

“There’s *Haemonchus* Among Us!” said one pronghorn to another. **The Borderlands Research Institute for Natural Resource Management, Sul Ross State University**

*article by Louis A. Harveson
photos courtesy of Justin Foster*

Editor’s note: Shawn Gray is the new Texas Parks and Wildlife Department Pronghorn and Mule Deer Program Leader stationed in Alpine, Texas. Shawn served as a regulatory biologist in Terrell, Pecos and Brewster counties for five years prior to taking the new position.

Pronghorn are an icon of the American West—symbolizing grasslands, speed, agility and wildness. Since the 1850s, the distribution of pronghorn has diminished and today is limited to a relict population in the western Edwards Plateau, portions of the Panhandle and the desert grasslands of the Trans-Pecos. Urbanization, fragmentation, land-use change, and brush encroachment are the primary culprits for the reduction. According to Texas Parks and Wildlife Department (TPWD) data, the Trans-Pecos has been the mainstay for pronghorn in the state where 60 to 70 percent of the statewide population is estimated to live. But Trans-Pecos pronghorn have seen better days.

Previous research at the Borderlands Research Institute has documented that along the southern edge of pronghorn distribution, rainfall is extremely important to their numbers. In wet years, adequate forage (forbs) and cover (grass cover) benefit fawn recruitment and survival, but in drought these habitat requirements are limiting. The relationship between rainfall and pronghorn is not new to landowners and biologists in West Texas but was especially evident in 2008. Following an eight-month drought, TPWD documented a significant die-off of adult pronghorn where an estimated 2,000 to 3,000 pronghorn were thought to have succumbed in the Marfa Plateau.

The 2008 die-off of pronghorn was not surprising, but what unfolded in 2009



Pronghorn populations in the Trans-Pecos have seen better days. Although precipitation levels have returned to “normal,” pronghorn populations have not recovered. Researchers with TPWD, Texas Department of State Health Services, and the Borderlands Research Institute are working with local landowners to determine the effects of diseases on pronghorn

stumped us all. For the Trans-Pecos, the first half of 2009 brought timely and abundant precipitation. This early precipitation provided much-needed forbs for lactating female pronghorn in the winter and for growing fawns in the spring and early summer. But rather than expanding pronghorn herds, landowners were reporting few observations of fawns and even accounts of adult pronghorns dying in the pasture.

“The few pronghorn we still had following the drought were in extremely poor condition,” said Bill Miller, whose family has been ranching near Valentine for over 100 years and received the Texas Land Stewardship Award in 2003. “We found three dead antelope, but none bore any signs of predation other than vultures.

All were found within eight to 12 hours and were in bad condition. It looked like they just lay down and died. All during this period, our numbers just kept dwindling and appear to continue to do so.”

After receiving several similar reports from landowners in spring 2009, TPWD staff began investigating possible causes for the decline. In June 2009, annual pronghorn surveys confirmed the observations: the Trans-Pecos pronghorn herd had experienced yet another abrupt decline. Based on aerial surveys, pronghorn recruitment across the entire Trans-Pecos region averaged only 13 fawns per 100 does (near record lows). The Marfa Plateau region, an area that generally produces 25 to 35 fawns per 100 does, was hit even harder and produced only nine

The West Texas Chapter
of Safari Club International
proudly supports the
Borderlands Research Institute
and their investigation
into the pronghorn decline.

fawns per 100 does, despite good rainfall.

Having heard and witnessed similar occurrences, Jon Means, owner of the Moon Ranch in Jeff Davis and Culberson counties, worked with TPWD District Leader Billy Tarrant to invite a group of local landowners, sportsmen, biologists, and researchers to discuss the recent demise of pronghorn. The group was later dubbed as the “Trans-Pecos Pronghorn Working Group.”

During their inaugural meeting, the Working Group reviewed the current status of pronghorns, discussed possible causes for the decline and formulated a strategic effort to collect data and evaluate possible hypotheses for the unprecedented decline of pronghorn in the Trans-Pecos. Several theories emerged from the discussion (e.g., predation, nutrition, infertility), but those were generally discounted because they could not explain the observations landowners had reported. One theory that emerged was the presence of *Haemonchus contortus* affecting the survival and productivity of pronghorn. *Haemonchus*, also referred to as barber pole worms, are parasitic bloodworms commonly found in the abomasums (true stomach) of ruminants.

In spring and summer 2009, working with Dr. Ken Waldrup and Dr. Dan McBride, TPWD biologists were able to conduct two necropsies of pronghorn from the Marfa Plateau region. A host of physiological and anatomical factors were evaluated, but the one that caught the attention of the veterinarians was the presence and abundance of *Haemonchus* in the two pronghorn specimens.

Haemonchus attaches to the inner lining of the digestive system and adult worms are able to draw off 0.1 cc of blood/worm/day. Additionally, where the worms attach in the stomach becomes scarified inhibiting the ability of the stomach to absorb nutrients. High infestations of *Haemonchus* have been reported in white-tailed deer in the southeastern United States and can cause anemia resulting in death. *Haemonchus* has been documented in pronghorn in the Great Plains region, but the reported levels were of little consequence.

Dr. Waldrup, who has studied *Haemonchus* in white-tailed deer, noted, “In dry environments such as West Texas, *Haemonchus* are usually not a problem. Their life-cycle is impaired by dry conditions, but could thrive during wet cycles



Following the formal presentation, TWA Director Dr. Dan McBride demonstrated blood, tissue and data collection methods using a goat in lieu of a pronghorn.

or conditions. In West Texas, optimal conditions for *Haemonchus* are likely around water holes, tanks or troughs. These areas could concentrate pronghorn and expose them to *Haemonchus* larvae as they forage around the water sources.

“As a general rule,” said Dr. Waldrup, “cattle are often more resistant to the effects of intestinal parasites due to size. A fat cow can lose 400 pounds and still survive, though she may not produce very good calves. Stocker calves are more prone to parasites than mature cattle. A pronghorn can’t lose that much weight and would be very susceptible. *Haemonchus* could also be affecting weaning fawns. Even if it didn’t kill them outright, it could make the fawns more susceptible to predation by causing anemia and reducing their stamina to escape.”

Given the fast-approaching 2009 pronghorn hunting season (some 30 days

away) and the preliminary data on *Haemonchus*, the group identified a host of variables that could be obtained from hunter-harvested pronghorn. Biologists would attempt to obtain blood, liver, fecal, genetic and abomasum samples from approximately 75 to 100 hunter-harvested pronghorn. The proposed sampling effort would be one of the largest of its kind for pronghorn in the United States.

“The Working Group had to do something about this,” said Dr. Dan McBride. “The pronghorn situation is dire and if we don’t determine what is going on, we may not have pronghorn in 10 to 20 years.”

“Pronghorn hunting certainly has an economic impact on the region,” added Billy Tarrant. “We have some landowners who historically receive 20 or more permits each year, and the last couple of years they have received only two to three.”

Understanding the urgency of the situation, members of the Working Group immediately implemented their plan. In a short amount of time, the Working Group: (1) updated and obtained permission from landowners, (2) formalized sampling protocols, (3) obtained emergency funding from conservation partners (West Texas Chapter, Paso del Norte, and Southern New Mexico chapters of Safari Club International), (3) ordered and built field sampling kits, (4) generated a press release to inform resource agency personnel



Seemingly harmless, the barber pole worm (*Haemonchus contortus*) is a parasitic round worm frequently found in domestic ruminants and some wildlife.

photo from www.nematodes.org

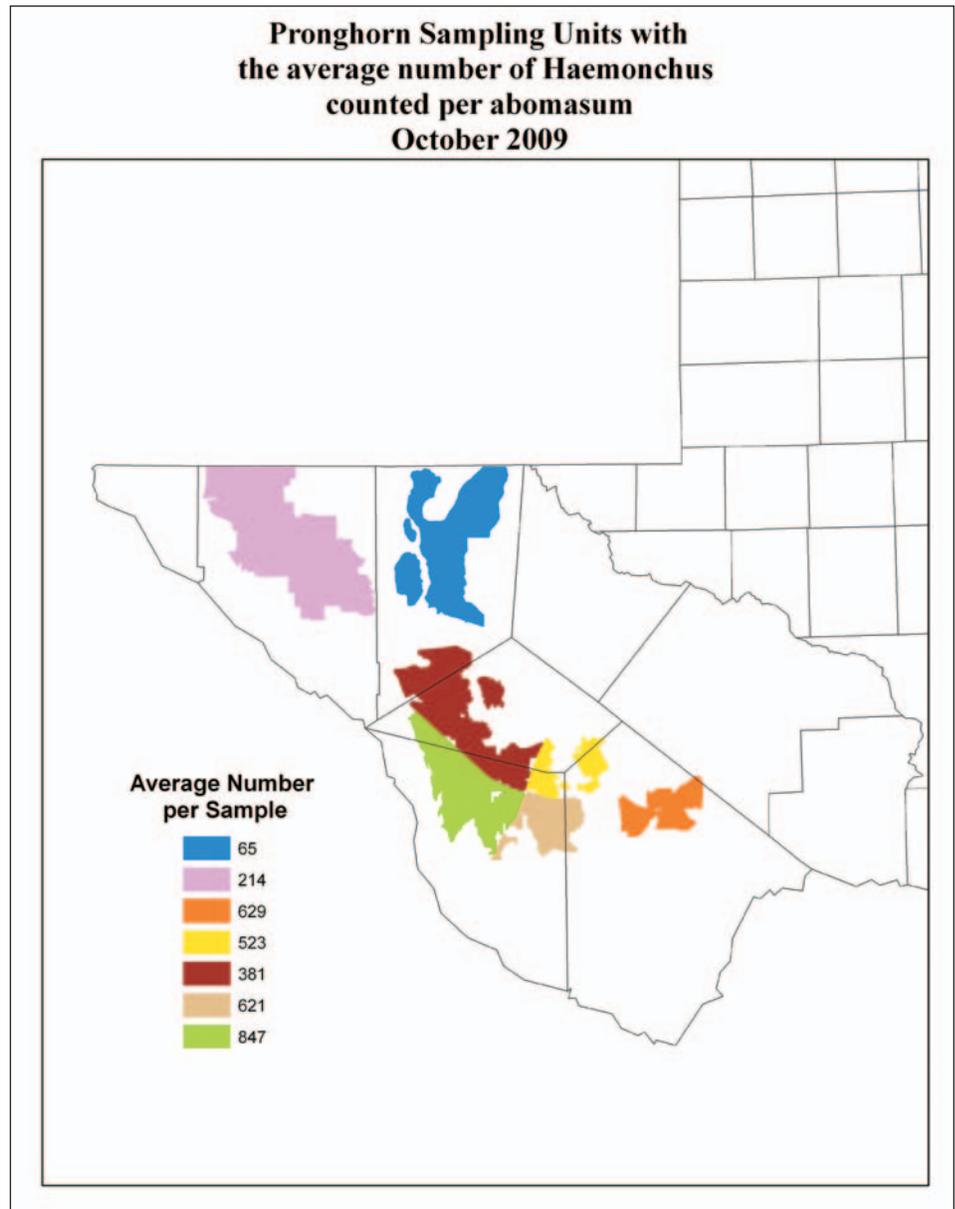
of the situation, and (5) assembled a group of volunteers and biologists to assist with the data collection.

Two days prior to the opening weekend of pronghorn season, over 75 resource professionals converged at Sul Ross State University for a training session. Tarrant gave an overview of the pronghorn decline and assigned volunteers to regional teams. Each team was led by a local regulatory TPWD biologist who had previously coordinated sampling opportunities with local landowners. Following the briefing, the group listened to Dr. McBride as he demonstrated necropsy and data collection procedures.

After the season closed, we had amassed 102 samples representing 50 ranches and 1.8 million acres for analysis. Prevalence of *Haemonchus* was 95 percent, that is, 78 of the 82 samples analyzed had barber pole worms. The average number of *Haemonchus* per pronghorn was 510 worms/pronghorn and ranged from 0 to 4,080. Apparent trends in parasite loads were revealed by geographic units (see map). We also tested blood and liver samples for selenium and copper levels, both of which are important to reproduction. Selenium levels were normal, but copper levels were very low, averaging 8 ppm (normal levels for deer are 25 to 100 ppm).

In most mammalian species, parasitic diseases (e.g., *Haemonchus*) can have sporadic infection rates because some individuals will be immune. However, the concentrations of *Haemonchus* we observed are alarming. Worm concentrations in sheep and goats (similar size to pronghorn) higher than 2,000 would affect survival and levels greater than 4,000 would result in death. Consequently, we believe that the high *Haemonchus* concentrations could be affecting the survival of pronghorn in the Trans-Pecos.

A seemingly easy answer to decrease barber pole worms would be to use a chemical wormer, but with the worm's ability to quickly become resistant to chemical treatments and the difficult task of providing enough wormer to numerous pronghorn throughout the landscape within a short timeframe, we recommend that landowners not attempt this. The last thing we want to deal with is a super *Haemonchus* strain. In addition, we cannot lose sight of the many other factors that have likely figured into the current pronghorn decline (e.g., suitable habitat, pre-



Average number of Haemonchus worms discovered in pronghorn from across the Trans-Pecos. (Figure created by Billy Tarrant, TPWD).

cipitation and predation).

In partnership with TPWD and private landowners, the Borderlands Research Institute is seeking funding to further investigate the plight of pronghorn in the Trans-Pecos. Specifically we seek to (1) establish baseline levels of *Haemonchus* from pronghorn in the Panhandle (a likely source for restoration efforts), (2) assess the occurrence of *Haemonchus* in other wildlife (mule deer, aoudad, elk), (3) evaluate the origin of *Haemonchus* affecting pronghorn, (4) research different habitat manipulations and treatments to decrease *Haemonchus* in the environment, (5) determine the prevalence of other diseases in pronghorn, and (6) monitor the survivability of pronghorn fawns in the Trans-Pecos. 🐾

Trans-Pecos Pronghorn Working Group

Jon Means (owner, Moon Ranch), Bobby McKnight (owner, McKnight Ranch), Albert and Bill Miller (owner, Miller Ranch), Dr. Ken Waldrup (DVM, Texas Dept. of State Health Services (TDSHS)), Billy Tarrant (TPWD District Leader), Johnny Arredondo (TPWD biologist-Jeff Davis County), Mike Sullins (TPWD biologist-Presidio County), Ernie Davis (retired TPWD biologist; hunting guide), Shawn Gray (Pronghorn and Mule Deer Program Leader, TPWD), Dr. Louis Harveson (Director, Borderlands Research Institute, SRSU), and Dr. Dan McBride (DVM; hunting guide).