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## DISTRICT 8 STAFF

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### Matt Reidy

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### Kent Williamson

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### Dustin Windsor

Duval, Jim Wells, San Patricio, Nueces & Aransas counties

## Drought Impacts for the Summer Season

Ashton Hutchins, Wildlife Biologist – Pearsall, TX

South Texas can be generalized as a place that does not receive much precipitation. Frio, Zavala and Dimmit counties lay within a semi-arid desert area that expects only 22-24 inches of rainfall per year. When the rains do fall, they are unpredictable at best. In Pearsall, we have only received 1 inch of rain in the last 180 days. Conditions are bad, but could get much worse if summer rains do not fall and offer some relief.

Living and working in a semi-arid desert, the next dry spell is always a concern. Planning ahead to lessen the impacts of drought conditions is important to any ranching or hunting operation. This is especially important when forecasts indicate a hot, dry summer may be in store for South Texas. Following a couple of common-sense guidelines, you could lessen the impact of a below-average rainfall year.

Foremost, focus on your management goals and practices, be mindful of your budget and allow for flexibility in your operation. Always maintain a minimum amount of ground cover. If possible, 1-2 feet of herbaceous cover through all seasons is desirable. This residual grass is for fawning cover and quail production. Leaving herbaceous cover for the next rainfall event provides healthy plants that offer the necessary food and cover for many wildlife species. The ability to leave standing cover means having a plan to reduce livestock numbers in the pasture and/or move livestock to irrigated crop land or improved pastures. During extended droughts, you may be faced with removing livestock all together. Along with cattle, keeping deer and hog populations within the habitat's carrying capacity will help reduce the potential for damage. By reducing the number of consumers on the land, you can maintain the minimum desired grass cover.

Second, maintain as many useable wildlife and livestock water locations as possible, especially in the hot, dry months. A desirable density would be one water location every 500 acres. Although this may not be possible in every area, even distribution of water will spread wildlife evenly across the landscape. Hot, windy days accelerate the evaporation rates, and can make it very difficult to maintain large stock ponds. However, it may still be possible and economically friendly to run livestock troughs and wildlife waters.

One option many ranches employ is the use of supplemental feed during drought. This is the last resort to maintain wildlife body conditions and survival. The ability to feed wildlife (and livestock) may minimize the impacts on your habitat, but prolonged supplementing will impact your pocket book and habitat.

Finally, prepare for the next rainfall event. Keep all machinery in working order, and be ready to disturb the soil to maximize the use of rainfall. A part of being ready is also having a means of keeping track of how much rain falls, and when. The timing of rainfall is sometimes just as important as the amount for deer and quail.

Let's just keep hoping for rain!

## GETTING TO KNOW D8 STAFF – Ashton Hutchins



Photo courtesy of Ashton Hutchins

Howdy! My name is Ashton Hutchins and I have been working for TPWD for nearly 7 years. I began employment with the department in August of 2004. I cover Frio, Zavala and Dimmit counties as a wildlife biologist, and I reside in Pearsall with my wife Jenn. We will be celebrating our third wedding anniversary on June 28th.

I obtained my Bachelor's Degree in Wildlife and Fisheries Management from Texas A&M University in College Station in 1997. I then went on to Texas A&M University-Kingsville and received a Master's Degree in Range and Wildlife Management in 2003. I studied the "Effects of Releasing Pen-raised Bobwhites on Wild Bobwhites in South Texas" for my Master's Thesis.

I enjoy just about anything involved with the outdoors, especially hunting and fishing. My passion is dove hunting with Capone or Babyface, our Labrador retrievers.

## News and Policy **UPDATES**

Alan Cain, White-tailed Deer Program Leader – Austin, TX;

Daniel Kunz, Technical Guidance Biologist, Alice, TX; Dustin Windsor, Wildlife Biologist – Alice, TX

**Deer Management Permit applicants need to be aware of some new changes for the next permit year. Please see the DMP info sheet when it is released this summer. Changes include:**

1. All **new** DMP pens must be between 5 to 100 acres.
2. All **new** pens must have at least 50,000 ft<sup>2</sup> of natural vegetation typically used by white-tailed deer for concealment and cover. An example of escape cover would be continuous mixed brush thick enough to hide deer from one end of the pen to the other, even in winter when leaves may be absent.
3. Antlerless breeder deer may be released into a DMP pen and must be released to the ranch by release date specified in the DMP plan. Antlerless breeder deer may NOT be returned to a breeder facility.
4. You can now release DMP deer up to 45 days before the deadline for stocking deer in the next permit year; in South Texas this date is October 30.
  - a. Be aware that you must leave the pen vacated for 30 days after release before adding deer for the next permit year. So a release date of October 30 would only allow a 15 day window in which to catch and add deer under a new permit. It is possible that some does may already be bred in the first two weeks of December.
  - b. You cannot serve as a TTT trap site if deer held in a DMP have been released in the same permit year. If you plan to TTT deer off your ranch, all DMP deer must be released by August 31.

Changes 1 and 2 apply to all new pens. All permittees with approved pens in 2010 will be grandfathered in and do not need to modify their pens to accommodate the new rules, as long as they keep their permit every year.

In our December newsletter, you probably read a story about the San Antonio Food Bank and a venison donation program. I am pleased to report that the San Antonio Food Bank was able to distribute 8,678 pounds of ground venison. The largest single donor was Wren Munsterman (Alice B. Hall Martinena Ranch, Encinal, Texas), followed closely by Mark G. Davis (Halff Brothers Ranch, Pearsall, Texas). Wren extends his appreciation to the crew (Country and Don) in Pearsall for their efforts in making this "an all-around fulfilling experience for all of us."

Keep up the great work and remember this valuable program if you find yourself with extra venison.

## Game Management and Its Impact on Non-Game

Matthew Reidy, Wildlife Biologist – Pleasanton, TX

From South Texas to the rest of the Lone Star State, wildlife game species garner the most interest from the public. This is because game species provide a unique and consumptive recreational resource that cannot be duplicated. Furthermore, this intense interest provides income to private landowners as well as state and federal agencies through hunting access and license fees.

With all that being said, there is also intense interest in managing habitats for increased numbers and quality of game species for harvest. In South Texas, far and away, the primary landowner interest is white-tailed deer and to a lesser extent Northern bobwhite quail. Habitat management practices as well as wildlife management practices are being utilized on a large and small scale to benefit these game species throughout South Texas.

What are the effects of all this management on the multitude of non-game species? With over 600 bird species, 184 mammal species and approximately 200 reptile species identified in Texas, you can see there are a lot of species out there that are impacted by your management.

Before we can discuss the impact our game management is having on non-game species, we should first discuss in a broad sense what



Loggerhead shrike. Photo courtesy of Robert Benson

type of habitat suits most of our game species. White-tailed deer and Northern bobwhite are considered "edge" and early to mid-successional species. They prefer the transition zones between dense brush and open grasslands as well as disturbed areas. These areas include brush for cover and food, grass for cover, and disturbed ground for forb (wildflowers) and insect production. An even distribution of diverse plant species and habitat types in a mosaic pattern provides the preferred habitat for most game species.

To accomplish this mosaic of habitat types, land managers utilize many different management practices. Habitat management practices (including mechanical and chemical brush control, shredding, fallow discing, prescribed grazing and prescribed fire) are utilized on the landscape to a varying degree. Wildlife management objectives, such as supplemental feed, supplemental water, predator control and harvest management, are also important and effective tools aimed at enhancing game populations.

Many non-game species benefit from game species habitat management. The loggerhead shrike, painted bunting, Texas horned lizard, indigo snake, pocket mouse, Texas tortoise and red-tailed hawk (just to name a few) require similar habitats and benefit from habitat management practices targeted at white-tailed deer and Northern bobwhite.

On the other hand, many non-game species are negatively impacted by either too much brush clearing, or too much brush encroachment. The ocelot, an endangered cat species found in deep South Texas, requires dense, diverse and virgin South Texas brush to survive. Furthermore, olive sparrows, sage thrashers and white-eyed vireos also decline with a reduction in brush density. On the other hand, Henslow's sparrow, prairie rattlesnake, Sprague's pipit, prairie



Texas Tortoise. Photo courtesy of Google Images

chicken, long-billed curlew and hispid cotton rat all decline with increased brush encroachment.

Livestock grazing was once the dominant land use for all of Texas' rangeland; however, with wildlife generating income, many landowners have reduced or even eliminated livestock on Texas ranges. Grazing, be it from cows, sheep or buffalo, is an important part of the natural ecosystem. The stocking rate (number of animals per unit area, or area per animal) can determine whether grazing is good or bad for the range and which wildlife species will benefit. Heavier grazing may be beneficial to black-tailed jackrabbits, meadowlarks, vermilion flycatchers and killdeer. Very light grazing is beneficial to Leconte's sparrows, pocket mice and cottontail rabbits.

Fire is an important tool that has been almost eliminated from many Texas rangelands for many years, but is beginning to make a comeback. Prescribed fire is generally accepted as the most economical habitat management tool available. However, we all know the risks (liability) of improper use of this tool. Prescribed fire is a great tool for managing habitat for game species. Fire can rejuvenate the landscape and promote vegetative growth that is beneficial to game species. Non-game species may also benefit from a prescribed fire. Kill-

deer, white-tailed hawks and longbilled curlews will come in soon after the fire has passed. Texas tortoise, Texas horned lizard, and eastern meadowlarks respond favorably to the new growth after a fire. However, harvester mice, wood rats, Henslow's sparrows, and cotton rats will respond negatively to a fire, as litter accumulation and dense grass growth are important to their survival. All in all, a moderately applied prescribed fire regime aimed at promoting a patchwork of vegetative conditions will promote the highest diversity of plant and wildlife species.

Across South Texas and beyond, supplemental feeding (deer feeders, etc.) is a very common practice. Pelleted "protein" feeders, spincast corn feeders, milo quail feeders, turkey feeders, truck/atv feeders, and others are used as part of a game management program. Furthermore, supplemental water, historically used to provide for live-stock production, is now further expanded and modified for wildlife management. Stock tanks, wildlife guzzlers, and wildlife friendly water troughs now dot Texas range-lands.

What effect does all this extra feed and water have on non-game species?

Some of the effects can be readily apparent. Raccoon populations seem to expand (and grow smarter) with every feeder design and addition. Many songbirds and rodents are also attracted to available food and water sources. Northern cardinals, lark buntings, wood rats, meadowlarks, ground squirrels and brown-headed cowbirds commonly visit feeders. Supplemental water will attract a multitude of nongame including skunks, armadillos, mockingbirds, great-tailed grackles, bobcats, crested caracaras and coyotes just to name a few.



Raccoon on hog at feeder. Photo courtesy Google Images

Feeders and water sources may also have some detrimental effects for non-game species. This includes the increased risk of predation. Predators will seek out feeders and water sources because of increased prey concentrations. Furthermore, congregations of animals in any one spot greatly increase chances of disease transmission.

Landowners interested in wildlife management practice predator control to varying degrees. Predator control ranges from an occasional coyote and feral pig harvest to intensive raccoon, skunk, coyote, bobcat, etc. shooting and trapping. The effect on remaining non-game species may be important. Many non-game prey species such as hispid cotton rats, wood rats, Texas rat snakes and leopard frogs may expand with reduced predators and compete with game species for food.

Comprehensive wildlife management plans designed to improve the quantity and quality of white-tailed deer always include a harvest strategy. Harvest is the main method used to maintain deer densities within a property and to "cull" unwanted antler characteristics from the herd. Harvest strategies of game species have important impacts on non-game species. When white-tailed deer populations are allowed to grow beyond the carrying capacity, the natural habitat gets damaged and all the non-game species that rely on that habitat suffer. Furthermore, eliminating all the deer on a property can also be detrimental to species that may rely on white-tailed deer impacts.

As you can see, the management we conduct on our properties has a multitude of effects. Some wildlife species benefit while other species are harmed by game management. It is up to each individual landowner to create their own land ethic and develop unique motivations and goals.



White-tailed doe with fawns. Photo courtesy Jimmy Rutledge, retired TPWD biologist

## Eagle Ford Shale Play and Habitat Protection in South Texas

Len Polasek, Region 4 Director – Rockport, TX

The Eagle Ford Shale Play covers more than 6,000,000 acres of land in approximately 17 counties in South Texas and stretches from Gonzales County in the northeast to Webb County in the southwest. The rich oil and gas producing geologic formation can be found at depths between 7,000 and 12,000 feet below the surface. Information from the Texas Railroad Commission indicates that 1,692 wells were permitted between 2008 and March 2011.

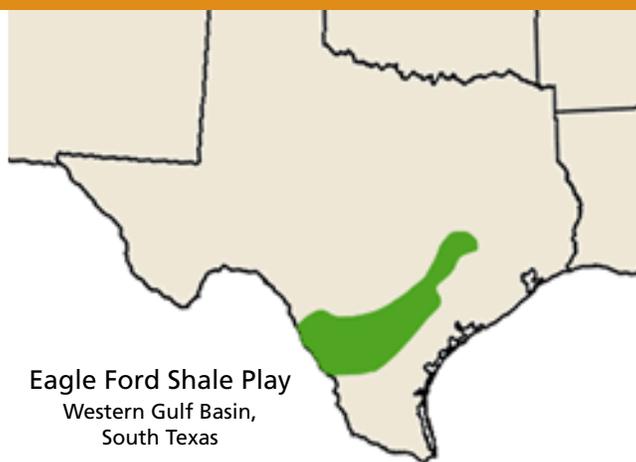
Many landowners within the Eagle Ford Shale are enjoying the income they have received by leasing their oil and gas minerals and the royalties they are receiving from the production. However, numerous landowners want to know how they should protect their land and wildlife during all of the exploration.

In Texas, the mineral rights for a piece of property take precedence over the surface rights. Therefore, if you do not own the mineral rights on your land, you cannot prevent the mineral owner from leasing and exploring their minerals. The individual rights of landowners with or without mineral ownership can be complicated and if you have questions, you may consider visiting with an attorney specializing in oil and gas leases.

The first step to protect the land and wildlife is developing a surface use agreement with the exploration company to define where and how they will conduct their exploration. The agreement can outline gate access, roads, pad development, ponds for fracturing (frac) water, gathering facilities and pipelines. The tremendous amount of infrastructure (seismic lines, roads, pads, etc.) that is constructed can lead to habitat fragmentation when additional brush is cleared. Additional clearing can affect deer, quail, and turkey, but also remember potential impacts to songbirds, Texas tortoise and the Texas horned lizard. The construction of roads places tortoises and horned lizards in jeopardy of being hit by vehicles, but the open area also makes them more susceptible to predation by avian predators.

You can request that access to the ranch be limited to one location and a gate guard be present during drilling and production operations. If the property is high fenced, it will insure that no gates are left open allowing cattle or deer to escape. You can also prohibit anyone entering the property from having a firearm in their vehicle to help minimize the possibility of poaching. Any new roads constructed on the property should be routed through open fields or along existing senderos or ranch roads on the property and avoid dense brush stands and drainages.

When locating pad sites, request that the exploration company create the smallest possible pads, drill multiple wells per pad and use horizontal drilling to minimize the number of pads on the



property. A question is whether to mulch or doze the brush when constructing pad locations. Early observations indicate that the pads cleared by mulching tend to revegetate more quickly with brush species due to remaining root systems in the soil. If the top soil is removed during pad construction, pile the seed rich soil adjacent to the site to be used later for reclamation purposes. Always remember to reseed pad sites with native grasses and forbs instead of introduced grasses like buffleggrass.

Fracturing operations within the Eagle Ford Shale require 180,000 to 300,000 barrels (42 gallons per barrel) of water per well. Companies will construct reservoirs (frac) ponds to hold 500,000 to 1,000,000 barrels of water and be able use temporary piping to move the water up to 2.5 miles to supply water to the wells during a short period of time. In sandy soils, the ponds will likely be lined to prevent water from seeping through the pond bottoms. The ponds should be located in previously disturbed open areas if possible to minimize impact to dense brush stands. The companies will typically drill two water wells at each frac pond to supply the needed water. Request that the companies leave the water wells when they exit the property and run electricity to these wells so that the ranch has additional water supplies that can be piped for wildlife in the future. If the frac ponds are constructed within a drainage, they may be capable of collecting run-off water. If they are on a high point of the ranch, you may have to continually pump water into the reservoir to supply water for wildlife and cattle.

Landowners should also hold the exploration companies liable for any negative affects on existing water wells due to the pumping of large volumes of frac water from the Carrizo Aquifer. It is also recommended that you require the companies to use "closed loop" systems during drilling and fracing operations. The closed-loop system requires all water and chemicals removed from the oil wells during the fracing process be trucked off

site and disposed at a permitted location.

The final process is the construction of central gathering facilities and pipelines to move products off of the property. Gathering facilities can be unsightly and noisy, so address these issues early in the process. Request that the companies double dig pipeline trenches and keep the topsoil separated from the subsoil. Placing topsoil back on the surface will speed up revegetation when the pipeline trench is filled in.

Hopefully these recommendations can help you in your

decision making. You are encouraged to contact your local Texas Parks and Wildlife Department (TPWD) biologist if you have additional questions. In addition, TPWD, Texas Wildlife Association (TWA), and the Caesar Kleberg Wildlife Research Institute will be hosting a South Texas Wildlife Conference, September 28-30, 2011 in Victoria. The entire agenda on the 29th is dedicated to presentations dealing with exploration and wildlife habitat within the Eagle Ford Shale Play. Registration information is located on the TWA Web site.

## SOUTH TEXAS Plants

### Whitebrush

Ryan Darr, Wildlife Biologist – Floresville, TX

What is the first plant that comes to mind if someone says the words “tangled thicket” when referring to South Texas shrubs? If you are like most landowners and managers in South Texas, a mental picture of whitebrush (*Aloysia gratissima*) is likely to appear! Whitebrush is a small shrub that averages only 4 to 8 feet in height. It can be identified by white stems that are covered in clumps of narrow, oblong leaves. Whitebrush is also one of the few thornless shrubs growing in South Texas! Whitebrush produces cone-shaped arrangements of white flowers that have a strong perfume-like smell. Flowers are produced when moisture is available from March to November. The shrub heavily invades fertile bottomland soils where the wiry, white stems intertwine to form large “tangled thickets” that are impassible by most any human! However, whitebrush is also found in upland areas where it grows in small, dense mottes or as individual plants interspersed between other shrub species.

Whitebrush leaves are rarely eaten by white-tailed deer and the seeds are not commonly used by northern bobwhites, doves, or songbirds. It is also not favored by cattle and is toxic to horses, mules and donkeys. Whitebrush, like many plants in South Texas, is not readily preferred by deer, quail or livestock; however, it is still extremely important to wildlife and a necessary component of good wildlife habitat. The perfume-scented flowers of whitebrush serve as an important nectar source for bees, butterflies and other pollinators. Because of its growth form, whitebrush is an excellent source of cover for many wildlife species. Lowland thickets provide cover for a variety of wildlife including large mammals (deer), predators (coyotes and bobcats), small mammals (skunks, foxes and rodents), birds (songbirds and turkeys) and even reptiles (Texas tortoises and snakes). Even though whitebrush is often impassible by humans, you can easily find wildlife trails snaking through the thickets allowing easy passage by most wildlife species. Small mottes on the edges of openings in upland areas also provide especially good



Whitebrush photo courtesy of Eric Garza, TPWD

escape and loafing cover for northern bobwhites, despite the lack of thorns.

Though useful to wildlife, whitebrush thickets can become too dense and expansive, thereby decreasing the value of available habitat for wildlife. However, there are simple management techniques such as strip shredding and selective removal that can help maintain the appropriate arrangement and abundance of whitebrush. Contact your TPWD biologist or another habitat management professional for more information on proper whitebrush management.

## Job SPOTLIGHT

# Developing a Wildlife Management Plan

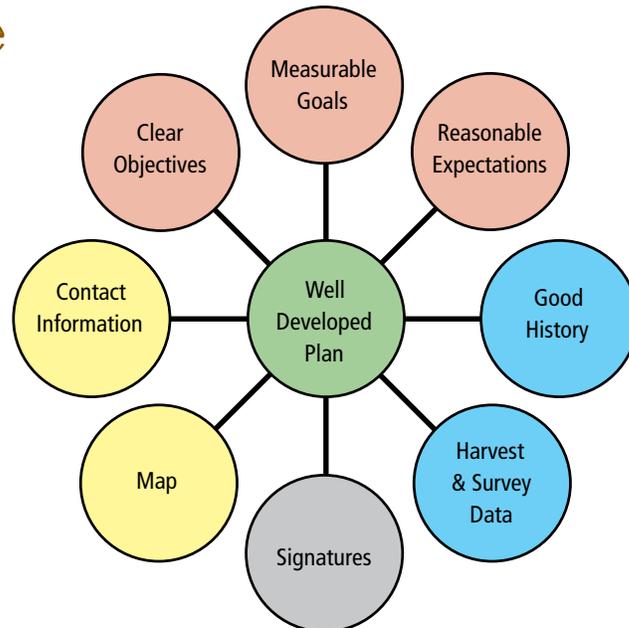
Dustin Windsor, Wildlife Biologist – Alice, TX

For most, the phrase “wildlife management” is interchangeable with deer management. For some, it could be quail management or turkey management. As your South Texas TPWD wildlife biologists, we work with thousands of landowners annually on wildlife management and habitat management. The first step in improving wildlife management is developing a thorough wildlife management plan (WMP). We are here to help, but hopefully you will soon see why you have to take the first step (as a starting pitcher would) and we come behind to polish off the job (a good “closer”).

The form most generally used will be the TPWD Wildlife Management Plan (PWD 1046) from our Web site. This 14-page document offers a great framework to express your goals, interests, history and understanding of your ranch and its management. I would advise that you print this document and follow along as I provide guidance and explanations in developing a WMP.

Section 1 provides your biologist with accurate contact information for the landowner, possible agents and the general location of the ranch. Section 1 should also be accompanied by a map. In our last edition, you read of free, internet-based mapping programs that will help you create a map with boundaries and other important features. Look back to that for some guidance if you have never had a quality map of your property.

Section 2 rarely receives the attention it deserves. From the start, this document asks for goals and objectives. I imagine that any South Texas biologist can pull a WMP where the goals are described as “more, bigger deer,” “more quail” or some equally obscure remark. While that does indicate your goals, that answer is poor. Goals and objectives should be measurable; they should be based in reality; they should have a time frame. Basically, your goals and objectives should be clear expressions of the picture in your mind. Objectives should define a path to achieving your goals. A proper Section 2 answer would be: “Manage a *sustainable herd through sex ratios, density and habitat management to allow an increasing trend of five B&C inches for the 3.5, 5.5, and 6.5+ age class white-tailed buck deer. Monitor these B&C scores annually and seek improvement in a five to seven year time interval.* Also, manage doe populations to *promote mature does that provide a reliable fawn crop to stabilize the total number of deer below the carrying capacity of the native habitat.* Supplemental feed will be provided; however, *population levels will be managed for drought condition so that during times of abundant rainfall, we will maximize our herd potential.*”



If you review the italicized phrases you will see that you have measurable parameters (sex ratios, density, age, fawn crop, B&C scores and habitat quality), a time frame and flexibility. You can manage for a density dictated by the habitat's capability. This answer provides your biologist with far better information than “more, bigger deer.” In the event you are not meeting your goals, we can isolate why and help create a plan to ensure success.

Section 3 may be the most intimidating section of the WMP, but this is another area where we are glad to help. We can gauge an area and describe habitat and ecological types important to your goals and objectives. Questions 2 and 3 seek information on the recent use of the land and the historical use of the range. You may not think practices from the 1960s or 1970s are important now, but some treatments have had long-lasting effects on the landscape. Questions 4 and 5 describe what the landscape is currently undergoing. These also provide justification for long-term management and acceptable practices that your biologist will use to shape a unique and custom set of recommendations for you. Question 6 looks to improve our knowledge of your water systems and distribution.

Section 4 addresses three critical habitat parameters: water, food and shelter/cover. Depending upon your species of interest, the answers in this section will help describe any deficiencies that may be limiting your management success. Each parameter could hold the key to overcoming some hurdle you have been facing with your management.

Section 5 seeks to improve our understanding of any requirements on the property as dictated by conservation agencies. This short section can be immensely important to proper planning and applicable recommendations.

Section 6 is the real meat of the line-up. I have heard the question asked “how can you manage something if you don’t know what’s out there?” Section 6 answers that question thoroughly. Some areas specifically call for your TPWD biologist to submit an answer (6A 4-6, etc). You may make notes for discussion on the side of the page to help the biologist understand a unique need you may have (commercial hunt interests, for example). Ultimately, your biologist is likely to tour the ranch and evaluate your habitat to help you determine what is feasible and what may be too “ambitious” of a goal.

Finally, you arrive at Page 14, Section 7. Once you have cre-

ated your draft, met with the biologist and toured the ranch, the biologist will make their notes and ask you to sign the WMP. Some permit programs (Managed Lands Deer permits or the Trap, Transport, and Transplant permit) require that your biologist have an approved WMP on file. Your signature is a critical component to the approval of your WMP for these permits.

If you believe that your plan needs some refreshing, make some notes, write down some questions and give your local biologist a call. Many (if not all) of us are in this career because we prefer seeing some South Texas brush far more than we like seeing the inside of our offices.

## HABITAT MANAGEMENT Techniques

### *Roller Chopping and Aerating*

Daniel Kunz, Technical Guidance Biologist – Alice, TX

Aldo Leopold once outlined the use of tools beneficial for wildlife management. He said the same tools responsible for the destruction of wildlife habitat could also be used to repair or even enhance habitat. These tools he described are the axe, plow, cow, fire and the gun. The aerator and roller chopper are two common implements that simulate the axe, and to a lesser extent the plow.

Good habitat management is the cornerstone for healthy wildlife populations. Before considering habitat manipulation, let’s define the term “habitat.” Habitat consists of

1. Food
2. Cover
3. Water
4. Space

Good habitat maximizes food, cover, water and space available for the target species. The native plant species available to wildlife form the building blocks of good habitat. Diversity of plant species is also key in providing many different types of wildlife with the resources and protection they need to maintain healthy populations throughout the year. As Matt Reidy outlines in this quarter’s newsletter, different wildlife species will react differently to various management techniques. Habitat that is ideal for bobwhite quail is not ideal for the ocelot, and with certain practices (like root plowing) the brush community could be changed permanently. Identifying your goals and detailed planning are essential when deciding when and how to manipulate the habitat on your property. Knowledge of the plant life, soil types and rainfall patterns in your area is essential, and will determine the response you get after manipulating the habitat. Additionally, leaving enough brush with a heavy canopy throughout the entire landscape is extremely important because thermal cover is essential in our hot summers (and sometimes winters!). If your property already has excellent diversity and very little manipulation has occurred in the past, I do not recommend large scale brush treatments such as those achieved by a roller chopper or aerator. You may already have the



Rollerchopping. Photo courtesy of David Rios, TPWD

maximized usable space for your target species, and the treatment response may be less desirable than the plant community you started out with. That being said, many game species thrive in areas with different successional stages and varying heights of vertical structure, so an aerator or roller chopper can be a useful tool if you need to manipulate the brush community to suit these species.

Many use the term aerator and rollerchopper interchangeably, but there is a difference. A roller chopper consists of a large steel drum with horizontal blades on the surface. It crushes and chops the brush stems near ground level. An aerator has a large steel drum with staggered and curved 6-inch blades. It is designed to flatten and chop brush as well, but the teeth also penetrate into the soil. The twisting design leaves an open divot and fractures the topsoil when exiting. This allows for subsoil water infiltration and less runoff. Typically the drums on both the aerator and roller chopper are filled with water for added weight, and both are pulled behind a tractor or bulldozer.

Compared to other mechanical brush treatment methods, aerating/chopping is one of the best methods for maintaining brush species diversity. Both the roller chopper and aerator also leave grass communities intact; however, if exotic grasses are present in an area these treatments may encourage exotic grasses to spread as they disturb the soil. These implements are best used in sandy to loamy soils, and clay soils that have some soil moisture. Rocky, saline and shallow soils are best avoided, because equipment damage may result and plant response in these areas may be less than desirable. Areas of heavy mesquite are also best avoided because mortality is rare with a surface treatment and individuals will regrow with multiple stems. Again, I recommend a detailed plan when applying brush manipulation, and stay out of all drainages and riparian areas. A mosaic pattern and brush motting is the best design to use for wildlife, but be sure to leave enough cover for your target species. When used in a detailed plan, these implements can create more openings in thick brush, allowing brush to resprout and forbs to propagate. These brush resprouts are often more nutritious than older growth, and can temporarily increase the ranch's nutritional plane. Palatable brush resprouts, increased forb growth, and increased insect production in these opened areas can benefit deer, quail and turkey. Additionally, aerating can increase water infiltration into the soil, allowing for increased soil moisture that persists longer in our frequent droughts.

If you plan to use aeration/roller chopping, be aware that you need to budget for continuous follow up treatments, every 3 to 5 years depending on rainfall. Most brush species in South Texas resprout from basal

buds near ground level, so chopping an area with no follow up treatment will result in dense multistemmed regrowth. Some species like blackbrush may also increase the amount of chemical compounds in their leaves and the size of thorns grown on their stems, which may reduce palatability and availability. Continually chopping the same areas may also decrease the density of first-choice plants such as Texas kidneywood, so avoid areas with excellent diversity or high densities of preferred browse species. Many land managers use aeration to create open areas and stimulate grass production and then maintain the open area with prescribed fire. Economically this is much cheaper than continuously chopping the same area over and over again, and prescribed fire also brings additional benefits. How much and where you chop depends on your goals, environmental factors, and the species you are managing for. If applied correctly chopping can be beneficial to wildlife and cattle managers and could be another tool in your toolbox. For more information on habitat manipulation including aeration and rollerchopping, please contact your local TPWD biologist.



Aerating machine. Photo courtesy of Daniel Kunz, TPWD

## LAW ENFORCEMENT & Regulations

### Hunting Javelina in South Texas

Colt Gaulden, Game Warden – Laredo, TX

**Disclaimer** – *This situation is/was presented hypothetically. The answers provided are a generalization of many unique situations. If you encounter a similar situation, the results of that encounter may not be exactly as described above/below. Any fines, penalties, or arrests are made by the warden on-site and reflect that warden's judgment given the particular situation. For clarification on your exact situation, please contact your local law enforcement office to request further information.*

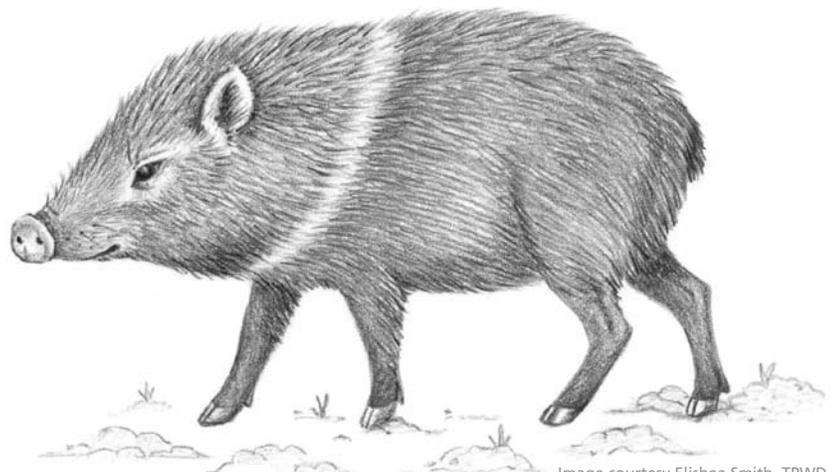


Image courtesy Elishea Smith, TPWD

South Texas is home to the collared peccary, also known as the javelina. The javelina provides an excellent opportunity for those hunters looking to experience an exciting hunt. In the 2010-2011 season the North Texas javelina season ran from October 1, 2010 to February 27, 2011. However, in South Texas the season runs from September 1, 2010 to August 31, 2011 allowing for year-round javelina hunting. As a game warden stationed in South Texas, I have seen many violations in game laws associated with javelina hunting. These violations stem from confusion over the classification of the javelina as a game animal to general disdain for the animal from an incorrect perception that the javelina is a ferocious, fence-damaging competitor for the white-tailed deer's food sources. Classified as a game animal since 1939, the javelina is protected by many of the familiar laws that regulate white-tailed deer hunting.

On many occasions, I have approached javelina hunters in the field only to find that they are not in possession of a hunting license. These hunters have wrongfully concluded that since the javelinas are nuisance animals, they are exempt from the hunting license that is required to hunt any mammal, bird, frog or turtle in this state. Also, confusion that the javelina is a feral hog or pig has led many hunters to break the law.

While there is no bag limit or set shooting hours for the feral hog, the javelina has a two per license year bag limit and possession limit. One problem encountered by game wardens is that there are no tagging requirements associated

with the javelina. Without tags, there is a greater opportunity for unethical hunters to over-harvest javelina. Extra vigilance is required by game wardens to combat this issue and their hard work has definitely impacted the pocket books of many unethical hunters. In addition to fines sought by local judges, those hunters that take more than two javelina per license year are also required to pay the state civil restitution, which is the replacement value associated with any fish or animal taken illegally. Javelina can be taken from thirty minutes before sun up to thirty minutes after sundown. While out hunting hogs or varmints at night, the temptation to shoot javelina past legal shooting hours or with artificial light must be ignored.

Another infraction that wardens find on many ranches is javelinas being killed in snares. Often, snares are set so as to catch non-game animals like coyotes or bobcats that cross under game proof fences through holes dug by the coyotes. While snares are indiscriminant devices, their placement can be set as to not pose a threat to javelinas while still catching their intended targets. Cage traps are an effective means of controlling feral hog numbers and seem to be a fixture on many ranches. Javelinas can find themselves trapped in the hog traps as can deer and precautions should be taken to exclude these game animals from these devices.

The above mentioned problems with enforcing game laws as pertaining to javelina are as wide-spread as the home territories of these creatures. Nonetheless, the most common law broken, when it comes to javelinas, is the necessity to keep the meat taken from harvested javelinas in edible condition. While a large javelina skull makes a handsome trophy to remember an excellent South Texas hunt, a properly prepared meal of javelina can make for tasty table fare. All meat from a javelina must be kept in a condition suitable for human consumption. Any meat destroyed in the harvesting of the animal or meat that is obviously infected or diseased is exempt. Wasting javelina meat is a class C violation of the Texas Parks and Wildlife Code and each violation can be accompanied by a fine of up to \$500.

In closing, I would like to say that these creatures are an integral part of the South Texas ecosystem and do not share the prolific breeding habits of the feral hogs that they share the brush country with. Without conserving the javelina, we are prone to returning to the late nineteenth century where a javelina sighting was a rare occurrence.

**I welcome any questions anyone may have.  
I can be reached at 956-763-8229.**

**G. Colt Gaulden, Texas Game Warden  
Webb County**

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***Editor's Note:** Javelina are a recognized and scored game species within Texas Big Game Awards. Information will soon be available from: <http://texasbiggameawards.org/>*



Javelina photo courtesy of TPWD

## Urban Interests and EDUCATION

# Reading the Bones

Richard Heilbrun, Urban Biologist – San Antonio, TX

I like to know what everyone is eating. Whether it's my son away at college, or the forage available at the ranch, it just helps me to know that everything and everyone is on the right track. The same applies to the meso-mammals, the group of animals bigger than a bread basket, but smaller than a wolf.

There are countless studies on the diets of these animals and their effects on game species in South Texas. I suspect, however, that the ranch road can tell you more about what is going on than a month in the library. When you find those droppings on the road, get out a take a look. Notice that you can sometimes tell just what the omnivores are eating before you are even out of the truck. If the coyote and raccoon scat on the road is purple and shapeless (grapes), the deer will also be gorging themselves on this same food. Red and full of tiny dots? Prickly pear. Full of medium sized brown seeds? Could be persimmon or mesquite beans. There's a pretty good chance this is what is most available to quail, deer and turkey.

It is even more apparent when you get out of the truck. Grab a good scat identification guide—I like Jim Halfpenny's *Scat and Tracks of the Desert Southwest*—and identify the donor first. Coyote scat will be long and ropy, with tapered ends. Bobcat droppings will be cylindrical and have a "cup & saucer", highly segmented appearance. You will rarely find vegetation inside bobcat scats, so if you do, you might take a

second look at the guide. Fox scat will be segmented, but very skinny and usually is full of bug parts. Raccoon, opossum and skunk are very similar, and proper identification takes a lot of practice. Usually raccoon scat is very dark and can have lots of different types of diet items.

If the scat is in a typical formed shape and not just a mass of seeds or berries, put on some work gloves and break it open. You can really learn what your predators are—or are not—eating. When you break it open, what do you see? Bones, teeth, hair and claws do not get digested, and can yield valuable information about seasonal diets. Coarse, dark or red hair usually means your predators are feeding on pigs. Very few bones, with lots of fine grey hair usually mean rabbit. Look carefully inside and you'll probably find medium sized rabbit teeth whose surfaces are heavily angled. Fine clumps of red hair? Dark black claws? Could be squirrel. Bone fragments with lots of little dots or holes? Armadillo. Very often you'll find little tiny bones, claws and teeth that indicate the primary food item at the time is mice and rats. Check carefully in early May and you might also find light colored hair or soft hooves that tell you the first fawns have hit the ground.

Be sure also to pay attention to what you are not seeing. Feathers are pretty rare in bobcat and coyote scat. Especially quail feathers. In fact, you are far more likely to find cardinal and coot feathers than quail or turkey. But what

about all those bobcat photos at the feeder on the game camera? Dollars to doughnuts they are feeding on the rats, rabbits and piglets feasting on your spilled seed. Are you thinking of that taxidermy bobcat reaching after a quail? According to the science, that would be an extremely rare occurrence.

Bobcats spend much more time feeding on small prey, and because they cannot eat seasonally abundant fruits and seeds, they must switch between small prey items depending on what they can find. Diets fluctuate seasonally, but rodents (38-65 percent) and rabbits (21-75 percent) far outnumber any other prey item. In the summer months, white-tail fawns can comprise up to a third of a bobcat's diet, but are probably not a major source of deer mortality.

It may not be something you can talk about over the dinner table, but identifying the diets of your meso-mammal population will give you an idea of the forage availability, and small mammal diversity that are running around on the ranch. You can use this information to inform your habitat and population management decisions. Good diversity in mammal scat can tell you a lot about the entirety of the ecological microcosm that exists on your property.

*Editor's Note: At the risk of getting some dangerous parasites, never hold scat close to your face or touch it with your bare hands.*

## Wildlife **DIVERSITY** Interests

### Weather Forecast For South Texas: Hot And Dry, With Little To No Chance Of Rain...

Jesús Franco, Wildlife Diversity Biologist – Mission, TX

As South Texas and much of the state inevitably moves closer and closer towards the hottest months of the year, getting ready and planning ahead for potentially worsening drought conditions can be the key to making or breaking your wildlife management objectives. With no signs of improvement in sight or any assurances that the current South Texas drought is about to come to an end, it is imperative that South Texas landowners revisit and revamp their water supplementation plan.

Water is of critical importance to wildlife. Without available water many populations of wildlife can decline, even when other habitat requirements are met. Lack of free and available water can quickly lead to stressed wildlife populations, which can result in reduced body weight, poor health, reproductive failure and possibly death. Creating and maintaining adequate water sources is probably the single most important management practice landowners can do to improve wildlife habitat in the south Texas brushlands.

Many existing water systems for domestic livestock can be modified to make water more accessible to wildlife. Water troughs and open storage tanks can be cleared of obstructions such as fences (if feasible), braces or vegetation to facilitate usage by deer and smaller mammals. Many species that drink while flying, such as bats, swallows, swifts and nighthawks will also benefit when obstructions are removed. Songbirds, doves and raptors will also welcome and benefit from the added oasis. It is especially important to equip these water sources with adequate wildlife escape structures or wildlife ramps to prevent the drowning of wildlife that accidentally fall in the water. Equally important is to continue maintaining these water sources for wildlife use when a pasture is deferred from livestock grazing.

Another simple way to make water available for wildlife on the ground is by rigging up wells, troughs and windmill storage tanks to produce and catch water overflow. Concrete, fiberglass or dirt catchments are easy to construct and maintain and are relatively low cost. When properly protected from livestock, overflow water sources can quickly become magnets for wildlife like quail, dove, javelina, small mammals, songbirds and many others seeking relief from the hot and dry environment. Water pipelines can also be tapped into and outfitted with water drippers to provide water for wildlife.

More elaborate ways to improve water access to wildlife include the development or restoration of marshes and wetlands. Based on wildlife needs water may be made available seasonally through artificially created wetlands and marshes, and natural pothole restoration and protection. Where feasible, water control structures are desirable for easier, more efficient water and aquatic vegetation management. Spring development and enhancement can be implemented by excluding livestock from the immediate area to prevent trampling and to protect native plant cover; water moving along the spring or through a pipe to a lower trough or overflow will be available to wildlife while preventing degradation of the spring area.

During dry times the threat of disease transmission and an increased risk of predation are a possibility, as animals congregate in increased numbers around limited water sources. Increasing the number of water locations across your ranch can help alleviate the possibility of these detrimental effects. The diversity of wildlife that will use supplemental water sources is extensive. As long as those water sources are maintained and kept clean, their benefits can far outweigh any possible detrimental effects.



Drowned red-tailed hawk



Trough with wildlife escape ramp



Trough overflow



Doves drinking from tire water source

Above photos courtesy of RMBO,  
Daniel Kunz and Google Images

# Battling Big Cane in the Nueces Basin

Sky Jones-Lewey, Nueces River Authority – Uvalde, TX and David Rios, Wildlife Biologist – Uvalde, TX

## *Riparian Landowners Band Together to Combat Invasive Plant on the Nueces and Sabinal Rivers*

When the Nueces River Authority (NRA) began its Riparian Landowners Network program in 2008, the goal was to educate private landowners and other decision makers about the function of riparian zones and their benefit to creeks, streams and rivers. After more than 30 workshops, reaching almost 700 people who manage about 1.6 million acres of land, private landowners in the Nueces basin have begun to interact with each other and manage riparian resources based on shared knowledge. That shared knowledge and common vocabulary have suddenly become essential in solving an imminent and threatening problem.

### The Problem

In the water rich, riparian environment of the Nueces and Sabinal floodplains, an invasive plant named *Arundo donax*, also called River cane or Giant reed, is spreading like wildfire as its downed, floating stalks take root from its multiple joints. Gnawed stalk ends point to the culprit; a water-centric exotic rodent called a Nutria, is cutting the stalks and proliferating the spread of *Arundo* colonies.

Nutria and *Arundo*, both non-native species, have crossed paths to create a *perfect storm* of invasive damage. Both have been present in the system for many years, but it's believed that Nutria recently developed a new feeding behavior and are drawn to *Arundo* like never before.

*Arundo donax* is an aggressive grass that forms thick colonies growing to more than 20 feet in height. *Arundo* sprouts from nodes at joints of the stalk to form a compact mass of interconnected fibrous roots and dense stalks, often creating an impenetrable wall of vegetation. A valuable plant under cultivation, it provided the early Spanish colonizers with a ready supply of forage for their animals, building material and was even reportedly used as primitive water piping. However, in a riparian area with ready access to water, the plant is known to be phreatophytic; meaning it is known to mine shallow groundwater, pumping unknown quantities of water into the atmosphere through transpiration. *Arundo* is also highly flammable and pyrogenic, meaning it survives and thrives with fire. Many landowners are dismayed at the recent spread of this invasive plant, and as one rancher put it, "Giant reed is only good for sheltering feral hogs and hiding junk cars."

In the early spring of 2010, several Riparian Network landowners began noticing an explosive expansion of *Arundo* on their land accompanied by large diurnal [daily] fluctuations in river flows. At the same time, Network members downstream began observing dramatic diurnal vacillations in river flows as well. Landowners observed dense monocultures of *Arundo* out-competing native vegetation and dramatically altering the river channel along with the aquatic and riparian habitat.

Physically, the plant is choking the flow of water, and in places is completely blocking the river's channel. Additionally, *Arundo* is consuming what appear to be enormous quantities of water—an estimated 5,000 acre feet of base flow from the Nueces basin headwaters in 2010. It's also believed to be altering water quality, with tests showing a marked rise in PH value and visual changes within the algal community.

*Arundo* is spreading extremely fast in the upper Nueces and Sabinal rivers and can be expected to rapidly colonize downstream on these rivers if not controlled. The plant has little to no ecological value and eventually will create a monoculture, as it has on much of the Rio Grande River along the border between Texas and Mexico. Once this occurs, native riparian vegetation, and the function it provides to the surface waters and the aquifers, may never recover.

*Arundo* is a game changer for the pristine rivers of the upper Nueces basin. The *Arundo* and Nutria nexus is putting the riparian systems into a dysfunctional mode. Swift action is needed, and riparian landowners are responding accordingly.

### The Solution —

#### **Arundo Control and Riparian Restoration**

A multi-pronged invasive-combat project is planned with riparian landowners leading the charge through cooperation, common understanding and hard work. A number of state and federal agencies and specific programs have joined the effort to provide technical support and some program funds.

Project *Arundo* Control kicked off in Fall 2010 with some funding from Texas Parks and Wildlife Department's Landowner Incentive Program to support a local landowner demonstration effort. The demonstration control project involved 12 landowners on the upper Nueces River who donated time, effort and their own funds as well, to test herbicide application methods and to hand-pull *Arundo* sprouts from rivers and banks. NRA has been the center of communications, management, technical support and documentation for these early control efforts.

In response to the success of the demonstration efforts and a growing number of concerned landowners, NRA is now heading up an expanded effort. Additional Texas Parks and Wildlife, Texas State Soil and Water Conservation Board and US Fish and Wildlife funds are committed to treat other affected segments of the Nueces and Sabinal rivers. NRA is at the center of this intense, communication program with more than 160 affected landowners and nearly 300 downstream landowners who may be in the path of the spreading and damaging invasive plant. Outreach and education components of the project are being supported by private foundations and the Rio Grande Nueces RC&D. Landowners are being warned against mechanical disturbance that spreads the sprout-able stalks and against burning, which is known to favorably stimulate *Arundo* growth and reproduction.

The Project has a three-year plan to implement strategies and study the results within the defined Project Areas that include both Nueces and Sabinal River segments. Control methodologies within all project areas will involve three key activities—hand pulling new sprouts (PULL), herbicide applications and reduction of the Nutria population (KILL), and restoration of riparian function through efforts to propagate and plant native, beneficial riparian plants (PLANT).

**PULL:** New *Arundo* sprouts, which are rapidly forming from floating animal-cut stalks, are best removed by hand pulling. When placed on dry ground out of the river channel, these new sprouts quickly desiccate and become non-viable.

**KILL:** So far only one herbicide has proven completely effective in killing *Arundo donax*. The systemic herbicide Habitat™ containing the plant amino acid blocker Imazapyr is approved for aquatic environments. Imazapyr is labeled as having no effect on animal species and non-toxic to birds, mammals, honeybees, earthworms, fish, algae and aquatic invertebrates. But care must be taken to avoid impacts to non-target plants.

Nutria, the rodent responsible for the spread can be trapped or hunted. At no cost to the project, USDA APHIS Wildlife Service Division is organizing a Nutria population control effort to help stop the creation of new stalk sprouts.

**PLANT:** The restoration of native riparian plant communities is an important final goal of the Project. As *Arundo* colonies die, the treated plants cannot be removed without risk of stimulating a re-growth of *Arundo*. These dead clumps, rich in trapped river sediments and protected by brittle pointy stalks offer an ideal nursery environment for young riparian trees. NRA is working with landowners to support the planting of native riparian trees in dead *Arundo* clumps. While early-succession native riparian plants can be expected to begin re-colonizing treated areas within one to two years, the planting activity will further engage riparian landowners in the project and help to overcome the “ugly factor” posed by the slow decay of dead clumps.

**In Summary**

It is feared that this perfect storm of invasive species on the Nueces and Sabinal rivers could cause substantive, if not permanent damage, to waterways that have historically provided a wide range of ecological benefits to the region. Riparian function and all the values it produces, such as clean flowing water, fish and wildlife habitat and recreational opportunities, are at risk. The situation requires immediate and strategic attention.

Project Arundo Control is a landowner-driven multiyear program approach that involves a community volunteer effort with support from state, federal, and foundation partners that will effectively halt the *Arundo* invasion and reverse the damage already incurred. This program delivers a comprehensive balanced approach, and ultimately an opportunity to prove the value of riparian landowner networks.

With a keener understanding and honed observation skills, it was a collective of private landowners who first rang the alarm about the recent proliferation of *Arundo* along their stream and riverbeds. In Texas, with more than 95 percent of the state in private ownership, it will be these private landowners and landowner networks that ultimately save the day.

*The Nueces River Authority, a small governmental agency created in 1935, has broad authority to preserve, protect, and develop surface water resources, but it does not receive any state or federal appropriations or taxes, nor is it a regulatory or permitting agency. Sky Jones-Lewey, Director of Resource Protection and Education for NRA helped to develop the Riparian Landowner’s Network with support from private foundations and Texas Parks& Wildlife Department.*

For more information and to receive a copy of the NRA’s publication, *Your Remarkable Riparian* a field guide to riparian plants in the Texas Nueces River Basin, contact Sky at [slewey@nueces-ra.org](mailto:slewey@nueces-ra.org) or call 830-278-6810.

**PHOTOGRAPHIC EVIDENCE**

**THE PROBLEM**



*Arundo on the Rio Grande*



*Arundo on the Nueces in Montell*



*Arundo invading riffles on the Nueces*



*Nutria cut stalks of Arundo*

**THE SOLUTION**



**PULL**  
*Arundo nutria-cut stalk sprouts*



**KILL**  
Herbicide application



**PLANT**  
Needed after treatment

## “Wastelands”

Chase Currie, Nueces Ranch  
– LaSalle County, TX

As one drives through the famed “Brush Country”, it becomes apparent that in most cases, previously disturbed areas (open areas, fields etc.) are dominated by vast expanses of buffelgrass (*Pennisetum ciliare*) and Kleberg bluestem (*Dicanthium annulatum*). For the most part there is very little diversity, no bare-ground, and fuel loads that could create an incidental wildfire. I think a friend of mine hit the nail on the head when he said, “We are dealing with the dawn of a conservation crisis.” So, can we as wildlife managers combat this ever increasing ecological problem? We at the Nueces Ranch have been trying.

In 2007, we initiated a long term experiment to try and mitigate this ecological concern. Our primary goal was to restore these areas into a native prairie. Thus far, we have had reasonable success. Not all treatments have been deemed successful, but we are better off now than when we started.

Our most successful treatments have consisted of multiple disturbances using a Rome disk and sometimes fire. We first shred the area in October, and then use a Rome disk to get a complete soil turnover. The disking application may be repeated several times throughout the late fall to insure a better soil turnover. Provided moisture is adequate, this disturbance typically results in an increase in forb species during the late winter months. The same trend seems to hold true for your



Native grass and forbs restored, April 2008. Photo courtesy of Chase Currie

native grass species such as plains bristlegrass (*Setaria leucopila*), pink pappusgrass (*Pappophorum bicolor*) and windmill grasses (*Chloris spp.*). It seems winter and early spring rains favor native species, thus giving them a competitive edge over exotic species (which typically respond better to late spring and summer rains). The picture illustrates a diverse array of native grasses and forbs in April following an early fall disking treatment when moisture was available. This area was previously dominated by buffelgrass.

I would use fire with caution! Our experiences have yielded both good and bad results. More often than not, the exotic grasses discussed here tend to have a positive response to fire, resulting in a denser stand post-fire. We have had some success if the fire is followed with the disking treatment. I am sure many of you are thinking to yourselves, “How much does this cost?” I do not have an exact number for you, but our only costs are the diesel for the tractor and the gas and

diesel for the drip torch, which we feel are minimal if the results are positive.

Obviously, there are multiple variables that determine the amount of success you have. Soil moisture, the amount of seed in the soil pre-disturbance (both native and exotic), soil type and a little luck can all have drastic effects on the end result. We realize we will never be able to eliminate exotic grasses such as buffelgrass and Kleberg bluestem, but we feel we can buy ourselves time to allow native species to establish themselves and have a chance to compete with exotic species. We also feel we can increase plant diversity to a certain extent. These are just some ideas and treatments that have worked well for us, but results will vary from ranch to ranch. In a worst case scenario, your treatments will have no effect and you are back to where you started. I will close with saying, “You can never turn a wasteland into a promise land if you don’t try, and a little luck never hurt no one either.”

# Scientific REVIEW

## Kent Williamson Graduate Research Summary

Kent Williamson, Wildlife Biologist – Laredo, TX

My graduate research at Texas A&M University–Kingsville investigated the effects supplemental feeding has on diet selection of white-tailed deer, along with the combined effects of supplemental feeding and deer density on antler growth. My project was part of a larger research project under the direction of Drs. Charles DeYoung, Timothy Fulbright and David Hewitt in cooperation with the Comanche and Faith ranches. On each ranch, six 200-acre enclosures were constructed in 2004. Both ranches have three enclosures with and three without supplemental “protein” feed provided year round. There are three different densities maintained in supplemented and unsupplemented enclosures of low (20 acres/deer), medium (8 acres/deer) and high (5 acres/deer). Densities were determined using a marked population and camera census technique, which may not be directly comparable to helicopter surveys.

The diet aspect of my study involved the use of tame, captive-reared female white-tailed deer residing in low-density supplemented “fed” and unsupplemented “unfed” enclosures. Ryan Darr, Luke Garver and I followed these deer seasonally and recorded the vegetation they consumed. I compared the proportion of forbs (weeds), grasses, mast (fruit), shrubs (brush), sub-shrubs, flowers, dead leaves, cacti and fungi in deer diets. I found vegetation composition of diets varied seasonally, and diet composition also differed between deer that were provided feed and those that were not. The primary effect of feeding was that deer with feed provided consumed less mast and more shrubs than did unfed deer. I hypothesized the supplemental feed would allow deer more time to consume shrubs which contained smaller bites while deer without feed would be more reliant on mast with larger bites high in energy. Additionally, fed deer consumed more dead leaves in winter. These dead

leaves possibly served as “roughage” to aid in the digestion of the supplement. Contrary to my initial hypothesis, I found no evidence of fed deer consuming more forbs.

To investigate the effects of supplemental feed and density on antler growth, I used yearling (1 year old) and mature (>5 year old) bucks. I compared percentage of spike-antlered (two antler points) yearlings in fed enclosures and in enclosures with no supplemental feed. I found spikes were more common (95 percent) in unfed than fed (44 percent) enclosures. The additional nutrition provided by the supplement resulted in yearling bucks with heavier body weights and larger antlers. Deer density had no effect on percentage of spikes in fed enclosures. In mature bucks, I found no decrease in gross Boone & Crockett antler score in fed enclosures with increasing deer densities. In unfed enclosures, I found antler score decreased approximately 15 inches from low (20 acres/deer) to high (>5 acres/deer) density, supporting previous studies finding antler size decreased with increasing density. Thus, providing pelleted feed reduced the proportion of spike-antlered yearlings and increased antler size of mature bucks at all but the lowest densities.

What does all of this mean? Supplemental feed seems to allow deer more time to forage, consuming less mast and possibly more “roughage” to aid in digestion. It also results in fewer spikes and offsets the negative effects of increasing density on antler size of mature bucks. The Comanche-Faith study is an ongoing research project that should shed more light on the effects of supplemental feed and deer density on foraging behavior, vegetation effects and antler size of white-tailed deer.

I appreciate the support of T. Dan Friedkin, the Comanche Ranch, the Stedman-West Foundation, and the Faith Ranch, which made my thesis research possible.

Executive Director  
Carter P. Smith

Editor, *The South Texas Quarterly*  
Dustin Windsor



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