



# L.I.P. Bulletin

TEXAS  
PARKS &  
WILDLIFE

A N N U A L N E W S L E T T E R

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The Landowner Incentive Program (LIP) is administered by the Private Lands and Public Hunting Program of the Texas Parks and Wildlife Department Wildlife Division. In partnership with the TPWD Inland Fisheries Watershed Conservation Program, LIP strives to meet the needs of private landowners wishing to enact good conservation practices on their lands for the benefit of healthy terrestrial and aquatic ecosystems. The LIP Bulletin is the venue for showcasing the great work of our landowner partners as well as providing program information and opportunities to get involved.

JILL NOKES, PRIVATE LANDOWNER  
DALE SCHMIDT, TPWD BIOLOGIST FOR LLANO AND  
SAN SABA COUNTIES, STATIONED IN LLANO, TEXAS

## Marshcall Creek Riparian Corridor Restoration – a Landowner’s Notes

I first heard about Texas Parks and Wildlife Department’s Landowner Incentive Program (LIP) at a 2011 workshop in Kimble County. I was encouraged to find out more about it by contacting Dale Schmidt, the TPWD wildlife biologist for our area (southwest Llano County). Dale’s guidance proved invaluable during the grant application and planning process.

While developing the strategies for tackling our project, we tried to match some of the objectives listed in the LIP grant guidelines to site-specific conditions and concerns on our own property. These included: restoring native grass cover in severely degraded rangeland, reducing soil erosion, increasing rainwater infiltration, and improving habitat and water quality. In addition, we wanted to experiment with different equipment and methods with the intention of sharing the results with as many other landowners as possible.

We are fortunate on our property to have a very nice woodland corridor along the bank of Marschall Creek, which flows into the Llano River. However, due to overgrazing, fire suppression, neglect, heavy deer browsing, and feral hogs, these precious woodlands had become dominated by a dense understory of Mexican persimmon (*Diospyros texana*), tasajillo (*Opuntia leptocaulis*), and white brush (*Aloysia gratissima*).

*Continued on page 2*

*The edge of the riparian corridor is a dense thicket of Mexican persimmon, white brush, and tasajillo.*



*The banks of Marschall Creek are secured by dense grasses and large trees.*



## CONTINUED FROM PAGE 1

In these crowded thickets, we very seldom encounter decent-sized seedlings that might replace our aging trees. Since acquiring our property, we have devoted considerable effort to remove the larger brush beneath the bigger trees closest to the creek. We learned that white brush and persimmon are difficult to eradicate because they are vigorous re-sprouters, and there is no effective chemical control that does not involve serious risks for nearby vegetation and waterways.

The goals for our LIP project included reducing brush density, followed by planting native grasses not currently present or abundant. We also hoped to locate and protect any tree seedlings we encountered during the clearing.

The most common and (initially) cheapest method for “brush removal” is to simply bulldoze everything in the entire area. It’s my opinion that this method is one reason so much of my neighbor’s land has been reduced to impenetrable thickets. Are they good habitat? Sure, just ask the hogs and even the abundant deer. But do they provide a variety of material for food, nesting, and cover? Not so much. Surrounded by land that is stuck in that condition, we wanted to open up our woodlands to allow a different combination of woody plants, grasses, and forbs to emerge.

We hired a contractor with a forestry mower and grappler and his ground crew to mechanically remove and shred the undesirable plants. This first phase was completed in June of 2012.

In October of 2012, another crew came out to dig up any re-sprouting brush and then broadcasts seed into these roughed-up areas.

In October of 2012, I was worried that the well-timed rains we’d enjoyed the previous summer would cause the existing winter grasses to overwhelm the newly sown warm-season grasses when they tried to germinate the following spring. But an exceptionally warm and dry fall significantly reduced that concern.

It will likely take two to five years before we can tell if our efforts made a difference, but we knew when we started, that the LIP grant project was a process, not a project. However, we feel certain that by bringing in more light, opening up space for recovery of diverse forbs and grasses, and by caging tiny seedlings, we have been able to set in motion positive changes that will ultimately benefit our little piece of the habitat, and the creatures who reside there, including ourselves.

For more information about this LIP project, visit [www.jillnokes.com/nokes\\_projects.html?itemid=5147&thisyear=2012](http://www.jillnokes.com/nokes_projects.html?itemid=5147&thisyear=2012)



*The skid steer with the grappling attachment plucks persimmon out of the ground.*

*A sunlit clearing with mulched brush and seeded with native grasses replaces the former thicket.*





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STATIONED IN BASTROP, TEXAS

## Houston Toad Habitat Enhancement Projects in Bastrop County: 2009-2012

The Houston toad has experienced monumental challenges and historical lows in population between 2009 and today. The Lost Pines area of Bastrop County (approximately 124,000 acres) still supports the largest remaining population of the federally endangered Houston toad (*Bufo houstonensis*), despite the rapidly changing conditions of the county's landscape.

The Houston toad reached its lowest known population numbers during 2011, with a total of eight individuals detected throughout the entire season in Bastrop County. The combined impacts of prolonged extreme drought conditions, reduction in quality of habitat through land fragmentation and fire suppression, followed by the catastrophic Bastrop County Complex Fire in September of 2011, have made habitat improvement projects for this species more important than ever.

Two habitat enhancement projects utilizing LIP funding that began in 2009 were completed in 2012. Both projects included thinning of understory choked with vegetation as a result of prolonged fire suppression, and involved installment of fire breaks to facilitate prescribed burning to help maintain an open understory and prevent a build-up of fuel. Mechanical methods that limited ground disturbance were used to reduce any temporary negative impacts to the Houston toad, including the use of a hammer-flail attachment on a skid-steer loader, and/or use of a forestry mulcher. A solar-powered aerator was installed in one potential breeding pond to improve water quality for breeding Houston toads. Trees were also planted in open pasture and along potential breeding ponds to increase canopy cover where it was lacking in order to protect emerging juvenile toads during dispersal. After successful installation of fire breaks, a prescribed burn was successfully conducted on approximately 40 acres during the winter of 2012 to conclude these projects. Both sites will be monitored for vegetative response over time using photo points, as well as surveyed for Houston toad use. These two projects affected a total of approximately 400 acres of Houston toad habitat. Both landowners intend to continue with their habitat improvements through the use of prescribed fire, and/or mechanical and chemical brush treatment over time to maintain high quality Houston toad habitat.



BRENT ORTEGO

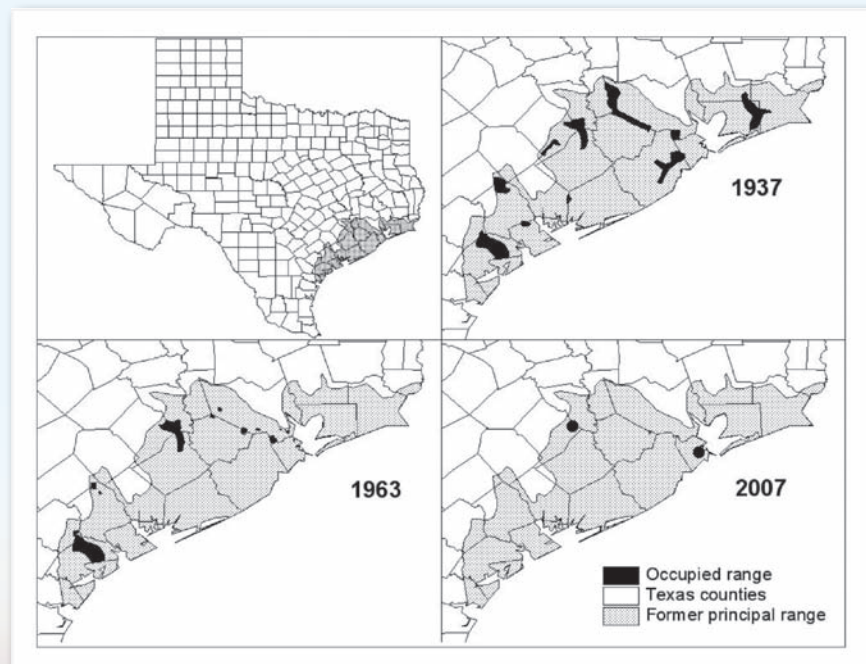
TPWD DIVERSITY BIOLOGIST, COASTAL AND SOUTH TEXAS, STATIONED IN VICTORIA, TEXAS

## LIP-funded Coastal Prairie Conservation 2000–2012

The sounds of cooing and cackling could be heard across the prairie as dawn approached. Dancing in front of us were the dark shapes of prairie-chickens as they went through their spring “booming” ritual, repeated for thousands of years previous. Sadly, this performance is not witnessed by many these days.

The Attwater’s greater prairie-chicken (APC) whose range is restricted to the coastal prairie, historically contained about one million individuals (Lehmann 1968). Its population declined as habitat acreage shrunk due to agricultural conversion, urban and industrial expansion, excessive grazing, encroachment into the prairie by woody species due to fire suppression, and fragmentation of habitats (Lehmann 1941, Jurries 1996). Wild APC on the coastal prairie declined to near zero in the early 1990’s and the recovery of the species became focused on a captive rearing program to release birds back into the wild (U. S. Fish and Wildlife Service 1996).

Figure 1. Approximate distribution (black patches) of APC in southeast Texas historically, 1937, 1963, and 2007 (from Morrow et. al 2004 with modification).





Attempts to restore the coastal prairie by conservation groups and agencies have only resulted in a few hundred fragmented and isolated acres restored. The first major landscape-scale habitat restoration efforts started with the formation of the Coastal Prairie Conservation Initiative in 1999 (CPCI). The CPCI focused the resources of multiple agencies into a planned effort to enlarge and connect blocks of existing coastal prairie. The CPCI is a good example of landscape-scale habitat restoration requiring partnerships between federal, state and private organizations, as well as private landowners to foster conservation on the ground at a scale that is meaningful to bird populations. Currently the CPCI is a partnership of the U.S. Fish and Wildlife Service, USDA Natural Resource Conservation Service, Texas Parks and Wildlife Department (TPWD), The Nature Conservancy, and the Grazing Land Conservation Initiative pooling their resources to assist private landowners in retaining family ownership, maintaining historic values, profiting from agriculture and conserving wildlife, all while achieving the collective goal of restoring the Coastal Prairie for the APC and other wildlife and plants native to the prairie.

Through its Landowner Incentive Program (LIP), TPWD has worked with private landowners and its partners within the CPCI from 2000 through 2012 to enhance 75,000 acres of grasslands for the APC and other native prairie wildlife along

the coast. LIP funded projects on 13 ranches in Goliad, Refugio, and Victoria counties – sites that would have the greatest benefit for APC conservation and restoration. It also funded projects in Calhoun, Kames and Wharton counties at sites that offered significant benefits for all grassland wildlife.

Funded activities included installation of water facilities and fences to implement better grazing practices on participating ranches. Funding also implemented various brush control practices to restore prairies that had been invaded by brush (mostly mesquite and huisache) due to natural fire suppression and lack of prescribed burning.



While spraying of individual trees with appropriate herbicides was a common management practice, the standing dead trees can provide perches for raptors that might prey on APC.

Controlled burning was the most common management practice used for prairie restoration because of its low cost, effectiveness, and the fact that it was an important part of the original landscape.



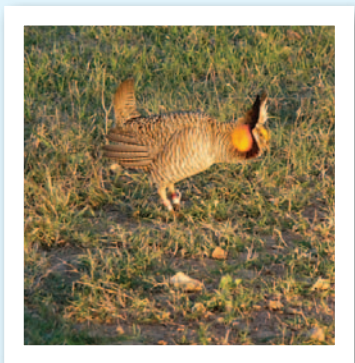
As a result projects since 2009 focused on using mechanical shearing and spraying of the stumps with approved herbicides rather than using herbicides alone. This effectively killed the brush and removed snags at the same time creating an open prairie fairly quickly.

Mechanical brush control was only used in very specific circumstances due to the high cost of the treatment. Mechanical brush control was employed in areas with the densest brush where herbicide spraying alone would not work. In addition to the high cost of mechanical brush treatments, controlled burns and herbicide application were still necessary to control the abundant sprouts resulting from mechanical treatment.



LIP also funded a project in Wharton County to assist a landowner with native seed production and harvest. The availability of native seed adapted to a restoration site can increase the success of re-established native grasslands on former agricultural lands along the coast.

With partners, LIP also funded two projects in Calhoun County to control running live oak on ranches that had a high potential for native grassland restoration with expectation the ranches would become much more suitable for Mottled Duck, Whooping Cranes, and N. Bobwhite.



Private Landowners with assistance from the CPCI and LIP have made significant progress with maintaining and restoring Coastal Prairie for the benefit of their ranching operations, APC, and other native endemic wildlife dependent on native grasslands.

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JON HAYES  
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## TPWD LIP Works With the Oaks and Prairies Joint Venture to Achieve Grassland Bird Habitat Objectives

Grassland birds as a whole are declining faster than any other group of birds in North America. There is a long list of factors that are often blamed for the decline of these species but the fundamental driver of this decline has been landscape level loss of high quality, suitable habitat.

More than 97% of the native grasslands in the United States have been lost, and of the remaining, only 13% can be found on publicly owned lands, and in Texas, this is an even smaller amount. Therefore, grassland restoration on private property is essential to ensuring the continued existence of these species.

The Texas Parks and Wildlife Department Landowner Incentive Program is working in partnership with the Oaks and Prairies Joint Venture ([www.opjv.org](http://www.opjv.org)) to deliver grassland habitat objectives on private lands in key areas throughout the state. In 2012 and 2013, twelve private landowners initiated LIP projects for the benefit of grassland birds in the OPJV target areas. Currently, projects are being implemented on over 600 acres of Texas pastureland and rangeland in an effort to restore these areas to properly functioning grassland ecosystems. Practices being employed involve mechanical and chemical removal of brush, conversion of exotic grass pastures to native bunchgrass communities, and use of prescribed fire to restore natural ecosystem processes, all of which will improve the suitability of these areas for Northern Bobwhite and other grassland bird species.

The OPJV is a self-directed, voluntary partnership of natural resource agencies, organizations, and individuals working collaboratively to address bird conservation in the Oaks and Prairies and Edwards Plateau regions of Texas and Oklahoma. Strategic landscape-level conservation that employs conservation planning, tracking, and monitoring, alongside conservation delivery, provides the best opportunity for success in addressing catastrophic decline of these priority bird species. Through LIP and other efforts, TPWD is playing a vital role in this partnership. Restoring our native grasslands is the only way to ensure that future generations of Texans will get to experience the thrill of a quail covey flush or the sweet song of a meadowlark on a spring morning.

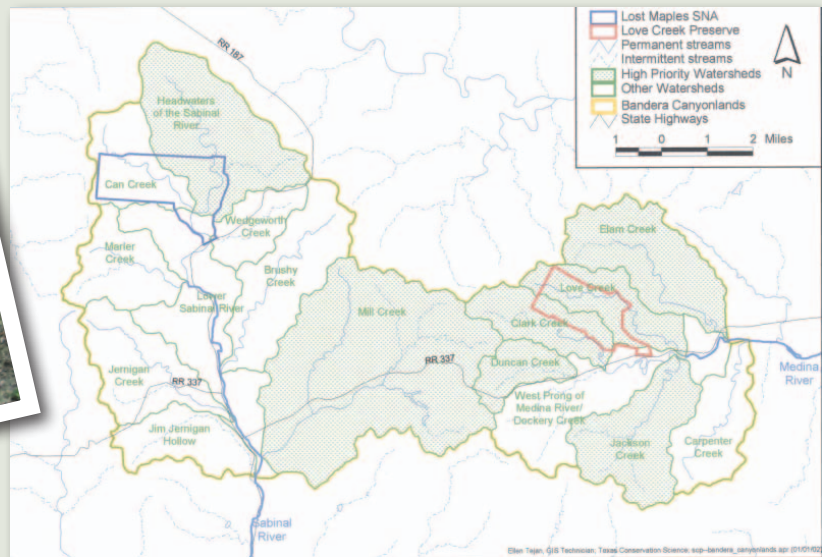


DAVID WOLFE, DIRECTOR OF CONSERVATION STRATEGIES, ENVIRONMENTAL DEFENSE FUND, INC.  
JOYCE MOORE, TECHNICAL GUIDANCE BIOLOGIST, TEXAS PARKS AND WILDLIFE

## A Collaborative Approach to Conservation

The **Bandera Canyonlands Alliance (BCA)** is a non-profit, grassroots organization dedicated to the conservation of biological, scenic, and cultural resources in the **Bandera Canyonlands** region of central Texas.

Typified by thin escarpment soils and a mixed oak-juniper plant community, the roughly 54,000-acre Bandera Canyonlands region is located in western Bandera and eastern Real counties in the Edwards Plateau. Landowners in this region began working collaboratively with Environmental Defense Fund in the late 1990s, and shortly thereafter with Texas Parks and Wildlife Department, Natural Resources Conservation Service, Nueces River Authority and others. Their mission was to conserve stream and spring resources and associated watersheds through land stewardship, protection of water rights, and participation in regional water planning efforts. These initial actions resulted in additional landowner interest, and the ultimate establishment of the BCA. As of May 2013, approximately 50 BCA members cumulatively manage over 20,000 acres of land in the Bandera Canyonlands region.



BCA members have, and continue to conduct a variety of stewardship activities aimed at not only conserving the watershed resources of the region, but also to promote sustainable habitat for several endangered wildlife species.

In August 2008, Bill Spangler, then BCA President, signed a Memorandum of Understanding with Texas Parks and Wildlife Department (TPWD) for the purpose of participating in a rare resource project. Specifically, Mr. Spangler, on behalf of the BCA and ten participating ranches, agreed to implement a variety of habitat enhancements for the federally listed Black-capped Vireo and Golden-cheeked Warbler, but also for the Texas Indigo Snake and Tobusch Fishhook Cactus. Cost-share assistance would be provided from TPWD's Landowner Incentive Program (LIP).

*Golden-cheeked Warbler and Black-capped Vireo*



### Breeding Bird Surveys

Visual and auditory surveys of avian species are conducted annually on as many as nine ranches representing over 8,000 acres during peak breeding/reproductive periods for both endangered songbirds. These surveys provide valuable information regarding overall habitat quality and integrity. Standard breeding bird census methods are used: Stations are located every 3/10 mile on ranch roads and three minutes are spent at each station recording all birds observed and heard. These surveys are designed to detect most, if not all of the bird species and habitats present including premier breeding areas for the GCW. A total of 100 different species have been recorded since 2003 (a list is available upon request).

### Cedar Management



In the Edwards Plateau, many landowners are actively engaged in the control of regrowth Ashe juniper as a means of habitat improvement. Technical guidance regarding appropriate locations and techniques for removal are provided by state and federal agencies, as well as private consultants. For most

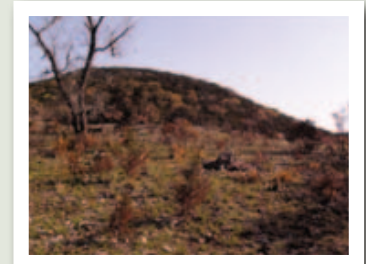
individuals, the ultimate goal is to maintain habitats that are appealing to a diversity of wildlife species, while also enhancing water infiltration, and groundwater recharge. On BCA lands, cedar regrowth in the understory is targeted for removal, while mature, old-growth on slopes is protected as a premier habitat component for the endangered GCW. This is accomplished thru a combination of brush management techniques designed to maximize light penetration and mobility thru the dense understory. The first step is selective removal or thinning of individual juniper stems not penetrating the woodland canopy. This technique targets the removal of second growth juniper less than 10 years of age which prevents light penetration to the forest floor, and which limits accessibility by most wildlife species. Areas are then

treated with a follow-up procedure known as underlimbing to remove standing slash or deadwood in the understory. Both techniques are labor-intensive, requiring hand tools and sweat equity, however, the end result allows increased access and flight mobility for the GCW. Cut slash is allowed to remain in place at ground level to encourage woody regeneration, and to protect emerging hardwood seedlings from browsing.

### Use of Prescribed Fire

The value of prescribed fire is well documented as an effective tool for maintaining the patchy, low-growing, early successional habitats desired by a diversity of wildlife species. On BCA lands, cool-season burns on upland sites target habitat improvement for the endangered black-capped vireo and other wildlife species. Treatment areas include

gently-rolling uplands, or riparian areas adjacent to streams which are deemed suitable BCV habitat. When possible, sites are treated with prescribed fire on a four- to six-year rotation, or as often as weather and fuel conditions allow. As a result of recent LIP funding, some 400 acres have been scheduled or treated on six BCA tracts. Success is measured through post-treatment habitat monitoring and utilization by the targeted species.



### Control of Invasives—Feral Hogs and Cowbirds

Non-native feral hogs are a major threat to the integrity and quality of springs and streamside vegetation in the Bandera Canyonlands. Classed as omnivorous, feral hogs will eat a variety of food from grain to carrion. Vegetable matter, particularly roots and tubers, also make up a considerable portion of their diet. Likewise, shallow streams and springs are excellent places to wallow in an effort to maintain body temperature, and to free themselves of pesky skin irritants. Highly adaptable, prolific, and protective of their young, feral hogs have few natural predators, having successfully encroached on most habitats across Texas. In fragile wetland and spring habitats, their rooting activity causes massive damage to native vegetation, not to mention negative



impacts to water quality. During drought, when water is limited, the situation can quickly become exacerbated. Since 2004, a cooperative of

BCA landowners has been cost-sharing control of feral hogs through trapping and canine-assisted hunting. This effort has yielded noticeable results with catch rates declining from 16 hogs/100 acres in 2004 to 6 hogs/100 acres in 2010. At the same time, participating ranch acreage continues to increase, and most members plan to continue with trapping activities even after LIP funding is complete.

In addition to feral species, brown-headed cowbirds are also controlled on BCA. Although a native species, cowbirds have adapted a parasitic nesting behavior to coincide with the historical movement patterns of roaming bison herds. Although the bison are gone, cowbirds continue their nomadic way of life by allowing other songbirds to rear their young. Through a concerted trapping effort, cowbirds are lethally removed on BCA with the goal of improved long-term songbird production and recruitment.

### Riparian Habitat Management

The riparian zone is that narrow band of vegetation that occurs directly adjacent to a stream bank. In the Hill Country, healthy riparian zones include grass and grass-like vegetation on the edge of a stream, as well as a diversity of shrubs and trees along the banks and in the floodplain. Healthy riparian zones are important landscape components because they provide important escape and screening cover for wildlife, along with important water quality features which ensure sustained stream flows, and ensure bank stability during flood events. They are also an important recreational resource for anglers, hunters, and paddlers. As a result of information and guidance provided by the Nueces River Authority, many BCA landowners are now implementing best management practices which target the maintenance and restoration of native vegetation adjacent to streams. This includes deferment of livestock grazing within the riparian zone, the encouragement of deep-rooted, native bunchgrasses for bank stabilization, removal of invasive non-natives such as *Arundo donax* and (Giant Reed) chinaberry, and retention of large woody slash within the waterway to reduce velocity of runoff during rainfall events. As a result of these conservation measures, water

quality in the Bandera Canyonlands region has been significantly improved.



### Educational Programs

In addition to conducting on-the-ground conservation and training of its own membership at field days and seminars, the BCA regularly disseminates natural resource information for the general public through bi-annual meetings. These gatherings typically involve fellowship and an educational message on a range of watershed and conservation-related topics such as oak wilt, riparian area management, appropriate cedar control, and rare plants of the Bandera Canyonlands. Presentations have been provided by Environmental Defense Fund, The Nature Conservancy, Texas Parks and Wildlife, the Natural Resource Conservation Service, Texas Forest Service and the Nueces River Authority to name a few.

### Summary

Beneath the magnificent scenery of the Bandera Canyonlands region is a landscape of exceptional biodiversity and water resources. Over the past several years landowners in this region, recognizing the challenges of protecting these resources, established the BCA as a way to more effectively achieve conservation goals. The BCA is unique among landowner associations in that it has a broad mission: Its members are committed to working collaboratively to conserve the biological, water, cultural, and scenic resources of the region. Strong partnerships with Environmental Defense Fund and Texas Parks and Wildlife Department have greatly enhanced the BCA's ability to achieve this mission.



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WRITTEN IN COLLABORATION WITH USFWS TEXAS FISH AND WILDLIFE CONSERVATION OFFICE,  
AND THE NATURE CONSERVANCY

## Holistic Spring and Ciénega Restoration Projects in West Texas

Springs and ciénegas are critical components of a desert landscape.

They support diverse aquatic and terrestrial flora and fauna by providing a scarce resource, water, in arid areas. Many of these springs and ciénegas support endemic, genetically distinct organisms that have diverged because of spatial and temporal isolation. Some of these rare, endemic organisms are listed as endangered and face threats as a result of anthropogenic activities in their respective watersheds.

The Balmorhea Springs Complex occurs in the Chihuahuan desert in West Texas between the Toyah Basin and Davis Mountains. This spring system supports an assemblage of three endangered species and two species of concern (i.e., Comanche Springs pupfish, Pecos gambusia, and four invertebrates). The persistence of these springs and ciénegas and the organisms that rely upon them are threatened by issues including complete dewatering, depletion of aquifers by groundwater pumping, conversion for agricultural or recreation use, poor land management practices (e.g., over grazing and destruction of grasslands, erosion), and invasive species. Several large springs in this region have already dried up or no longer flow as a result of excessive pumping from a regional aquifer. Comanche Springs was historically one of the largest springs in Texas flowing at more than 42 million gallons per day in 1899 but ceased flowing in the early 1960s because of groundwater pumping. Management of spring and ciénega systems requires a holistic, watershed approach with private, state, federal, and local partners to conserve, restore, and address threats to these important desert habitats. Phantom Lake, San Solomon, West Sandia, and East Sandia springs and ciénegas in the Balmorhea Springs Complex have been actively managed by multiple partners in order to protect these aquatic habitats and associated organisms.

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### Phantom Lake Spring Ciénega Restoration



The US Bureau of Reclamation purchased the land surrounding Phantom Lake Spring and ciénega in 1945. In 1945, a concrete irrigation ditch was constructed to divert the water to the Reeves County Water Improvement District's main canal at San Solomon Springs. Phantom Lake Spring has decreased in flow since the 1940s (when measurements began) and ceased to flow out of the cave in 2001. A 2.5-foot drop in the aquifer and the cessation of spring flow out of the cave has been a result of groundwater pumping and decreased aquifer recharge. When the spring stopped flowing out of the cave in 2001, a pump system was installed to pump water from the cave to the remnant ciénega to support the aquatic community. The dam constructed to maintain the ciénega leaked and the pump system experienced several failures causing a high risk of extirpation from the site of the endangered species.

#### *Site during restoration*



Phantom Lake Spring ciénega restoration was selected as a priority project by Desert Fish Habitat Partnership, Texas Parks and Wildlife, US Fish and Wildlife Service, and US Bureau of Reclamation in 2010. The objective of the Phantom Lake Spring ciénega restoration project was to minimize the extinction risk for listed species at the spring by creating a larger ciénega and renovating the existing ciénega. The project was started and completed in 2011 and has significantly increased the amount of habitat for both fish and invertebrate species. The restoration also allowed better access to terrestrial wildlife by providing a larger water source and installing a bat friendly gate on the cave entrance.



*Phantom  
Lake Spring  
ciénega*

### San Solomon Ciénega

Most of the original ciénega at San Solomon Springs was drained and spring flows were diverted into an irrigation network starting in the mid-1870s. These canals are an unnatural, ephemeral habitat that is wholly dependent upon local irrigation practices and other water-use patterns. In the 1930s, the Civilian Conservation Corps modified San Solomon Springs into a large swimming pool at Balmorhea State Park. The work of this New Deal program enhanced the park's visitor services, but further disrupted what was left of the natural ciénega. When the original San Salomon ciénega was modified, and for the most part destroyed, the only habitat remaining was in the irrigation canals where Comanche Springs pupfish and Pecos gambusia managed to survive but their numbers were greatly reduced.

In 1996, a cooperative effort among private, state, and federal entities allowed the creation of this ciénega habitat. The Reeves County Water Improvement District and the agricultural community it represents agreed to provide the essential water needed to create a secure environment for the endangered fishes. While the agricultural community had previously



viewed the fishes as something that hampered and perhaps threatened their livelihood, they realized the fishes could be their best insurance for sustained spring flows. Biologists, engineers, and resource managers from universities and government agencies joined forces to construct the ciénega and the 2.5-acre San Solomon Ciénega was completed. The ciénega is situated within the boundaries of the original, natural ciénega and as a result the fish have flourished. Aquatic plants indigenous to ciénegas as well as grasses and shrubs were planted and are now well established.

People of the local and regional community and state park visitors benefit from a living exhibit that shows the importance of the springs and their wetlands for fishes and other wildlife of West Texas. Texas Parks and Wildlife has provided access to the restored ciénega by building an observation deck and a custom window for below-water viewing of underwater life.

### Clark Hubbs Ciénega



In 2008, a second ciénega was created in Balmorhea State Park in the same area as the previously constructed San Solomon Ciénega in order to produce an additional natural and stable refugium for the spring's endangered species. The ciénega creation was planned to maintain a population of Comanche Springs pupfish isolated from other protect populations, enhance the quality and quantity of habitat for all listed and candidate taxa, and take into account the need to protect historically significant buildings in accordance with state antiquities laws. Water was diverted to the newly constructed ciénega in May 2009 and fish were released in September 2009. Since 2009, vegetation has colonized the ciénega and the habitat supports a healthy population of Comanche Springs pupfish and Pecos gambusia.

### Sandia Springs Preserve



Sandia Springs are a pair of desert springs and ciénegas located on a 246-acre preserve owned by The Nature Conservancy. The Sandia Springs harbor the federally endangered Pecos gambusia and Pecos assiminea snail, two other rare snails (Phantom springsnail and Phantom cave snail), one rare amphipod (diminutive amphipod), and are possibly historic habitat of the Comanche Springs pupfish. West Sandia Spring is the smaller of the two, with a dense stand of large cane marking the spring's head and the first few hundred feet of the flowing creek. East Sandia Spring is much larger and more open, with a deep, clear pool lined with bulrushes. Both East and West Sandia springs contribute water to the Balmorhea canal system for agricultural irrigation. The majority of the fish species and populations live in East Sandia Spring. In addition, to the rare aquatic species East Sandia Spring also supports a population of the rare puzzle (Pecos) sunflower which is endemic to only a few saline ciénegas. The Conservancy's on-site stewardship of the preserve has included ongoing salt cedar and mesquite control in the uplands and area adjacent to the spring pool and creek as well as continued biological inventory and monitoring. Additionally, the Conservancy recently donated a corner of land to the town of Balmorhea for the construction of a recreation and interpretation center to increase public access and conservation awareness in the local community. The Conservancy's management of this preserve is a long-time commitment to natural resource stewardship and water protection in the area.

### Conservation Partners

Desert Fish Habitat Partnership  
Texas Parks and Wildlife Department  
US Fish and Wildlife Service  
US Bureau of Reclamation  
The Nature Conservancy  
Dexter National Fish Hatchery  
and Technology Center

Reeves County Water Improvement District  
Texas Department of Agriculture  
Environmental Protection Agency  
USDA Natural Resource Conservation Service  
Texas Agricultural Extension Service  
University of Texas at Austin  
University of Texas – Pan American

Sul Ross University  
Texas Department of Transportation  
Texas Department of Criminal Justice  
Educational Foundation of America  
National Fish and Wildlife Foundation  
City of Balmorhea

BRIAN GOWIN, CONSERVATION AND SFI MANAGER, CAMPBELL TIMBERLAND MANAGEMENT, LLC  
 DANIEL PRICE, WILDLIFE BIOLOGIST, TEXAS PARKS AND WILDLIFE DEPARTMENT

## Longleaf Ridge Conservation Area

Longleaf Ridge Conservation Area, two hours northeast of Houston in the Pineywoods Region of Texas, contains some of the best examples of remaining intact and biodiverse longleaf pine woodlands in the southern United States. Roughly fifty miles long and six miles wide, Longleaf Ridge lies along parts of Highways 63, 255, 87, and 96 in Angelina, Jasper, Newton, and Sabine counties, encompassing portions of Angelina and Sabine national forests, Sam Rayburn and Toledo Bend reservoirs.

Longleaf Ridge is a strategic conservation priority for numerous organizations, including but not limited to: The Nature Conservancy, The Conservation Fund, US Fish and Wildlife Service, US Forest Service, Texas Forest Service, National Wild Turkey Federation, and Texas Parks and Wildlife Department. The Campbell Group is working in partnership with these and other organizations to protect unique values on SFI®-certified lands it manages within the Longleaf Ridge Conservation Area.

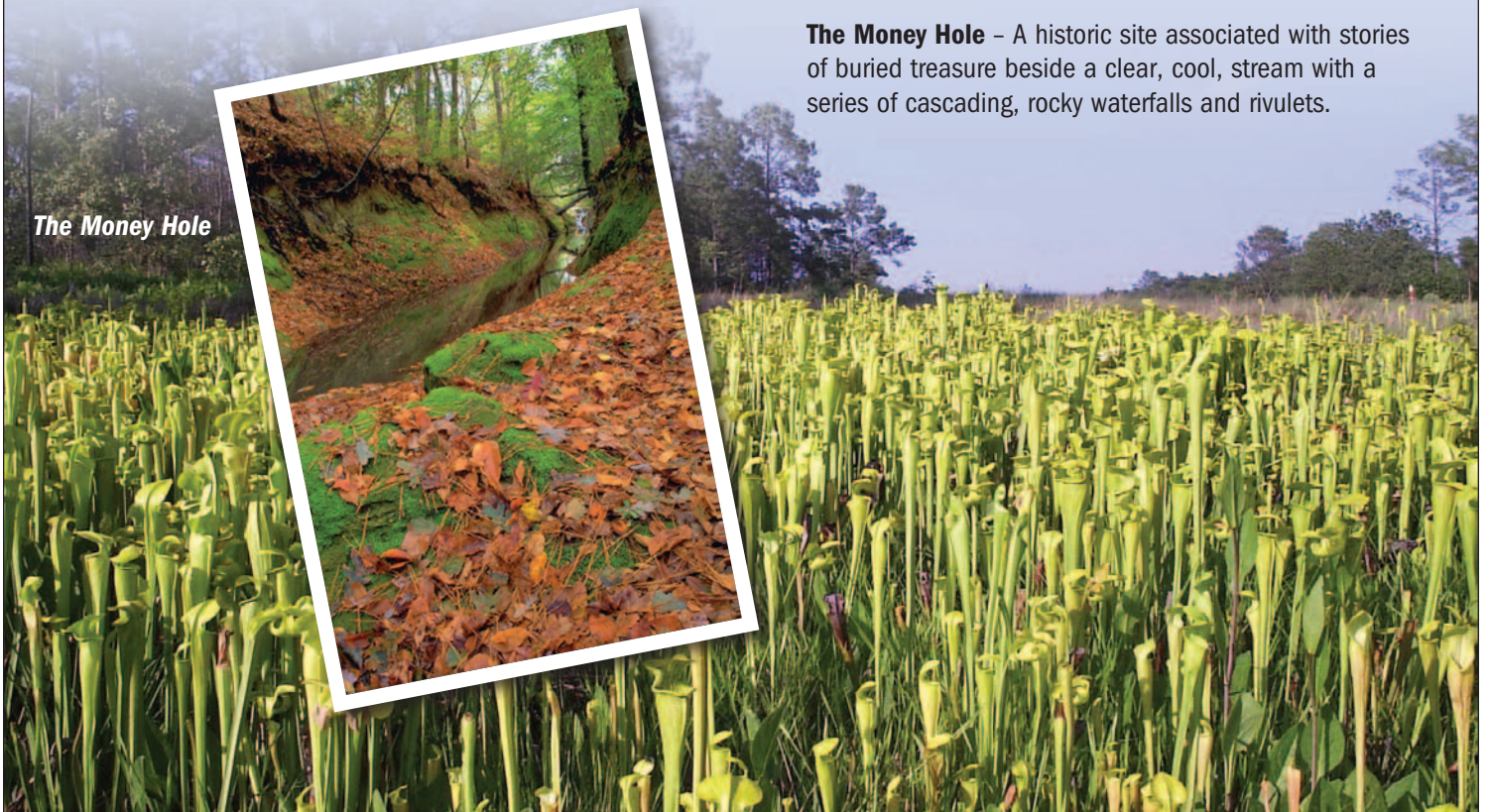
Beginning in 2008, The Campbell Group partnered with Texas Parks and Wildlife Department through its Landowner Incentive Program (LIP) to restore and enhance approximately 5,000 acres of upland pine forests and associated riparian habitat. This project played a critical role in a broader conservation plan to conserve and protect a large part of Longleaf Ridge, restore and maintain the integrity of the longleaf pine forest, and provide favorable conditions and habitat for a host of rare plant and animal species.

Longleaf Ridge encompasses more than 400,000 acres and is the most diverse conservation area in The Nature Conservancy's Ecoregional Plan. The project area includes several Campbell Group "Special Sites" or areas specifically managed to protect unique features:

**Beef Creek Waterfall** – A fifteen-foot waterfall over a Catahoula outcrop surrounded by a beautiful beech and white oak forest.

**The Money Hole** – A historic site associated with stories of buried treasure beside a clear, cool, stream with a series of cascading, rocky waterfalls and rivulets.

*The Money Hole*





The area also contains a high concentration of unique and globally threatened communities such as:

Catahoula sandstone barrens	Xeric sandhills
Pitcher-plant bogs	Beech forests
Longleaf pine forests	

Longleaf Ridge owes much of its uniqueness to the Catahoula Formation. The most obvious indication of the Catahoula Formation is the presence of sandstone outcrops, aka Catahoula barrens. Catahoula barrens are not “barren” at all. They nearly always support a group of specialized and uncommon plants such as Wright’s sunny bell, yellow hedge hyssop, or the federally endangered Navasota ladies-tresses orchid. A slight variation of the Catahoula barren is the Catahoula sandstone glade. Catahoula sandstone glades also support rare species such as incised groove bur and slender gayfeathers. Glades of this type are more likely to be found in Louisiana than in Texas, so their presence at Longleaf Ridge makes them all the more significant. Barrens, bogs, and glades are found scattered in Longleaf Ridge. Carnivorous plants such as the yellow pitcher plant, butterwort, bladderworts, and sundews are found in many bogs along Longleaf Ridge. Among the pitcher plants bogs, several rare plants occur in the projects area including bog cone-flower, Chapman’s orchid, roughstem yellow-eyed grass, and Drummond’s yellow-eyed grass.

In addition to the rare plants and communities described above, restoration efforts within Longleaf Ridge improves the habitat required by the Louisiana pine snake, red-cockaded woodpecker, Bachman’s sparrow, and benefit many other animal species such as eastern wild turkey, northern bobwhite, American woodcock, white-tailed deer, and a myriad of non-game species. The habitat type required by these

species is a natural result of the frequent fires that occurred in the presettlement Southern Forest and along Longleaf Ridge – creating an open, savannah pine woodland with a lush groundcover of native grasses and wildflowers.

Longleaf pine habitats are dependent on frequent fires and other treatments to reduce competition, minimize woody species encroachment and to control non-native species. The restoration and maintenance of a fire regime that mimics that of the historic past is a vital part of conserving and restoring habitat conducive for the management of these species. The TPWD-sponsored project included harvesting of existing loblolly pine stands, chemical site preparation to reduce competition and prepare sites for planting, replanting of containerized longleaf pine seedlings, and prescribed burning to improve, maintain, and restore native longleaf pine forests. From 2009-2012, The Campbell Group conducted prescribed burning for timber stand improvement on approximately 4,000 acres, prescribed burning for site preparation on approximately 500 acres, chemical site preparation and planting of longleaf pine seedlings on approximately 1065 acres, and timber stand improvements to remove undesirable competition within 135 acres of recently planted longleaf forests.

The longleaf pine restoration initiative conducted by The Campbell Group and supported by TPWD is critical in addressing conservation priorities identified in the Texas Wildlife Action Plan. High-priority species such as red-cockaded woodpecker, Louisiana pine snake, Bachman’s sparrow, a host of rare plants, and many other unique assemblages of a natural heritage benefited from this habitat stewardship project.



**Beef Creek Waterfall**

**Longleaf Savannah**

KORY PERLICHEK

TPWD BIOLOGIST FOR MASON, MCCULLOCH, AND GILLESPIE COUNTIES, STATIONED IN MASON, TEXAS

## Mason County LIP Projects

In 2012, multiple conservation projects broke ground on over 18,000 acres along the James and Llano River watersheds in Mason County thanks to the Guadalupe Bass Restoration Initiative (GBRI).

Through the Landowner Incentive Program (LIP), the GBRI provides private landowners with necessary cost-share funds to implement conservation activities that benefit the State Fish of Texas, the Guadalupe Bass, and its habitat. Such activities promote water quality and quantity, and reduce degradation of riparian areas.

On-going habitat improvements in Mason County include: 1) Creating alternate water sources for domestic livestock, to encourage maximum utilization of the property, and to decrease dependence on natural springs and creeks. 2) Selective brush removal and herbicide treatment of invasive species in the riparian floodplain. This practice increases the water table and spring flow by encouraging the growth of native vegetation. Resulting slash will be windrowed along topographical contours to prevent soil erosion. 3) Exclusionary fencing around springs and seeps (using net and barbed wire), designed to eliminate or decrease the use of these highly sensitive areas by feral hogs and livestock. In turn, re-establishment of bank vegetation is promoted, and water quality is protected. 4) Construction of interior pasture fencing (cross fencing) to allow increased rotational grazing of domestic livestock. 5) Construction of corral-type hog traps designed to control/eradicate feral swine in an effort to minimize their negative impacts to sensitive habitats.

The Mason County projects will reduce large-scale erosion and sedimentation of the springs and creeks that flow into the James and Llano river watersheds. These management practices will not only positively impact the aquatic habitats of the Guadalupe Bass, but will also serve to increase the vitality and health of the properties involved, as well as contribute to the resiliency of the watersheds.

These projects wouldn't have come to fruition if it wasn't for the hard work and dedication of Inland Fisheries staff, Gary Garrett and Megan Bean, along with State LIP Coordinator, Arlene Kalmbach.



## OPPORTUNITIES

For the 2013 - 2014 state fiscal year, the LIP program is excited to have two funding opportunities for Texas landowners wishing to initiate conservation projects on their lands.

**1** With funding from the USFWS Partners for Fish and Wildlife Program, the TPWD LIP program once again offers funding to private landowners throughout the state for conservation projects. This funding series has a pre-proposal submission deadline of September 15, 2013. While this funding series gives highest priority to projects targeting federally listed or candidate species in targeted areas of the state, all projects are welcome for consideration. To learn more about this funding, go to [www.tpwd.state.tx.us/lip](http://www.tpwd.state.tx.us/lip) or contact your local TPWD biologist.

**2** In partnership with the Inland Fisheries Division Watershed Protection Program here at TPWD, the LIP program has funding for private landowners in the Llano River Watershed who wish to mitigate erosion, combat invasive species, and in general take measures to improve the landscape - be that upland or riparian - that ultimately result in benefit to the watershed. This funding is also available to landowners in the James River Watershed. In addition, look for opportunities in the near future for landowners in the Pedernales River watershed as well. For more details on this funding opportunity go to [www.tpwd.state.tx.us/lip](http://www.tpwd.state.tx.us/lip) or contact your local TPWD biologist. This LIP funding series takes applications on a rolling basis.

Executive Director  
Carter P. Smith

Editor, L.I.P. Bulletin  
Arlene Kalmbach



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