

## CENTRAL ARIZONA GRASSLAND CONSERVATION STRATEGY



Arizona Game and Fish Department  
Bureau of Land Management  
Prescott National Forest  
Tonto National Forest  
Natural Resource Conservation Service

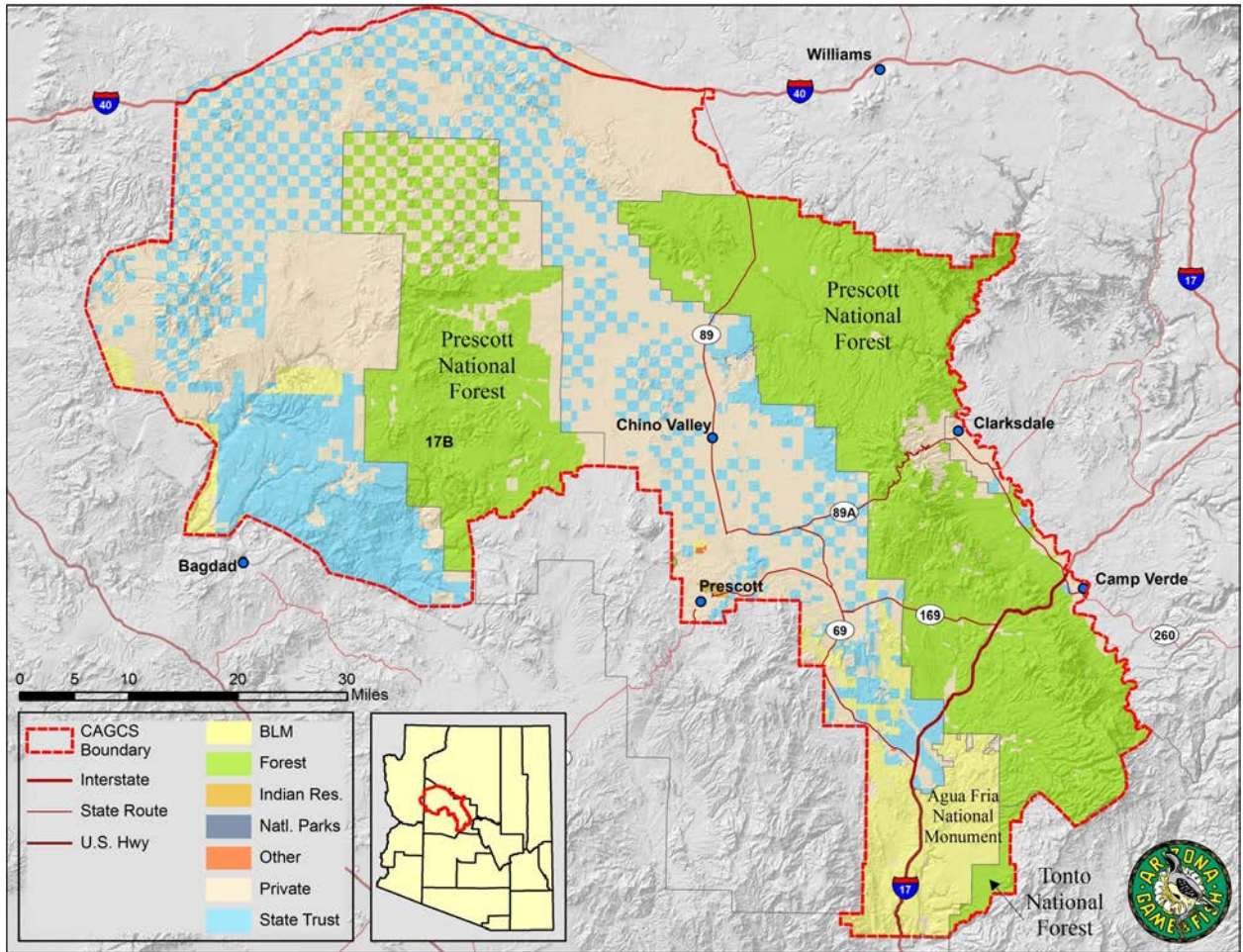


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## ACKNOWLEDGEMENTS

The Central Arizona Grassland Conservation Strategy was originally developed by an interagency Team of representatives from the signatory agencies and signed in 2010. Tom Finley and Larry Bright provided team leadership under an interagency team charter. The Team's mission was to develop an integrated management strategy for conservation and restoration of grassland ecosystems and associated pronghorn populations in central Arizona. Special Thanks to Pamela Jarnecke, Prescott National Forest, for editorial review and compilation of the final document content and format in 2010. Thanks to the Natural Resource Conservation Service for joining the Implementation Team in 2013. Additional thanks to the 2014 Implementation Team for review and update of the document prior to public release.

## Central Arizona Grasslands Conservation Strategy Project Area



The project area map was developed to define the general area of interest as opposed to mapping only grasslands. The team understands that areas within the boundary may not be grassland or suitable pronghorn habitat.

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## **Introduction**

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The Central Arizona Grassland Conservation Strategy (CAGCS) was signed (2010) by three signatory agencies to the charter with complementary roles and responsibilities in managing historic grassland ecosystems and/or the wildlife species that inhabit them. The Bureau of Land Management (BLM) management emphasis within the Agua Fria National Monument (AFNM) is to conserve and restore diverse habitats, vegetative communities and corridors of connectivity to sustain a wide range of native species. The Arizona Game and Fish Department (AGFD) hold the public trust responsibility of managing the wildlife that inhabits these ecosystems. This includes but is not limited to gathering and managing wildlife data, and providing expertise in the implementation of management strategies.

A key grassland species with a high conservation and restoration priority for the AGFD is the American pronghorn antelope. Pronghorn are recognized as a “Priority Game Species” by the BLM.

The Forest Service (FS) in the Southwestern Region is operating under the “Central Priority” that emphasizes restoration of fire adapted ecosystems, of which grasslands are a major component. The Prescott National Forest (PNF) is in the final stages of revision for the Land and Resource Management Plan (LRMP) and the Tonto National Forest (TNF) has begun the revision process on the LRMP that will provide management direction on the PNF and TNF for the next decade or longer. In the PNF LRMP, pronghorn have been selected as a Management Indicator Species (MIS) for grassland ecosystems. In that capacity, they will act as an umbrella species, representative of a whole suite of species with related habitat needs, which rely upon grasslands for all or part of their life-cycles. As an umbrella species, it is assumed that if management actions initiated in grasslands will provide benefit to pronghorn, those same management actions will provide benefit to the other species that make up that suite of grassland wildlife species. It is also recognized that because each of the species that makes up this suite have differing ecological needs, implementation measures will not provide equal benefit to all of the species for which the MIS provides representation.

In an effort to ensure that implementation of the LRMP aligns with and supports the strategic plans of the AGFD and other key partner agencies and entities, the PNF has chartered a Strategic Action Planning Committee (SAPC) composed of representatives from partner agencies, NGO’s and decision-makers from Yavapai County and proximate municipalities. This group is tasked with prioritizing the PNF’s LRMP implementation efforts, to ensure that its own management objectives are met, while at the same time ensuring that those same efforts provide support for the strategic management objectives of key partner agencies and entities. The SAP and PNF have pledged support for, and placed a high priority on management actions that will support the goals and objectives set forth in the Central Arizona Grassland Conservation Strategy.

The Horseshoe Copper Creek Coordinated Resource Management Plan (CRMP) also addresses many issues related to grassland importance and maintenance. Development of the CRMP and CAGCS should utilize similar, if not the same practices including stakeholders and partners. Such activities will fall within LRMP direction for the Tonto and Prescott National Forests.

Pronghorn population estimates statewide continue to remain below target levels. Grassland habitats are threatened from a variety of factors in central Arizona. Several independent efforts to address pronghorn populations and habitats are ongoing. However, a single coordinated look at central Arizona's grasslands and associated pronghorn habitat is needed in order to gain maximum use of limited agency resources. This conservation strategy was developed to serve as an integrated management strategy for conservation and restoration of grassland ecosystems and associated pronghorn populations in central Arizona. Coordinated efforts like the CRMP in combination with the CAGCS will emphasize the importance of grassland habitats and pronghorn ensuring management activities complement each other to achieve improved grassland habitats.

## **Mission**

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The three agencies recognized that by working together, restoration of grassland ecosystems and the wildlife species that inhabit them can be maximized for the American public. Working with the Chino Winds and Triangle Natural Resource Conservation District and the Natural Resource Conservation Service, the mission of this effort is to develop an integrated management strategy for the conservation and restoration of grassland ecosystems and associated pronghorn populations in central Arizona. This strategy includes habitat assessment information, risk assessments to grassland ecosystems and pronghorn populations, management strategies and recommendations, and the use of an interdisciplinary approach for its development and implementation. This strategy should be viewed as a dynamic work in progress with an emphasis on ground level adaptive management.

The strategy encompasses an area generally defined: on the north, northwest, west, southwest by the Prescott National Forest and BLM lands, on the south by Black Canyon City, and on the east by the Verde Rim.

## **Background**

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### **Central Arizona Grasslands and their Status**

North America's central grasslands are considered one of the most threatened ecosystems on the continent and in the world (Gauthier et al. 2002). Conservation and sustainable use initiatives are becoming more strategic and comprehensive in nature, engaging multinational focus between the USA, Mexico, and Canada. It is estimated the Great Plains and desert grasslands once covered over 500 million acres stretching between

Canada, Mexico and the United States. Nearly 200 wildlife species were found to use this immense sea of grass in 11 different states (*parts of Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming*) within the United States (WAFWA 2011). The North American Commission for Environmental Cooperation (NA-CEC) and The Nature Conservancy (TNC) established a process to identify and map grassland priority conservation areas (GPCAs), one of several initiatives towards grassland conservation (CEC and TNC 2005) and part of a broader strategy to conserve North American biodiversity (*Strategic Plan for North American Cooperation in the Conservation of Biodiversity, CEC 2003*) and (*Continental Grasslands Conservation Strategy CEC 2003*). Several other national and trinational initiatives focus on the conservation of grasslands and associated species of concern including the North American Bird Conservation Initiative, The Nature Conservancy Prairie Wings Program, Alliance for Grassland Conservation, Partners in Flight, Duck's Unlimited Grasslands for Tomorrow, and World Wildlife Fund's Northern Great Plains ecoregional assessment and initiatives to name a few. Additionally, there are many efforts ongoing across the western states.

In 2004, the Western Association of Fish and Wildlife Agencies (WAFWA) recognized the need for a conservation focus on grassland ecosystems because of past (agricultural conversion, infrastructure development, and urbanization) and current (invasive species, energy development, climate change and urban sprawl) impacts, and the under-representation of this ecosystem in conservation areas. WAFWA directed its Habitat and Nongame and Endangered Species Committees to use renewal of a Memorandum of Understanding (MOU) for black-tailed prairie dog conservation as a vehicle for beginning the transition toward an ecosystem conservation approach and to develop a cohesive, comprehensive prairie conservation strategy that integrates pertinent components of companion efforts for prairie dog, black-footed ferret, swift and kit fox, lesser prairie-chicken, mountain plover, burrowing owl, ferruginous hawk, Swainson's hawk, loggerhead shrike, and, as appropriate and feasible, other shrub and grassland species. This effort became known as the WAFWA Grassland Initiative (WGI); a west-wide, broad scale, multi-state cooperative approach which seeks investment of partners in a comprehensive conservation strategy with actions designed to work toward stabilizing and expanding grasslands while halting and reversing declines in wildlife species dependent on them. The mission of Western Grassland Initiative is to serve as the primary contributor to the implementation of conservation and management actions, through partnerships and cooperative efforts, resulting in improved species status, grassland habitats, and recreational opportunities for grassland dependent species across North America.

The concern with the ecological status and sustainability of Arizona's temperate grasslands has increased exponentially in recent years. The most comprehensive grassland assessment applicable to the CAGCS area of focus was conducted by The Nature Conservancy (Gori and Enquist 2003) for the Apache Highlands (APH) Ecoregion (U.S. and Mexico). Grasslands across the region were evaluated to characterize their condition, the extent of vegetation changes and identify the best remaining grasslands for restoration and conservation. TNC concludes that changes to

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grassland vegetation have been extensive, due mostly to shrub encroachment and invasion of non-native grasses. Further, grasslands are extremely vulnerable to development and most lack protective status.

Of the more significant findings in this report; most native grasslands, within the U.S. portion of the APH Ecoregion with low shrub cover (the highest quality rating) are either private (44.3%) or State lands (23.3%). High quality native grasslands are less abundant on federal ownership (BLM and USFS), totaling only 17.1%. However, there is a very high percentage of native grasslands with restoration potential in public ownership (USFS 21.6% and BLM 15.4%), approximately 2.5 million acres. These lands represent the greatest opportunity for conservation efforts that will provide lasting benefits to future generations and wildlife populations. Lastly, there is a significant portion of native grassland with restoration potential on State land (33.8%) that could be important if regional and statewide land use planning appropriated portions of these lands for conservation purpose.

In conclusion, there are several local, state, national and international initiatives that have implemented public/private partnerships to accomplish grassland conservation in Arizona. The High Plains Partnership (USFWS-Mountain-Prairie Region) is working towards conservation on private lands in Arizona. The Malapai Borderlands, a nonprofit organization, works towards conservation and restoration of habitat and species through grass banking, conservation easements, prescribed fire and outreach in southeastern Arizona and New Mexico. The Sonoita Valley Planning Partnership collaborates with the Sonoran Institute on grassland conservation within the Cienega Creek Watershed near Tucson. On a local level, the Conservation Implementation Strategy (CIS) being initiated through the combined efforts of the Triangle and Chino Winds Conservation Districts (NRCs) in Yavapai County will focus on landscape level, brush management practices, directly improving grassland habitat. Prescott National Forest is developing a Strategic Action Plan which will employ an Ecosystems Management Decision Support tool out of the University of Redlands.

Grasslands management and conservation interests are diverse across the CAGCS planning area. The largest local collaboration, indirectly related to grassland conservation through watershed management, includes The Verde River Basin Partnership and the Southeastern Grasslands Initiative. The Nature Conservancy has been the most active entity in pursuit of a comprehensive grassland habitat assessment to facilitate conservation plans; however, no significant partnerships or initiatives have been developed for our strategy area to implement landscape level grassland conservation and restoration strategies. The CAGCS is intended to be a first step towards landscape level conservation planning and implementation, and seeks to unite the many disparate agency and non-governmental organization grassland conservation efforts that are currently taking place in central Arizona's grasslands, with the hope that by unifying and consolidating such efforts, a synergy will be effected, resulting in maximized benefits to central Arizona's grasslands and pronghorn populations.



Several strategic plans applicable to Arizona and the signatory agencies include goals and objectives relevant to the conservation and restoration of grasslands and associated wildlife species (refer to Appendix A for specific list of policy and plans). The Comprehensive Wildlife Conservation Strategy (CWCS), now referred to as the Statewide Action Plan (SWAP): 2005-2015 identifies several conservation agreements and other planning documents related to wildlife species within the APH Ecoregion (AGFD 2006). A few of the broader and most relevant plans that include grassland habitats or species include: Arizona Partners in Flight Conservation Plan (Latta et al. 1999), the Arizona Bat Conservation Strategic Plan (Hinman and Snow, eds. 2003), Black-footed Ferret Recovery Plan (USFWS 1988), American peregrine falcon, Rocky Mountain and Southwest populations, Recovery Plan (USFWS & Rocky Mt/Southwestern Peregrine Falcon Recovery Team 1984), Draft Statewide Small Mammal Conservation Plan (AGFD), and the White-tailed prairie dog and Gunnison's prairie dog conservation strategy (O'Neill 2006).

### **Central Arizona Pronghorn Populations and Status**

Pronghorn antelope (*Antilocapra americana*) were once common throughout all grassland areas of northern and southern Arizona at elevations ranging from 1,000-8,000 feet. Unregulated market and subsistence hunting as well as wide spread overgrazing by livestock took their toll on pronghorn populations during the late 19<sup>th</sup> century as Arizona became settled. By 1907 Mearns reported "*the pronghorn antelope is already a rare animal in the region of the Southwest, where it ranged in the thousands 25 years ago.*"

Three subspecies of pronghorn occur in Arizona today. American pronghorn, the most abundant of the subspecies, are found mainly in the north-central portion of the state. Small, scattered herds of Chihuahuan pronghorn occur in southeastern Arizona and the endangered Sonoran pronghorn are found in southwestern Arizona. Sonoran pronghorn are not addressed in this document, but are addressed in a separate recovery plan for this federally endangered subspecies. Most pronghorn in Arizona are found between 3,000-7,000 feet elevation. Sometimes, northern herds occur as high as 10,000 feet during summer. This range in elevation encompasses a variety of grassland habitats ranging from desert grasslands to forest and mountain meadows. Pronghorn prefer flat, open grassland areas, but also use rolling or broken hills and mesa tops of less than 20 percent slope. They also use such diverse habitats as sparse deserts, woodlands, and open forests. Pronghorn home range estimates are quite large, and can vary from 20-40 mi<sup>2</sup>. The current statewide pronghorn population is estimated at 11,000 post-hunt adults, with 21,000 mi<sup>2</sup> of occupied habitat.

The Department's Pronghorn Antelope Management Goal is to maintain and, where possible, enhance pronghorn antelope populations at levels that provide diverse recreational opportunities, while avoiding adverse impacts to the species and its habitat. Specific objectives for pronghorn management include increasing the statewide population of adult pronghorn, maintaining an annual harvest of 500 or more, and providing recreational opportunity for 900 or more hunters per year at 4,000 or more hunter days per year; maintaining existing occupied habitat with emphasis on retention of

medium and high quality habitat, and restoring the historical range in Arizona by repopulating through translocations.

Goals, objectives and strategies outlined in this grassland conservation management strategy are intended to support and integrate with those identified in the aforementioned management plan.

The Department uses Game Management Units (Units) as boundaries for managing game populations; however, some populations move between Units. Within the central Arizona strategy boundary, there are 3 general areas with distinct local populations of pronghorn (described below). Some of these local populations function as a metapopulation with interchange through dispersing individuals. Most are distinct and have herds that interchange within, but there is no research or evidence to illustrate how they may interchange between other local populations. A few of these populations are very small and more isolated than others. Their long-term viability is most precarious due to numerous factors without intensive management strategies and actions. Maintaining local populations at high densities and protecting high quality habitats are critical to meeting Department management objectives.

Arizona has experienced tremendous human population growth over the past decade and current projections indicate growth will continue at a rate of 2-4% per year over the next 10 years (Arizona DES Population Projections). Beginning in the late 1980s, the Department expressed concern over the loss of high quality pronghorn habitat that was being eliminated at an alarming rate through urban sprawl and population expansion into rural areas. Throughout the 1990s, continued loss of habitat caused some local pronghorn populations to be drastically reduced or eliminated. An example is the Willow Lake herd was located within the city limits of Prescott and is no longer in existence. The loss of this herd may be directly attributed to increased urbanization and habitat fragmentation created by highways and housing developments. The Department realized this type of problem has the potential to increase and spread into other areas of the state. It became evident that there was a need to identify factors affecting pronghorn populations and develop a plan to address these issues and to begin a process for working on the most critical problems. In 2002, the Arizona Game and Fish Commission directed the Department to create plans for all pronghorn populations in the state.

Declining pronghorn populations in portions of Arizona continues to be a concern. The statewide pronghorn population estimate in 1987 was nearly 12,000 post-hunt adults; by 1999 this estimate declined to less than 8,000. The Department conducted a statewide evaluation of pronghorn habitat in 1995 (Ockenfels et al. 1996). In that analysis, the quality of pronghorn habitat was quantified and ranked according to a variety of parameters. Pronghorn occupied an estimated 21,000 mi<sup>2</sup> of habitat across the state in 1999. About 250 mi<sup>2</sup> of this land was classified as high quality habitat.

Causes of decline in pronghorn herds across Arizona are numerous, but generally consistent. Paramount to the persistence of any wildlife species is presence of quality habitat. Continued urban sprawl and associated highway construction has fragmented

and damaged quality pronghorn habitat (the latter continues to cause direct mortality via collision with vehicles). Grasslands, historically dependent upon predictable fire regimes, have been reduced in size by invasion of juniper and shrub species resulting from decades of fire suppression. Past livestock grazing and historic fencing practices have reduced habitat quality and created barriers that pronghorn cannot cross. Finally, persistent drought and predation has affected pronghorn populations to varying degrees statewide. The combination of these factors has led to a reduction in habitat availability and quality, a substantial decline in fawn recruitment, and a correlated increase in efficiency of pronghorn predators.

### **Area 1:** Units 17B, 19A and 19B Central Yavapai County and Verde Valley

This section describes administrative boundaries and pronghorn habitats in the Prescott, Prescott Valley, Chino Valley, and Paulden areas, collectively known as Central Yavapai County in north central Arizona. The planning unit is comprised of 3 Units: 17B, 19A, and 19B. Land status in the area includes private land (including local municipalities), Arizona State Trust Land (State Trust Land) managed by the Arizona State Land Department, and federal land managed by the Prescott National Forest (PNF) and the Bureau of Land Management (BLM). Major habitat types in the area include interior chaparral, Mohave desertscrub, Great Basin conifer woodland and desert scrub, pinyon-juniper woodland, and semi-desert grassland. The planning unit contains about 2,191 mi<sup>2</sup> of land. Of this, about 1,362 mi<sup>2</sup> is habitat occupied by pronghorn. Of pronghorn habitat ranked as high quality statewide, about 30% is contained in this planning unit. There are 75.5 mi<sup>2</sup> of high quality pronghorn habitat in Central Yavapai County and 372 mi<sup>2</sup> (Ockenfels et al. 1996).

The Central Yavapai County planning area supports one of the highest density pronghorn populations in the State. About 10–20% of the statewide pronghorn population can be found in this area where habitat is being actively managed for livestock operations. Cultivating relationships with ranchers and maintaining a cooperative dialogue is central to the overall success and future of pronghorn in this region.

#### Unit 17B

##### Management Objectives

- Maintain a population of 150-225 post-hunt adult pronghorn, annually harvesting 5 to 8 bucks.
- Work with landowners to ensure continued access to Unit 17B.
- Create and enhance grassland habitat and travel corridors by working with landowners and land management agencies.

This unit encompasses 671.6 mi<sup>2</sup>. The eastern boundary is formed by Williamson Valley Road from the junction of Camp Wood Road, south to Iron Springs Road in Prescott. The County highway between Prescott and Bagdad comprises the southern boundary, while Camp Wood Road from Bagdad to Williamson Valley Road encloses the rest of the Unit. Prescott and Bagdad are located at the southeastern and southwestern corners of the unit, respectively. The unit is composed of a mix of grassland, pinyon–juniper

woodland, chaparral, ponderosa pine–oak woodland, and Sonoran desert habitat types. Numerous rugged canyons and associated mesas, rolling hills, and flat open grassland characterize the terrain. Elevations vary from 1,800 to 6,466 feet.

The area is primarily comprised of mid elevation (4,620 foot average) open grassland mixed with sparse oak, algerita, pinyon, and juniper stands. A natural seep feeds a meandering wetland that provides water for pronghorn and other wildlife, and habitat for waterfowl. Well waters and dirt stock-tanks provide additional water sources. Most of the area is used as grazing land for livestock. One lightly traveled paved road (Fair Oaks Road) bisects this area. About 41 mi<sup>2</sup> (26,240 acres) of pronghorn habitat exists in the northeastern portion of Unit 17B. Most of this habitat is located on 2 ranches: the Long Meadow and Las Vegas. Las Vegas Ranch is comprised of a few sections of State Trust and PNF land, but most of the 28,880-acre ranch is privately owned. Long Meadow Ranch is situated immediately south of the Las Vegas. Recent sale of the Long Meadow has resulted in subdivision, and subsequent deterioration of pronghorn habitat. A significant portion of properties have been transformed into an Exurban landscape, where homes sit on small acreages, separated by woven wire and other wildlife impermeable fencing.

A limited amount of pronghorn habitat is also present on adjacent ranches in Unit 17B. The Bar U Bar Ranch lies directly south of the Long Meadow and provides a small amount of habitat. The Yolo is a large ranch located in northwestern Unit 17B, southwestern Unit 17A, and eastern Unit 18B. A small amount of habitat exists on this ranch but juniper encroachment compromises its' quality. Indian Rock Ranch contains pronghorn habitat, but much of this area is limited by lack of water and juniper invasion. Tank Creek Mesa, located on Indian Rock Ranch in south-central Unit 17B also contains pronghorn habitat. Much of this area is limited by lack of water and deteriorated habitat conditions due largely to shrub and tree encroachment.

Most pronghorn in Unit 17B are located primarily on deeded private land within the Las Vegas and Long Meadow ranches. These pronghorn move along north-south routes between Unit 17A and along west-east routes into Unit 19B. Continued development and the associated traffic volumes on Williamson Valley Road increasingly impact pronghorn movement patterns described above.

#### Unit 19A

The majority of pronghorn habitat in Unit 19A occurs on 6 ranches that comprise 172 mi<sup>2</sup> or 120,320 acres of land. The ranches are the Fletcher, Perkins, Wells, Deep Well, Granite Dells, and Fain. The Fletcher Ranch is located in the northeastern portion of Lonesome Valley north of Highway 89A. The ranch is composed of primarily public lands (State Trust and PNF) with some private. Several large pastures on the ranch were ranked as high quality pronghorn habitat, but yearlong water sources are limited in these pastures. Perkins Ranch, situated in the northern portion of Lonesome Valley, contains 9,600 acres of private and 1,300 acres of State Trust Land. Wells Ranch is located along the eastern edge of Lonesome Valley and is a checkerboard pattern of private (3,800 acres), and State Trust Land (2,500 acres). A portion of the Deep Well Ranch is located on the western edge of Lonesome Valley along highway 89. This ranch consists of 3,800

acres of private, and 1,900 acres of State Trust Land.

Granite Dells Ranch is located roughly in the center of Lonesome Valley and extends south across highway 89A to Glassford Hill. It consists of about 18,500 acres of private, and 4,500 acres of State Trust Land. This ranch contains extremely high quality pronghorn habitat. The Granite Dells Ranch changed ownership in early 2013 and the southern portion of the ranch is slated for commercial development (approximately 7,000 acres). Ownership does not have any current plans for development and has recently been partnering with AGFD on peripheral grassland habitat projects. Fain Ranch is located south of Highway 89A and east of Prescott Valley. This ranch consists of about 16,600 acres of privately owned and 11,520 acres of State Trust Land.

Approximately, 800 post-hunt adult pronghorn inhabit Unit 19A in 7 distinct subpopulations. Geographical features, urban developments, and Highways functionally isolate these subpopulations. The Orme population resides north of Cordes Junction, between Highway 69, I-69 and I-17. Much of the habitat occupied by this group consists of a mix of interior chaparral and grassland. Pure grassland habitat is present only in small pockets. The group is threatened by isolation from larger herd units and habitat to the east in Unit 21 by I-17; and from the Lonesome Valley area to the west by State Route 169 expansion. Invasion of chaparral into grassland habitats is also problematic for this herd. An additional 15-25 animals (Cherry subpopulation) reside north of Highway 169 and west of I-17 on PNF land; the herd similarly has limited connectivity with animals in the Verde Valley. Juniper encroachment also jeopardizes this group.

Continuing west, Fain Ranch is bisected north to south by Fain Road, a 4 lane, double fenced road connecting Highways 89A and 69. The highway design incorporates right-of-way fencing that pronghorn cannot maneuver. A Highway Bypass is also slated to be constructed through the center of the ranch in the next 10-20 years. Continued habitat fragmentation, an increase in road kills, and herd reduction will result. The expansion of Glassford Hill Road and Highway 89A west of Fain Ranch has already impacted a herd of approximately 50-70 pronghorn (the Prescott Valley Subpopulation) in the manner described above. This small herd has been extirpated due to loss of habitat from urban development.

The Antelope Hills subpopulation occupies the lower north slope of Mingus Mountain in the vicinity of the Phoenix Cement Plant. This small group is decreasing in numbers, and is currently part of a study to determine movement corridors and population interchange. Land status is private and Prescott National Forest. Pronghorn occupy a small area of habitat seasonally on Little Black Mesa. Pronghorn possibly use this area as a movement corridor between Lonesome Valley and areas north of the Verde River.

Glassford Hill is an extension of Granite Dells Ranch south of US Highway 89A. US Highway 89A to the north, Glassford Hill Road to the east, and Highway 69 to the south isolate pronghorn occupying the Glassford Hill area. Land status is State and private. Historically, as many as 175 pronghorn may have occupied this area, however the 2013 survey data indicated about only 30-50 pronghorn currently occupy the area. The area

was removed from the Unit 19A hunt structure in 2002. This area is also slated for commercial development in the next 5-10 years which will effectively extirpate this population. A pronghorn population in Lonesome Valley is confined by Highway 89A to the south, Mingus Mountain to the east, Highway 89 to the west, and the Verde River to the north. Land Status is predominately private and State. Pronghorn do occupy some PNF land to the north and east.

### Unit 19B

Unit 19B currently has severely limited access for sportsmen. The following ranches are all closed to public access: The Chino Grande (CV/CF) Ranch, the K-4 Ranch, the Campbell Ranch, the T-2 Ranch, and the Lobo Ranch. The latest ranch closure, the Chino Grande, prompted the Commission to zero out pronghorn tags for the 2011 hunts. The above mentioned ranches remain closed or allow limited access as of this date. The Deep Well Ranch manager currently allows sportsman foot access to hunt antelope. Archery hunters also access State Trust Land sections in and near the town of Chino Valley, but the habitat is severely fragmented by residential development.

This unit covers about 763 mi<sup>2</sup> and roughly forms a triangle in the planning unit with corners at Prescott, Seligman, and Ash Fork. The unit is composed of a mix of grassland and pinyon–juniper woodlands. Landforms include open plains, rolling hills, mesas, and buttes. Big Chino Valley, high desert grassland, dominates the center of the unit. The majority of this valley provides a historic representation of southern areas in the planning unit that are now urbanized. Water is well distributed throughout the unit, in the form of earthen stock tanks built to support livestock grazing operations. Elevations in the unit range from 4,360 to 7,168 feet. Most pronghorn habitat is found between 4,400 to 5,100 feet in elevation.

Most pronghorn habitat in Unit 19B occurs on 3 large ranches: The K-4, Chino Grande (CV/CF), and Campbell. The K-4 Ranch is located in Big Chino Valley and occupies the southwestern half of the unit. This ranch contains 83 mi<sup>2</sup> or about 25% of the pronghorn habitat within this unit. Land ownership is private, State Trust Land, and PNF. Chino Grande (CV/CF) Ranch is the northern portion of Big Chino Valley. Land ownership is 30,000 acres of private, and 20,000 acres of State Trust Lands. This ranch constitutes about 51 sections or 15% of the unit's pronghorn habitat. Subdivision of this ranch has been recently proposed. The Campbell Ranch is located in the north and northwestern portion of the unit, and is comprised of 55 sections of land. About 38 sections are considered pronghorn habitat, or about 11% of the unit's total. Twenty-two sections lie south of I-40 and are included in this report. I-40 effectively prevents north-south movement of pronghorn on the ranch.

The majority of historic pronghorn habitat that was south of the Atchison, Topeka, and Santa Fe Railroad is now residential housing. Isolated pronghorn habitat is present, but most is threatened by continued subdivision. Several ranches exist in this area and continue to provide some habitat for pronghorn. The Deep Well Ranch is semi-isolated from adjacent open grasslands due to its location between Prescott and Chino Valley proper. It contains about 20 sections or 6% of the pronghorn habitat within the unit.

Ownership is a mixture of private and State Trust Land. The Lobo Ranch is an open grassland ranch in Big Chino Valley. Although smaller than adjacent ranches, about 8 mi<sup>2</sup> contains important pronghorn browse that is required during drought. The T-2 Ranch is adjacent to the Lobo Ranch and contains pronghorn habitat that is similar in value; its' 12 sections contain Big Chino Wash, adjacent grasslands, and juniper woodlands.

Juniper Woods Estates is a former ranch located southwest of Ash Fork. After the ranch's private property was sold to developers, State Trust land was also converted to private ownership *via* land trade. Presently, its approximate 131 mi<sup>2</sup> are all private lands subdivided into 40 acre or less residential lots. This area contains about 50 sections of pronghorn habitat. Human occupancy varies with access, but significant damage to pronghorn habitat has resulted. The actual pronghorn use area was substantially reduced following creation of this subdivision. About 5 sections of open juniper woodland on the Kaibab National Forest between Juniper Woods Estates and State Route 89 remain suitable for pronghorn. Pronghorn use on these sections varies throughout the year, and is sometimes very low.

The Unit 19B pronghorn herd is distributed among 4 subunits: Big Chino Valley (including the Campbell Ranch), Juniper Woods Estates, Deep Well Ranch, and Willow Lake. The area north of I-40 (the Strip) is functionally isolated from other subunits by the interstate highway, and is not included in this discussion. The Big Chino Valley and Juniper Woods Estates subunits have no or unknown access for sportsmen. Based on the 2011 surveys, the pre-hunt pronghorn population for Unit 19B is 566 individuals. Distribution of pronghorn within each subunit is discussed below (subunits are listed in order of importance based on the percentage each contributes to the overall population).

The Big Chino Valley grassland extends northwest from Paulden to Picacho Butte and the Juniper Mountains. The area historically provided about 230 mi<sup>2</sup> of habitat. Rural residential housing now comprises 12 mi<sup>2</sup> around Paulden. Continued development on checker-boarded sections of private land significantly reduces pronghorn use on adjacent, undeveloped State Trust sections. Invasion of juniper trees into grassland habitat is also problematic. Although the Campbell Ranch lies north of this valley, it is included within the Big Chino analysis because of pronghorn use of a small grassland mesa that separates the 2. All ranches in the Big Chino Valley subunit are currently closed to public access. With the latest closure, the Chino Grande Ranch, the commission chose to zero out pronghorn tags for Unit 19B in 2011. The Department is in discussions with the Chino Grande Ranch regarding access.

The Juniper Woods Estates subunit has extensive pronghorn habitat (50 mi<sup>2</sup>) which extends south and west from Ash Fork, and gradually transitions to juniper woodlands. Over the past 22 years, scattered occupancy of 40-acre lots has greatly reduced pronghorn distribution and numbers. As such, limited management opportunities currently exist with this herd and development trends will likely continue.

The Deep Well Ranch subpopulation is threatened by habitat fragmentation. Presently, the ranch is semi-isolated from adjacent open grasslands by urban infrastructure in

Prescott, the Town of Chino Valley, and State Route 89. As of 2013, the Deep Well Ranch comprises the majority of pronghorn habitat accessible by sportsmen.

The Willow Lake herd represents a prime example of pronghorn isolation caused by urbanization. This declining subpopulation of <50 pronghorn persists within the Prescott city limits near the Willow Lake-Prescott Lakes area in the southern portion of the unit. The herd occupies habitat that is being rapidly converted to a residential housing-golf course development. Historical dispersal or migration from this area likely influenced the number of pronghorn in the area. However, construction of 2 roads (and associated fencing) more than 30 years ago created the first major barrier to movement on the northern border of the area. Continued urban development has reduced habitat from 10 mi<sup>2</sup> in 1990 to less than 2 mi<sup>2</sup> in 2000. Although the Willow Lake Park is city property, most of the remaining pronghorn habitat is private property that will be developed in the near future.

Pronghorn survey data has been collected in Unit 19B since 1961. Specific hunter harvest data for this unit are not available until 1989 because the area was historically combined with adjacent units.

Pre-hunt population estimates were compiled from annual hunt recommendations from 1988 to 2011. Pronghorn buck numbers have remained relatively stable during this time period, ranging from an estimated low of 125 in 1996 to a previous high of 290 in 1994. The doe population ranged more widely from 602 in 1996 to 1,083 in 1994. Population estimates generally coincide with survey data collected in this unit. The number of pronghorn surveyed was lowest in 1972, 1996, and 2000. Peaks occurred in survey numbers at 2 to 3 year intervals just prior to each low point. Annual hunter harvest in this unit is typically 50-60 animals. Hunt success for general seasons averages about 90%. Archery hunt success typically averages about 20-25% however this may drastically increase in drought conditions, e.g. 73% success in 2002. Fawn survival averages about 30 fawns per 100 does, however survival during the 1996 and 2002 droughts dropped to 2 and 4 fawns per 100 does, respectively.

#### *Specific Issues and Proposed Management Actions*

The prevailing threat to pronghorn populations in this planning unit is loss and degradation of available habitat to urban development associated with a rapidly expanding human population. Yavapai County is the fourth largest county in Arizona by population, following only Maricopa, Pima and Pinal counties. The town of Prescott Valley is the seventh largest growing incorporated area in the state, with 161.5% growth occurring between 1990 and 2000. Much of this growth has occurred in high-quality pronghorn habitat, and much more development is forecasted. Ancillary impacts to pronghorn are often common to many areas; however, others may be site specific. This section identifies threats common to multiple subpopulations, which were discussed in the introduction of this document. Threats and issues specific to the 14 subpopulations that occur in this planning unit are detailed in this section.

#### **Area 2: Unit's 6B, 8**

##### Unit 6B



A pronghorn telemetry project initiated in 1999 tracked the Garland Prairie herd in Units 6B and 8. A migration corridor linking Garland Prairie to Wagon Tire Flat skirts south and west of Bill Williams Mountain to access lowland (about 4,000 feet elevation) winter habitat along the west boundary of Unit 8. Telemetry data from a Unit 6B pronghorn indicate that the North Unit 6B (including Unit 11M pronghorn at Dry Lake) herd follows this migration route, often staging at Garland Prairie and/or Hat Ranch during the migration seasons.

The north herd in Unit 6B contains about 40 pronghorn, primarily using Rogers Lake, Mill Park-Yellow Flat, Fry Park, and Camp Navajo. Wildland Urban Interface fuel treatments on the Northern Arizona University Centennial Forest and Coconino National Forest Woody Ridge have reduced ponderosa pine stand basal area to increase pronghorn use of the boundary area of Units 6B and 11M (Flagstaff Well Field, Fisher Tank-Budweiser, Rogers Lake adjacent). The Woody Ridge project south to Fry Park, created a link between the meadows and allowed pronghorn to disperse east from Fry Park to cross State Route 89A into GMU 6A.

Pronghorn range in the south half of Unit 6B occupies juniper savanna and desert grassland habitat between Sedona and Cottonwood. Pronghorn activity centers include Wheatfield Flat, Duff Flat, Upper Sheepshead Valley, Windmill Ranch headquarters, and White Flat. The Sedona Wastewater treatment facility adjacent to the White Flat and Windmill HQ provide spray-irrigated acreage that buffers the worst effects of severe summer drought for this pronghorn herd unit. This herd population tends to vary from approximately 35 to 55 pronghorn. A Verde River crossing site on the west edge of Duff Flat allows potential gene exchange with the small Cement Plant pronghorn herd unit in Unit 19A. Both the Wheatfield-Windmill herd and the Cement Plant herd have been highly vulnerable to predation by mountain lions.

Beginning in 2010, Unit 6B featured an archery hunt with 10 tags in the northern portion of the Unit and 2 general permits in the southern portion. Harvest has averaged 3 bucks annually.

*Specific Concerns:*

- Juniper encroachment into grassland habitat in the Putney Flat (Unit 8) and Perkinsville area has impacted habitat quality.
  - Prescott and Kaibab National Forests have an effective juniper management strategy prioritizing treatment of travel ways to aid habitat connections.
- Threats to movement corridors.
  - Identify and enhance potential pronghorn movement corridors by removing juniper and ponderosa pine and modifying fences.
- Poor habitat–range conditions.
  - Work with the USFS and livestock operators to develop livestock rotation plans which leave vegetative cover in key pastures during the critical

- pronghorn fawning season.
- Work with the USFS and State Land Department to prioritize pronghorn habitat in their prescribed burn program.
- Urbanization of habitat
  - Work with local government planners to retain maximum pronghorn habitat capability in the Sheepshead Valley near Cottonwood. In 2009, the city of Cottonwood proposed an annexation-development plan for about 7 sections of State Trust land vital to the southern 6B pronghorn herd. This block of land is critical to future of this herd unit.
- Isolated populations may become non-viable due to reduced size, lack of genetic variability, and lack of emigration-immigration.
  - Determine potential pronghorn corridors between subpopulations and enhance them to encourage pronghorn movement.
  - Use transplanted pronghorn to bring genetic variability into isolated populations.

#### Unit 8

##### Specific Concerns:

- Continue pronghorn movement research (Units 6B, 8, and 19A) to identify herd movement corridors
- Reduce use of electric fences
- Modify fences along roads to facilitate pronghorn movement (i.e., wildlife specification fencing, goat bars, staging areas) and resist fencing along roads on migration corridors (Perkinsville Road)
- Modify fences along railroads to facilitate pronghorn movement
- Remove juniper from Rabbit Bill to Putney Flat and in the Perkinsville area
- Encourage wider utility corridors through juniper woodlands in pronghorn habitat
- Encourage predator control when appropriate

#### **Area 3: Unit 21 Agua Fria Grasslands**

The Unit 21 population is considered an isolated population due to the I-17 corridor and also by topography and the Verde River. I-17 separates pronghorn in Unit 21 from those in Unit 19A in the Orme Ranch area and in Unit 20A in the Cordes area. Further, a small area of suitable habitat occurs in the highway median just north of the Dugas-Orme Ranch interchange. It is unlikely that any modifications to highway fences can be accomplished to mitigate these impacts; increasing traffic volumes are a contributing factor to a significant interstate barrier effect. No bridge along this route appears large and open enough for pronghorn to pass under. The bridge at the Agua Fria River has some chance of a passage between Units 19A and 21, if the mesquite and catclaw thickets on both sides are cleared and the slopes lessened by grading. Until movement corridors are established across I-17, the Unit 21 herd will remain an isolated population. Additionally, it is essential to maintain open rangeland along the 2 most traveled dirt roads bisecting Unit 21 pronghorn habitat, Dugas and Bloody Basin roads, so pronghorn will continue to move across them. Fencing along these roads should exceed game

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standards with a bottom smooth wire greater than 46 cm above ground. The first 4 miles of the Dugas Road are paved; future expansion of the paved roadway should be discussed and evaluated to determine if additional barriers will be created.

In 2011, the Department acquired the Horseshoe Ranch, a key property comprising nearly half the suitable pronghorn habitat in the southern portion of the unit, along with some management influence over the 70,000 acre grazing allotments (Horseshoe and Copper Creek) associated with the ranch. A number of the management issues and opportunities will be addressed through the CAGCS and the CRMP. Three agencies (TNF, BLM and the Department) originally signed a Memorandum of Understanding (MOU) and are collaborating with NRCS and other cooperating stakeholders for the 2 allotments. An agreement is also in place with the BLM and TNF grazing permittee. The planning process is public and collaborative; designed to engage all interested publics-stakeholders in the identification of local resource needs-opportunities, assist agencies in the collection of resource data, assist in the development of alternatives that address these needs-opportunities, and to encourage participation on long-term resource working groups.

Numerous livestock fences occur in Unit 21 with some barbed-wire fences that do not currently meet wildlife standards. A GIS database and map of fences and natural barriers has been developed for Unit 21. Results from a fence quality inventory conducted in 2004–2005 were archived in that database along with updates since that time. Data from those archives indicated only 33% of fences within Unit 21 pronghorn habitat met wildlife standards (personal communication, D. Warnecke, AGFD). Within the last ten years, several sportsmen groups like the Arizona Mule Deer Foundation and the Arizona Antelope Foundation have been active in updating and improving fences. Improvement have included updating fences to meet game standards, removing or replacing the bottom barbed wire strands with a smooth wire 41–46 cm above ground. New fence posts have been added along allotment fences, as a minimum mitigation feature. Coordination occurs between the Prescott National Forest, permittee, land managers, and others to determine if any fences can be removed and still maintain adequate livestock control. Fences along the movement corridors between north and south core habitats should be priorities for removal. Fences continue to be improved through partnership efforts (most recently with funding from CAGCS, Arizona Mule Deer Foundation and the Arizona Antelope Foundation for fiscal year 2014).

Water developments are not adequate within Unit 21. Recent drought has impacted water availability at stock tanks, which hit a critical low the summer of 2012. Several water developments (stock tanks and wells) have been identified for repair and maintenance on Perry Mesa. Fencing around all stock tanks, especially those on Perry Mesa, needs to be reduced-removed modified to exceed game standards. Brush around some waters needs to be removed throughout the unit. A GIS layer of water sources was developed for Unit 21. This data should be updated with seasonal water availability, and it should be used as a tool for monitoring and maintaining water availability. Using buffers around waters with known availability will assist in locating areas that would benefit from new water developments and by identifying water developments that are in need of improvements.

Juniper, prickly pear, shrub form mesquite, and catclaw have invaded many grassland areas. Shrub encroachment within movement corridors between the northern and southern portions of high quality habitat in Unit 21 have reduced visibility and make them less suitable for pronghorn movement. This is of major concern and negatively affecting pronghorn habitat quality in Unit 21. The 2005 Cave Creek Complex Fire burned approximately 248,300 acres through most of Unit 21. The fire greatly reduced encroachment of juniper, prickly pear, and mesquite through much of the area. As a result the Tonto Forest has not conducted prescribed burns as frequently as in the past. Natural fire return intervals are a key consideration for prescribed fire. Prescribed fire has been one of the primary tools the Tonto Forest has used to maintain grassland and plant diversity in the area. Since 2002, there has been an interagency effort to cut and burn juniper trees across ~5800 acres east of Cordes Junction within movement corridors and mesa tops to reduce tree densities and increase openness of movement corridors. Tree thinning and prescribed fire is a practical control for juniper but catclaw and mesquite are not effectively root-killed with these methods. Herbicides may be necessary to thin catclaw and mesquite dominated grasslands. Cabling, chaining, and pushing may thin numbers, particularly if prescribed fire follows the initial treatment. Efforts to apply experimental treatments outlined within the CAGCS are discussed and proposed as part of the proposed PNF Agua Fria Grasslands Improvement Project, the Healthy Lands Initiative through BLM and associated Resource Management Plans and the Natural Resource Conservation Service, Conservation District Strategic Plan. In addition, Habitat Partnership Committee projects continue to contribute to the acres being treated.

Mesa tops in Unit 21 are dominated by tobosa grasslands found on deep, cobble, silt clay loam soils. These soils typically support low plant species diversity. However, there are intrusions of alternate soil types adjacent and within these mesas that support higher plant species diversity. These factors have contributed to increases of exotic annuals, snakeweed, and prickly pear across these semi-desert grasslands. Most notable in recent years is the expansion of *Avena fatua* (California oatgrass) and *Brassica Nigra* (Black mustard) as well as several other non-native invasive weed and grass species, from the I-17 corridor east across Black Mesa and the Agua Fria River canyon onto Perry Mesa. Application of prescribed fire concurrent with a few occurrences of lightning caused wildfire, combined with ongoing drought resulted in significant reductions of native grass and forb cover across several portions of Perry Mesa and set the stage for the non-native invasive species to take hold, despite no livestock grazing in the area between 2006-2011. Black Mesa has been highly impacted by these factors over past decade; current ecological conditions are highly departed from semi-desert native grassland. Precipitation patterns in recent years have favored cool season annuals with higher winter precipitation levels, and lower than average monsoon precipitation which is critical for native warm season grasses.

Unit 21 is near the Phoenix metropolx, and considerable recreational traffic occurs during all but the summer months. Major access routes include Bloody Basin Road, Dugas Road, and Forest Road 677 (segments of the Great Western Trail). Visitation and commercial tours are expected to increase on the Perry Mesa and Black Mesa pronghorn habitats as a result of future archaeological interpretative development within the Agua

Fria National Monument (about 40% of the Unit 21 pronghorn habitat is within the monument). Vehicular access in the north on Dugas Road is expected to increase as private lands along Sycamore Creek are subdivided and developed. Dugas Road also provides access to the Pine Mountain Wilderness.

Controlling access to key fawning areas during fawning season (March-May) may be needed to improve fawn survival. Closure of non-system roads and numerous OHV trails may be required to protect and maintain pronghorn habitat. The Agua Fria National Monument Resource Management Plan (BLM 2010) addresses these issues through management actions including seasonal use restrictions, vehicle type and speed restrictions, rerouting and closure, and/or suitable road impact mitigation. In addition, the CRMP addresses actions and adaptive management strategies.

Cordes Junction development has resulted in the loss of habitat for pronghorn in Unit 21. Further, it has affected seasonal movements between East Pasture and Black Mesa. Continued clearing of the gas line easement just east of I-17 may mitigate some of the impact. The potential for development of private lands along Sycamore Creek and the Agua Fria River is increasing. Private land along Sycamore Creek was targeted for development in 2005; however, the water needed for the proposed housing development was not available. Developer plans are still pending for a housing project at a smaller scale that could increase the recreational demand on the surrounding habitat. Development of private land inholdings within USFS and BLM lands have the potential to fragment core habitats in the north and south and negatively affect pronghorn movement corridors between them. The most critical issues for pronghorn in this unit are to maintain habitat connectivity between north and south ranges, protect or improve habitat quality and quantity, and minimize private land development. Conservation efforts should target these private lands to minimize development using land use planning, acquisition, or conservation easement tools.

## **Value Statement**

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A proper functioning grassland ecosystem provides values to the public that can be classified as recreational, aesthetic, educational, biological, social and economic/commercial. Regal grassland species like pronghorn have also come to symbolize the link between the pioneering spirit of early settlers and present day westerners need for open space and majestic views. In addition to pronghorn, a diverse assemblage of grassland species can be found on the open plains. These include many species of upland birds, which are enjoyed by recreational birders and hunters alike. While not as easily observed, small mammals and reptiles are also key residents of these grasslands. Healthy grasslands also provide forage that helps support the livestock industry and ground cover that contributes to proper functioning watershed conditions. Based on the immeasurable value of central Arizona's grasslands, our purpose is to maintain/improve/manage this unique habitat in both quality and quantity for future generations. Desert grasslands may eventually change into pinyon-juniper stands with a lack of fire. Optimum grasslands tend to have a wide diversity of vegetation

communities and cover types. They are typically a mosaic of forbs/grass, grass/brush, brush/trees, and tree dominated often with bare soil patches. Springs and intermittent creeks provide riparian habitats and water sources to support many aquatic species. Thus, grasslands provide habitats for a wide range of wildlife and fish species.

## **Risks Statement**

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Options for the management of central Arizona's grasslands and associated species such as pronghorn are limited to the risks factors under our control. While factors such as drought and disease will always exist, they will have less impact on healthy, viable populations. As land management agencies, stakeholders and land stewards, our primary focus should be to maintain vast areas of contiguous grassland habitat that meets the biological requirements necessary to sustain viable pronghorn populations. Where suitable, we should strive to improve habitat conditions and ecological functions in areas that have been degraded or altered by previous land management practices. Improved management along with habitat restoration efforts should result in future enhanced pronghorn habitat conditions, sustainability of pronghorn populations and an increase in wildlife based recreational opportunities.

Risks to central Arizona grasslands and pronghorn herds are numerous, and the interrelationships between risks are complex. However, the critical elements that are paramount to the persistence of Arizona's native grasslands and the wildlife they support can be generally summarized into the following 3 categories: habitat quality, habitat quantity, and connectivity. Therefore, minimizing or mitigating risks to these critical elements is the primary focus of this cooperative planning effort. Strategies and objectives for achieving these goals will be covered in the following section, but a brief synopsis of the risks to these 3 critical elements will provide a better understanding for the rationale behind planning objectives.

Habitat quality can be difficult to assess because grasslands are complex ecosystems that vary both spatially and temporally based on site characteristics and climactic conditions. Forage quality and quantity are vital to maintaining or increasing pronghorn populations and other wildlife. Forage is a component of habitat quality, and optimum forage conditions are a function of composition (grass/forb/shrub), species diversity, precipitation and inter/intraspecific competition when forage is poor.

Furthermore, historical land uses such as domesticated livestock grazing, fire suppression, and agriculture have altered grasslands in many areas. These practices have led to declines in herbaceous cover and species diversity, and increased encroachment of woody species. The continued spread of invasive, nonnative species is also threatening native grasslands.

The alteration of natural fire cycles and livestock grazing can have combined effects in many areas. Over utilization by livestock can reduce fine fuels to levels that are not sufficient to "carry" a fire. Additionally, fire suppression and exclusion have been a

standard land use practice in many grassland ecosystems that were historically maintained by natural fires associated with the summer monsoons. Without periodic fires to kill small trees and shrubs, species such as mesquite and juniper have increased and altered native grasslands. The reduction of herbaceous cover has also been linked to accelerated erosion, which can have negative hydrologic impacts to watersheds. These factors, along with recent (20 year) drought have had a huge impact on the overall decline of habitat.

While all the aforementioned factors contribute to the reduction of habitat quality, they also simultaneously reduce the quantity of available habitat. As grasslands become dominated by woody vegetation and lose their native species diversity, they can become unsuitable for pronghorn and other grassland obligate species. The reduction in habitat quality is only compounded by the fact that many large parcels of privately owned grasslands are being lost to development and urban sprawl.

The direct effects of development and urban sprawl are twofold. Not only is the quantity of suitable habitat being reduced, the connectivity between suitable habitat is being severed. Connectivity is lost as habitat quality is diminished, suitable habitat is reduced creating isolated areas and genetically bottlenecked populations are occurring impacting those isolated sub populations. As a result of this loss of connectivity, the viability of small disconnected/disrupted pronghorn populations is questionable. Populations are also impacted by the loss of connectivity in movement corridors lost or altered by habitat fragmentation.

**The following were specifically identified and agreed upon by the signatory agencies as threats:**

The productivity, diversity, and species richness of native grasslands are threatened by competition from noxious and invasive weeds/grasses. Productivity is threatened by other factors including drought, soil erosion, fire suppression, and improper livestock management practices. Healthy native grasslands are more productive and resilient to natural climatic stressors such as prolonged drought.

Factors that create fragmentation of pronghorn populations can threaten the long-term sustainability or viability of populations. The threats include genetic bottleneck (lack of gene transfer), recruitment and production.

The direct and indirect effects of recreation cause habitat degradation/deterioration and disturb wildlife populations. Disturbance disrupts breeding, feeding, fawning, habitat distribution, movement patterns and other species life history requirements.

Other risks to pronghorn that might not be avoidable regardless of mitigation measures exist. Broad scale management for these risks is not feasible for the purposes of conservation and restoration of grasslands and pronghorn populations.

Alteration of natural fire cycles, climatic changes, past land use and management

practices have led to encroachment of woody species into historical grassland areas.

Grasslands are a prime target for subdivision and suburban/rural development. This development reduces opportunities for habitat corridors linking adjacent mountain ranges, and prevents the restoration of important ecological process like fire that are critical in maintaining plant species diversity and preventing shrub encroachment in grasslands. (TNC Highlands 2003, pg. 2)

Urbanization and development can cause a reduction in the availability of free water leading to higher competition and concentration adjacent to water sources resulting in potential higher predation.

Climatic changes resulting in drought conditions continues to lead to decreased vegetation resulting in reduced fawn cover, predator and prey species habitat; also decreased forage quality and quantity. Decreased forage quality lowers recruitment and fawning rates. Decreased vegetation also causes increased soil erosion and degraded watershed conditions.

Alteration of natural fire regime has contributed to shrub invasion, alteration of the natural flora of the area, and has contributed to soil erosion. Key factors contributing to alteration of the natural fire regime has been wildfire suppression, and inadequate fine fuels due to drought or grazing to carry periodic fires. A factor contributing to wildfire suppression includes wild land encroachment by urban and other development that creates a need to protect these properties from fire. Effects to wildlife have been loss of pronghorn fawn hiding cover, loss of ground bird nesting cover, and conversion from perennial grasses to non-native annual grasses and forbs. The lack of fire has also created older seral communities and a loss of plant biodiversity and the early seral communities.

A key impediment to growth of pronghorn and other grassland wildlife populations can be predation given the other habitat components are present that can support the increased numbers of pronghorn. Key pronghorn predators include coyotes and mountain lions. Illegal killing of pronghorn by humans (poaching) can also be considered an unregulated type of predation. The impacts of predation are complicated by other factors such as abundance and distribution of fawn hiding cover, the lack of which can increase the success of predators in detecting fawns and the abundance and availability of other prey species. Impediments to escape, such as fences, can also contribute to higher rates of predation. Excessive cover for stalking predators is increased with shrub encroachment into grassland areas. Excessive cover near water sources can also make it easier for predators to ambush pronghorn. Conversely, lack of cover for ground nesting birds can also increase predation on nests.

Free movements of pronghorn are restricted by a wide variety of barriers. These barriers have isolated and fragmented groups of pronghorn and inhibit genetic exchange, transportation infrastructure bisecting movement corridors creating impediments, repopulation of areas, and also cause or contribute to direct mortality (such as road kill



and fence entanglement). Barriers to movement can also contribute to predation. Key issues in this area fall into three general categories: loss of travel corridors, fences, and highways.

Interspecific competition with cattle and other livestock can be a problem for pronghorn, in areas of where forage and fawn hiding cover are lacking. These conditions also affect other species of grassland dependent wildlife. In semi-desert grassland where rainfall may be inconsistent, the amount of plant matter available to ungulates is a major limiting factor. Generally, cattle and pronghorn prefer different types of plants, however in dry conditions; the diets of these animals will overlap more. The overall carrying capacity of the land can be compromised by an overabundance of any one species of ungulate.

With projected increases human population, urban sprawl and fragmentation are likely to continue to impact grassland habitat. Relationships with the ranching community take on greater significance and importance. Facilitating projects and practices that are of mutual benefit to ranch resources and habitat may help allay development into pristine grassland environments and compliment the ranching culture that is often our best partner in sustaining populations of grassland dependent species.

Often, issues and problems related to administrative and process issues are impediments to proper resource management. Resource management objectives are based on what the public wants or desires, and this comes down to the resource management agency through a political process. Wildlife populations are managed by the state wildlife agency, but the wildlife habitat managed by land management agencies, both State and Federal other, often federal agencies. This division of management responsibility tends to lead to a lack of interagency coordination or collaboration. Administrative paperwork necessary to comply with NEPA, ESA and other laws often have to be incorporated into the project planning well ahead of implementation on the ground.

Decisions regarding population management, recreational hunting structure, and population objectives may conflict with other objectives and issues other than maximizing the number of animals on the landscape. The needs and desires of the public contribute to wildlife management objectives. Providing hunting opportunity, different types of hunts and meeting herd composition objectives also play a big role in hunt structure. Inadequate or ineffective regulations can all affect wildlife populations.

Inadequate hiding cover may be a significant contributor mortality involving pronghorn fawns, ground nesting grassland birds as well as other grassland species requiring cover from predators. Drought, fire, and grazing intensity/timing can significantly decrease hiding cover. Lack of hiding cover is less important in drought years when fawn mortality is directly related to the lack of forage production for utilization by lactating does.

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## **Goals, Strategies, Objectives and Actions**

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This document provides management options for agencies, private landowners and other stakeholders. The management options are tiered as goals, strategies, objectives, and tactics listed below in relational order. For the purposes of this document a goal is a broad primary outcome, a strategy is the approach taken to achieve the goal, an objective is the measurable step taken to achieve a strategy and an action is the tool used in pursuing an objective associated with a strategy. Subsequent implementation efforts would focus on working towards the goals in this document using strategic approaches by accomplishing measurable objectives through implementing actions. The following Goals (**G**), strategies (**S**), objectives (**O**) and actions (**A**) were developed in alignment with various agency plans, related conservation plans and other landscape scale plans.

### **G – Improve health of grassland ecosystems**

#### **S - Restore and maintain native grassland ecosystems.**

- O - Increase collaborative relationships / opportunities towards conservation goals**
  - A - Explore joint funded wildlife/habitat cooperative land use planning positions with County/Municipal governments**
  - A – Develop relationships with nongovernmental organizations to facilitate collaborative efforts and common goals**
  - A - Establish relationship with ASLD to work towards conservation goals**
  - A- Develop with stakeholder’s management agreements, conservation easements, acquisitions, land exchanges, revolving land purchases, grass banks, and habitat improvement projects**
  - A - Develop grassland education outreach for the public and elected officials**
  - A - Develop community based goal setting and ecosystem management planning**
  - A - Develop collaborative research**
  - A - Integrate strategy with county planning efforts**
  - A - Develop conservation tax incentives**
  - A – Partner with ranches on planning and varied support strategies**
  - A - Work with landowners to develop environmental credits**
  - A - Develop demonstration projects for sustainable ranching**
  - A – Seek support from the Governor’s Natural Resource Advisory Council**
  - A – Develop and implement a public process to engage those interested and develop process for identified key stakeholders to have a seat at the table for information sharing and informing decisions**
- O - Improve grassland species diversity; reduce cactus, shrub, and tree encroachment**
  - A - Mechanical thinning (Agra-axe, chainsaws, brush crusher, brush shredding, chaining)**
  - A - Prescribed Fire**
  - A - Develop site specific treatment priorities and methods**
  - A - Reseeding (Imprinting, Harrowing, Drilling, Mulching, Hydroseeding)**
  - A- Identify where cover/forage are no longer adequate utilizing land management**
  - A -Agency and other monitoring and assessments; evaluate and identify where improvement is needed.**
- O - Eradicate or control noxious / invasive species**
  - A- Integrate treatments with the Southwest Weed Management Council maps**

- A - Collaborate with AZ Volunteer Noxious Weed Invasive Plant Management organizations to implement treatments in priority areas
- A - Integrate fire management plans with noxious invasive species management Strategies
- A - Work with the land management agencies on invasive species management plans
- - Utilize prescribed fire to restore grassland ecosystem processes
  - A - Incorporate Wild land Fire Use into appropriate land use plans
  - A - Identify specific areas appropriate for wildland fire use and integrate with regional fire plans (i.e. SW Strategy...)
  - A - Develop prescribed fire plans that integrate between administrative boundaries
  - A - Conduct prescribed burn monitoring and research (pre/post burn vegetative composition and cover evaluations)
  - A - Develop integrated fire restoration management plans with Arizona State Trust Lands and private lands
- - Coordinate with agencies and stakeholders to protect and maintain native grassland characteristics and wildlife habitat requirements (cover and forage)
  - A - Develop drought mitigation/conservation measures (including FS R3 Regional Drought guidelines for reference)
  - A - Develop, improve and enhance relations with permit and livestock operators
  - A - Review federal – state – county lands actions and develop mitigation for pronghorn and grassland conservation: allotment management plans (AMP), annual operating instructions (AOI), Land Use planning, Forest Plan revisions, land exchanges or acquisitions, fuels reduction and other land use actions
  - A - Explore grass banking initiatives with land owners and ranchers.
- - Develop recommendations to minimize or improve habitat fragmentation as a result of transportation and infrastructure development
  - A - Minimize OHV damage – Make recommendations for travel management plans for public lands.
  - A - Railway barriers – identify and evaluate for recommending mitigation
  - A - Fence setbacks along highways – identify and evaluate for recommendations
  - A – Coordinate with federal, state and county transportation planners to avoid future transportation development impacts to habitat connectivity and develop appropriate mitigation.
  - A – Retrofit transportation infrastructure for wildlife crossings – identify and evaluate for recommendations.
- - Research
  - A- Research projects for grasslands (urban growth, woody plant encroachment, habitat fragmentation, degradation and conversion, and solutions, and restoration techniques)
  - A- Research projects for noxious/invasive species control and treatments.

**G - Improve populations of wildlife associated with grasslands**

**S - Maintain self-sustaining pronghorn populations and other grassland obligate**

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**species in central Arizona**

- O** - Increase collaborative relationships / opportunities towards conservation goals
  - A**- Initiate adopt a ranch partnerships
  - A**- Continue and seek local HPC involvement and support
  - A** - Develop involvement with other NGOs such as Audubon, Friends of AF.
  - A** - Build relationships with major land owners for interest and opportunity for developing conservation easements and other programs for conservation
  - A** - Collaborate with other grassland conservation initiatives/groups to promote and increase visibility of conservation efforts and potential funding
  - A** - promote partnerships on acquisition and management of high priority lands for conservation
- O** - Maintain and/or develop adequate water sources within suitable pronghorn habitat
  - A** - Assess and spatially represent wildlife waters, livestock watering improvements (troughs, windmills, stock tanks) and natural perennial water (springs and streams)
  - A** - Conduct water distribution analyses; identify availability shortfalls, identify distribution problems with overabundance; collaborate on optimum distribution and abundance with livestock operations considering political and biological aspects
  - A** - Reduce predator cover in the immediate vicinity of important water sources and set fences back
  - A** - Identify loss of waters due to habitat fragmentation and movement barriers, recommend mitigation to retain access or replace/relocate waters with a goal of no net loss
- O** - Maintain or restore habitat connectivity
  - A** - Identify movement corridors, barriers and specific restoration actions
  - A** - Identify highway barriers and specific locations for crossing structures, design mitigation facilities with ADOT and FHWA, Decommission highways (ex. I-17 on black mesa)
  - A**- Reduce fence density and improve quality
  - A**- Inventory fence locations and designs and modify to meet wildlife standards
  - A** - Identify unoccupied historic pronghorn habitats for potential restoration and transplants, utilize and incorporate examples like the AFNM RMP and the PNF regarding stubble height for fawning cover
  - A** - Coordinate with ROW holders and ask for wider corridors to be cleared (powerlines, pipelines, etc.)
  - A** - Pronghorn crossing on any major roadways that bisect and fragment grassland habitat important to pronghorn
  - A** – Identify telemetry projects to inform
- O** - Maintain population management goals for growth, maintenance and harvest
  - A** - Promote the Departments OGT (Operation Game Thief) program in the project area to address issues with unlawful harvest of pronghorn
  - A** - Identify transplant priorities
  - A** - Hunting regulation options: Recommend harvest objectives and hunt structures in accordance with Commission-approved hunt guidelines.

Periodically evaluate hunt guidelines and recommend changes in best management practices in accordance with peer-reviewed scientific research.

- A - Predator control
- A - Mitigate recreational impacts (i.e. special recreation permits for guided tours, racing events, Archeological I&E developments that will increase visitation such as to the Squaw Creek Ruin on the south end of Perry Mesa (TNF)); by implementing seasonal closures for fawning / nursing areas to minimize disturbance impacts where necessary to sustain adequate fawn recruitment for population maintenance and growth
- A - Identify and map core habitat, fawning ground areas, nurseries, and corridors and use information to prioritize conservation management actions
- A - Integrate grazing management strategies that protect fawning habitat characteristics/requirements and minimize disturbance during critical neonate periods
- A - Implement special cowbird permits and eradication treatments
- A - Identify areas where interspecific competition (wild ungulates is negatively impacting pronghorn population trends and implement appropriate management strategies
- A - Educate people about the importance of keeping dogs away from fawns in the urban interface
- A - Monitor and measure recreational impacts on pronghorn distribution and habitat use for developing adaptive management actions
- O - Research
  - A - Measure physiological effect of tour operators on pronghorn (hot air balloons, other aircraft)

### **G – Implement the CAGCS**

**S - Develop a team that will be responsible for the implementation of the Central Arizona Grassland Conservation Strategy. This team will be known as the Central Arizona Grassland Implementation Team.**

- O - Create an interagency membership for this team with members from the Forest Service, BLM, NRCS and AGFD. The team will operate within the context of the original charter of the Central Arizona Grassland Conservation Strategy
  - A - Adjust the team members as needed over time to include other agencies, stakeholders, etc.
- O - Create an adaptive evaluation and planning process and monitor results annually or as needed
  - A - Develop cost effective monitoring (implementation, validation) strategies or methods: Vegetation – Soils –Wildlife
  - A - Identify current assessments and monitoring processes in place through the land management agencies and identify any gaps for evaluation of additional needs
  - A - Evaluate annually
- O - Pursue funding sources and funding strategies annually or as needed

- A - Pursue outsourcing opportunities to potentially fund NEPA
- A - To stretch dollars for NEPA we need to identify all similar work plans and develop programmatic NEPA within or adjacent to the CAGCS boundary area.
- A - Integrate CAGCS and projects into land management agency NEPA
- A - Agencies may consider co-funding a staff(s) to complete GIS analysis, NEPA, coordination and funding for these projects
- A - Pursue legislative appropriations for large-scale habitat projects
- O - Integrate special status / other species conservation plans and funding opportunities into priorities
- O - Develop triple bottom line philosophy: monetary, social, and stewardship
  - A - Develop annual reporting and planning protocol
- O - Develop a central geodatabase for project proposal, development (analysis and prioritization) and implementation monitoring
  - A - Incorporate data sets that facilitate evaluation of goals and objectives (acres of habitat restoration, conservation easements, transportation mitigations, etc.)
  - A - Establish and utilize a GIS data steward; explore cost share as expressed above.
  - A - Utilize and/or integrate various tools offered by other agencies and/or organizations for development of analysis and prioritization processes.
- O - Review and apply applicable habitat assessments and/or plans
- O - Evaluate CAGCS for opportunities for adaptive management
  - A - Review CAGCS annually for revision considerations

## **Management Priorities**

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The Project Proposal Evaluation (Appendix A) is intended to serve as a documentation process for evaluating a single proposal and assigning a priority assessment. It is designed to be used by an interagency implementation team, although project proponents should become familiar with the evaluation and use it to help develop their proposals. The evaluation would be used to assess a priority of a proposal with others to assist in making informed decisions about project priorities for an identified time period. The prioritization would be based on the completion of identified components of the proposal. Overall, project priorities should emphasize landscape level goals and objectives; as opposed to small piece-meal projects that are not part of a landscape level strategic plan.

There may be exceptions to using this type of evaluation. Wide reaching events, issues, and opportunities may arise that may take precedent over other priorities.

Some projects may be implemented outside of the Project Proposal Evaluation team process. These projects may be agency priorities for other reasons, but also fulfill the goals and objectives of this strategy. An example may be a Wildland/Urban Interface project that thins junipers on grasslands. However, the matrix can be used when a decision maker has to ask the question, "How do we prioritize this proposal to meet goals

and objectives for grassland or pronghorn conservation in the Central Arizona strategy area”?

## **Implementation Processes**

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The CAGCS is meant to allow the sponsor agencies to, with agility, take bold steps to conserve/improve grassland habitats and ensure the sustainability of grassland obligate species, particularly pronghorn. The vision of the sponsor agencies is the long-term sustainability of grassland habitat and address long-term land management to include urban and rural growth and development.

The success of the CAGCS depends on the effective distribution and incorporation by sponsor agencies, and key stakeholders, the implementation by the sponsor agencies and a commitment of support and follows through by the sponsor agencies, along with public support and key stakeholder commitments.

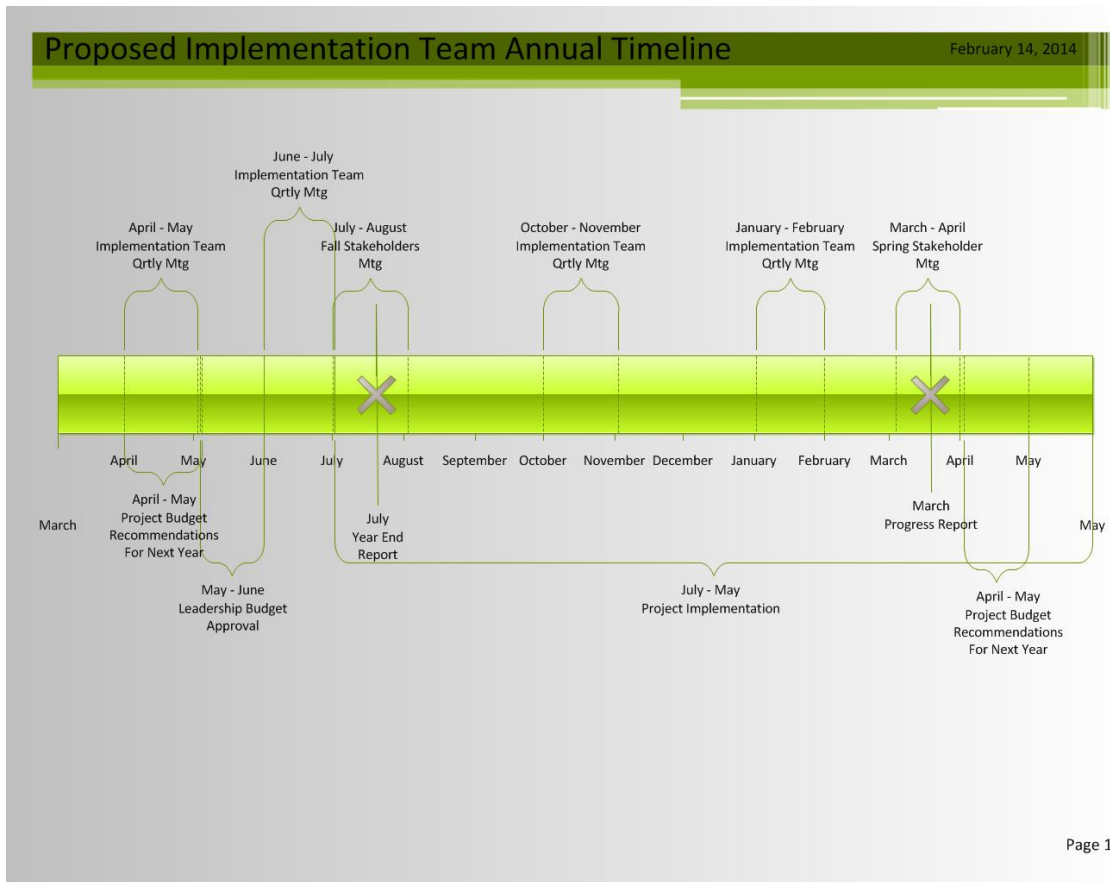
The primary implementation of the CAGCS is coordinated by an interagency team known as the Implementation Team. The team meets no less than bi-annually (or as agreed upon by the sponsors) to:

- Update the geodatabase to evaluate progress towards the goals, strategies, objectives and actions
- Include additional GIS analysis and incorporation of new data as needed
- Identify new projects and funding opportunities
- Prioritize projects
- Incorporate prioritized projects into the Team's annual work plan that will be updated and submitted to the Team sponsors
- Review/update the CAGCS and the geodatabase to ensure that it is meeting the needs of the sponsor agencies and providing an agile approach to resource conservation

The team provides a progress report to the sponsors at the conclusion of each meeting. Project proponents provide progress updates on the projects listed in the annual work plan. Agency sponsors are responsible for incorporating the team work plans into agency priorities, strategic planning and budgets.

The team generally agreed that the need for project evaluation and monitoring was highly variable. There will likely be opportunities for scientifically meaningful monitoring and evaluation of individual projects that are proposed within the implementation process. The team also realized that many conservation projects will not involve an extensive monitoring/evaluation effort. These projects might be understood to be beneficial based on the product of similar projects completed in the past. Funding might be most wisely utilized in creating generally accepted benefits on the ground as opposed to the repetitive monitoring/evaluation of similar projects. When more intensive monitoring is needed, emphasis should be placed on collaboration.





## Public Process

Public participation is recognized as a vital piece to any strategy and/or projects and all of the signatory agencies to the strategy not only support and encourage this participation, but are mandated to engage the public. Generally, a distinction has been made between two kinds of participants within this particular process: **interested public** who have a general interest, but are not likely to be directly involved; **key stakeholders** are those who have a more vested interest in helping to inform the decision making process and/or have special expertise pertaining to the implementation process. The general public may contain a subset of those interested in a particular topic that would generally like to stay informed about but do not chose to be directly involved in the process. Key stakeholders are people, groups, organizations, or institutions with expertise and/or resources that would assist with implementation of the strategy, and/or those entities likely to be affected either positively or negatively by implementation of this strategy.

Public participation of the different interested publics and key stakeholders within the decision-making process (be it active involvement or passive involvement) introduces a range of ideas, experiences, perspectives and expertise that motivate the development of

alternative solutions. This in-turn, enhances the knowledge of the people involved in decision-making and implementation of the projects under the strategy. Moreover, if involvement of specific stakeholders can lead to reaching consensus at an early stage in the projects, the potential for conflict, which is detrimental to the projects, decreases and the likelihood of lasting and improved solutions increases. For the success of a strategy/project, it is important to know what the views and interests are of the stakeholders to the potential alternatives to the strategy and/or projects.

The signatory agencies (Sponsors of the strategy) along with the Implementation Team have identified the initial interested publics for dissemination of general information and indirect participation and key stakeholders for an initial invitation to participate directly in this process. However, it is understood and shared by the Sponsors that this process would evolve and would be anticipated to have shifts in the levels of participation by the various interested publics/stakeholders and in the participants themselves as some would likely come and go throughout the process.

In order to provide information in an accessible and simple way to the interested public and to the stakeholders, the use of distribution lists (via email) and web based platforms (blog site/website) would be utilized. In addition, those key stakeholders would be invited to bi-annual meetings with the Implementation Team. Further, workshops may be developed in the future to provide for another forum for information gathering and sharing to inform the public and the process.



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## **Appendix A: Agency Plans and Guidance Documents**

The signatory agencies implement management actions under the guidance of the following agency policy and plans:

### Arizona Game and Fish Department

- Arizona Revised Statutes Title 17
- Wildlife 2012 - Wildlife Management Program Strategic Plan 2007-12
- Comprehensive Wildlife Conservation Strategy: 2005-2015
- Pronghorn Management Plan 2013
- Wildlife 20/20
- State Wildlife Action Plan 2012-2022

### U.S. Department of Agriculture Forest Service

- Impending Strategic Action Plan (EMDS – Univ of Redlands)
- Forest Service Handbook 2209.13, Southwestern Region (Region 3), GRAZING PERMIT ADMINISTRATION HANDBOOK, (Drought Guidelines), March 22, 2006
- Prescott National Forest Land and Resource Management Plan (Nov. 1986 as amended)
- Prescott National Forest Plan Amendment #16 Wildland Fire Use Amendment (August 6, 2007)
- Healthy Forest Restoration Act (USDA Forest Service R-3 Central Priority)
- Tonto Land and Resource Management Plan, Amendment #25, August 2006

### U.S. Bureau of Land Management

- Phoenix RMP and EIS (BLM 1988)
- Agua Fria National Monument and Bradshaw-Harquahala Proposed Resource Management Plan and Final Environmental Impact Statement (June 2008)
- Black Canyon Habitat Management Plan (1993; revised)
- Proclamation 7263 establishing Agua Fria National Monument
- Department of the Interior Instruction Memorandum No. 2002-008, Interim Management Policy for Bureau of Land Management National Monuments and National Conservation Areas (BLM 2001)
- Agua Fria National Monument Current Management Guidance (2002)
- Agua Fria Grassland Fuels Reduction Project FONSI/DR (Environmental Assessment #AZ-020-2004-005).
- Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management and Decision Record, September 28, 2004.

- Arizona Standards for Rangeland Health and Guidelines for Grazing Administration, 1997

## Appendix B: Project Proposal Evaluation

### PROJECT PROPOSAL EVALUATIONS

Department Funding Priority Assessment:  High Priority  Medium Priority  Low Priority

**PROJECT NAME:** \_\_\_\_\_

**CAGCS PROJECT NUMBER:** \_\_\_\_\_

The proposal is complete with all required components: YES  NO

If Project is a Water Development:

Has Coordination with Development Branch Occurred? YES  NO

1.	Project is appropriate for grassland restoration funds, and clearly demonstrates direct benefits to the identified grassland species:  <input type="checkbox"/> Significant benefits <input type="checkbox"/> Moderate benefits <input type="checkbox"/> Minimal benefits <input type="checkbox"/> No direct benefit ○ <i>PROPOSAL IS NOT VALID – STOP!</i>	<u>Comments:</u>  
2.	Proposal provides clear and sufficient detail to describe all essential aspects of the project including the scope of work, project location(s), budget information, engineering / construction / implementation details, and water development / tree shearing worksheets (if applicable).	<u>Comments:</u>  

<p>3.</p>	<p>Project will address AGFD, BLM, TNF, PNF strategic or operational plan objective(s). (e.g. Regional Habitat Plans, Wildlife 2012, Comprehensive Game Management Plan, Water Development Annual Work Plan, HPC Priorities, forest plans, land and resource management plans, etc)</p>	<p><u>Comments:</u></p>
<p>4.</p>	<p>Project is part of a larger landscape wildlife habitat improvement project or plan.</p>	<p><u>Comments:</u></p>
<p>5.</p>	<p>Project will resolve documented critical internal or external customer needs, issues, and/or concerns?</p>	<p><u>Comments:</u></p>
<p>6.</p>	<p><u>Matching &amp; Cost Share Funds:</u></p> <p>Includes cash, in-kind labor, or administrative (i.e. NEPA, environmental compliance, etc.) and ratio is:</p> <p><input type="checkbox"/>5:1 or greater  <input type="checkbox"/>4:1  <input type="checkbox"/>3:1  <input type="checkbox"/>2:1  <input type="checkbox"/>1:1  <input type="checkbox"/>&lt;1:1  <input type="checkbox"/>No match</p> <p><i>NOTE: Matching funds should be evaluated in direct relation to the current project as proposed.</i></p> <p><i>Although valid for the overall goals of a project - previous phases, existing infrastructure, or completed work should not constitute as match under this evaluation criteria.</i></p>	<p><u>Comments:</u></p>

7.	<p>Overall value of project to identified grassland wildlife habitat or management needs:</p> <p><input type="checkbox"/>High value  <input type="checkbox"/>Moderate value  <input type="checkbox"/>Low value  <input type="checkbox"/>No value</p>	<p><u>Comments:</u></p>
8.	<p>Project has a secondary benefit to other grassland or other wildlife habitat or management needs:</p> <p><input type="checkbox"/>Significant benefits  <input type="checkbox"/>Moderate benefits  <input type="checkbox"/>Minimal benefits  <input type="checkbox"/>No direct benefit</p>	<p><u>Comments:</u></p>
9.	<p>Project planning, environmental compliance requirements, and administrative record is complete, and project is ready to be implemented:</p> <p><input type="checkbox"/>Immediately  <input type="checkbox"/>Within 6 months  <input type="checkbox"/>Within 12 months  <input type="checkbox"/>Within 24 months</p>	<p><u>Comments:</u></p>
10.	<p>Other Considerations:</p>	<p><u>Comments:</u></p>

## **Appendix C: Geospatial Information**

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In order to prioritize which areas within the CAGCS boundary should receive the most focus on restoration work, a logical decision tree model will be created and made available to stakeholders for review.

Supporting GIS data is currently being managed by the Arizona Game and Fish Department and may be available upon request. Note that data containing sensitive information or data that was provided for this analysis with a special use agreement may be excluded from dataset provided.

Final datasets showing project boundaries within the CAGCS boundary, prioritization models, and relevant supporting GIS data will be made available via the web before the end of calendar year 2015.

This appendix will be updated with the link to the web viewer once development is completed.

## **Appendix D: Definitions**

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**Historic habitat**- habitat beyond a threshold generally caused by development and urbanization, fragmentation, or crossing of a biological threshold that prevents recovery of the grassland or pronghorn habitat.

**Allotment** — Area of federal lands designated for the grazing use of a prescribed number and kind of livestock under a specific plan of management.

**Allotment Management Plan (AMP)** — Contains action program needed to manage the range resource for livestock grazing with consideration to soil, watershed, wildlife, recreation, timber, and other resources on lands within a range allotment.

**Available Forage** — That portion of the forage production that is accessible for use by a specified kind or class of grazing animal.

**Bare Ground** — All soil surface not covered by vegetation, rock or litter.

**Carrying Capacity** — The average number of livestock and/or wildlife which may be sustained on a management unit compatible with management objectives for the unit. In addition to site characteristics, it is a function of management goals and management intensity.

**Cover, Total** — The percentage of ground area covered by aerial parts of live plants, litter, gravel and rocks.

**Cover, Total Vegetative** — The percentage of ground area covered by live aerial parts of plants.

**Critical Area** — An area of high resource value which must be treated with special consideration due to inherent site factors, size, location, condition, values or significant potential conflicts among users.

**Deferment** — The delay or discontinuance of livestock grazing on an area for an adequate period of time to provide seed production, establishment of new plants, or restoration of vigor of existing plants. Generally defined as delay of grazing until the seed of the key forage species is mature

**Deferred-Rotation Grazing** — Moving grazing animals to various parts of a range in succeeding years or seasons to provide for seed production, plant vigor, and for seedling growth.

**Density** — Number of individuals or plant stems per unit area.

**Ecological Site** — A kind of land area with a specific potential natural community and specific physical site characteristics, differing from other kinds of land in its ability to produce vegetation and to respond to management.

**Ecological Status** — The present state of vegetation and soil protection of an ecological site in relation to the potential natural community for the site. Vegetation status is the expression for the relative degree to which the kinds, proportion and amounts of plants in a community resemble that of the potential natural community. Soil status is a measure of the present vegetation and litter cover relative to the amount of cover needed on the site to prevent accelerated erosion.

**Ecosystem** — A complete interacting system of organisms (i.e. community) considered together with its environment.

**Forage** — Browse and herbage which is available to and may provide food for grazing animals or be harvested for feeding. Also, to search for or consume forage.

**Forage Production** — Weight of forage produced within a designated period of time on a given area.

### **Genetic Bottleneck**

**Grasses** — Plants of the Gramineae family. Usually herbaceous plants with narrow, parallel-veined, two ranked leaves.

**Grassland** — Lands on which the vegetation is dominated by grasses, grass-like plants, and/or forbs.

**Grass Banking** - Grass banking is where property owners lease land to ranchers at a discount in exchange for ranchers carrying out conservation-related projects on their pastures.

**Grazing Management** — The manipulation of grazing and browsing animals to accomplish a desired result.

**Ground Cover** — The percentage of material, other than bare ground, covering the land surface. It may include live and standing dead vegetation, litter, cobble, gravel, stones and bedrock.

**Habitat Type** — The collective area which one plant association occupies or will come to occupy as succession advances. The habitat type is defined and described on the basis of vegetation and its associated environment. Habitat type is similar in concept to ecological, site depending on how specifically plant associations are defined. Habitat is commonly misused to refer to classification of vegetation or wildlife habitat rather than a land classification.

**Key area** — A relatively small portion of rangeland selected because of its location, use or grazing value as a monitoring point for grazing use. Should be located with a single ecological site or plant community, where it is responsive to resource management – indicative of the site or



community to be represented.

**Native Species** — One which is part of the original fauna or flora of the area in question.

**NEPA** - National Environmental Policy Act of 1969 — A Congressional Act which established a national policy for the environment, and provided for the establishment of the Council on Environmental Quality (CEQ).

**NFMA** - National Forest Management Act of 1976. — Requires each National Forest to prepare a Forest Land Management Plan. All subsequent management actions must be directed at effective implementation of the Plan.

**Occupied habitat**- Those areas currently occupied or utilized by pronghorn.

**Potential habitat**- Those areas of historic habitat that could potentially be restored to increase pronghorn abundance and distribution. This includes areas that are currently supporting low population levels and unoccupied areas. Habitat that can be restored to grassland and habitat that can be modified to increase pronghorn abundance and distribution (Recoverable habitat currently not occupied or at such low population levels)

**Potential Natural Vegetation** — A historical term defined as the stable vegetation community which could occupy a site under current climatic conditions without further influence by man. Often used interchangeably with Potential Natural Community.

**Potential Plant Community** — One of usually several plant communities that may become established on an ecological site under the present environmental conditions, either with or without interference by man.

**Proper Use** — It is associated with physiological responses of plants to grazing utilization. It is the level of use that will maintain and improve plant growth and reproduction. Does not translate to average utilization on all species.

**Range** — Includes rangelands and forest lands that support a cover of herbaceous or shrubby vegetation suitable for grazing by livestock or game

**Range Condition** — A generic term relating to present status of a unit of range in terms of specific values or potentials. Specific values or potentials must be stated. Also defined as the present state of vegetation of a range site in relation to the climax (natural potential) plant community for that site.

**Seasonal Use** — The amount of utilization that has occurred before the end of the growing season.

**Shrub** — A plant with persistent, woody stems and relatively low growth. Generally produces several basal shoots (stems) and many branches.

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**Site Conservation Rating** — An assessment of the protection afforded a site by the current vegetation against loss of potential.

**Site Conservation Threshold** — The kind, amount and/or pattern of vegetation needed as a minimum on a given site to prevent accelerated erosion.

**Succession** — The process of vegetation development whereby an area becomes successively occupied by different plant communities of higher ecological order.

**Threatened and Endangered Species (T&E)** - — Threatened and endangered species of plants and animals that are listed by the US Fish and Wildlife Service and must be protected under the terms of the Endangered Species Act.

**Terrestrial Ecosystem Survey (TES)** — Survey used in making land management decisions through integration of soils, vegetation and climate data.

**Trend** — The direction of change in ecological status or resource value rating observed over time. Trend in ecological status should be described as toward or away from the potential natural community, or as not apparent. Trend in a resource value rating should be described as up, down or not apparent. Trends in resource value ratings for several uses on the same site at a given time may be in different directions, and there is no necessary correlation between trends in resource value ratings and trend in ecological statuses.

**Use, Utilization** — The proportion of current year's forage production consumed or destroyed by animals (including insects). It may refer to a single plant, a group of species, or the vegetation as a whole. Utilization is synonymous with use. This process requires a comparison of the amount of herbage left compared with the amount of herbage produced during the year.

**Vegetation Management Status** — The relative degree to which the kinds, proportions, and amounts of vegetation in the present plant community that resemble the desired plant community chosen for an ecological site.

**Vegetation Type** — A kind of existing plant community with distinguishable characteristics described in terms of present vegetation that dominates the aspect or physiognomy of the area. Examples include sagebrush, creosote bush, mesquite, short-grass, tall-grass, etc

**Weed** — Any unwanted or undesirable plant, whether grass, forb, shrub or tree.

## **Appendix E: Analysis Methodology**

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### **2014**

To be completed.

### **2010**

Areas/Locations to be defined on Unit Maps by Wildlife Managers/Field Biologists

Please use a black marker to identify the following in relation to **Pronghorn** and **Grassland Habitat**:

#### **Pronghorn Distribution**

1. Areas that are core pronghorn areas where they have been observed/surveyed on a regular basis. These areas may be very large or small areas where isolated herds persist. Please outline the area's boundary and label as "**Core Pronghorn Area**".
2. Areas that are known to be used by pronghorn does during fawning season. Please outline the area's boundary and label as "**Pronghorn Fawning Area**".

#### **Waters**

1. Water sources important to Pronghorn during fawning season. Examples could be any water sources you have seen Pronghorn use during fawning season, or water sources accessible to Pronghorn (not surrounded by dense brush) that are located in or near traditional fawning areas. Please label as "**Pronghorn Fawning Water**".
2. Water sources that are important to grassland species that have problems. Examples could be dirt tanks that don't hold water and may need to be cleaned out and relined, springs that could be developed to pipe water to a drinker accessible to pronghorn, solar well troughs that need repaired, etc. Please label as "**Water with Problems**" and identify the problem.
3. Water sources that are not on the map. Please label as "**Unmapped Water**".
4. Waters that almost always have water in them, even during drought. Please label as "**Reliable Waters**".

#### **Movement Corridors**

1. Pronghorn movement corridors that are currently used by pronghorn that have no issues. Please label as "**Good Corridor**" and draw lines along the general boundaries of the corridor.
2. Pronghorn movement corridors that are no longer used by pronghorn, or have some sort of issue associated with them. Examples could be corridors that have been encroached upon by woody vegetation, highway barriers, urban expansion, etc. Please label as "**Bad Corridor**" and draw lines along the general boundaries of the corridor, and identify the issue.

#### **Movement Barriers**

Barriers to pronghorn movement. These barriers may have strong links to some of the corridors. Please circle the barrier if it is shown on the map and label as "**Railroad Barrier**", **Urban Barrier**", "**Highway Barrier**", "**Topographic Barrier**", "**Significant Fence Barrier**" (sheep, woven wire etc), or whatever type of barrier it is.

## **Appendix F: Original Charter**

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### **Central Arizona Coordinated Grassland Management Plan Coordinated Management Plan Team Charter**

**Arizona Game & Fish Department (Regions III and VI)  
Bureau of Land Management (Hassayampa Field Office)  
Forest Service (Tonto and Prescott NF's)**

**Sponsors:** AZGFD - Region III Supervisor  
AZGFD - Region VI Supervisor  
BLM Phoenix District - District Manager  
Tonto NF - Forest Supervisor  
Prescott NF - Forest Supervisor

**CO Team Leaders:** Tom Finley – AZGFD, Larry Bright - Prescott NF

**Team Members:** Nicole Brown – AZGFD GIS  
Todd Willard – Tonto NF Wildlife  
Jerry Bradley – Prescott NF Range  
Larry Bright – Prescott NF Wildlife  
Dana Warnecke – AZGFD  
Tim Hughes/Jay Vacca – BLM Hassayampa Field Office Wildlife  
AZGFD Region III Representative  
Russ Haughey – AZGFD  
**Advisory Support:** Other's as needed

**Facilitator:** Provided by AZGFD.

### **Background:**

The three signatory agencies to this charter have roles and responsibilities in managing historic grassland ecosystems and/or the wildlife species that inhabit them. The Forest Service in the Southwestern Region is operating under the “Central Priority” that emphasizes restoration of fire adapted ecosystems, of which grasslands are a major component. The Bureau of Land Management, management emphasis within the Agua Fria National Monument is to conserve and restore diverse habitats, vegetative communities and corridors of connectivity to sustain a wide range of native species. The Arizona Game and Fish has the responsibility of managing the wildlife that inhabit these ecosystems.

A key wildlife species that has a high priority for conservation and restoration by the AZGFD in this ecosystem is the pronghorn antelope. Pronghorn population estimates statewide are below target levels. Grassland habitats supporting pronghorn are threatened from a variety of sources

in central Arizona. Several independent efforts to address pronghorn populations and habitats are ongoing. However, a single coordinated look at central Arizona's grasslands and associated pronghorn habitat is needed in order to gain maximum use of limited agency resources.

### **Mission:**

The three agencies with their similar management goals and responsibilities recognize by working together restoration of grassland ecosystems and the wildlife species that inhabit them can be maximized for the American public. The team's mission is to develop an integrated management plan for conservation/restoration of grassland ecosystems and associated pronghorn populations in central Arizona. This plan should include habitat assessment information, risk assessments to grassland ecosystems/pronghorn populations, management strategies and recommendations, and use an interdisciplinary approach.

### **Project Area:**

The plan will cover the area generally defined by: on the north and west the boundary of the Prescott National Forest, on the south by Black Canyon City, and on the east by the Verde Rim.

### **Parameters for Plan Development:**

1. A list of potential Stakeholders will be identified.
2. The effort should take full advantage of all existing data and information. The plan should include maps, with brief and concise text.
3. Any supporting habitat assessments components and the plan itself should be developed for a defined area.
4. The plan should address areas of current, potential, and historic pronghorn habitat.
5. The assessments/plan should address all risks to grasslands/pronghorn.
6. The plan should include a prioritization of areas based on population status, habitat quality, and risks to those populations and that habitat.
7. The plan should provide a "toolbox" of options for management agencies and willing private landowners.
8. The plan should include implementation strategies and potential projects.
9. The plan should include an evaluation component. The evaluation should include an annual report on implementation progress.
10. The plan should be viewed as a dynamic work in progress, practical, and emphasize on the ground management.
11. The plan should include information on potential funding sources.
12. This plan is intended to be an administrative effort only. NEPA required for this effort is addressed as any other inventory, data collection, or administrative function. Any NEPA required for site specific implementation will be accomplished as needed prior to before implementation.
13. Initially the team should focus on projects that have been previously approved through the agencies public and legal processes.

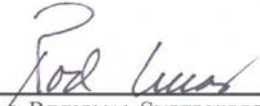
**Scope/Limits of Responsibility:**

1. The Team Leader shall ensure that the team understands the objectives of the team. The Team Leader shall confer with the Sponsor(s) as necessary to ensure that the team's mission is met.
2. Within the scope of its mission and objectives, the team may request additional external information from any Agency employee or work unit.
3. The team may create sub-teams or request input from other Agency employees, to assist with this assignment.

**Products/Deliverables:**

1. Final documents with recommendations will be completed and submitted to the Team Sponsors by January 31, 2007.

SIGNATORY AUTHORITIES



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## **Appendix G: Revision Statement**

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### **Amendments to Version 2.16.10**

#### **Reads:**

S - Hunting regulation options: Harvest objectives, Hunt structures (problems with hunting during rut), Population structures, (for example high buck ratios may decrease fawn predation, lowadult buck ratios causes young bucks to breed too late)

### **Changed to in Version 6.24.10**

S - Hunting regulation options: Recommend harvest objectives and hunt structures in accordance with Commission-approved hunt guidelines. Periodically evaluate hunt guidelines and recommend changes in best management practices in accordance with peer-reviewed scientific research.

### **Implementation Plans**

Revisions on an annual basis to the Implementation Matrix by the Implementation Team to include new and future projects would be required.

### **Formatting Revision**

Version 6.24.10 continued to have formatting complications including the appendices. These complications were fixed in April 2013. The Implementation Matrix is a living document and will be an attachment at the time of distribution to reflect the most accurate representation (see above Appendix A).

### **2014 Revision**

The Implementation Team provided a thorough review and recommendations for revision considerations. The sponsoring agencies provided additional thoughts and agreements on the recommendations.