

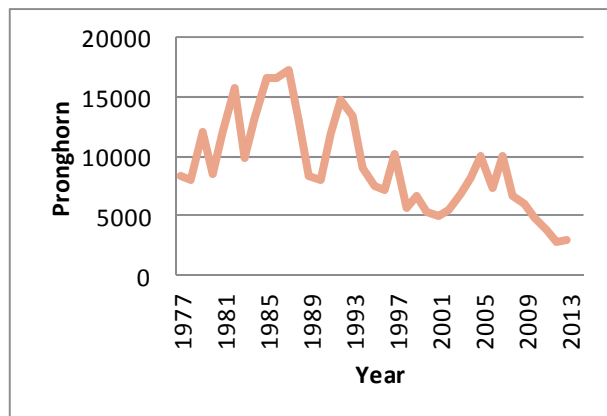
A photograph of three pronghorn antelope in a grassy field. The antelope are in the foreground, walking from left to right. The background is a vast, open landscape with rolling hills under a blue sky. The text is overlaid on the top half of the image.

# A RESEARCH REPORT ON THE RESTORATION AND MANAGEMENT OF PRONGHORN IN TRANS-PECOS, TEXAS

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## THE DECLINE OF PRONGHORN IN TRANS-PECOS, TEXAS

The current distribution of pronghorn in Texas is restricted to the Trans-Pecos, Panhandle, and portions of the western Edwards Plateau. Of these 3 regions, the Trans-Pecos historically supported 70% of pronghorn in Texas. Numbers of pronghorn in 1987 reached an all-time high with over 17,000 animals occurring in the Trans-Pecos. Unfortunately, the trend of high pronghorn density in this region has not continued. Over the past 30 years most pronghorn populations in the Trans-Pecos have experienced unprecedented declines, with less than 3,000 animals remaining in the region by 2012.



**Annual trends of pronghorn in the Trans-Pecos based on aerial survey data from 1977 to 2013.**

Beginning in 2011, the Borderlands Research Institute in partnership with Texas Parks and Wildlife Department and private landowners began a long-term restoration and monitoring project for pronghorn in the Trans-Pecos. To date, we have translocated over 400 pronghorn from the Panhandle to the Trans-Pecos. Using proactive and management-driven research we have been able to get a better understanding of why pronghorn populations had declined. Specifically, our research has shown that several inter-related factors have led to the



**Efforts are underway to determine the cause of pronghorn decline and to restore populations in the Trans-Pecos.**

decline in pronghorn, including drought, substandard nutrition, habitat fragmentation, diseases (e.g., stomach worms), poor fawn recruitment, and predation.

The purpose of this research report is to inform our partners, donors, and members of the public of our ongoing research efforts to restore pronghorn populations. This report includes a summary of projects focusing on:

- Restoration, translocation, and survival
- Habitat fragmentation and fence modifications
- Assessment of pronghorn release sites
- Movements following translocation
- Fawn production and survival

Research such as this would not be possible without the contributions made by the following sponsors: Texas Parks and Wildlife Department, Texas Parks and Wildlife Foundation, West Texas Chapter of Safari Club International, Borderlands Research Institute, Houston Safari Club, and many other individuals and organizations.

## RESTORATION, TRANSLOCATION, AND SURVIVAL

A useful method for restoring depleted animal populations is through translocating individuals from healthy populations. Approximately 6,500 pronghorn have been translocated in Texas since 1939. Prior success of translocations made it a prime candidate for use in the current pronghorn restoration effort in the Trans-Pecos.



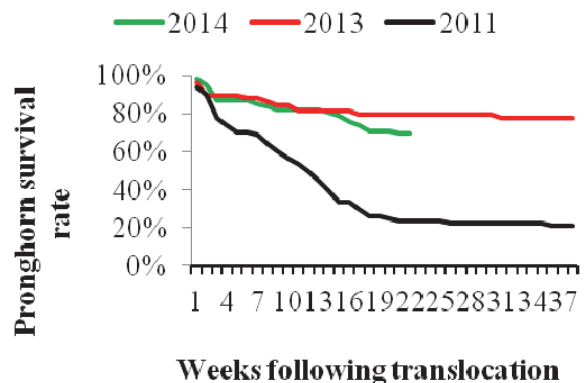
**Translocating pronghorn from the Panhandle has helped supplement the declining Trans-Pecos herds.**

A donor population of pronghorn was identified in the northern Texas Panhandle. Texas Parks and Wildlife Department has worked in collaboration with local landowners in the northern Panhandle to use healthy populations as source animals for boosting Trans-Pecos herds. Additionally, pronghorn can depredate agricultural crops resulting in some damage and financial losses to farmers. Reducing conflicts between pronghorn and farmers in the Panhandle while supplementing Trans-Pecos herds provides benefits to both regions. Since inception of the restoration program, translocations have been conducted in January-February of 2011, 2013, and 2014.

Prior to this restoration initiative, sparse information existed documenting success of pronghorn translocations. We therefore saw this as an excellent opportunity to record and

estimate site-fidelity, movements, survival, fawn production, and restoration success.

Over the 3 translocation years, we have seen improved survival of translocated pronghorn. In February 2011 we captured 200 pronghorn from the Panhandle and fitted 80 (40%) individuals with radio-collars. Unfortunately this translocation coincided with record setting drought, freezes, heat, and wild fires. About 20% of the pronghorn translocated in 2011 are estimated to have survived.



**Survival estimates of pronghorn translocated from the northern Panhandle to the Trans-Pecos.**

Results from the 2013 effort showed a marked improvement in restoration success. A total of 125 pronghorn was captured and moved to the Marathon area, with 58 (46%) being equipped with radio-collars. We currently estimate 76% of the 2013 pronghorn survived in 2013. The high survival rate has resulted in this population growing from a 30-year low of 40 animals in 2012, to over 300 animals in 2014.

So far, 2014 has shown similar success to that of 2013 where a total of 96 pronghorn was released in the southeast Marfa Plateau, with 62 fitted with radio-collars. As of August 2014, 70% of the translocated pronghorn have survived in the Marfa Plateau area.

## HABITAT FRAGMENTATION AND FENCE MODIFICATIONS

Fragmentation of habitat and barriers to movement influence the success of pronghorn translocations in the Trans-Pecos. Historically, pronghorn have been documented as being migratory and nomadic in nature. Pronghorn had the ability to move throughout the landscape in search of food. Since Europeans moved onto the landscape and erected fences to contain domesticated livestock, historic pronghorn ranges have been segmented into discrete patches.

Livestock fences are perhaps the greatest threat to free movement of pronghorn in the Trans-Pecos. Unlike deer, pronghorn will rarely jump over fences and so they become trapped in whichever pasture they have been fenced into. These obstacles can limit the ability of pronghorn to find adequate food, locate fawning areas, and escape from predators.



**Fences can act as significant barriers to the movement of pronghorn. This is especially true of net-wire fences**

Containment due to fencing can also disrupt the social structure and behavior of pronghorn. For example, females will leave herds and seek out areas offering good cover in

which to drop fawns. Fences may subsequently prevent females from accessing optimal fawning areas.



**Fences are lifted to a height of 18 inches (or more) above the ground to allow pronghorn the ability to pass underneath.**

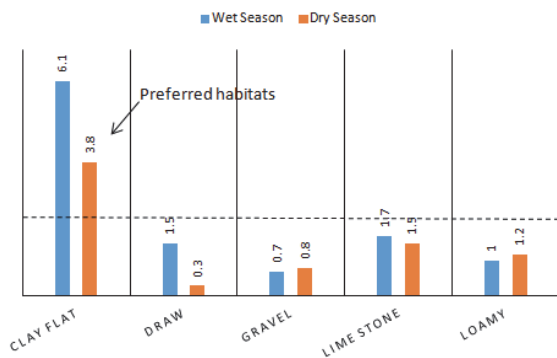
To ensure translocated pronghorn are able to move freely within the Trans-Pecos and to facilitate continued integration of translocated individuals with resident herds, significant efforts have been made to modify livestock fences across the region.

Fence modifications involve raising the bottom strand of barbed-wire fences or bottom portion of net-wire fences to at least 18 inches above the ground. This simple modification enables pronghorn to crawl under fences and gain access to additional habitat.

To date, the Borderlands Research Institute and Texas Parks and Wildlife Department have made over 500 modifications to fences throughout the Trans-Pecos. These modifications have tempered the effect of fragmentation by increasing connectivity between habitats, thus allowing pronghorn to move freely from pasture to pasture.

## ASSESSMENT OF PRONGHORN RELEASE AREAS

A critical factor in the success of pronghorn restoration is making sure that animals are being released into habitat that maximizes their chance of survival. By monitoring radioed pronghorn, we can better understand their habitat use patterns. The assumption is that pronghorn will selectively use habitats that optimize foraging and survival. We can then compare the used habitats to other habitats to assess the probability of survival of pronghorn. The Borderlands Research Institute and Texas Parks and Wildlife Department are currently conducting a study to assess habitat suitability for pronghorn throughout the Trans-Pecos.

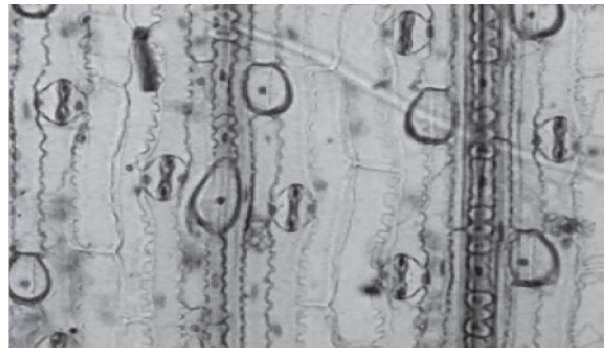


**Selection index showing the differential use of habitats by pronghorn between the wet and dry seasons.**

To determine which habitats are used most by pronghorn, we used GPS collar data from pronghorn translocated to the Trans-Pecos in 2013. The benefit of using GPS collar data is that we can determine precisely where the animals are on an hourly basis. We are then able to formulate a “selection index” for each habitat which tells us the likelihood of habitat use by pronghorn. The higher the value of the selection index, the higher the chances are that pronghorn will use that habitat.

Although this study is still ongoing, we have already been able to determine seasonal use by pronghorn from the dry season (Apr-Jun) to the wet season (Jul-Oct). This information is important because it shows pronghorn give different values to different habitat at certain times of the year. Furthermore, the differential use of habitats throughout the year highlights the importance of habitat connectivity for pronghorn. Pronghorn need to be able to move between the respective habitats throughout the year if they are to optimize survival.

We are also using diet analyses and plant nutrient values to determine why these habitats are so favorable. To do this we are using micro-histological fecal analyses to define seasonal diets. This method identifies fragments of vegetation in pronghorn feces by looking at the unique cellular structures contained in plant membranes. To estimate the nutritional quality of plants we are determining the levels of carbon, hydrogen, and nitrogen in the plant. Each of these minerals are important dietary components to pronghorn. These data will tell us which plants are preferred foods, and will assist managers in better evaluating habitat suitability for pronghorn, as well as guide management to enhance habitat quality.



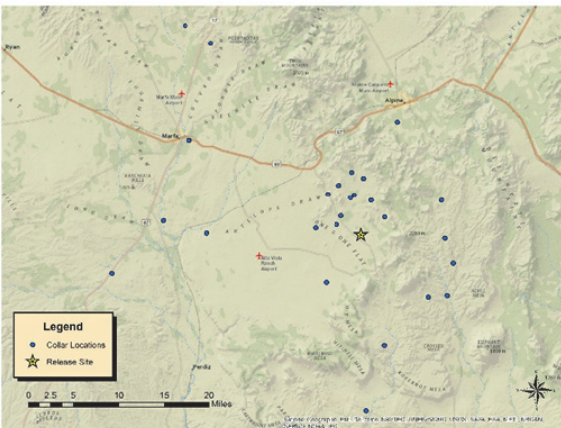
**The unique cellular structures of plant membranes are used to identify fragments in pronghorn feces.**

## MOVEMENTS FOLLOWING TRANSLOCATION

When restoring wildlife populations, evaluation of movements is vital to understanding the ability of animals to assimilate to their new environment and survive. Movement information provides valuable insight into post-release behavior and helps assess restoration success and determine requirements for future restoration. In late January of 2014, we translocated 96 pronghorn (83 F, 13 M) from the Texas Panhandle to the Marfa Plateau to further bolster populations. Forty-nine adult pronghorn and 13 fawns were equipped with GPS or VHF radio-collars.

As with our 2013 release in Marathon, the majority of the pronghorn released in 2014 on the Marfa Plateau showed high fidelity to the release site. The radio-collared animals from 2014 are still within 10 miles of the release site. Some radio-collared pronghorn have traveled 20–25 miles away from the release site and 2 crossed US Highway 90.

The furthest movements occurred while range conditions were driest in late Spring. As an



**Some of the translocated pronghorn have been recorded as dispersing more than 20 miles from the release site in 2014.**



**Fence modifications increase pronghorn movements and survival by improving habitat connectivity.**

example, one of the ear-tagged does moved to an area between Marfa and Valentine, over 40 miles from the release site. Since the release area has received rains and following the conclusion of fawning season, movements have stabilized and larger groups of pronghorn have begun to reassemble. Because of the fence modifications and newer pronghorn friendly fence put in by some landowners, the translocated pronghorn have been able to move freely throughout the release site.

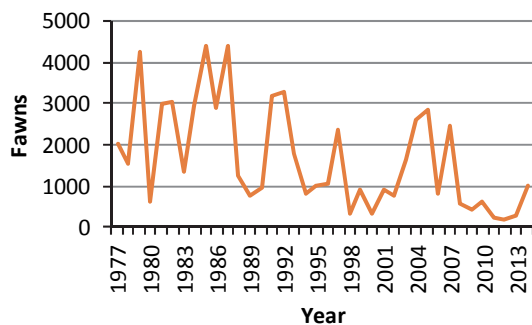
Once collars are retrieved in late November, we will be able to determine more specific movement patterns. Data gathered from the collars will also allow us to examine seasonal distribution of pronghorn on rangelands.

Movement data not only allows us to estimate the distances travelled by pronghorn and the home range of these animals, but the data is also able to guide future management actions.

## FAWN PRODUCTION AND SURVIVAL

The population of pronghorn in the Trans-Pecos is essentially isolated from populations elsewhere. Because of the lack of immigration and emigration from the region, the only way the current population can sustain itself or grow is through translocation of animals from other areas or through reproduction. Recruitment of young individuals is paramount to sustain and grow populations. Therefore, in the Trans-Pecos the birth and survival of fawns may be the single most important factor contributing to the sustainability or growth of the population.

Fortunately, pronghorn does have an exceptionally high incidence of twinning (>90%), resulting in the ability of the population to recover relatively quickly from declines when conditions are favorable.



**Fawns crop each year from 1977 to 2014, as estimated from aerial surveys.**

Pronghorn fawns are most likely to die during the first six weeks of life. Aerial surveys from 2010 and 2011 suggested extremely low recruitment in the Trans-Pecos, with less than a 10% fawn crop. The low fawn crops/recruitment rates were hypothesized to be one of the major contributing factors to the population decline.

To understand the low recruitment rates, we initiated a fawn survival study in 2011. Each year we captured neonatal fawns then aged, weighed, ear-tagged, and fitted them with an expandable light-weight radio-collar. Fawns were then monitored from afar to document behavior and survival.



**Fitting fawns with lightweight expandable VHF collars allows us to estimate survival and movements.**

During 2011, only 2 of 26 radioed fawns survived to 6 months old (8%). Survival in 2012 was slightly higher than 2011 with 7 of 35 radio-collared fawns surviving (15%). In 2013, 40 fawns were captured and fitted with radio-collars. Recruitment was much higher than in 2011 and 2012, with 50% of the fawns surviving. Much improved range conditions as well as predator management contributed to the significantly higher fawn survival rate in 2013.

This research has been instrumental in addressing plausible causes of low fawn recruitment. It appears that fertilization and conception rates are normal; however, we conclude that nutrition and predators are having the greatest impact on fawn survival and recruitment.

## FUTURE EFFORTS...

The pronghorn population in the Trans-Pecos still has a long road to recovery. The Borderlands Research Institute, Texas Parks and Wildlife Department, Texas Parks and Wildlife Foundation, and Trans-Pecos Pronghorn Working Group are committed to restoring pronghorn to suitable habitat in the Trans-Pecos. The support of the public and local landowners is imperative in ensuring the continued success of restoration and monitoring projects completed thus far.

We are currently planning numerous projects to help reverse the decline of pronghorn in the Trans-Pecos. We aim to use science to inform and accelerate the restoration of pronghorn. Current and upcoming projects include:

- Enhance and expand restoration efforts.
- Determine the nutritional quality of pronghorn forage.
- Estimate optimal stocking rates for livestock and pronghorn on rangelands.
- Improve our assessment of optimal habitats in which to release pronghorn to maximize success.
- Monitor movements of resident and translocated pronghorn.
- Evaluate predator management and its impact on fawn recruitment.

**To find out how you can help with future restoration and research efforts please contact:**

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