# South Texas Natíve Plant Restoratíon Project

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# South Texas Native Plant Restoration Project Launched

Katharine Armstrong Idsal, Texas Parks and Wildlife Commission and Will Harte, Canyon Oil and Gas

We are pleased to present the first issue of the South Texas Native Plant Restoration Project Newsletter. This newsletter will be produced throughout the life of the project, and is designed to provide updates about the progress of our work to develop and promote high quality and affordable native plants and seeds for the restoration of wildlife habitat in South Texas. The newsletter will also provide helpful information about different kinds of plants and planting strategies, and will serve as a venue for an ongoing dialogue about native plants.

The South Texas Native Plant Restoration Project is off and running. From casual conversations to what is now a well-organized and concerted effort, the project has struck a chord with landowners of all economic means throughout South Texas. There is clearly a critical need for high quality native plants and seeds for use in habitat restoration, and in quantities that match the ever-growing demand.

The habitats found in South Texas harbor a wide array of wildlife species - from piping plovers to white-winged doves, from whitetailed deer and bobwhite quail to ocelots, bobcats, and raptors. This



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Coreopsis is a flowering plant native to South Texas.

has made South Texas one of the nation's premier ecosystems. The focus of this project is on a region broadly defined as extending from Victoria to San Antonio to Del Rio and Brownsville, Texas. Three major ecological regions are found here: South Texas Plains, Coastal Sand Plains, and Gulf Coast Prairies and Marshes. As urbanization and agricultural changes occur in these habitats, restoration and enhancement of existing lands becomes more urgent. Native habitats provide a complex of biological resources from microorganisms to insects, plants, and animals. This complex not only provides an exciting diversity, but its interrelationships account for its long-term biological resilience and stability.

At the heart of this habitat stability are native plants. These plants provide for the numerous food and energy cycles that maintain biological diversity. The goal of the South Texas Native Plant Restoration Project is to provide economically viable sources of plants and seeds for the restoration of South Texas plant communities. It is important to establish native seeds, plants, and planting strategies so that invasive, or introduced plants do not overwhelm our environment. Establishment and restoration with native South Texas plants will maintain the region's important genetic resources and the ecosystems that are part of the South Texas biological heritage.

The organizational structure of the South Texas Native Plant Restoration Project includes two primary divisions, an Advisory Group of civic leaders, landowners, and businessmen and women who are endorsing the project and overseeing fund raising and educational activities. The second division is a Technical Committee of wellrespected soil and plant experts. Partners from diverse backgrounds are involved in both groups. The Caesar Kleberg Wildlife Research Institute at Texas A&M University-Kingsville serves as the project manager. We look forward to keeping you informed as the South Texas Native Plant Restoration Project develops in the months ahead.

# A New Life for an Old Farm

# Alta Forshage, Foremost Paving

Having been in the highway construction business for many years, my husband Eddie has paved over miles and miles of South Texas, building much-needed roads. What a shame, though, that native plants and animals were paying the price for peoples' towns and traffic in loss of habitat. We wanted to pay back!

Actually, it was the search for caliche (road-rock), that brought us to a sandy, wind-swept farm north of Edinburg. We bought it and are restoring part of it to its natural state as brushy wilderness, to provide a home for a variety of wildlife.

Before we could begin our project, we needed a plan. This meant finding out about plants and people, preparation, and programs.

Lisa Williams of The Nature Conservancy of Texas looked the place over and drew up a list of native plants appropriate to this part of Hidalgo County. She advised us about first putting out woody plants, especially the fast-growing legumes and acacias, to provide shade for the lower-growing bushes to be introProject Sponsors Robert J. Kleberg, Jr. and Helen C. Kleberg Foundation, Lee and Ramona Bass, Hugh L. McColl, Jr., ExxonMobil Foundation, Texas Parks and Wildlife Department, Conoco Inc., The Dougherty Foundation, Behmann Brothers Foundation, and Jan and Jack Cato

duced later, keeping diversity as a goal. She explained that our best A chance for success was to plant th seedlings grown in plant-bands (biodegradable cardboard tubes) con-

taining a recommended soil mixture. With lots of Lisa's great advice in our heads, we took her specimen list to Rancho Lomitas near Rio Grande City. There we found Benito Trevino, whose nursery is a wonderful source for native seedlings. With seeds handpicked from wild trees, bushes, and flowers, Benito's education, experiments, and research have made him an expert in his knowledge of plants, even as to their medicinal uses. He agreed to start work on our order right away, as it would take six months or more to get the first set of plants ready to put out in the fall.

Another person who helped and encouraged us from the beginning is Roel Trevino, an agent with the Natural Resources Conservation Service of the U.S. Department of Agriculture, who is familiar with all the steps it takes to turn such a dream into reality. Roel advised us about soil preparation and designed a pattern of spacing that would allow tending and watering (from a tank pulled behind a tractor) during the critical first months. He showed us how to mark the areas so the tiny young plants could be located and inspected after seasonal weeds spring up around them.

Roel was invaluable in another way; he helped us find and apply for federal assistance through a program called WHIP (Wildlife Habitat Improvement Program). This program offered matching funds for two years and made it possible for us to do more than we had first thought possible.

In the fall of 1999, Benito was ready to bring the first 4,000 plants. There was a little ground moisture, and the planting began. Four men



Eddie Forshage at his farm near Edinburg.

C Alta Forshage

set out 800 to 1,000 seedlings a day, using a cordless 3/8 inch drill fitted with a 2 inch long-shaft augur. Water with root stimulant was poured around each plant.

The year 2000's fall planting was similar, but with a few more varieties. We had 5,000 plants set out for a total of 9,000. The overall rate of success was 70%.

We would like to continue transforming farm acreage into brushland. Our efforts are satisfying in themselves, and we hope that the wildlife in our area will benefit for many years to come.

# A Perspective from the Seed Industry

# Gary Pogue, Pogue Seed Company

When I was first asked to write an article offering comments from a commercial seed man's perspective for our South Texas Native Plant Restoration Project Newsletter, I reluctantly agreed to do so. I say reluctantly because in order for me to be completely honest and objective in sharing my forty years of experience in basic and applied seed research and development, production, harvesting, processing, and marketing, I may rain on a few parades. I procrastinated, made excuses, and even had quadruple bypass heart surgery to avoid this task. By the way, thanks to those of you who sent cards and offered your prayers. The bypasses avoided a heart attack, the doctors gave me a twenty-year warranty, and I am doing very well.

The goal of the South Texas Native Plant Restoration Project is to develop and promote native plants for restoration and reclamation of habitats on private and public lands, highway right-of-ways, oil and gas work sites, general landscaping, and other purposes. Let me emphasize that Pogue Seed Company and my other friends in the seed industry are dedicated to assist in reaching those goals. It will not be easy. Attempts to commercially produce native plants have usually ended in failure. Recently, we planted 130 acres of native plant species under center pivot irrigation. The only ones to emerge, under good wet conditions, were Dr. William Ocumpaugh's bundleflower selections.

The following statement, made by me at an earlier date, sums up our main problem, "For years, the Farm Act that created the Conservation Reserve Program (CRP) has dictated the planting of native species on CRP land. We have been unable to successfully produce this seed in South Texas and have purchased seed from growers in the Texas Panhandle, Oklahoma, Kansas, New Mexico, and Nebraska. The results have been a total failure and the continued planting of these imported seeds is a farce. Most NRCS personnel agree with me. Millions of dollars have been wasted. I do not intend to be a party to this charade any longer. The plain truth is that when these seeds are brought to our area from plants grown 400 to 800 miles north of here, they are absolutely not adapted. Technically speaking, they may be the same species but are entirely different ecotypes. It is imperative that we select native species and produce the seed here."

Fortunately, many key members of our Technical Committee agree with me and began selecting local native plant seed and plants several years ago. During the past two years, Pogue Seed Company personnel began collecting seed from many South Texas native plants and presently are evaluating transplants from those seeds. In our nursery or greenhouse, we have plains bristlegrass, bundleflowers, side oats grama, big cenchrus, Eastern gamagrass, yellow Indiangrass, brownseed paspalum, slim tridens, hooded windmillgrass, and Arizona cottontop. Species we are evaluating usually produce enough seed that can be harvested. Without that important trait, you can forget them.



© Pogue Seed Company

Gary Pogue of Pogue Seed Company standing in a field of bundleflower.

Let me stress we are not attempting to duplicate John Lloyd-Reilley's work, only to help when possible.

That brings up a subject that is the most important one we must address; the plants we choose must produce enough viable seed to be commercially harvested and sold at a price that the producer can afford. Much is done with custom-built equipment and some third world country methods. I have listened in silent disbelief at some of the species that some of you have mentioned. If seed could be produced, harvested, and processed from them, the planting cost could easily be \$500 to \$1,000 per acre.

Of almost equal importance is the fact that some of our group need to stop spending so much time preaching on what they are against and begin stressing what we are for. Remember, as explained to me, our efforts concern South Texas. If you circle the globe and encompass the area from 30 degrees latitude north to 30 degrees latitude south, you will be astonished to discover that most of our South Texas introduced grasses thrive in that entire global environment. For the landowner who is trying to make a living producing livestock, it is entirely possible that a mixture of native and introduced plants would be to his

advantage. As one of our members stated during our San Antonio meeting in August of 2000, we all have different conceptions of how we want our places to look and what we are trying to accomplish.

This reminds me of a story I heard regarding invasive species. An old rancher stood up and asked a scientist why they shouldn't plant the introduced "green wonder grass" that produces ten tons of dry matter per acre compared to his native that produces one ton per acre. The scientist answered, "Well, since your only interest is producing beef, I guess that would be OK but is it an invasive species?" The old rancher replied, "Well, I don't rightly know but I shore hope so." He then asked the scientist if he owned any dry land and raised any livestock. The scientist said, "Yes, I do and am proud to say that everything on it is native." The old rancher replied, "How are your bison and longhorns doing?"

Again, the point I am trying to make is that we should not alienate people who don't agree with us by severe criticism concerning what we are against. Use tactful reasoning with those people by explaining what we are for, our goals, and why we think it is part of our Creator's plan to use our beautiful native plants when possible and practical to do so.

In conclusion, I feel it is safe to say that the commercial seed industry will strongly endorse our efforts if we create a demand for native plant seed and place priority on selecting plants that produce commercially viable seed.

# Why Natives?

# Tim E. Fulbright, Ph.D., Meadows Professor of Semi-Arid Land Ecology, Caesar Kleberg Wildlife Research Institute

Each year in Texas, thousands of pounds of seeds of non-native grasses are planted along highways



🕽 Tim E. Fulbright

Tim E. Fulbright, Ph.D., of the Caesar Kleberg Wildlife Research Institute is shown here standing before a Texas Persimmon on the left.

and in pastures. The term, "nonnatives," refers to plants that are not a part of the natural vegetation in an area. The quantity of non-natives annually planted in Texas far exceeds the amount of natives that are planted.

If non-natives are not a part of the natural flora, why do people prefer them? Non-natives are often easier to establish than natives, making them a favorite for livestock forage, erosion control, or for ground cover along highway right-of-ways. Seeds of non-natives are usually less expensive and more available commercially than natives.

Widespread use of non-native plants resulted from attempts by university, government, and private researchers to increase forage production on rangelands and in pastures for domestic livestock. King Ranch bluestem, Kleingrass, buffelgrass, bermudagrass, and other nonnative grass species have been a staple of the livestock industry in range and pasture plantings for many years.

Forage scientists have traditionally focused on increasing livestock production and have given little attention to the ecological effects of planting non-natives. Development of non-native grasses for rangeland and pasture planting is ongoing in many university and federal research laboratories. However, attitudes toward non-native plants are beginning to change for a number of reasons.

Today, the general public values native plants and preservation of biodiversity more than in the past. Creating and maintaining native wildlife habitat is an increasingly important goal of Texas landowners, whereas production agriculture and maximizing livestock forage production are less important. Ecologists have become aware of negative impacts from planting nonnative grasses, particularly those species that are "invasive," or spread without the aid of man.

Non-native plants reduce plant species diversity, displace and prevent re-establishment of native species, and lower soil fertility by reducing soil nitrogen and carbon accumulation. Monocultures of non-native grasses such as buffelgrass and bermudagrass provide sterile habitats for wildlife. Once established, non-native plants are difficult to remove. Diligent efforts to eliminate non-natives are being made by certain groups and organizations. For example, the staff at Organ Pipe Cactus National Monument in Arizona mechanically removed 40 tons of buffelgrass

during 1999 to keep it from replacing organ pipe cactus, giant saguaros, and ironwood.

Non-native grasses have completely replaced native grasslands in many areas of the U.S. The native grasslands of central California, formerly dominated by perennials, were replaced by non-native annuals from the Mediterranean region. Cheatgrass, an invasive non-native annual, has replaced the native grasslands of the Palouse Prairie in Oregon and Washington. These non-native grasslands are less productive for livestock and are poorer wildlife habitat than the native grasslands that preceded them.

Compared to non-natives, planting natives is better for wildlife habitat, conserving biodiversity, and maintaining soil fertility. Finding seeds of natives to purchase is difficult, however, which has seriously inhibited their use in rangeland and pasture seeding. Demand for nonnatives has resulted in a relatively meager supply and variety of native plants on the commercial market. To make matters worse, there are no ecotypes of the few native species that are available on the seed market that are adapted to South Texas. Today, if a rancher wants to plant grass, his or her best bet for successful establishment at a reasonable cost is, unfortunately, to select buffelgrass, Kleingrass, or some other non-native.

Someone has to take the lead to shift landowners and public agencies from planting non-native plants to planting natives. The more nonnatives that are planted on Texas rangelands, pasture, and highway right-of-ways, the greater will be the loss of the state's wildlife habitat. biodiversity, and soil fertility. We need to make sure that landowners, highway planners, and others interested in native plants will have a wide selection of adapted native species available at reasonable prices. That is a major goal of the South Texas Native Plant Restoration Project. However, our goal goes far deeper than just promoting planting of native plants. Our goal

# South Texas Native Plant Restoration Project Advisory Group

Co-chairs:

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Will Harte, Canyon Oil and Gas

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Ellen C. Temple Publisher, Landowner

Robert H. Welder, II Pat Welder Ranches

Lawrence Wood Landowner is preserving the habitats, biological diversity, and soils that help make our state a great place to live.

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### The Importance of Soils

# Larry Zibilske, Ph.D., U.S.D.A. Agriculture Research Service

Weathering of different rocks produces soil particles that differ in size and chemical makeup. As a result, soils differ greatly in their ability to support plants. In a natural system, plants that grow on a given soil are those that are best adapted to the restrictions imposed by that Soil acidity. particular soil. alkalinity, clay content, doughtiness, and chemical content influence plant survival. To a large degree, the plants that best manage these soil characteristics are the most competitive and tend to survive.

But soil is much more than just a reservoir of water and chemicals. It is also a habitat for many kinds of microbes and other creatures. The question is what are all these little creatures doing? Could they possibly affect plants? Getting at the answers to some of these questions is easy, other questions are more difficult to answer, and some are exceedingly complex and must wait for a time when we have a greater understanding of plant-soilmicrobe relationships.

What we know about soil microbes falls into a couple of broad categories. First, microbes recycle nutrients for the next generation of plants by decomposing organic matter. This is probably the most recognizable function of soil microbes, and the one that we know the most about. The second category includes activities that have grown out of intimate associations of plants and microbes that have developed over eons. Microbes grow on and in plants, some are pathogens while others are beneficial. In truth, we really know little about this category of plantmicrobe interactions. However, the more we learn, the more essential these relationships appear to be. In natural soil systems, plants may not do well without soil microbes.

The biological balance between plants and microbes is affected by environmental changes. Natural cycles of temperature and moisture cause short-lived, reversible changes in the plant-soil-microbe relationship. The relationship is very resilient. However, more drastic changes, such as those caused by changes in land use and natural disasters often cause longerterm problems. They can even permanently change the biological balance in the soil. For instance, agriculture and rural development play significant roles in long-lasting changes in the plant's environment. Recovering from such radical change is often difficult and may take a very long time.

The often difficult task of revegetating degraded land will undoubtedly include steps to improve soil conditions so that repopulating plants have a better chance at survival. Modifying the soil environment will enhance fertility and promote the beneficial activities of soil microbes. A better habitat for soil microbes will aid the establishment and productivity of reintroduced plants. Sometimes adding beneficial soil microbes directly to plant roots helps. Mycorrhizal fungi form symbioses with roots that aid in nutrient uptake and help ward off root diseases. Inoculation of such microbes may boost the survival of new plantings. Other microbes enrich the soil with nitrogen, making it easier for plants to survive.

The point is that improving the soil habitat will draw us closer to a natural relationship between soil, plants, and microbes that will provide a better chance for sustainable plant productivity. If we can learn how to set them up appropriately, nature will take care of the rest.



© Larry Zibilske

Researchers can use a soil respirometer to measure microbial respiration.

### South Texas Native Plant Restoration Project Technical Committee

Lloyd Anthony Speedling, Inc.

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Lavoyger J. Durham

Jim Everitt, Ph.D. U.S. Department of Agriculture

Tim E. Fulbright, Ph.D. Caesar Kleberg Wildlife Research Institute

Vivian Garcia Natural Resource Conservation Service

C. Wayne Hanselka, Ph.D. Texas Agriculture Extension Service

### Personal Reflections on the Project

Paula D. Maywald, Caesar Kleberg Wildlife Research Institute

Having been a rangeland manager in South Texas for the past ten years, I have developed a deep appreciation for native plants and their import role in ecosystem function. It is one of the reasons I became involved with the South Texas Native Plant Restoration Project, and why I accepted the offer to become its coordinator.

The South Texas Native Plant Restoration Project is an initiative begun by the Caesar Kleberg Wildlife Research Institute, area landowners, and businessmen and women to develop and promote native plant species for the restoration and reclamation of habitats on private and public lands, highway right-of-ways, and general landscaping. Our goal is to have availRichard Hoverson Hoverson's Native Plants

John Lloyd-Reilley Kika de la Garza Plant Materials Center

David Mahler Environmental Survey, Inc.

Paula D. Maywald Caesar Kleberg Wildlife Research Institute

Bill Neiman Native American Seed

William Ocumpaugh, Ph.D. Texas A&M University

Gary Pogue Pogue Seed Company

Stan Reinke Natural Resource Conservation Service

able economically viable sources for native plant materials that are endemic to the region, and to develop methods and techniques of application. The Project will also strive to educate the public about the importance of native plants, and to encourage their use.

Managing rangeland in South Texas has its challenges. Many times when faced with a restoration task, I would get angry with the previous land managers who made the mess I was charged with fixing. What I deemed to be poor management decisions or lack of management was actually a difference in goals and objectives, or a lack of knowledge. In some cases, these recommendations were based on well-meaning government agency personnel. As time moves forward, it is even more apparent to me the need for sound rangeland management. I also know my predecessors were only doing what they thought was best at the time to meet their management objectives.

David Riskind Texas Parks and Wildlife Department

Jimmy Rutledge Texas Parks and Wildlife Department

Stephen P. Walker Texas Department of Transportation

Lisa Williams The Nature Conservancy of Texas

Steve Windhager, Ph.D. Lady Bird Johnson Wildflower Center

Larry Zibilske, Ph.D. U.S. Department of Agriculture

Today's goals and objectives for landowners and land managers have grown to include watershed management, livestock grazing, oil and gas production, hunting, birding,



<sup>©</sup> Tom Urban

Paula D. Maywald, Coordinator of the South Texas Native Plant Restoration Project, has a degree from Texas A&M University-College Station and has managed private lands over nine years. nature tourism, and many other forms of recreational activities. Multiple uses of our rangelands have caused a greater dependence on our native flora.

Texas land ownership has changed greatly in the past ten years, and land values based upon recreational use have increased. Many of our counties' land values are based heavily on recreation, which exceeds fifty percent. The new landowner has goals that are different from their predecessors, and many of these landowners come from backgrounds different from traditional ranching. Today, rangeland managers have a greater knowledge of the interdependence of the soils, plants, wildlife, and livestock. But as professionals, have we done our job to educate new landowners and the public about the importance of our native flora?

Exotic plants displace and disrupt the balance of the ecosystem.

Wildlife, water, and soils are all adversely affected. There is even a federal noxious plant hit list! The "Catch 22" for those given the task of restoration and reclamation of rangelands is the lack of native plant materials and the lack of knowledge about native plants by our new landowners and new land managers. Exotic species like King Ranch bluestem, buffelgrass, and salt cedar were introduced into the U.S. for purposes such as controlling soil erosion caused by water and wind and to provide additional forage for livestock. But, there were already native plants in South Texas that served these important purposes. It is much like the television commercials for products that promise to help you lose weight or to become fit quickly. When it comes to "wonder" plants like exotics, they have become a "pain in the ecosystem"!

There is a great need to develop ecotypic seed and plant resources

for use in restoration. And, to educate our new-age landowners about the value of natives in maintaining the health of the unique rangelands of South Texas. I look forward to working with our technical experts and Advisory Group members in the months and years ahead to achieve these goals.

# **Seed Collection Request**

In an effort to receive seed across South Texas, we will be helping our 4H and FFA plant and range teams earn money for trips to competitions, and also learn more about seed collection and processing. We will pay teams by weight for grass and forb seeds and per seed for shrubs. A list of species along with handling procedures will be sent to area 4H and FFA leaders.

Anyone with an interest in allowing students to collect seed on their property or assisting the teams in collection, please contact Paula Maywald or their local 4H and FFA leaders as soon as possible.

### For more information, please contact:

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Please also find information about the project on our Institute web site: www.ckwri.tamuk.edu



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