

Prescribed Fire and Cattle Grazing to Manage Tanglehead for Wildlife Habitat Improvement

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Introduction

by Poncho Ortega

Invasive species that reduce plant diversity represent a threat to wildlife habitat. In 2001, when I first came to Kingsville to join the Caesar Kleberg Wildlife Research Institute team, one of the first questions I was asked was if I knew how to kill Guineagrass; my response was simple... I spent 18 years of my professional life trying to make it survive in Mexico, and we killed it in many places. Of course, I know how to kill it! Since then, other invasive grasses have become challenges in wildlife conservation: buffelgrass and old world bluestems, for example, but a native grass, tanglehead, has become a significant problem for ranchers in several counties of Central-South Texas.

Background

Exotic, i.e., non-native, grasses were introduced to the US primarily to increase the production of forage for cattle in the mid-1950s; at the time, these decisions were made with a focus on livestock, and the value of wildlife species was not as important as it has become in the last 20 years. One key characteristic of exotic grasses is that they are very palatable for cattle. However, tanglehead is different; this species is a native grass considered in the literature to be a “decreaser” and good forage for cattle. Nevertheless, it has been invading native rangelands in the sand sheet region of South Texas, a prime area for white-tailed deer and bobwhite quail hunting. Thousands of acres converted to monocultures of tanglehead, with very low palatability for cattle when plants mature, have replaced critical native wildlife habitat.



Tanglehead creates ample fine fuel, approximately 5,000 lbs per acre in this pasture, that is continuous and conducive to prescribed fire.

In most of the ecological sites of the sand sheet region, tanglehead would naturally comprise about 5% of the native vegetation cover. A plant within a group of two or three plants spaced throughout the landscape is good nesting cover for bobwhites and wild turkeys, and also creates white-tailed deer fawning cover. When the plant bunches start spreading across the pasture forming small motts, the use of glyphosate (such as Roundup WeatherMAX®) at 2% v/v can be used to kill individual tanglehead bunches and prevent an infestation that may be near impossible to control later. Monitoring how the tanglehead population is changing over time is crucial for knowing when to take action.

Tanglehead can increase very rapidly; for example, populations in Kleberg and Jim Hogg counties increased from 1.4% in 1999, to 2.7% in 2002, to 8.1% in 2009, and to 17.8% in 2014. Within those 17 years, the plant increased its distribution by about 10 times, driven by a combination of factors. The primary factors were likely changes in rainfall patterns from predominantly spring to summer rain and the removal of cattle grazing that has occurred on many recreation ranches focused on habitat management for wildlife.

Fire and Grazing

Lack of action at the initial stages of tanglehead invasion may lead to a monoculture that requires intensive management for the land to maintain productivity and diversity. We have been successful in managing monocultures of tanglehead with prescribed fire and cattle grazing. The capacity of tanglehead to accumulate forage (about 5000 lb/ac) is conducive for using practices like prescribed fire, with burning in November or February yielding similar results. In addition to reducing fine fuel and the mortality of some plants, the new growth of tanglehead spurred by the fire increases the palatability and nutritive value of the forage for cattle. According to our research, mature tanglehead can increase



Tanglehead produces abundant seedheads which contribute to its rapid spread, particularly in the South Texas sandsheet.

from 4% crude protein to 16% in the regrowth 34 days after fire. It takes about 2 years for cattle to “acquire a taste” for tanglehead. They will readily consume the young fresh growth of burned areas but it may take longer for them to start consuming the young growth of non-burned plants. Younger stocker type cattle do not graze tanglehead as well as older animals. We suspect it’s because of their baby teeth and softer mouths.

We found that burning patches roughly 10% the size of the pasture with a stocking rate of cattle at about 20 acres per animal unit effectively reduced the tanglehead population and increased native plant species richness, and this effect lasted for 48 months. Prescribed fire increased utilization of tanglehead to 42-52% in the burned areas compared to 6-7% in the non-burned areas, however observations in other sites indicate that utilization increased on non-burned areas after cattle learned to graze tanglehead in year 3 and 4 after starting a patch burn program. Cattle used the burned areas 4.5 times more than the non-burned areas. Plant species richness increased 275-300% in the burned plots compared to before burning.

We also found an effect on basal circumference of tanglehead plants. In the areas that were burned and grazed, the basal circumference of tanglehead plants did not increase in size while basal area in the patches that were only burned, or only grazed, or control areas (not treated with either burning or grazing) increased in basal circumference by 2.8 to 4.7 inches. The ground cover of tanglehead remained the same in the burned and grazed area while in the only burned, only grazed, and control areas it increased from 24 to 54% cover.

We had similar results with prescribed burns conducted in either November or February. The effects of burning and the cattle grazing are long-term. Following the November burns, plant species richness was 300% higher than before the burn, 4 years after burning. In the case of the February burn, plant species richness was 275% higher 1 year and 9 months after the burn.

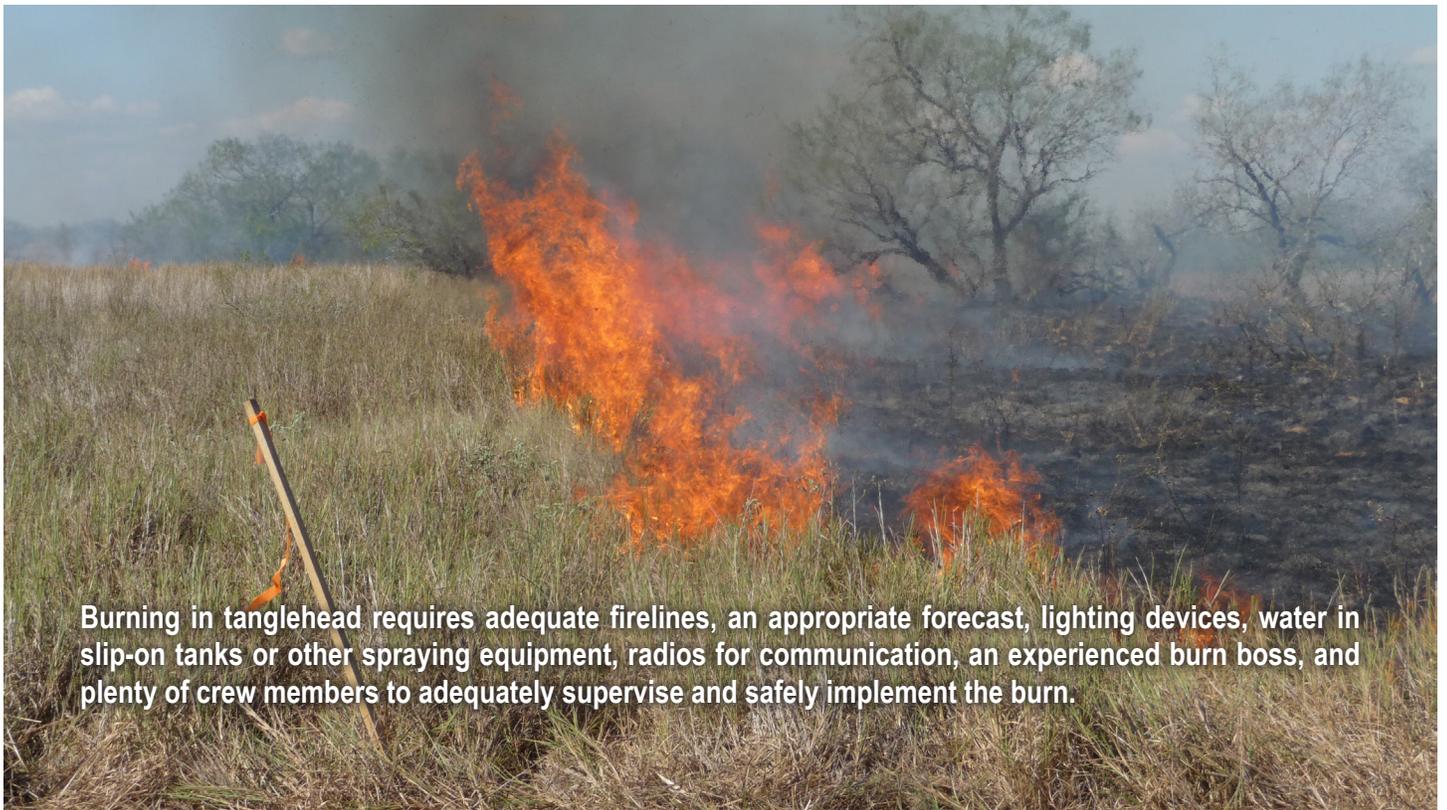
Bare ground is an important component of bobwhite habitat; tanglehead monocultures are

too dense to allow the movement of bobwhites. Bare ground made up 7% of the ground cover before burning in November and 23% 4 years after the burn. For the February burn, bare ground was 16% before burning compared to 19% 1 year and 9 months after burning. The November burn had a more dramatic effect on the amount of bare ground; however, this may have been a result of our study design in which we collected data for a longer period of time after burning in November. The prescribed burn and cattle grazing clearly increased the open spaces for bobwhite movement especially in the case of the November burn.

Even though November and February burns yielded similar results, the late fall/early winter burns may have some advantage. Tanglehead is a warm-season grass, and burning at the end of the growing season or right before the beginning of dormancy could weaken the plants, providing opportunities for cool season native plants to germinate and become established.

Lighting a thick, matted stand of tanglehead with a pear burner to improve forage quality and value for wildlife.





Burning in tanglehead requires adequate firelines, an appropriate forecast, lighting devices, water in slip-on tanks or other spraying equipment, radios for communication, an experienced burn boss, and plenty of crew members to adequately supervise and safely implement the burn.

For those ranches invaded by tanglehead but with limitations or lack of desire to graze cattle it may be possible to use exotic wildlife to obtain similar effects as with cattle. On a 8,800-acre ranch in the Hebbronville area we burned 4 patches of tanglehead ranging from 7 to 30 acres, which corresponded to about 1% of the ranch, during November. The ranch was stocked with 60 wildebeests, 25 sable antelope, 50 zebras, 20 blackbucks, 20 oryx, 3 kudus, 8 gemsbok, and 20 axis deer. Percent utilization of tanglehead was higher in the burned area with 48% utilization compared to the control area with 30% utilization.

Conditions for prescribed burns may not always be ideal in South Texas. Other approaches may be considered as substitutes; for example, anecdotal observations indicate that mowing patches of tanglehead could increase the palatability and nutritive value of grass regrowth, attracting cattle to the mowed areas, which would result in a similar effect as using prescribed fire. However, mowing may allow increases in crown size and tanglehead spreading, resulting in reduced bare ground over time compared to prescribed burning.

Cattle productivity during the four years of our study was satisfactory and acceptable for the region's standards. Weaning rate in the study area ranged from 90 to 100%, and average weaning weight from ranged from 500 to 503 lbs at 7 months of age. Over a period of 4 years, the burned patches encompassed about 25% of the pasture, which did not have an impact on cattle performance.

The increase in plant species richness and bare ground made the habitat more attractive for bobwhites. The first two years of the study (November burns 2017-2018), we counted 71 bobwhites in the burned and grazed areas compared to 16 in the control area. From 2019 to 2020 we counted 91, 45, and 70 bobwhites in the February burns, the November burns, and the control areas, respectively. We believe that with increasing the number of burned patches from November 2017 through February 2019, the mosaic of non-burned areas, as well as the patches of areas burned at different times, created habitat that was more attractive to bobwhites, and this mosaic of different growth stages increased the use of not only the burned and grazed areas but the control patches as well.

Both cattle and exotic wildlife utilize more forage in burned areas than non-burned areas. Note the green sprigs of grass growing back within a few days of burning.



Conclusion

The combination of prescribed fire and cattle grazing will increase bare ground and plant species richness, and decrease tanglehead cover making the habitat more attractive for bobwhites. Additionally, utilization of tanglehead by cattle in the burned areas will increase significantly with acceptable levels of cattle productivity for the standards of the region.

Recommendations

- A tanglehead plant every 30 steps may be desirable in the habitat as good nesting cover for bobwhites, wild turkeys, and other grassland birds, as well as white-tailed deer fawning cover. Closely monitoring the density of tanglehead will allow for quick decision-making to reduce the density of individual plants when they start to increase beyond this level. Glyphosate at 2% v/v can be used to kill individual plants or tanglehead clumps.
- Monocultures of tanglehead can be managed with prescribed fire and cattle grazing. Prescribed fire may be applied in November

or February with similar results. When forage standing crop of tanglehead before burning is around 5000 lb/ac, cattle may be stocked at about 1 animal unit per 20 ac on a continuous grazing scheme.

- When conditions are not favorable for prescribed fire, mowing spots with high density of tanglehead to encourage the regrowth and attract the cattle may yield similar results as using prescribed fire.
- Areas in pastures with higher densities of tanglehead should be the priority to burn the first year, then in consecutive years target areas with lower density.
- Burned patches should not represent more than 10% of the size of the pasture, and new areas should be burned every other year.

Resources

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To find a Certified and Insured Prescribed Burn Manager or a course in prescribed burning, visit the Prescribed Burn Program page of the Texas Department of Agriculture's website.

To see if there is a Prescribed Burn Association in your area, visit: www.pbatexas.org.

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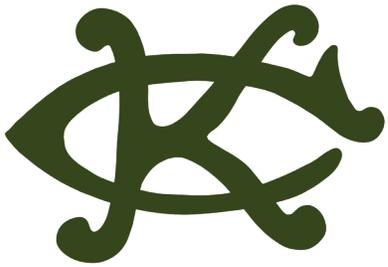
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