tusayan on the south rim of the Grand Canyon traveled to the San Francisco Peaks and returned to the Grand Canyon. In fact, about half of the mule deer collared near the Grand Canyon unexpectedly traveled about 50 miles to the Peaks. This surprise indicates there are some long-distance movements related to the San Francisco Peaks we don't understand. Additionally, we have Flagstaff area municipalities discussing with us what can be done about the seasonal road kills that happen in a few areas east and west of Flagstaff (see map below). We need to document movements near and across I-40, SR 180, SR 89, and SR 64. SR 89 east of the San Francisco Peaks experiences road kills that elicit concern from the public. Animals also move back and forth between GMUs 7 and 9. Evidence indicates mule deer are summering in the higher elevation habitat on and around San Francisco Peaks and then moving out to lower-elevations in cooler months as indicated by our Grand Canyon deer and the seasonality of road kills. These indications of deer occupying the peaks in summer and dispersing in other months

should be investigated with GPS collars deployed on deer while they are on the San Francisco Peaks in summer. This will allow us to not only identify movement corridors in relation to transportation structures and exurban development, but also guide our management with properly delineated herd units. Managers need to make sure that they are collecting survey data to inform management decisions on the same deer population present when those prescribed fall hunts occur.



Legend

- Deer Locations

Deer Movements and Potential Movements around the San Francisco Peaks in Northern Arizona

N

Miles

0 5 10

Budget for Research Priority: San Francisco Peaks Mule Deer

Item/Activity	
Mule Deer Capture (15 x $1000 each)	15,000
15 Mule Deer Radio Collars & Airtime ($1,800 each)	27,000
Sub-Total	$42,000

(Note: This research priority project will be funded using USFWS funds as a result of SO3362)

4) Spatial and temporal distribution of mule deer in Game Management Units 1 and 27.

Need: Over the last few years wildlife managers have noticed mule deer in GMUs 1 and 27 are not consistently available to observers during the December-January survey period. The timing of the fall general firearms hunt seems to influence hunter success rates, apparently because of deer movements we have not previously understood. If the timing is such that the hunt dates fall later into the November time period, hunt success is drastically reduced. These 2 GMUs are squeezed in between the state boundary with New Mexico and Tribal lands (See map) and have been very important deer populations for AZGFD and our hunting constituents. Anecdotal information indicates there may be movement by these deer into other adjacent GMUs, New Mexico, and Tribal lands. AZGFD wildlife managers need to develop survey methodologies that are reflective of the GMU mule deer population during the fall hunt periods. Also, wildlife managers would like to be able to prescribe recommendations for the fall general hunt with confidence that the mule deer population present during surveys is available during the hunt, offering a consistent and predictable hunt success. In addition to the need for proper management, mule deer in neighboring New Mexico have tested positive for Chronic Wasting Disease (CWD). Knowing how mule deer interact and move across the state border is critical to understand the potential for spread of the disease and planning for a response if it is detected in Arizona. Previously, deer collared in New Mexico have traveled >50 miles into Arizona in GMUs to the south near Willcox, AZ.

Budget for Research Priority in GMU 1/27

Item/Activity	
Mule Deer Capture (30 x $1000 each)	$30,000
30 Mule Deer Radio Collars & Airtime ($1,800 each)	$54,000
Field Equipment: 1 telemetry receiver	$1,000
Sub-Total	$85,000

Summary budget for all 4 top research priorities

Priority	
1 - Interstate 11 Corridor	**$169,000**
2 - State Route 77 Overpass	**$56,000**
3 - San Francisco Peaks	**$42,000**
4 – GMU 1 & GMU 27 movements	**$85,000**
Total	**$352,000**

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Appendix A - Secretarial Order 3362

SECRETARIAL ORDER NO. 3362

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

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

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

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

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

b. U.S. Geological Survey Organic Act, as amended, 43 U.S.C. 31, *et seq*.;

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

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

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

The Bureau of Land Management (BLM) is the largest land manager in the United States (U.S.) with more than 245 million acres of public land under its purview, much of which is

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

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

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

Accordingly, the Department will work with our State partners and others to conserve and/or improve priority western big-game winter range and migration corridors in sagebrush ecosystems and in other ecotypes as necessary. This Order focuses on the Western States of: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. These States generally have expansive public lands with established sagebrush landscapes along with robust big-game herds that are highly valued by hunters and tourists throughout the Nation.

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

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

a. Collaborate with State, tribal, and territorial fish and wildlife agencies to attain or sustain State, tribal, and territorial wildlife population goals during the Department's land management planning and implementation, including prioritizing active

habitat management projects and funding that contributes to achieving wildlife population objectives, particularly for wildlife that is hunted or fished, and identifying additional ways to include or delegate to States habitat management work on Federal lands;

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

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

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

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

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

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

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

(2) Within 45 days, provide the Coordinator information regarding:

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

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

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

(iv) The location of areas that have been identified as a

priority for conservation and habitat treatments; and

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

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

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

(ii) Measurable outcomes; and

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

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

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

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

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

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

(5) Evaluate and appropriately apply site-specific management activities, as identified in State land use plans, site-specific plans, or the Action Plan (described

above), that conserve or restore habitat necessary to sustain local and regional big-game populations through measures that may include one or more of the following:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

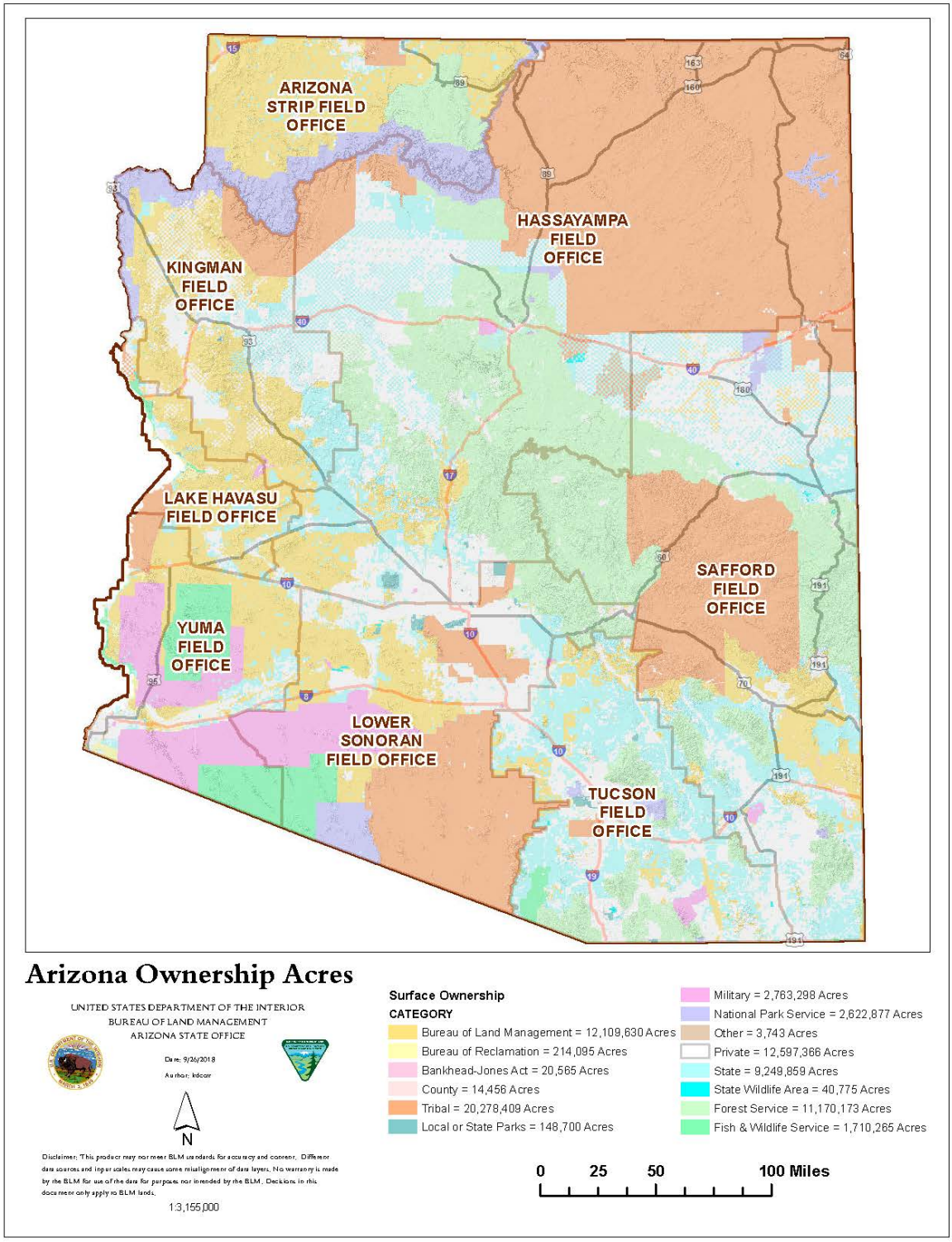
Sec. 5 **Management**. I hereby direct the Deputy Secretary to take is responsible for taking all reasonably necessary steps to implement this Order.

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

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

Appendix B – Maps

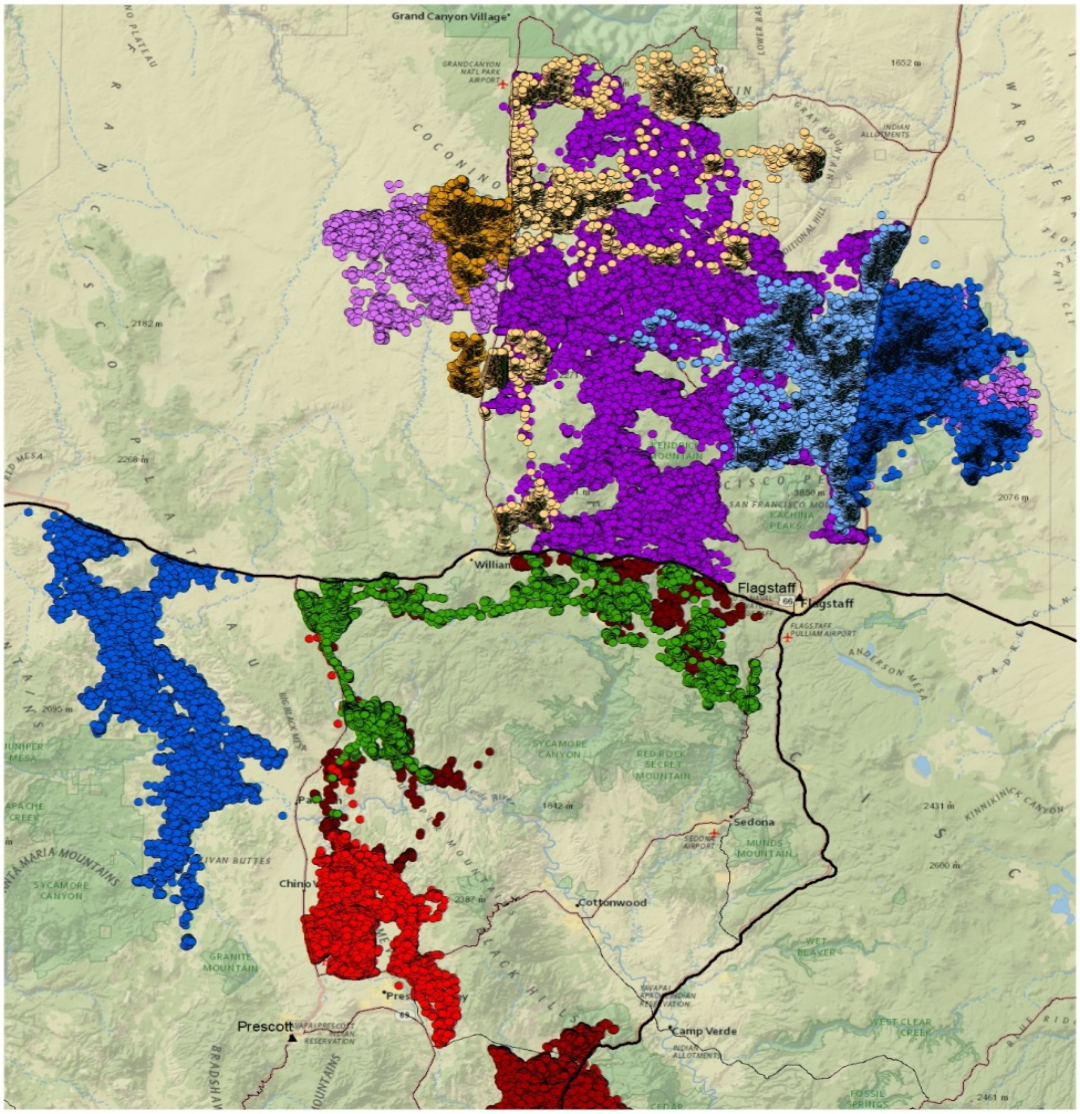
Map 1 – Arizona Land Ownership



Map 2A

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

Pronghorn movement data from several different highway projects. Different colors represent clusters of individuals from the same study or those captured on one side of a highway versus another to illustration purposes (e.g., light and dark blue).

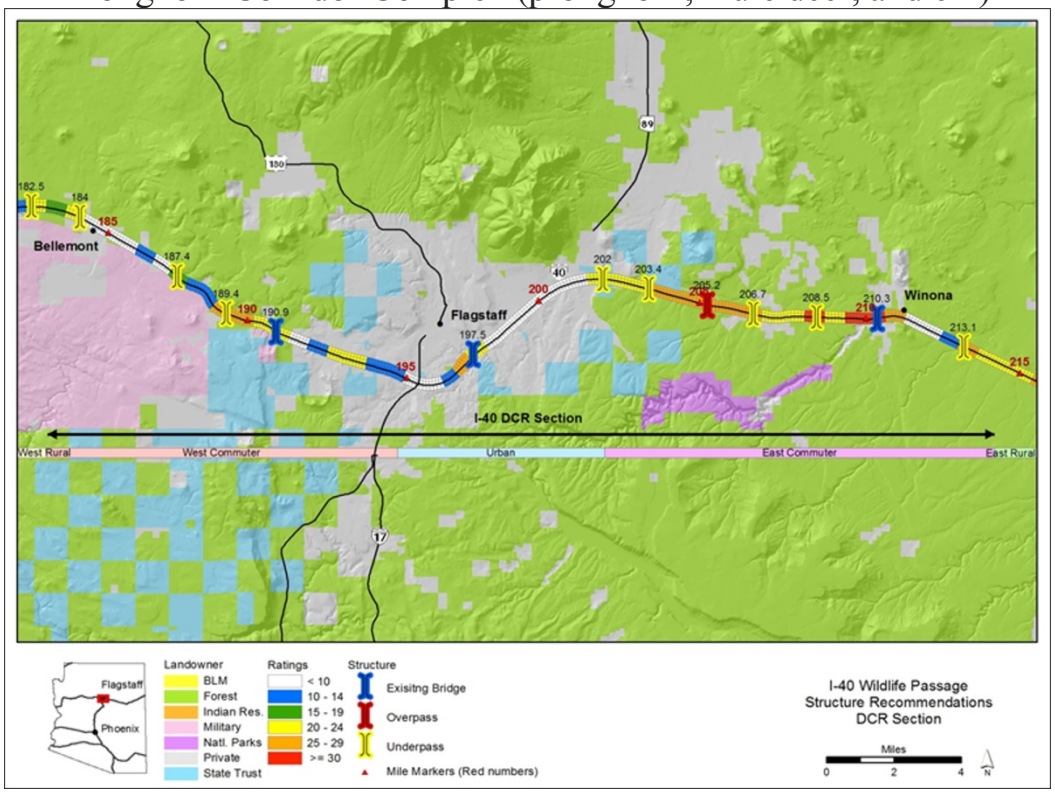


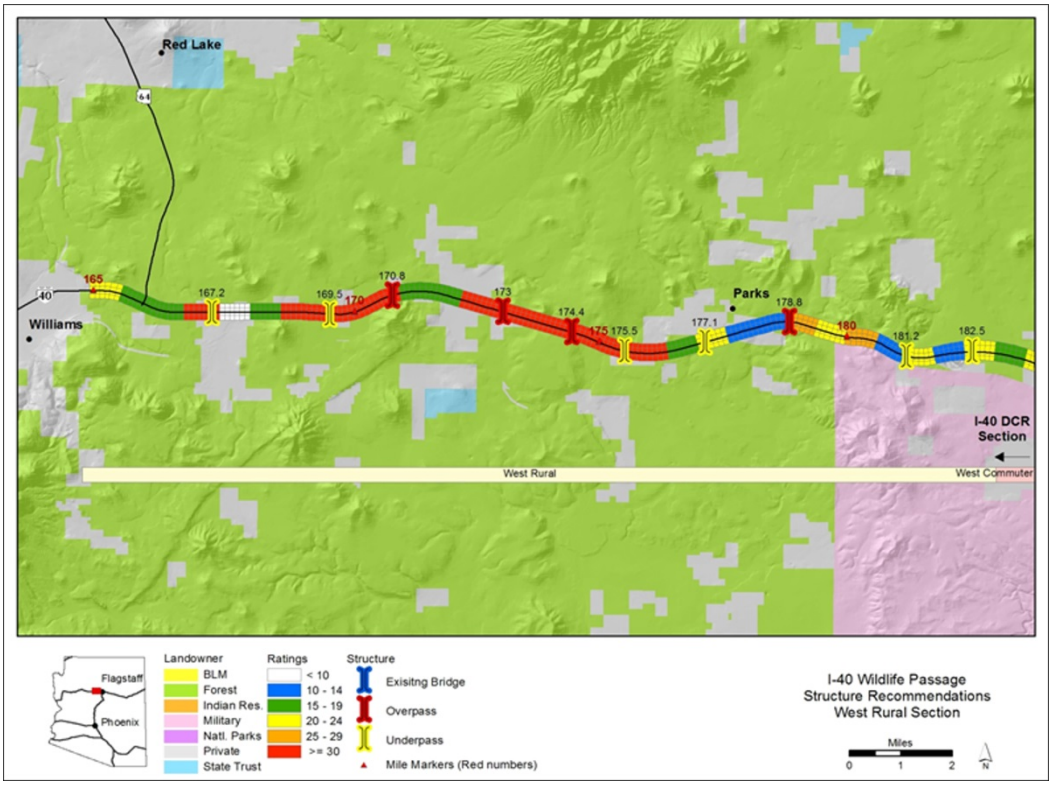
Pronghorn locations
collected by Arizona Game and Fish Department
using GPS Satellite technology.

Colors indicate various studies and side
of highway captured on.

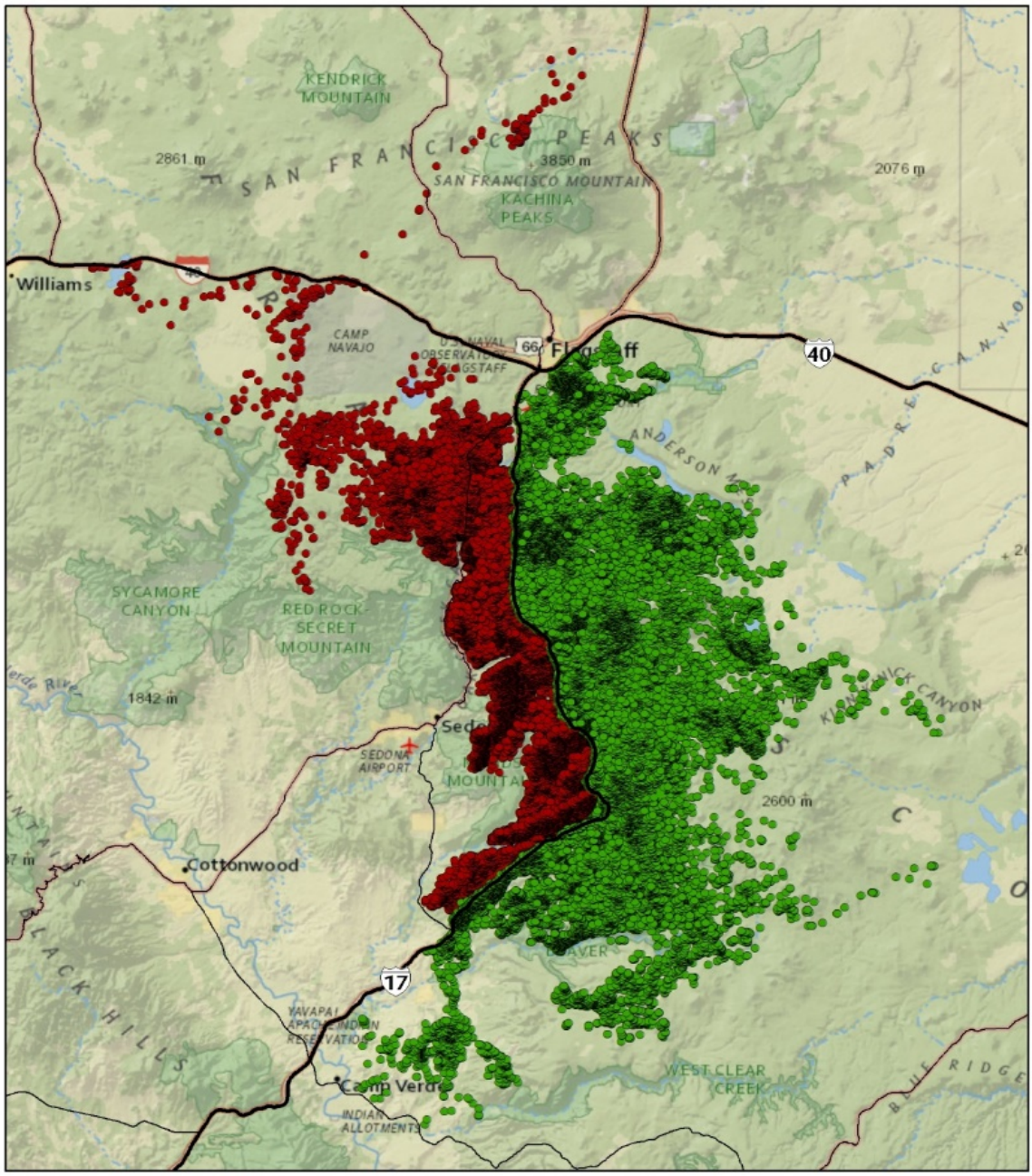
Map 2B & 2C

Recommendations for highway crossings in the Grand Canyon to Prescott Pronghorn Corridor Complex (pronghorn, mule deer, and elk)

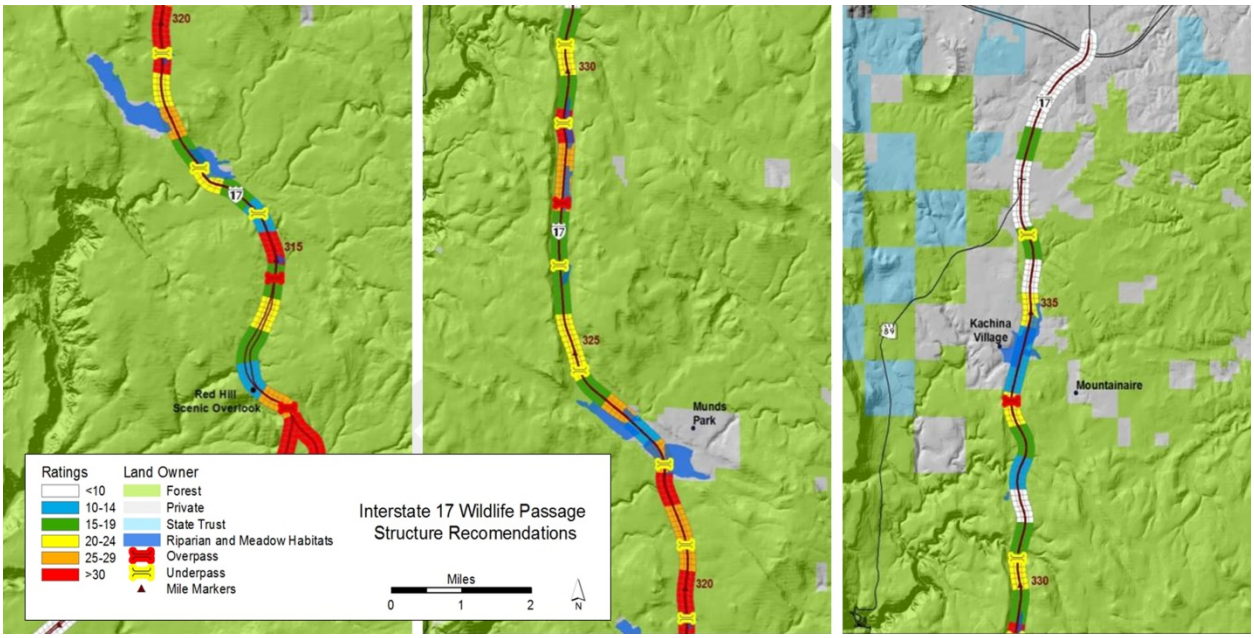




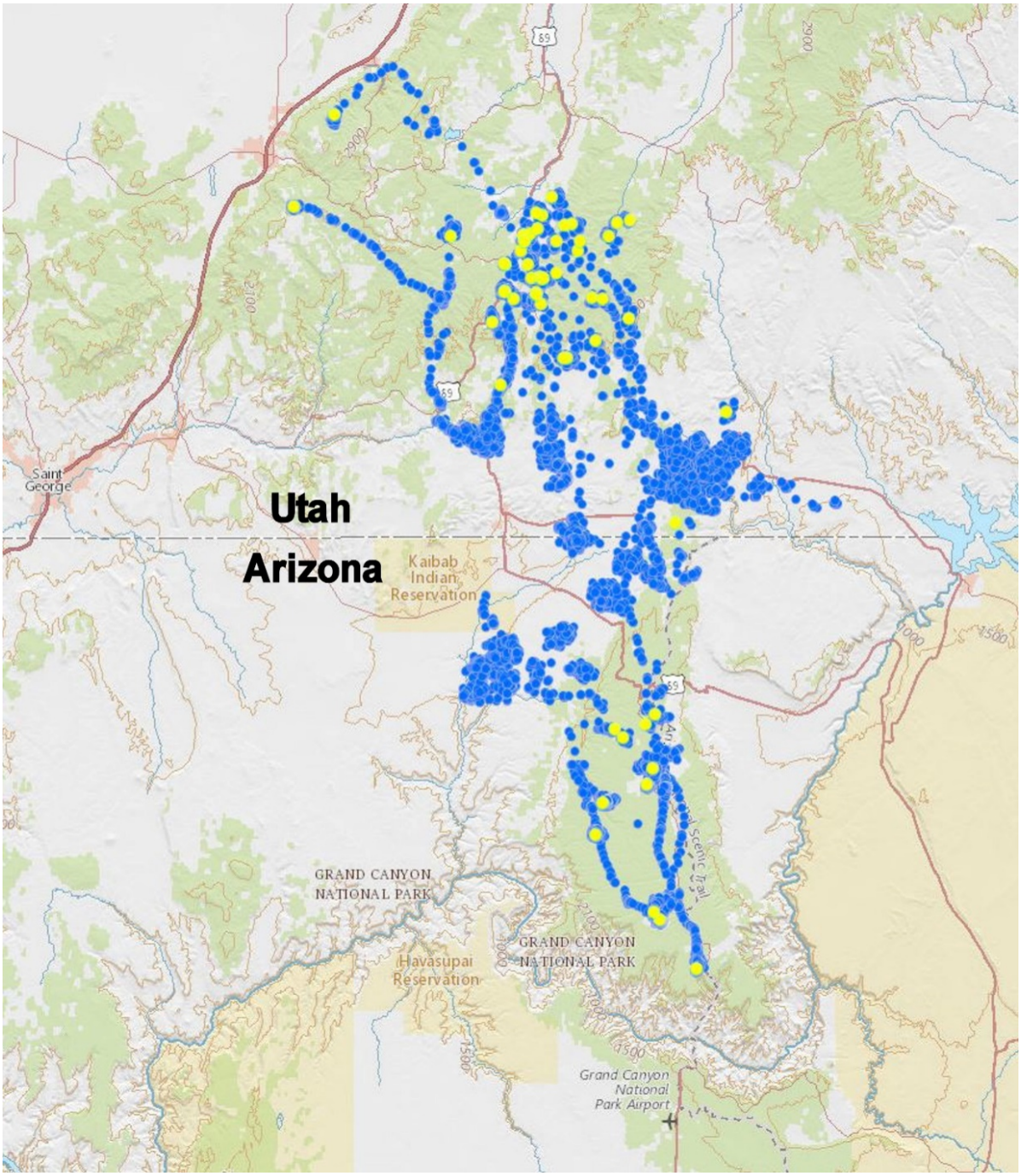
Map 3A – I-17 from Camp Verde to Flagstaff Corridor (Elk/mule deer)



Map 3B. Recommended highway crossings for I-17 from Camp Verde to Flagstaff Corridor (Elk/mule deer)



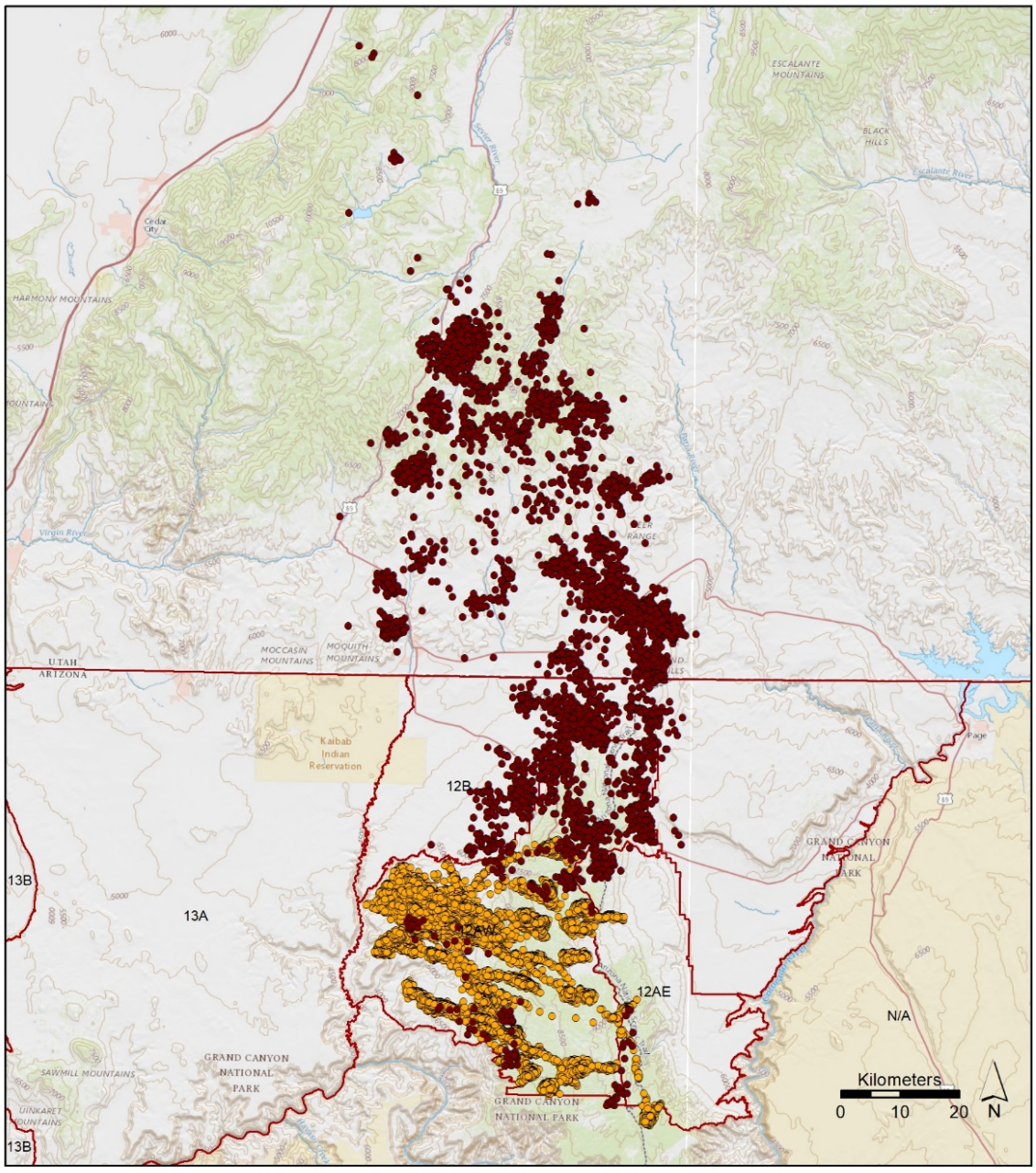
Map 4A -Paunsaugunt- Kaibab Plateau Corridor and Winter Range (Mule Deer)



Movement data from an ongoing collaborative study lead by Utah Division of Wildlife Resources including mule deer GPS-collared in Arizona and Utah showing movement between the Kaibab Plateau (AZ) and the Paunsaugunt/Cedar City (UT) area (2017-18). Yellow locations are last locations as of 7/2/18.

Map 4B - Paunsaugunt- Kaibab Plateau Corridor and Winter Range (Mule Deer)

Movement data from the Kaibab-Paunsaugunt area from a small study using GPS collars (2012-13) and also an older study using VHS data (1994-97)



- (VHF) Utah/AZ Deer Project 1994 - 1997
- (GPS) Kaibab Deer 2012 - 2013
- AGFD GMU

Paunsagaunt Deer

VHF was collected 2x per week for 5 weeks spring and fall, then twice a month rest of the year. GPS locations taken year round on a 5 hour / 7 hour schedule