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One hundred years ago Eastern Arkansas' Grand Prairie was a much different place than it is today. Roughly 400,000 acres of tall-grass

prairie undulated in great waves with each passing breeze. Over 100 species of grass and flowers flourished in the warm, seasonally arid climate. Quail, prairie chickens, and even an occasional elk or bison inhabited the vast prairie.

Immigrant farmers who settled on the Grand Prairie found it hard to grow the crops they traditionally raised in Europe. There was simply too little topsoil and not enough moisture to do much more than harvest the prairie grasses for hay.

Rice becomes cash crop

Then about 1905 farmers discovered they could drill a well into the underground aquifer, flood their land and grow rice. The thick clay cap under the thin layer of topsoil acted as a perfect bottom to contain the water. The farmers plowed under the prairies, carved up the former prairie with squat rice levees and created rice paddies.

As the prairies were destroyed, so was the habitat for much of the diverse wildlife of the area. Most of the elk and bison were gone by the 1840s. The prairie chickens vanished in the 1940s. Today, quail are becoming scarce and the prairie grasslands are down to only about 600 acres in a dozen remnants.

"Until about ten years ago I felt that protecting these remnants was all we could do," said Tom Foti, Chief of Research for the [Arkansas Natural Heritage Commission](#) (ANHC), the agency primarily responsible for protecting the state's natural areas like

the prairie remnants. ANHC owns or manages about half of the 600 acres that remain of the Grand Prairie.

“Many of us believed that to try and restore the Grand Prairie ecosystem would be impossible. That’s where the Corps of Engineers and the [Grand Prairie Area Demonstration Project](#) (GPADP) entered the picture and really raised our potential.”

Demonstration Project seeks to save aquifers

Farmers tapped both the alluvial and the deeper Sparta aquifer in the almost 100 years since they began growing rice on the Grand Prairie. Neither aquifer can now recharge sufficiently to keep up with irrigation demands. Studies indicate that if pumping continues at the present rate the alluvial aquifer will be commercially useless by 2015.

The GPADP is a comprehensive water management plan designed to protect and preserve the alluvial and sparta aquifers. It also allows the continued irrigation of current agricultural crops and reduces further depletion of groundwater aquifers, while continuing to provide critical benefits for the hundreds of thousands of waterfowl, which annually migrate through the region. The White River Irrigation District is the local sponsor for the project.

The project uses surface water and water from the White River to supplement a network of on-farm water recovery systems. The supplemental system will be used to fill water storage reservoirs to supply a portion of farmers’ irrigation needs.

A system of canals and pipelines will deliver water diverted from the White River during high river stages to the reservoirs and fields.

Some of these canals will be located near or adjacent to remnant prairies owned or managed by the ANHC. Still others will be constructed near privately owned prairies.

Project opens door for environmental restoration opportunities

As the Memphis District team developed initial plans for the project, they identified a need for ground cover on the canal levees and berms. When the project team asked the ANHC if they thought planting native grasses in these areas would be a good idea, they received an emphatic “YES.”

“Typically, the irrigation canals would have strips of grass up to 100 feet wide,” Foti said. “They would allow animals and plants to move more freely from one remnant area to another. The ecosystem would begin to function again and become pieces of a larger picture. The key element was the need to use local varieties of grass.”

Memphis District and ANHC planners selected four species of grass to use in the effort: big bluestem, little bluestem, Indiangrass and switchgrass. These species historically dominated the Grand Prairie landscape.

But finding the right grass to repopulate these areas proved to



Tom Foti of the ANHC examines big bluestem prairie grass on one of the remnant areas managed by his agency.



UAPB workers collected native prairie grass seeds like this and are using them to grow seedlings in their greenhouse on the Pine Bluff campus.

be a challenge. “We could buy what were called native grasses from vendors, but they would not be genetically the same as the true native grasses of the Grand Prairie,” Foti said. “A big bluestem or switchgrass from Nebraska would not be the same as what grew here.”

Native prairie grasses essential to project success

The best plan, they determine would be to plant local seeds in order to restore genotypes that evolved specifically within



Left to right, Karen Smith, ANHC Director; Julius Hancock, UAPB Farms Resident Director; and Tom Foti, ANHC Chief of Research examine grass plants at the UAPB greenhouse in Pine Bluff.

the Grand Prairie.

“The unique genetic composition of grass from the Grand Prairie is a result of about 5,000 years of geographic isolation,” said Edward Lambert, the Corps’ fish and wildlife biologist assigned to the GPADP. “About five or six thousand years ago there was an extremely dry period here. The western prairies moved eastward, extending as far as Mississippi and Alabama at times. When the climate changed again and the western prairies receded, the Grand Prairie was left from the expansion.

“It was about 100 miles from the Grand Prairie to the nearest other prairie area. As a result the prairie grass species that evolved were genetically different from others.”

Agencies cooperate to craft ecosystem restoration opportunity

Before this work of restoring the native prairie grasses could begin, some basic study on the best methods for growing seeds was needed. The Memphis District contracted with the Plant Materials Center of the [Natural Resources Conservation Service](#) to determine the best method for planting and establishing native grasses on the canal banks. As part of their study, the corps, NRCS, the White River Irrigation District and ANHC established a test canal near the airport at Hazen, Ark. Various combinations of topsoil were tried, and all four prairie grass varieties were planted on the banks.

Another problem facing the corps was locating a source for native grass seeds. The solution came from the ANHC and [University of Arkansas at Pine Bluff](#) (UAPB). UAPB, originally known as Arkansas Agricultural, Mechanical and Normal College, is one of America’s Historically Black Colleges and Universities. Its strong emphasis on agriculture research and



The test canal established by the corps, NTCS, White River Irrigation District and ANHC near the Hazen, Ark., airport is helping researchers determine the best way to grow native prairie grasses on levee slopes and berms.

during the growing season.

Once the plants on UAPB's Lonoke Farm grow to maturity, plans are to harvest the seeds for use on canal levees and berms. Lambert said he hopes they will be able to grow the native prairie grasses on as many as 3,000 additional acres of canal levees and berms.

Parallel synergies work to produce results

Work being done to restore the original nature of the Grand Prairie can best be characterized as parallel synergies: the whole will be greater than the sum of its parts. On the one hand, instead of a collection of what Foti calls "museum pieces," the Grand Prairie ecosystem—with all of its diversity of plant and animal life—will again have an opportunity to flourish.

In addition, the cooperative efforts of the Arkansas Natural Heritage Commission, the University of Arkansas at Pine Bluff, the White River Irrigation District, the [Natural Resources Conservation Service](#) and the U.S. Army Corps of Engineers will combine to accomplish far more than they could have individually.

"The Grand Prairie is a cultural region," said Foti. It is *the* place in Arkansas where people have a great identification with the land that supports them."

Working together through the Grand Prairie Area Demonstration Project, those agencies will ensure both an ample supply of water for generations to come, and take a big step toward possibly restoring a vital, viable ecosystem that once stood on the brink of extinction.

proximity to the project area made UAPB a natural for the work. ANHC agreed to help UAPB find the right seeds for the work.

"We were delighted to allow researchers from the UAPB to collect seeds from land we owned or managed," said ANHC director Karen Smith. "We also helped identify the best species to use, gave advice on propagation techniques and assisted with some of the fieldwork."

UAPB collects native seeds from prairies

Julius Hancock is the Resident Director of UAPB Farms. "We collected seeds from local prairie remnants to establish plants in our greenhouse on the Pine Bluff campus," he said. "Once they become viable we transplant them to our Lonoke Farm facility."

The next step was for the researchers at UAPB to establish seed-production plots. They were also contracted to harvest and store the seed for the project.

In order to produce the largest number of plants for seed production, UAPB is germinating them in flats. When the plants become viable, workers move them to individual containers for growth to a hardy stage. Workers then transplant the seedlings to fields in the exact spacing required for maximum production.

By growing the plants in single species plots, mechanical seed harvesting will be much easier. Individual prairie grass species grow to various heights and the seeds mature at different times



Grass plants grown in the UAPB greenhouse are transplanted to this field at their working farm outside Lonoke, Ark.