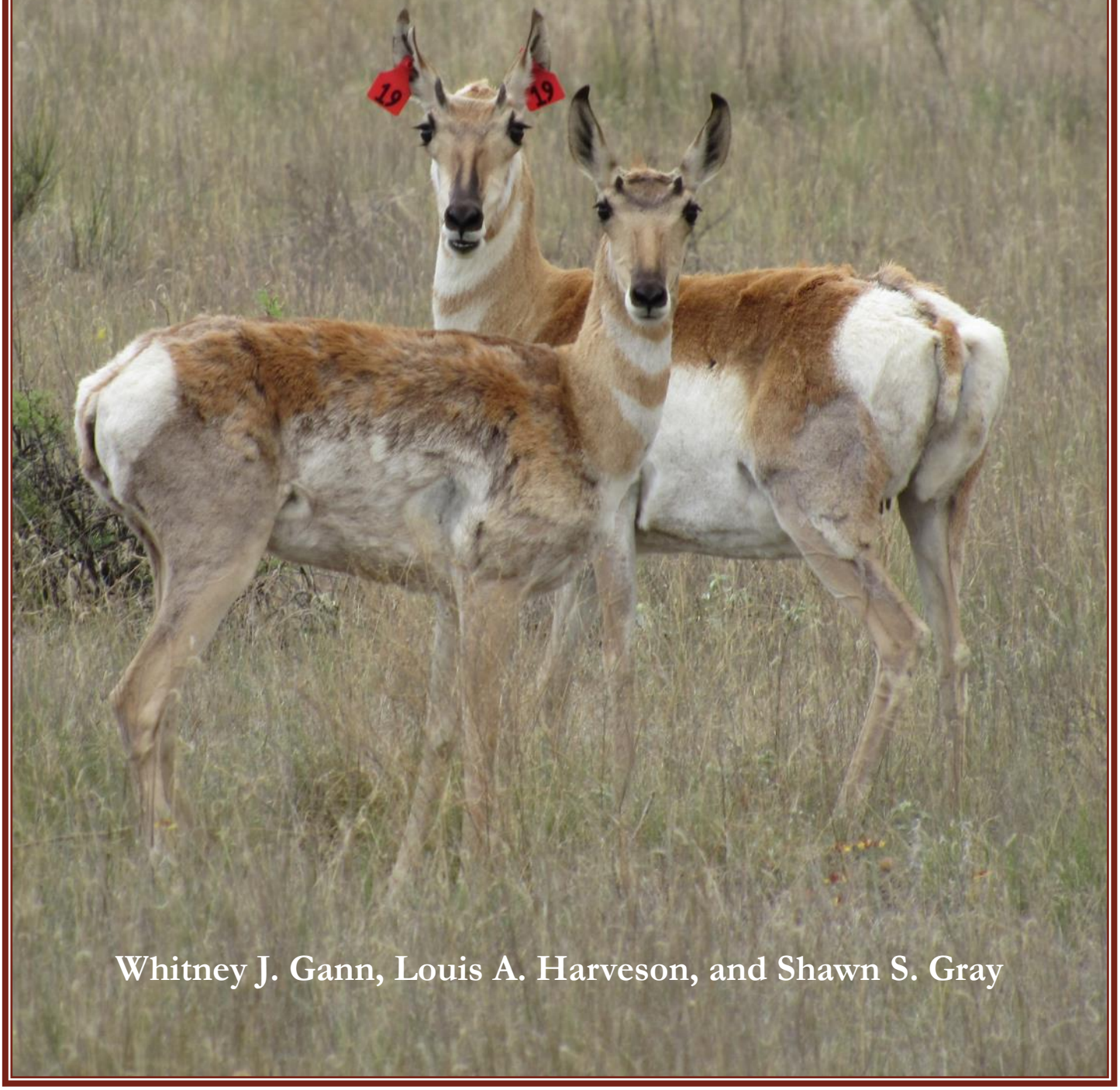
Trans-Pecos Pronghorn Restoration and Research Report



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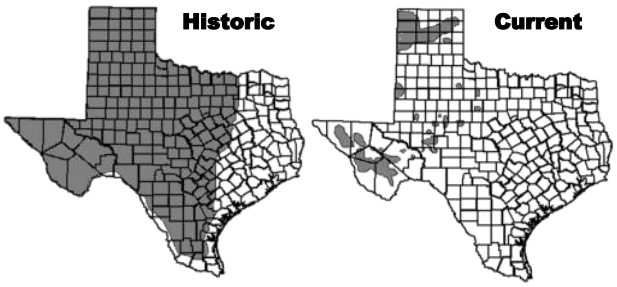
The Decline of Trans-Pecos Pronghorn

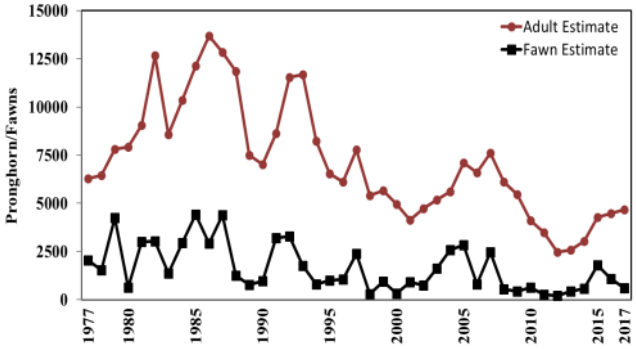
In the Trans-Pecos, pronghorn populations exhibit positive correlation between precipitation and demography. For example, population growth can be expected during years of increased precipitation. However, extreme drought in 2011 marked the culmination of declining rangeland conditions and significant pronghorn declines in the Trans-Pecos from 2008–2012. Concern arose when populations were not recovering following periods of increased precipitation. During 2012, the Trans-Pecos population dropped to less than 2,700 individuals; a new 80-year low.



Change in distribution of pronghorn populations across Texas.

Texas Parks and Wildlife Department (TPWD), in partnership with Borderlands Research Institute (BRI), the Trans-Pecos Pronghorn Working Group, and private landowners, began the Trans-Pecos Pronghorn Restoration Project in 2011 to identify causative factors for the decline and to restore populations.

The main objective of the Trans-Pecos Pronghorn Restoration Project is to restore pronghorn to a population level that reflects the long-term average (1982–2008; approximately 8,000 adults) for the region and is self-sustaining. However, more research will better define the population goal. Using proactive, management-driven research we have been able to gain a better understanding of the factors that contributed to the pronghorn population decline. Specifically, several inter-related



Trans-Pecos population estimates for pronghorn adults and fawns (1977–2017). Estimates obtained from summer aerial surveys.

variables including drought, habitat fragmentation, disease, poor fawn recruitment, and predation played a role.

Today, biologists are working closely with landowners to share best practices for range management and to implement habitat improvements such as pronghorn-friendly fencing modifications and brush control.

The purpose of this research report is to update our partners, donors, and members of the public of our ongoing research and management efforts. This report incudes summaries of projects focusing on:

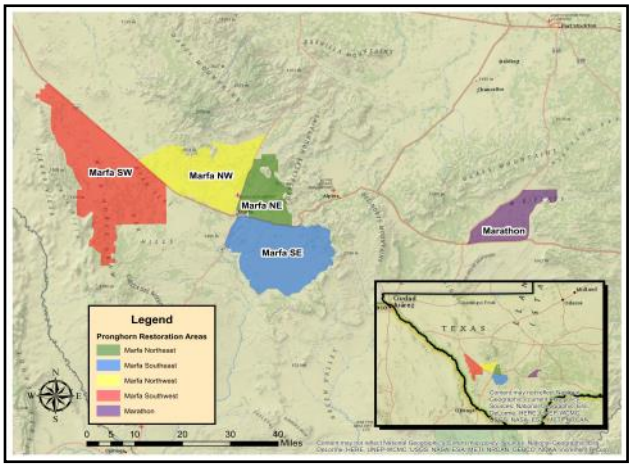
- Restoration, translocation, and survival
- Fence modification and replacement efforts
- Movements and habitat use
- Population trends following translocation

This restoration project would not be possible without the contributions made by the following sponsors and partners: Texas Parks and Wildlife Foundation, Texas Parks and Wildlife Department, Borderlands Research Institute, Trans-Pecos Pronghorn Working Group, West Texas Chapter of Safari Club International, USDA Wildlife Services, private landowners, and many other individuals and organizations.

Capture and Translocation

Capture and translocation of wild animals has and continues to be an integral part of wildlife management. In Texas, pronghorn translocation efforts have been focused on supplementing the Marfa Plateau and Marathon Basin populations.

The Marfa Plateau is a grassland that spans from Marfa along US Highway 90, north towards Van Horn. Pronghorn restoration in the Marfa Plateau is focused on 4 Restoration Areas produced by bisecting the plateau from west to east by HWY 90 and from north to south by HWY 67. The Marathon Basin is located northeast of Marathon and encompasses desert grassland bounded to the north by the Glass and Del Norte Mountains. US Highways 385 and 90 create the western and southern boundaries, respectively.



Map of restoration areas surrounding Marfa and Marathon, Texas.

All surplus pronghorn used for restocking were from the northwest (2011, 2013, and 2016) and northeast (2014, 2017) Texas Panhandle. These large donor populations consisted of healthy pronghorn who would potentially depredate crops. Translocation of these individuals reduces conflicts between pronghorn and farmers in the Panhandle while supplementing Trans-Pecos herds – a benefit to both regions. Release sites were selected based upon habitat evaluations, habitat connectivity, predator management, and agreements from landowners.

During each translocation, 35–65% of all translocated animals were equipped with either expandable breakaway VHF collars (fawns) or adult GPS radio collars. In 2017, we outfitted 40 animals with satellite radio collars for the first time.

Pronghorn were captured via helicopter net-gun in January and February when average ambient temperatures were relatively cool (<40° F). Upon capture, pronghorn were transported via helicopter and brought to a central staging area for veterinarian treatment and evaluation. All pronghorn were ear-tagged with colors corresponding to 'transplant year' and 'release site.'

Since 2011, the Pronghorn Restoration Team has captured, transported, and released 668 pronghorn from surplus populations in the Texas Panhandle to supplement depleted populations in the Trans-Pecos.

Survival of Translocated Pronghorn

Prior to this restoration initiative, little information existed documenting the success of pronghorn translocations. We utilized this opportunity to record data relating to survival, fawn production, and translocation success.

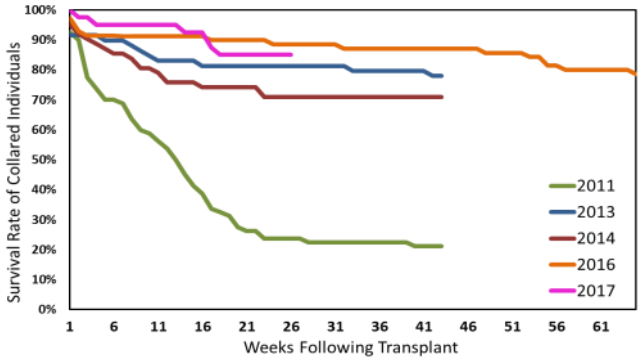
During the first 3 weeks post-translocation, almost all capture-related and capture myopathy (CM) mortalities will occur. In 2011, we incurred the highest number of both capture, transport, and CM-related mortalities. Severe drought conditions in 2011 contributed to increased mortality following translocation and a delay in population growth between 2011–2012.

Survival of translocated pronghorn is monitored by radio collars for 43 weeks post-release (65 weeks in 2016 and 2017).

In 2013 and 2014, we had several coyote predation events, which coincided with coyote breeding and denning. In 2014, we also observed increased mortality during weeks 14–19 resulting from a relatively dry winter and spring.

We experienced timely, abundant, and broad precipitation over the restoration areas in 2016, leading to exceptionally high fawn and adult survivorship.

Minimizing mortality in translocated animals is of great significance to maximizing restoration success. Most pronghorn mortalities that occurred during translocations were the result of injury or stress during capture and handling in 2011, our first year.



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

Experiences during 2011 allowed us to understand what increased stress levels and mortality risk in individual pronghorn. In subsequent years, we adapted our capture and transportation techniques and utilized additional preventative measures to reduce stress, reducing CM by 78% on average (table below). These capture protocol modifications were implemented prior to the 2013 translocation.

Summary of Translocation Success: 2011–2017

	Translocations				
Year	Feb 2011	Jan/Feb 2013	Feb 2014	Feb 2016	Jan/Feb 2017
Location	Marfa SW/NW	Marathon Basin	Marfa SE	Marfa NW	Marfa NE
Number Translocated	202 183^{F}; 19^{M}	133 117^{F}; 16^{M}	103 90^{F}; 13^{M}	116 106^{F}; 9^{M}	114 108^{F}; 6^{M}
Number Collared	80	59	62	70	40
Capture & Transport Mortalities	8 (4%)	8 (6%)	7 (7%)	4 (3%)	5 (4%)
Capture Myopathy (Mortality ≤ 3 weeks post-release)	18 (23%)	7 (12%)	8 (13%)	6 (9%)	2 (5%)
Survival at 43 Weeks Post-release	21%	78%	71%	87%	85%*

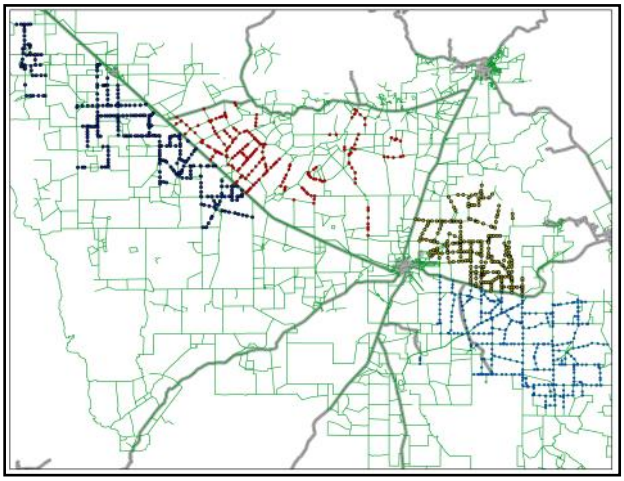
^{F} = Female; ^{M} = Male
*22 weeks post-release

Fence Modification & Replacement Efforts

After downloading 2011 pronghorn movement data from GPS collars, we were able to document the extent that fences act as barriers to pronghorn movement. In subsequent years we have modified restrictive fences in our Restoration Areas before translocation. To date, we have implemented >1,500 modifications throughout the Marfa and Marathon Restoration Areas. In addition, many landowners have voluntarily replaced miles of restrictive fence with pronghorn-friendly-fencing.

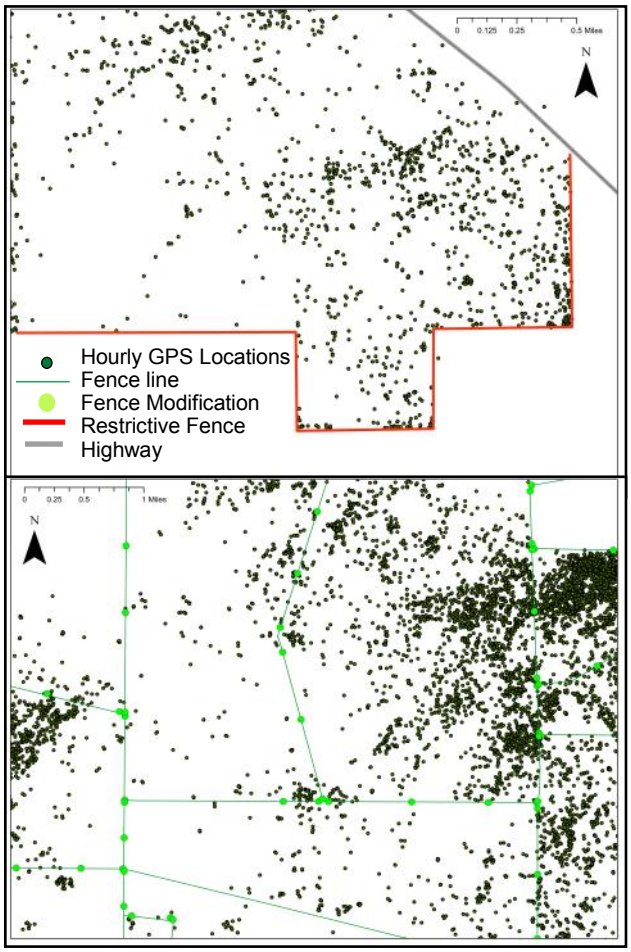
Across all 5 restoration areas, more than 310,400 acres of grassland habitat has been connected via fence modifications.

Fence modifications and pronghorn-friendly fences allow for pronghorn movement and connect critical habitat. The ability to move to areas with better range conditions to find resources is essential for pronghorn in the Trans-Pecos (e.g., moving to an area that has recently received precipitation or an area that provides preferred fawning cover). Additionally, pronghorn-friendly fences allow for predator avoidance. Properties with restrictive fences may experience increased mortality of pronghorn during drought years.



Fence modification efforts across Marfa restoration areas illustrated by colored dots above.

Fence modification consists of raising the bottom wire of restrictive fences to ≥18" from the ground in 20–30 yard stretches every 0.5 mile and near fence corners. We also focus on improving existing natural crossings. Fences that allow pronghorn to pass under are considered "friendly".



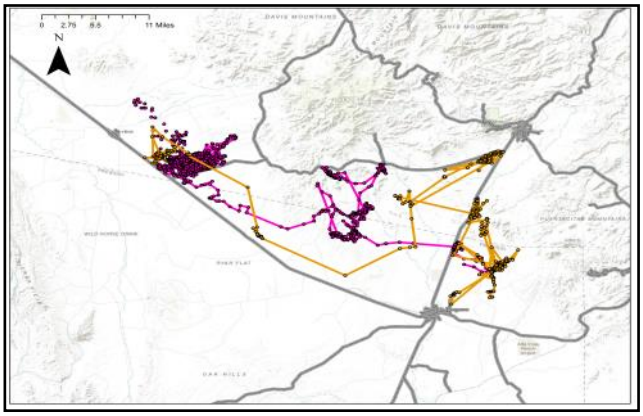
Hourly GPS locations from radio-collared pronghorn illustrate the negative impact restrictive fences, fence corners, and highways have on pronghorn movements (top image), whereas modifications and pronghorn-friendly fences facilitate movement (bottom image).

Pronghorn Movement and Habitat Use

In some target restoration areas, populations are recovering exceptionally well. Unfortunately, analysis of data retrieved from radio-collared individuals in the Marathon (2013) and Marfa (2016) restoration areas has revealed that there are pockets of habitat avoidance totaling more than 4,300 acres northeast of Marathon and more than 74,800 acres northwest of Marfa.

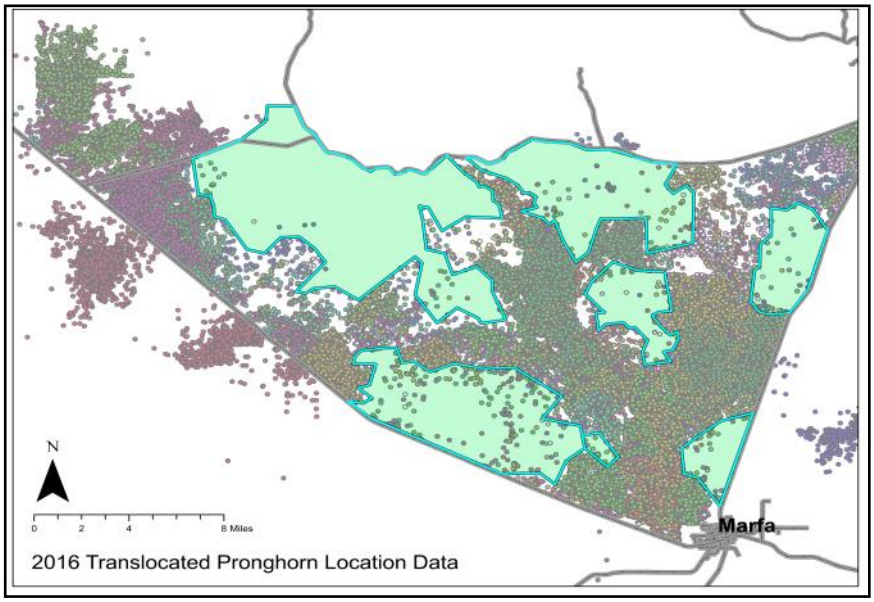
Since the 1900s, shrub composition has increased across all North American grasslands. More than any other factor, vegetation influences pronghorn density and distribution. Pronghorn avoid predators by using sight and are adapted specifically to low, relatively open grasslands that allow for broad visibility and ease of movement. Rangelands with low-growing vegetation (<25 in. high) provide optimal conditions for keeping vigilant while foraging and fawning.

Shrubs compete for moisture and nutrients with forbs and grasses. As a result, grassland sites dominated (25% or more) by shrubs generally have fewer pronghorn compared to sites dominated by herbaceous vegetation. However, not all shrubs should be eradicated, as they do provide forage during drought periods.



Large movements by pronghorn translocated to Marfa NE (2017).

With more fence modifications and pronghorn-friendly fences added across the region, pronghorn are making larger movements. For example, pronghorn translocated in 2017 (image above) are traveling large distances across the western restoration areas. It is common to encounter them attempting to cross highways. Alerting motorists to be aware of traveling pronghorn is important to prevent unnecessary mortalities. Movement patterns and spatial use of radio-collared pronghorn convey the need to manage habitat across large areas and prepare for sporadic movements, especially during drought and fawning periods.



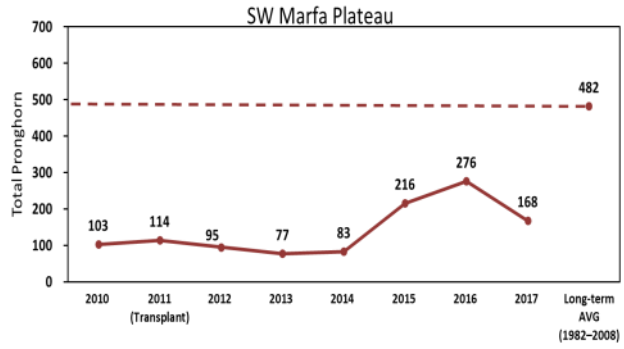
Left, blue polygons represent avoided portions of the Marfa NW restoration area by translocated pronghorn. Habitat imagery indicates that much of the avoided area around Marfa is severely invaded with honey mesquite and creosote stands.

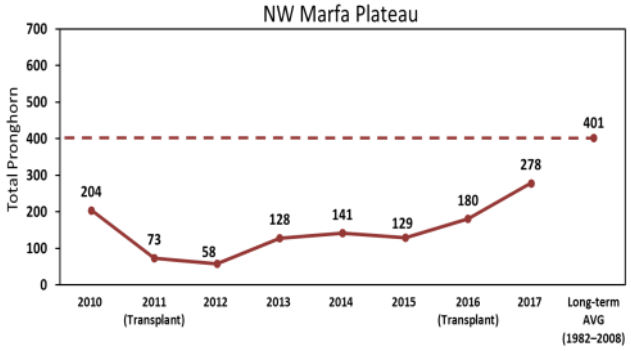
Historic fires in the West Texas desert grasslands have produced fire-adapted vegetation that persisted on the landscape due to periodic (10-year) fire-return intervals. A mixed pattern of burned and non-burned patches of vegetation can produce 200–300% more herbaceous vegetation than unburned sites. Grassland diversity is essential for pronghorn.

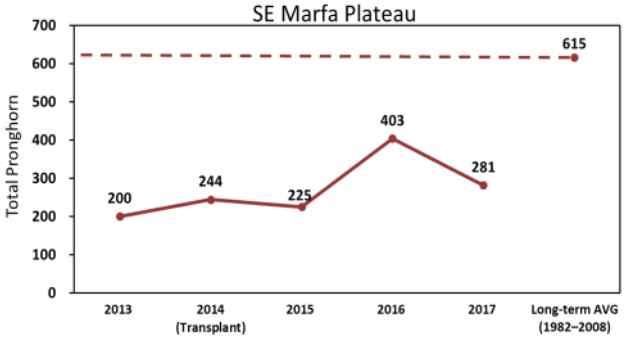
Regions of unusable habitat resulting from brush encroachment may influence our ability to reach target population sizes–a new and urgent concern.

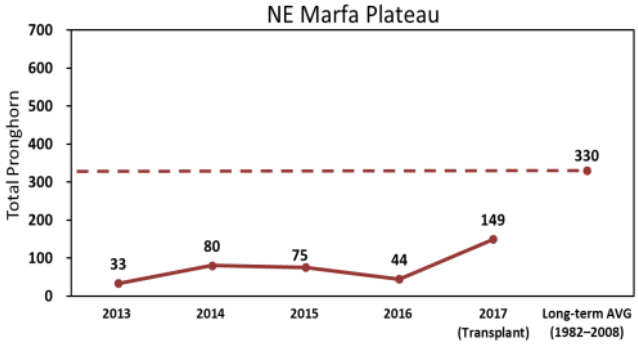
Population Trends in Restoration Areas

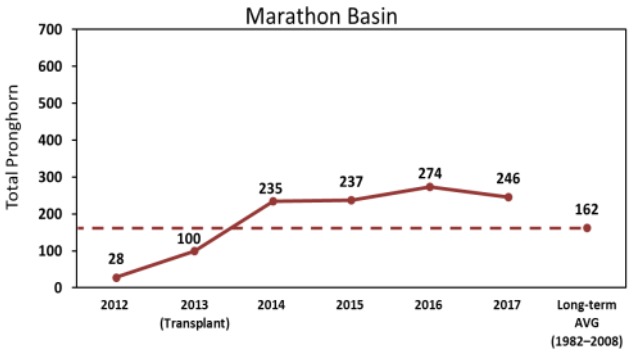
Pronghorn population estimates are obtained annually by conducting aerial counts of select herd units which comprise the primary range of the species in the Trans-Pecos wildlife district. Adult population estimates obtained from yearly surveys are compared to the long-term average prior to the decline (dotted horizontal line; 1982–2008) of each restoration area. Note: X-axis scale (year) is not the same for all restoration areas below.











Adult pronghorn populations in the Marathon basin exceeded the long-term average following translocation in 2013. Populations in the NW and NE Marfa Plateau are increasing towards the long-term average. Populations in SW and SE Marfa are stable. We expect the January 2018 translocation to take place in the SW Marfa Plateau.

Future research initiatives

Pronghorn are one of the cornerstone wildlife species of the southwest grasslands. Using the best science available, we will continue to implement our Pronghorn Restoration and Monitoring Plan in addition to collaborating with other researchers and biologists. Region-wide collaboration and active restoration is the only way this iconic species will recover and continue to roam the desert grasslands of West Texas.

We are currently seeking partners to broaden our research focus on the following topics relative to pronghorn conservation, management, and grassland restoration:

- Enhance and expand restoration efforts to include additional target areas
- Evaluate efficacy of strategic fence modification/replacement on pronghorn movements and connectivity of habitat
- Focus habitat restoration efforts on brush-invaded grasslands and improve our assessment of optimal habitats using new vegetation survey technology
- Enhance fine-scale monitoring efforts using satellite collar technology
- Document the effects of brush control practices on pronghorn movement, habitat use, and recovery
- Continue to closely monitor survival and movement of translocated pronghorn

For more information about the pronghorn restoration and research program: visit us at bri.sulross.edu or please contact:

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Many of the projects included in this report were conducted in cooperation with and supported by the private landowners of west Texas. The value of these collaborations to this effort cannot be overstated.