



# Texas Wetland News

and WETLAND CONSERVATION PLAN UPDATE

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## New Wetland Education Materials Available in August 2003

**Texas Treasures: Wetlands** is a new booklet designed to introduce Texans to the essential benefits this amazing resource provides while dispelling a few myths about wetlands. Through a regional look at Texas wetlands, the full-color images and factual information form a foundation for understanding the role Texans will play in maintaining healthy wetland resources. References are provided to encourage further investigation. The booklet is written for the general public but will also be useful to educators looking for Texas-specific resources about wetlands. Look for the booklet to be published in its entirety on the TPWD Web site.

Twenty-five **Wetland Education Kits for Educators** will be distributed to various educators and education service centers across the state, to be available for loan to teachers. These kits will contain lesson plans, books, posters, videos, bird and frog call CDs and field equipment to guide students in their investigations of wetland habitats.

For information on these educational supplies, check our Web site or call (512) 389-4998.

If you would like to be added to the mailing list or would like to submit an article for the next issue of the *Texas Wetlands News*, contact:  
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## To Save the Ogallala Aquifer, Save Playa Lakes

**As communities across the western Great Plains struggle to deal with drought and declining water tables, a major, yet relatively unknown natural resource is playing a critical role in replenishing and protecting the region's water supply.**

Scattered across the western prairie landscape are thousands of playa lakes. Playa lakes are the most numerous wetlands in the region, totaling more than 40,000 in eastern New Mexico, Colorado and Wyoming, western Kansas, Nebraska and Oklahoma, and the Texas Panhandle combined. More than 95 percent of the world's playa lakes are located in the western Great Plains – they are a unique natural resource.

Playa lakes are shallow, usually round, wetlands with clay floors that lie in the lowest point of a generally large, closed watershed and collect rainfall and associated runoff from surrounding uplands. Their average size is 17 acres, and all playa lakes combined make up about 2 to 5 percent of the total western prairie landscape. They are ephemeral, or seasonal, in nature and hold water only after rainfall or runoff events. Most of the time, they are dry, which is partially why many people don't recognize them as wetlands. Playa lakes are sometimes mistakenly referred to as buffalo wallows, mud pits or evaporation pans.

*continued on the next page*

## Save the Playa Lakes, continued

But there are several good reasons why people should learn about and maintain playa lakes, one of which is the wetlands' role in recharging the Ogallala Aquifer.

Over the past several decades, researchers have gathered substantial evidence pointing to playa lakes as the primary source of recharge for the Ogallala. This is big news for western Great Plains states, which have relied on pumping the Ogallala for agricultural, municipal and industrial use since the turn of the century. Although this research has been going on for quite some time, the results are relatively unknown to the general public and even conservation professionals. Since about 99 percent of playa lakes are located on private land, this information is crucial for farmers, ranchers and natural resource managers who hope to conserve water and maintain agricultural economies of the region.

"We want producers to realize that protecting a playa on their land has direct benefits to them, and for decision-makers to understand that protecting playas is an enormous help to the aquifer and economies of the western Great Plains," said PLJV Coordinator Mike Carter. "Playas put money in peoples' pockets."

The 174,000 square-mile Ogallala formation lies beneath portions of eight states: Colorado, Kansas, Nebraska, New Mexico,

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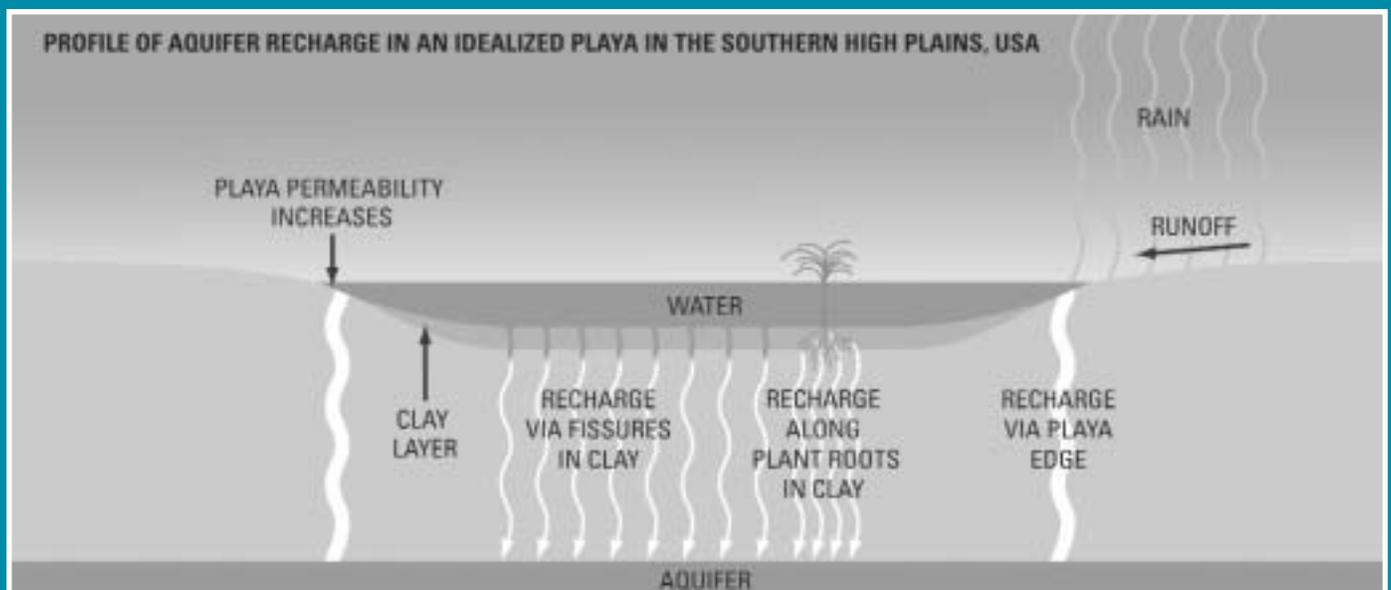
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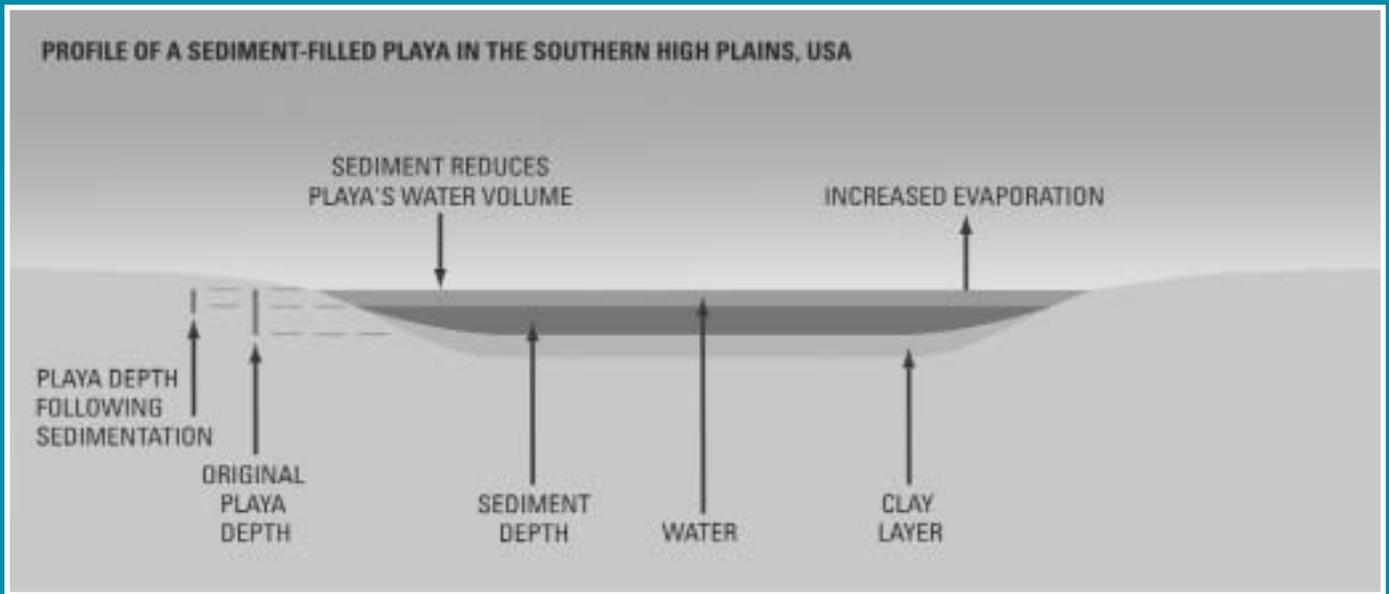
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Oklahoma, South Dakota, Texas and Wyoming. In 1990, it was measured to contain about 3.270 billion acre-feet of water. Use of the Ogallala began at the turn of the century, and since World War II, reliance on it has steadily increased. While in 1950 the Ogallala irrigated about two million acres of farmed land, by 1997 it irrigated 14 million acres. During this time, the Ogallala water supply has progressively declined and from 1950 to 1980 water levels dropped 9.9 feet, and from 1980 to 1999 they dropped 3.2 feet, according to the U.S. Geological Survey. With the recent advent of improved dry land farming and irrigation techniques, pumping of the Ogallala has decreased during the last decade, but still the rate of

aquifer depletion far exceeds the natural rate of recharge.

According to studies conducted in the Southern High Plains region of Texas and New Mexico, natural recharge occurs throughout much of the landscape above the Ogallala but is focused through playa wetlands. When a dry playa lake receives rainfall or associated runoff, water flows into the playa basin and penetrates the clay layer through deep cracks, plant root openings and other pores in the floor. Water then flows through fissures in the cap rock layer, ultimately reaching the Ogallala formation. Cracks in the playa lake floor eventually swell shut as the clay absorbs more water, limiting or diminish-





ing recharge through the basin. Recharge also occurs along the wetland's perimeter where clay is thin or non-existent. Landscape-wide recharge to the Ogallala in the Southern High Plains is about 11 mm of water per year, and about 9.2 mm of that – or approximately 85 to 90 percent – is focused through playa lakes, according to Dr. Warren W. Wood, Research Hydrologist for the U.S. Geological Survey. This means that 85 to 90 percent of all recharge is occurring on 2 to 5 percent of the landscape, amounting to about three to six inches per year under playa lakes.

“We’ve found that playa lakes are responsible for a significant majority of recharge to the aquifer, much more so than in the surrounding uplands,” Wood said, “Replenishing the aquifer therefore means ensuring that playas continue to function normally and naturally.”

Like the aquifer, playa lakes are also a threatened resource. Of the more than 40,000 playa wetlands in the region, resource managers estimate that at least 70 percent of those have been altered from their natural state through pitting, plowing or sedimentation. Of these, sedimentation is the single largest threat to playa lakes. Sedimentation occurs on all playa lakes that are surrounded by tilled lands. Water runoff from rain and irrigation carry soil into the wetlands, gradually filling them. Sediment build up reduces the volume of water they can hold and increases the rate of water loss through evaporation, ultimately limiting recharge.

Conservation practices used to protect playa lakes includes establishing native grass buffers around playa perimeters to filter out soil and agricultural contaminants present in runoff, and filling in man-made pits so water can reach the entire basin

and all recharge pores. In rangeland, playas can be fenced off to prevent excess trampling or denuding of vegetation by livestock. There are several programs available to private landowners wanting to protect playa lakes on their land through the Farm Bill. For more information about these and other programs, contact the Playa Lakes Joint Venture (PLJV), a conservation partnership dedicated to protecting playa lakes through cooperative and voluntary agreements with private landowners.

PLJV partners consist of representatives from non-profit and private organizations, and federal and state wildlife agencies in the western Great Plains states of Colorado, Kansas, Nebraska, New Mexico, Oklahoma and Texas. The PLJV's mission is to conserve playa lakes, other wetlands and associated landscapes for the benefit of birds, other wildlife, water and people. Joint Venture partners include: Ducks Unlimited, The Nature Conservancy, Pheasants Forever, ConocoPhillips, the Natural Resources Conservation Service, U.S. Fish and Wildlife Service, U.S. Forest Service, and state wildlife agencies of Colorado, Kansas, Nebraska, New Mexico, Oklahoma and Texas. The PLJV was established in 1989 and since then, has raised more than \$50 million to conserve more than 100,000 acres of wetlands and other wildlife habitat in the short and mixed grass prairie regions of the western Great Plains. For more information about the PLJV, aquifer recharge or wildlife conservation issues in this region, visit the PLJV Web site ([www.pljv.org](http://www.pljv.org)) or call (303) 926-0777.



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## Bessie Heights Marsh Restoration Update

**Since the early 1900s it is estimated that close to 6,000 acres of an intermediate, mostly emergent marsh in the Bessie Heights Marsh area has changed to open water. These losses, for the most part, are directly attributable to human activities from dredging of channels into the marshes to allow access for petroleum activities to deepening and widening of the Neches River.**

These changes in hydrologic and salinity regime have taken a toll on what was a freshwater emergent marsh.

Due to the nature of the hydrology that currently exists in the marsh, terracing was selected as the primary means of habitat restoration in phase one of this project. Terracing is a wetland restoration technique used to convert shallow subtidal bottom to marsh. This method uses existing bottom sediments to form terraces or ridges at marsh elevation. A terrace field composed of these ridges arranged in some pattern that maximizes intertidal edge and minimizes fetch between ridges is constructed, and the intertidal area is planted with marsh vegetation.

Today this marsh system is primarily brackish and salinities can range from very low (0 parts per thousand [ppt] ) to moderate (10ppt). These conditions are driven primarily by rainfall (or lack thereof) and tidal flows pushing the higher salinity waters back into this marsh complex where the holding time helps to elevate the salinity.

On a recent trip taken out to monitor the project on June 11, 2003, salinities of 6.8 ppt were observed in the terrace field. This raises some concern about the survivability of the species of plants that do not tolerate salt concentration very well, and this will be closely watched over the summer of 2003.



*Terraces prior to planting*

In the last *Texas Wetland News* article we described the construction of the project by Affolter Contracting of La Marque, Texas, and we briefly discussed the final stage of the project last December, which included harvesting and planting of the terraces that had a chance to consolidate.

We had some concerns about planting late in the year, especially if we had a severe winter. Our fear was that the plants would be killed by the cold; however, this fear proved unfounded, as the winter of 2003 was once again relatively mild. We also anticipated that by getting the plants in and allowing them a chance to establish that we should see some fairly significant growth in the spring of 2003. For the planting phase of the project the contract was awarded to Apache Ecological

Services and Benchmark Ecological Services working as Team Apache/Benchmark. Plants were harvested locally and then pre-staged on the terraces with major planting efforts being undertaken when tide and weather conditions allowed.

Team Apache/Benchmark had to overcome low water conditions due to cold fronts, working in the cold rain and soft muddy conditions in their planting efforts.



*Plants pre-staged on the terraces Dec. 6, 2002*



*Bill Quast of Benchmark Ecological Services carries a load of plants.*



*Planting Spartina alterniflora along the water's edge proved to be a "fun" task.*



*Brian Krueger of Apache Ecological Services moves plants.*

Although planting of the terraces was initially slow due to lower than normal tides and rainy weather, Team Apache/Benchmark made great strides in the planting efforts once the weather and tide cooperated. Some days as many as 20 terraces per day were being planted, following the old saying "Make hay while the sun shines." Or more applicable here, tromp the mud and muck and STICK IT as the water and weather allows.



*Planted terraces Dec. 16, 2002*

*Left to Right: Bob Davidson of Benchmark Ecological Services, Brian Krueger of Apache Ecological Services, Bill Quast of Benchmark Ecological Services and Mo Saleh, the project engineer, of Professional Engineering and Environmental Consultants.*



A site visit with Brian Krueger of Apache Ecological Services, Bob Davidson and Bill Quast of Benchmark Ecological Services along with Mo Saleh (the project engineer) and Andy Tirpak was made on December 16, 2002. This trip was to review the work done by Team Apache/Benchmark. The general consensus was that the terraces looked good and come next summer should the "creek" not rise we should expect some excellent growth of vegetation on the terraces. The planting phase of the project was approved and the project was allowed a well-deserved "rest" over the Christmas holidays.



*Terraces approximately one month (January 2003) after being planted*

Various trips through early 2003 showed the terraces and plants holding their own. There were some losses of plants and sediments for a variety of reasons. We suspect that some plants may have been lost due to the plants being washed out before the roots could establish themselves, and there were some limited signs that plants were being eaten by nutria.

By February of 2003 we observed that some of the plants were starting to green up and some had obviously grown since they were planted. We were encouraged by this progress.

We are seeing some very significant growths on some of the terraces, which may be attributed to the areas/soils with a high organic content present. Overall, we are pleased by the progress we are seeing.



*Terraces approximately four months (April 2003) after being planted.*

Monitoring of the project is slated to continue for several years and we are undertaking measures to dampen wind and wave energy around the terrace field, which will be the major "construction" effort during this year.

It is anticipated as well that phase two of the Bessie Heights project will kick off later this summer in association with the regular maintenance dredging of the Neches River. The beneficial use of the dredge material will allow for approximately another 100 acres of restoration in our quest to restore a bit of what was lost in the Bessie Heights Marsh.

Funding for this restoration project was provided by the GLO, USFWS Texas Coastal Ecosystem Program and the Natural Resource Trustees in conjunction with a USFWS National Coastal Wetlands Conservation Grant.



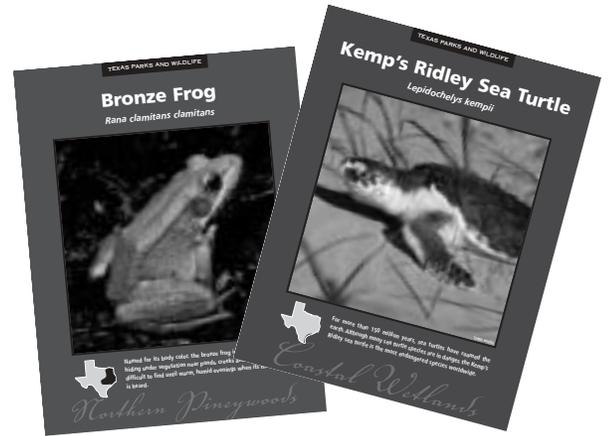
*Detail of terraces after six months*



*Terraces approximately six months (June 2003) after being planted.*

# Poster and Fact Sheet Sets

These wildlife posters and fact sheets are produced by Texas Parks and Wildlife Department with a grant from the Environmental Protection Agency. All posters are large, full color artist illustrations of Texas habitats highlighting native plants and animals. The 8.5 X 11-inch fact sheets include full color photographs with fascinating information about each species on the reverse side. Order each set for only \$7.50, which includes shipping and handling. Use the order form below.



## Urban Wildlife Poster/Fact Sheets

Blue Jay, Butterfly weed, Cardinal Flower, Downy Woodpecker, Eastern Bluebird, Eastern Fox Squirrel, Eastern Gray Squirrel, Inca Dove, Maximilian Sunflower, Monarch Butterfly, Northern Cardinal, Northern Mockingbird, Painted Bunting, Red-bellied Woodpecker, Red-eared Slider, Ruby-throated Hummingbird, Wood Duck



## Pineywoods Poster/Fact Sheets

Spotted Gar, Dragonfly, Largemouth Bass, Red-shouldered Hawk, Louisiana Milk Snake, Timber Rattlesnake, Yellow-billed Cuckoo, White-tailed Deer, Western Cottonmouth Snake, Southern Leopard Frog, Bald Cypress, Catfish, Marbled Salamander, Big-eared Bat, Giant Floater, Warmouth, Bronze Frog, Copperhead, Flier, Hellgrammite, Dogwood, Sweetgum, Northern Flicker, Pine Warbler, Redfin Shiner, Red Swamp Crayfish



## Coastal Wetlands Poster/Fact Sheets

Reddish Egret, American Oystercatcher, Black-necked Stilt, Long-billed Curlew, Fiddler Crab, Stone Crab, Roseate Spoonbill, Eastern Oyster, Common Blue Crab, Piping Plover, Kemp's Ridley Turtle, Barnacle, Lighting Whelk, Whooping Crane, Common Raccoon, Texas Diamondback Terrapin, Northern Harrier, Atlantic Croaker, Atlantic Bay Scallop, Sheepshead Minnow, Sea Grasses, Spotted Seatrout, Red Drum, Gulf Salt Marsh Snake

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PWD BR R0400-003 (7/03)

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