TOWARD SUSTAINABILITY ON ARKANSAS' GRAND PRAIRIE

A SUSTAINABLE ALTERNATIVE TO THE GRAND PRAIRIE AREA DEMONSTRATION PROJECT

ARKANSAS HAS A CHOICE:

The Corps of Engineer's $319 million proposal to re-plumb the Grand Prairie, foster unsustainability, compromise the White River, and ignite "water wars" in the Delta;

OR

A $144 million sustainable alternative to use water wisely, protect the White River and align agricultural and society with the Grand Prairie's capacity to sustain human uses.

TOWARD SUSTAINABILITY ON ARKANSAS' GRAND PRAIRIE

A SUSTAINABLE ALTERNATIVE TO THE GRAND PRAIRIE AREA DEMONSTRATION PROJECT

EXECUTIVE SUMMARY

Arkansans have a choice--unsustainability versus sustainability. The U.S. Army Corps of Engineers (Corps) is ready *now* to begin construction of a pump station and a 650-mile distribution system, to divert water from the White River to rice farms on the Grand Prairie. The Grand Prairie Area Demonstration Project (GPADP) needs only a federal appropriation from Congress, which the Corps expects by Summer of 2001. If pump construction begins, a virtually irreversible chain of events will commence, likely cascading into as many as 13 irrigation projects that would re-plumb most of Arkansas' agricultural watersheds. There still is time to avoid this unsustainable path to the Delta's version of "water wars."

THE PROBLEM

- Agricultural irrigation accounts for about 89% of groundwater withdrawal in the Grand Prairie.
- Agriculture has known since 1927 that the rate of groundwater withdrawal is unsustainable.
- The Alluvial Aquifer is predicted to be depleted in the Grand Prairie region by the year 2015.
- The White River basin:
  - hosts the White River and Cache River National Wildlife Refuges--the largest remaining functional bottomland hardwood ecosystem on any tributary of the Mississippi River;
  - supports the largest population of wintering mallards in North America; the state's only native population of black bears;
  - harbors one of the most important and diverse fisheries resources in Arkansas and the Mississippi Delta; and
  - is recognized under an international convention as a "Wetland of International Importance."
- Deficit use of Arkansas' abundant, but limited and declining, supply of water has enabled Arkansas to become the top rice-producing state in the U.S…. at a price.

THE CHOICE

1. The Corps' $319 Million Unsustainable Proposal

- The Corps proposes to solve the problem of the depleted Alluvial Aquifer by degrading yet another important water resource, Arkansas' internationally renowned White River.
- The Corps' proposal would:

- build a pumping plant on the White River to remove 1,640 cubic feet per second of water (1.06 billion gallons per day, 115 billion gallons per year);
- build a 650-mile regional water distribution system across private farmlands;
- increase irrigation efficiency modestly, from 60% to an *optimum* level of 70%;
- construct 8,849 acres of new on-farm irrigation storage reservoirs;
- irrigate 209,046 acres of cropland on fewer than 867 farms;
- cost $319 million--$367,935 per farm, or $1,525 per irrigated acre;
- still require a 15.6 percent *decline* in irrigated acreage; and
- meet *none* of its major objectives, including preserving the Alluvial Aquifer.

➢ The GPADP also would:
- prop up near-record commodity surpluses;
- depress already-low commodity prices;
- hamper farmers' ability to earn enough profit from their yields to stay in business; and
- further compound problems with the nation's agricultural economy.

➢ Almost half of the farmers--the would-be beneficiaries--in the area oppose the project.

2. The Half-price Sustainable Alternative

➢ Conservationists propose a *Sustainable Alternative* to get directly to the heart of the problem, which is unsustainable demand for irrigation water on the Grand Prairie.

➢ The *Sustainable Alternative* endeavors to use the Grand Prairie within its sustainable limits, rather than re-engineer this unique area to prop up and temporarily extend unsustainable uses.

➢ This alternative highlights the reality that--when confronted with critical, long-term water shortages--it is wiser to spend money to save water, than to waste water to save money.

➢ The *Sustainable Alternative*:
- leaves the White River alone;
- *maximizes* (instead of optimizes) irrigation efficiency, to 80% or higher, from 60%;
- *maximizes* the number and capacity of on-farm irrigation storage reservoirs;
- reduces the size of the irrigation problem from 362,662 to no more than 94,692 acres;
- recommends public money to convert the unsustainable cropland into less-water-demanding uses such as alternative crops, ecosystem restoration and wildlife recreation.

➢ To construct a pump and 650-mile regional water distribution system, costing more than $230 million, for only 94,692 acres would cost taxpayers more than $2,428/acre.

➢ The *Sustainable Alternative* is estimated to cost less than half the Corps' proposal.

CONCLUSION

The Corps' unsustainable proposal would launch Arkansas into a new era of large-scale, intensive irrigation projects that ultimately would re-plumb the landscape--and the water resources--of the Mississippi Delta. The GPADP would stimulate at least 12 other irrigation projects across Arkansas. Such projects provide only short-term remedies for the symptoms of the deeper, larger problem of unsustainable water demand. At worst, they solve no identified problems, while creating and compounding other problems, at tremendous costs to taxpayers and natural resources. The *Sustainable*

Approach provides Arkansas an opportunity to choose a higher road at half the cost. It is time to begin aligning agricultural and societal uses of the Grand Prairie with the land's inherent capacity to sustain human uses.

TOWARD SUSTAINABILITY ON ARKANSAS' GRAND PRAIRIE

THE SUSTAINABLE ALTERNATIVE TO THE GRAND PRAIRIE AREA DEMONSTRATION PROJECT

MAIN PROPOSAL

BACKGROUND

The lower White River is an international treasure in Arkansas, annually drawing visitors and tourists from around the world. The White River National Wildlife Refuge is the largest remaining functional bottomland hardwood ecosystem on any tributary of the Mississippi River. This ecosystem supports the largest wintering population of mallards in North America, as well as the only native population of black bears in Arkansas. The White River ecosystem has been designated by the international Ramsar Convention as a "Wetland of International Importance," along with such national treasures as the Everglades and the Okefenokee Swamp. The White River is home to more than 100 species of fish and 45 mussels, including several endangered mussels, and is one of the most diverse aquatic systems in the nation.

Agricultural irrigation is responsible for about 89% of annual groundwater withdrawal in Arkansas' Grand Prairie region. Arkansas agriculture has known since 1927 that the collective rate of irrigation water withdrawal from the Alluvial Aquifer is unsustainable. Nonetheless, irrigation continues to expand across Arkansas (Figure 1) at the second-highest rate in the nation (NRCS 1997 National Resources Inventory). This deficit use of Arkansas' abundant, but limited and declining, water supply has enabled Arkansas to become the top rice-producing state in the U.S…. at a price. The Arkansas Soil and Water Conservation Commission (ASWCC) estimates that the Alluvial Aquifer may be depleted in the Grand Prairie by 2015.

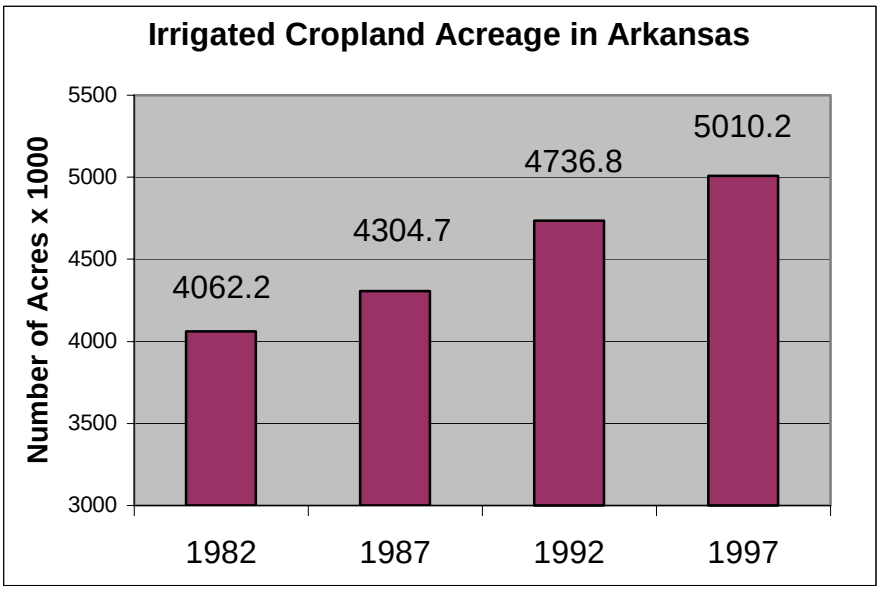

Figure 1. Number of acres of irrigated cropland in Arkansas, 1982-1997. Source – National Resource Inventory, 1997, USDA – NRCS.

Groundwater depletion is a very real, undisputed problem in several areas of eastern Arkansas. The U.S. Geological Survey and the ASWCC have documented cones of depression in the Alluvial Aquifer that indicate portions of the aquifer will be irreversibly depleted in the Grand Prairie by the year 2015.

Rice production across Arkansas has increased three-fold since 1970, to about 1.5 million acres (Figure 2). Arkansas currently is the top rice-producing state in the U.S., with about 42% of the nation's rice harvest. U.S. and Arkansas rice growers have been so successful they have contributed to a surplus-driven economic slump. Nationally, rice production is increasing, while season average prices are declining, and taxpayer subsidies have risen to record levels.

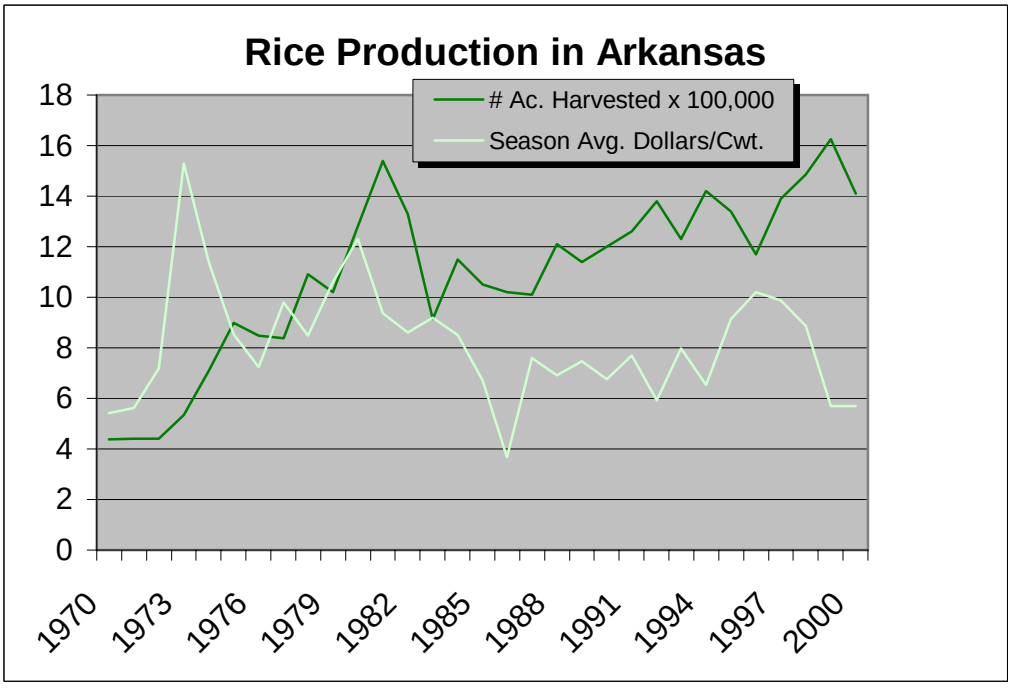

Figure 2. Number of acres of rice harvested in Arkansas, and season average

price in dollars/cwt., 1970-2000. Source – USDA Statistics Report, 2000.

It is a fundamental reality that Arkansas cannot sustain 1.5 million acres of rice production. Likewise, rice production on the Grand Prairie is unsustainable, as demonstrated by the very fact that the Corps proposes to tap and compromise yet another source of irrigation water.

Even though eastern Arkansas averages about 49 inches of rainfall annually, water is limited. Competition for water is growing among water uses throughout the White River basin. Municipal, agricultural, ecological, navigation and recreational uses all need the same water.

The GPADP is labeled a "demonstration project" for two reasons--first, irrigation is not a traditional mission of the Corps; second, because the Corps considers irrigation to be a growth opportunity, the GPADP is intended to prove that the Corps can plan and implement major irrigation projects. The ramifications are vast.

In Arkansas, alone, there are at least *13 irrigation projects* proposed or in planning. Three would divert water from the White River or its tributaries, *in addition* to the water being diverted by the GPADP. If completed, this array of irrigation projects would cover vast areas of Arkansas' agricultural land in the Delta, the Arkansas River Valley and the Red River Valley, effectively re-plumbing the state's agricultural watersheds.

ARKANSAS IRRIGATION PROJECTS PROPOSED OR IN PLANNING

White River Basin

Grand Prairie Area Demonstration Project
Little Red River Irrigation Project
White River Irrigation Project
Black River Irrigation Project
Little Red River PL-566 Irrigation Project
L'Anguille River PL-566 Irrigation Project
Bayou DeView PL-566 Irrigation Project
Northern Prairie County PL-566 Irrigation Project

Arkansas River Basin

Bayou Meto Irrigation Project
Boeuf-Tensas Irrigation Project
Point Remove Irrigation Project

Red River Basin

Walnut Bayou Irrigation Project
Maniece Bayou Irrigation Project

Because irrigated acreage continues to increase in the Mississippi Delta (Figure 3), Arkansas' water problems are inevitable in other Delta states. Arkansas' response to this challenge is certain to become a model for other Delta states.

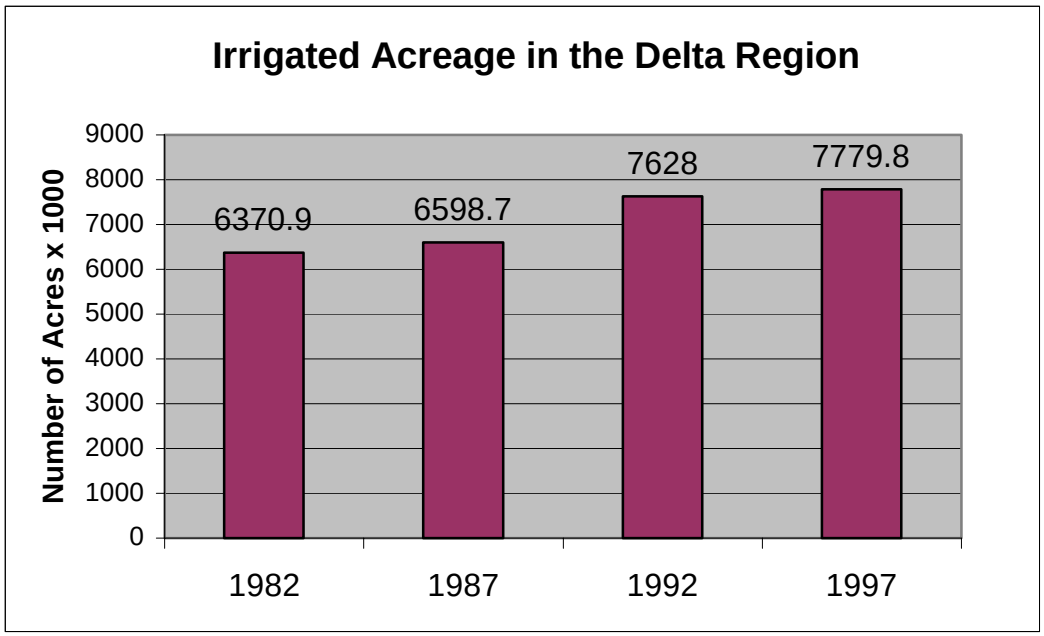

Figure 3. Number of acres of irrigated cropland in the Delta Region (AR, LA, & MS), 1982-1997. Source – National Resources Inventory, 1997, USDA – NRCS.

THE CORPS' $319 MILLION UNSUSTAINABLE PROPOSAL

OVERVIEW

The U.S. Army Corps of Engineers (Corps)--with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), the Arkansas Soil and Water Conservation Commission (ASWCC) and the White River Regional Irrigation Water Distribution District (WRID)--has proposed and approved a two-part project. The Corps is lead agency for planning and building a regional supplemental water supply system that would build a 1,640 cubic foot/second pump station (1.06 billion gallons/day) on the bank of the White River; twin 10-foot-diameter steel pipes to carry diverted water 1.7 miles to a holding reservoir; a 650-mile regional water distribution system; and at least 120 in-stream weirs.

NRCS would be the lead agency for planning and implementing a concurrent on-farm effort to enhance water conservation and storage. The on-farm portion would be composed of an *optimized* combination of water conservation features and water storage facilities. NRCS would oversee installation of 8,849 acres of on-farm irrigation storage reservoirs to hold the supplemental water; as well as implementation of tailwater recovery structures and other irrigation technologies to recycle water, while modestly reducing water losses and waste. The project objective is to optimize irrigation efficiency across the Grand Prairie, from the current 60% average efficiency to 70% efficiency.

The Corps claims that environmental enhancement is a purpose and is featured prominently in the project. The GPADP proposes to provide up to about 38,000 acres of winter-flooded, harvested rice fields for waterfowl, permanent water pooled behind weirs in existing streams for fish, and additional permanent water in on-farm reservoirs and irrigation canals. Finally, the Corps asserts that restoration of native prairies is an environmental feature. The reality to the contrary, as detailed in the next section, is that irreversible compromises to the incomparable White River ecosystem would be traded off for artificial environmental features that provide marginal ecological benefits, at best.

Of the GPADP's **$319 million** cost, about $208 million (65%) would be paid by U.S. taxpayers. The remaining $111 million will be paid by Arkansas taxpayers and project beneficiaries. For comparison with other well-known and controversial Corps projects, the White River Navigation Project would cost $30 million, and the Yazoo (Mississippi) Pumps Project less than $200 million.

THE CORPS' OBJECTIVES VERSUS REALITY

Even if the GPADP is implemented exactly as proposed, the project is unlikely to meet any of its major Planning Objectives, as stated on page 41 of the Main Report. The Corps' study-specific planning objectives, listed below, are contrasted by likely realities.

1. *Protect and preserve the Alluvial Aquifer.*
   In reality, the GPADP would take no steps to manage, regulate or protect the Alluvial Aquifer or to prevent unsustainable groundwater withdrawals from continuing. The project provides *zero* assurances that the Alluvial Aquifer will stabilize, much less recharge. Farmers can and will continue using existing wells; can and will continue drilling new wells; and can and will continue pumping groundwater at unsustainable rates, even with the project. Until or unless the state of Arkansas accepts its responsibility to manage groundwater, unsustainable levels of pumping from the Alluvial Aquifer most certainly will continue. Unfortunately, the state of Arkansas has demonstrated its unwillingness to assert any management authority over the Aquifer.

2. *Provide a supplemental water supply to meet the irrigation water needs of the Grand Prairie.*
   In reality, the GPADP will *not* meet the Grand Prairie's current irrigation water demands. Even if implemented exactly as proposed, the GPADP will meet *only 87.6%* of the average annual water demand for the project area, according to the Corps' own analysis (Main Report, p. 65). A planned average water shortfall of 59,791 acre-feet (Main Report, p. 86), would leave at least 30,820 acres of currently irrigated cropland vulnerable to frequent shortages (59,791 acre-feet / 1.94 acre-feet per acre, current demand @ 60% efficiency). In other words, even after spending $319 million, the GPADP would provide enough water to irrigate the entire project area only 57.4% of the time, or 27 out of 47 years (Main Report, p. 65).

   Consequences of the Corps' planned water shortfall may include:
   a. Some cropland would convert to dryland farming (Main Report, p. 86);
   b. Some of the winter waterfowl flooding would not occur (Main Report, p. 86);
   c. Overdraft from the Alluvial Aquifer would continue; and/or
   d. More water could be pumped from the White River than predicted.

   Over time, it is likely that more water would be pumped from the White River than predicted by the Corps. The state's minimum flow assurances and the Corps' pump cut-off levels are only as effective as the subsequent political will to honor and enforce them. Agricultural and political realities compel a reasonable prediction that the next drought will generate such political pressure as to cause the state's minimum flows and the Corps' pump cut-off levels to be compromised or waived, to provide desired irrigation water. It simply is human nature that, once a pump and distribution system are in place, the temptation to use them would be too great to resist.

3. *Maximize the use of conservation.*
   In reality, the GPADP plans to *optimize* the use of conservation, to modestly increase irrigation efficiency from 60% to only 70%. This optimum goal of water loss reduction was determined by

the Corps' benefit:cost analyses, that assumed no need to eliminate all waste, because a pump and distribution system would provide supplemental White River water. Affordable technology *already* is available to increase average irrigation efficiency to at least 80%.

4. *Enhance fish and wildlife habitat.*
In reality, the fish and wildlife habitat benefits of the project are overstated. The 38,000 acres of flooded, harvested rice fields promised for ducks are:
   - ✓ **unneeded**--the acreage objective for this habitat type under the North American Waterfowl Management Plan already has been met in Arkansas;
   - ✓ **low grade habitat**--waste rice is a high-energy but low-quality food, compared to natural foods, that is now known to be less abundant and available than once thought; and
   - ✓ **achievable without the GPADP**--the Arkansas Partners Project has been highly successful, on its own, in convincing rice farmers to voluntarily flood rice fields in winter, to attract ducks and generate extra revenue from hunting leases.

The project's purported fish habitat enhancement would consist only of marginal ecological benefits from permanent water pooled behind project weirs in existing water-conveyance streams, new on-farm reservoirs and new canals. These artificial habitats might benefit common, generalist fish species, but not the diverse community of species now in the White River, which would be subjected to increased risk during low flow regimes.

5. *Restore native prairies.*
In reality, the GPADP has simply committed to conduct an "experimental planting" of "native grasses and possibly some prairie forbs, instead of the usual tame grasses such as fescue and bermudagrass. These plantings will occur, not in large blocks of quality prairie habitat needed to attract true grassland wildlife, but in strips along the canal banks and rights-of-way. Theoretically, the project could provide up to 3,000 acres of native plants; however, because the Corps acknowledges "prairie restoration can be costly and time-consuming," the results of the experiment "will be used to ascertain the feasibility and amount of restoration practical" (Main Report, p. 46).

6. *Minimize cost/maximize outputs.*
In reality, a $319 million project proposal that would not meet any of its other planning objectives, by definition, does not meet this objective.

THE HALF-PRICE SUSTAINABLE ALTERNATIVE

The *Sustainable Alternative* addresses the problem of groundwater depletion at its *source*, rather than at its symptoms. The source of the problem of groundwater depletion in the Grand Prairie is unsustainable water demand for irrigation. Agriculture accounts for about 89% of the area's annual groundwater withdrawals from the Alluvial Aquifer. A viable, long-term solution that achieves sustainability must begin by making every effort to reduce demand. Any other approach--such as getting more water--addresses the symptoms, while compounding the problems. The Grand Prairie should be used within its sustainable limits, rather than re-engineered to meet desires for unsustainable, intensive uses.

Current rice production on the Grand Prairie is unsustainable, and must decline, even if the GPADP is constructed as proposed. This unpopular reality already is acknowledged by the Corps, NRCS, ASWCC and the WRID. By planning to provide irrigation water for only 209,046 of the project area's 247,556 currently irrigated acres (Main Report, pp. 64-65), project proponents *already* have accepted that a 15.6% reduction in irrigated agriculture on the Grand Prairie is socially acceptable and does not constitute a lethal blow to Arkansas' rice industry. On the other hand, proponents hold that a 75.6% reduction in irrigated agriculture on the Grand Prairie (the No-Action result) is an unacceptable impact to the rice industry's critical mass (e.g., Main Report, p. 23, 25).

The realities of unsustainability and imminent change on the Grand Prairie already have been acknowledged by all. The sideboards toward sustainability have been set--irrigated agriculture on the Grand Prairie must decline at least 15.6 percent, but no more than 75.6 percent. The central remaining question, then, is: *What is the "magic number" for reducing irrigated agriculture, that achieves sustainability on the Grand Prairie without fatally undermining Arkansas' rice industry?*

The *Sustainable Alternative* utilizes the Corps' own data and analyses to construct an alternative approach that would result in no more than a 40 percent decline from current rice acreage. This approach leaves the White River alone, needs no pumping station or water delivery system, maximizes wise use of limited water resources, and recommends public assistance to reduce irrigated acreage to sustainable levels. This alternative follows a three-step strategy, in order of priority. These steps are followed by a flow chart, "The Shrinking Problem," that illustrates how these measures reduce the size of the Grand Prairie's irrigation problem to a manageable level, eliminating any need for a pump station on the White River.

1. Maximize irrigation efficiency, to at least 80 percent.

The Sustainable Approach places highest priority on making the absolute best use of existing water by *maximizing* conservation. To wit, the Corps acknowledges (Main Report, p. 50) that "conservation yields the most return for the dollar invested."

The current average irrigation efficiency across the Grand Prairie is estimated at 60 percent (Main Report, p. 43). Of every 100 gallons obtained by farmers, 60 gallons reaches the crop plants and 40 gallons are lost. At this efficiency level, 481,195 acre-feet of water are required annually to irrigate the 247,556 acres of cropland in the GPADP project area (Main Report, p 64), for an average of 1.94 acre-feet per acre. The GPADP currently proposes to increase irrigation efficiency only to the "optimal" level of 70 percent because it would cost more to achieve higher efficiency.

The *Sustainable Alternative* asserts that it is wiser in the long term to spend money to save water, than to waste water to save money. It is technically and fiscally feasible to achieve at least 80 percent irrigation efficiency across the Grand Prairie. If the GPADP aimed for 80 percent efficiency, a total of 360,896 acre-feet of water would be needed per year, an up-front reduction in total water demand of 120,299 acre-feet (25.0%) from current levels. At 80 percent irrigation efficiency, only 1.46 feet of water is needed per acre, on average across the project area [360,896 acre-feet / 247,556 acres].

Grand Prairie average irrigation efficiency	**Total water demand to irrigate 247,556 acres**	**Acre-feet / acre**
60% (current level, GPADP)	481,195 acre-feet	1.94
70% (GPADP proposal)	412,453 acre-feet	1.67

80% (*Sustainable Alternative*)	360,896 acre-feet	1.46
85% (innovative possibility)	339,667 acre-feet	1.37
90% (possibly in future)	320,797 acre-feet	1.30
100% (actual need of current crops)	288,717 acre-feet	1.17

By achieving 80 percent irrigation efficiency, the 40,000 acre-foot sustainable yield of the Alluvial Aquifer can be stretched to meet the irrigation needs of 27,397 acres [40,000 acre-feet / 1.46 acre-feet per acre = 27,397 acres].

2. Maximize on-farm water storage.

On-farm irrigation storage reservoirs provide farmers the ability to become hydrologically self-reliant and to recycle water. Reservoirs enable farmers to capture and store available water during wet seasons, to be used later for irrigation. They also provide the ability to store and recycle excess irrigation tailwater. Reservoirs may be simply filled once during the wet season, or may be filled and emptied multiple times if sufficient water is available to re-fill them.

The Corps' analysis of on-farm storage raises as many questions as it answers. The project area currently supports 15,556 acres of on-farm irrigation storage reservoirs (Main Report, p. 68). The Corps purports (Main Report, p. 31) to use 8 feet average depth to calculate the volume of existing storage, which should estimate 124,448 acre-feet of storage capacity. However, the Corps *actually* used 5.43 feet average depth in its calculations, resulting in their estimate that existing reservoirs have a storage capacity of 84,525 acre-feet (Main Report, p. 44, 68). Finally, the Corps can't make up its mind whether the existing reservoirs provide all 84,525 acre-feet for irrigation (Main Report, p. 44) or only 73,188 acre-feet of the capacity is actually available for use (Main Report, p. 68).

The Sustainable Approach deals with these discrepancies in two steps. First, the most conservative Corps estimate of 73,188 acre-feet is shown to provide water for 50,129 acres, at 80% irrigation efficiency [73,188 acre-feet / 1.46 acre-feet per acre = 50, 129]. Second, this alternative takes the Corps' at its word that existing reservoirs already have a storage capacity of 8 feet average depth or could be upgraded to 8 feet. Thus, at 80 percent efficiency, an additional 27,383 acres could be irrigated by the extra 39,979 acre-feet of storage capacity [39,797 acre-feet / 1.46 acre-feet per acre = 27,383 acres]. If existing reservoirs already are 8 feet average depth, the $9.5 million cost to upgrade them is eliminated.

According to the Corps' plans, all new irrigation reservoirs will be 10 feet average depth, and will provide 10 acre-feet of water per acre of reservoir with just a single fill/empty cycle. For example, 8,849 acres of planned new reservoirs could provide 88,493 acre-feet of water (Main Report, p. 44, 68). Every 1,000 acres of new reservoirs takes 1,000 acres of cropland out of production, since the Corps clearly states that all reservoirs will be located on cropland (Main Report, p. 31, 44, 68). Also, every 1,000 acres of new reservoirs will provide 10,000 acre-feet of irrigation water, that will meet the needs of 6,849 acres of cropland at 80 percent efficiency [10,000 acre-feet / 1.46 acre-feet per acre = 6,849 acres]. Therefore, every 1,000 acres of new reservoirs can reduce the project area's water demand by the equivalent of 7,849 acres [1,000 acres + 6,849 acres = 7,849 acres].

Without supplemental water from the White River, the Corps estimates that a maximum of 1,379 acres of new reservoirs can be supported by the project area watersheds (Main Report, p. 69). Conservationists believe this estimate is very conservative, and that by capitalizing on abundant surface water available during winter, additional reservoirs could be functional. Additional, independent analysis

of this aspect of the project area's watersheds is warranted. If the project area will support an additional 1,000 acres of reservoirs, the irrigation needs of another 7,849 acres will be addressed (1,000 acres removed from production + 6,849 acres supplied with water). Or, if the project area actually will support an additional 5,000 acres of on-farm reservoirs, the water demand of 39,247 acres of cropland will be addressed (5,000 acres removed from production + 34,247 acres supplied with water).

3. Convert the unsustainable cropland to less-water-intensive uses.

Several options are, or could be made, available to assist farmers in converting unsustainably irrigated cropland to less-water-intensive uses. Switching to crops that require less water than rice or that can be dryland farmed are the logical first choices. For example, new rice varieties are becoming available that require less water. Because weed control is a major reason rice requires so much water, herbicide-resistant varieties facilitate weed control without flooding.

USDA's Wetlands Reserve Program (WRP) and Conservation Reserve Program (CRP) are intended for the very purpose of retiring marginal, surplus or unsustainable cropland and converting it to less-intensive conservation uses. These programs are hugely popular with farmers because they are voluntary programs that provide fair compensation from taxpayers for the public environmental and agricultural benefits obtained. WRP costs taxpayers about $1,000/acre in Arkansas, of which about $700/acre goes to the landowner as an incentive.

Farmers who choose to enroll in WRP or CRP retain ownership and control of their property, and can continue to make certain economic uses of the property. For example, recreational income from hunting leases or trespass fees is a thriving industry in the Grand Prairie and elsewhere in Arkansas. In the Grand Prairie, duck blinds typically lease for around $5,000 per season, and deer hunting leases earn about $2-3/acre/season. Finally, timber management is a viable long-term revenue opportunity that can be pursued on both WRP and CRP land.

More creatively, because much of the Grand Prairie consisted of native tallgrass prairie prior to rice culture, vast opportunity exists to promote *bona fide* prairie ecosystem restoration. Such efforts could accelerate the recovery of northern bobwhites and other upland game species, and eventually could even allow for restoration of greater prairie chickens to Arkansas.

THE SHRINKING PROBLEM

The *actual* magnitude of the irrigation problem on the Grand Prairie is far smaller than portrayed by the Corps. This analysis is based on the Corps' own studies and analyses, as published in the Eastern Arkansas Region Comprehensive Study, Grand Prairie Area Demonstration Project, General Reevaluation Report. Most numbers are taken straight from Volume I, Main Report, or are re-calculated from numbers originating in the Main Report.

Acres

362,662	The total project area evaluated by the Corps' General Reevaluation Report.
-115,106	Acres within total project that are *not* irrigated cropland {p.11}.
247,556	*Subtotal, acres of currently irrigated cropland within the total project area.*
- 38,510	Acres of currently irrigated cropland Corps would convert to reservoirs (8,849 acres) or to "dryland" farming, even if GPADP implemented as planned, since there will be a 59,791 acre-foot average shortfall {p. 64}. Corps plan would provide irrigation water for only 209,046 acres (84.4% of currently irrigated acreage) {p. 65, EIS-30}. If the Corps is willing to disregard these acres, this alternative need not be concerned with them.
209,046	*Subtotal, acres that the Sustainable Alternative needs to address*
- 27,397	Acres irrigatable (@ 80% efficiency) by Alluvial Aquifer sustainable yield [40,000 acre-feet / 1.46 feet per acre = **27,397** acres], {Vol.3, App. B, Section I, page IV-5}.
181,649	*Subtotal of acres remaining to address*
- 9,445	Acres irrigatable by the 1,379 "maximum" acres of new reservoirs the Corps estimates are possible without a supplemental water supply {p. 69}, @ 10 feet average depth and 80% efficiency [13,790 acre-feet / 1.46 acre-feet per acre = **9,445** acres].
172,204	*Subtotal of acres remaining to address*
- 50,129	Acres irrigatable by the existing 15,556 acres of on-farm irrigation storage reservoirs, at the 5.43 feet average depth used in the Corps' calculations. Of the 84,525 acre-feet total storage capacity, at least 73,188 acre-feet (and maybe all of it) are available for irrigation (p. 68 versus p. 44); [73,188 acre-feet / 1.46 acre-feet per acre, @ 80% efficiency = **50,129** acres] {p. 68}.
122,075	*Subtotal of acres remaining to address*
- 27,383	*Additional* acres irrigatable by the existing on-farm irrigation storage reservoirs, assuming the average depth actually is 8.0 feet, as the Corps states, instead of only 5.43 feet. Extra capacity of reservoirs would be 8.0 - 5.43 = 2.57 feet; multiply by 15,556 acres = 39,979 acre-feet total extra storage capacity. At 80% efficiency, 39,979 acre-feet / 1.46 acre-feet per acre = **27,383** more acres irrigatable.
94,692 ac	**The *actual* size of the Grand Prairie's irrigation problem.**

THE SUSTAINABLE ALTERNATIVE

INNOVATIVE POSSIBILITIES FOR 94,692 ACRES

"The Shrinking Problem" worksheet demonstrates that the actual size of the Grand Prairie's irrigation problem is, at most, only 94,692 acres. To solve this problem with a $230 million pump and regional distribution system would require taxpayers to spend **$2,428/acre in addition to** the money already spent to promote irrigation efficiency and on-farm storage. The *Sustainable Alternative* proposes to address this remaining problem with a fiscally and ecologically defensible array of innovative measures.

1. Reduce water loses and waste even further, by making every effort to exploit emerging, cost-effective irrigation efficiency technologies and evolving best management practices, to **boost irrigation efficiency to 85%**, instead of just 80%. By making this 5% additional improvement, the water sources proposed in the *Sustainable Alternative* could be stretched to irrigate **another 10,541 acres**.

2. Seek creative ways to maximize new on-farm irrigation storage reservoirs beyond the 1,379 acres the Corps estimates to be feasible without a supplemental water supply. For example, by aggressively monitoring, capturing and storing abundant runoff water during winter months, more reservoirs may be feasible. If the project area watersheds will support an **additional 1,000 acres** of reservoirs (which would provide 10,000 acre-feet of irrigation water), the irrigation demand of another **6,849 acres** (at 80% efficiency) will be addressed. At 85% efficiency, the 10,000 acre-feet would irrigate 7,299 acres.

	Acres Irrigated at:	
Extra Reservoirs	**80% Efficiency**	**85% Efficiency**
1,000 acres	6,849	7,299
2,000 acres	13,698	14,598
5,000 acres	34,246	36,496

3. Reduce the bottom line water demand by switching to experimental rice varieties that require less water, such as the new **ClearFieldRice** that is herbicide tolerant. Because weed control is a major reason rice requires so much water, herbicide-resistant varieties allows better weed control without flooding.

4. Provide public incentives to directly reduce irrigation water demand by purchasing short- or long-term **"no irrigate" agreements** with willing farmers. The state of Georgia currently is experimenting with this approach. Stakeholders there have achieved a functional level of concurrence among farmers, conservationists and politicians, resulting in the state's first-ever bidding process to purchase one-year "no irrigate," voluntary agreements with farmers.

5. The federal government has two major USDA cropland retirement programs designed to reduce commodity surpluses, while promoting environmental restoration to improve soil, water and wildlife habitat. The **Conservation Reserve Program (CRP) and the Wetlands Reserve Program (WRP)** were designed for just such situations as the Grand Prairie, where marginal, surplus or unsustainable cropland is available that landowners may be willing to retire, with adequate incentives. Both proven programs could be earmarked to apply directly to this project, or variants of the two popular programs could be created for this specific application. To voluntarily retire 50,000 acres of the unsustainable cropland under the WRP, and to restore natural prairie or bottomland hardwood habitat would cost only $50 million.

OTHER POSSIBILITIES VIA DISCREPANCIES

1. The total project area of the Corps' General Reevaluation Report for the GPADP is 362,662 acres, of which 247,556 acres are irrigated cropland (Main Report, p. 46). Following the signing of the Record of Decision by the Corps' Division Commander on February 25, 2000, the WRID commenced an intensive effort to meet the state requirement for signatures from 50% + 1 of the landowners in the project area. Upon realizing the minority landowner support for the project, the WRID began--in Spring 2000--carving out major pockets of land--and landowner opposition--from the project area. By the time the project area had been gerrymandered enough to achieve majority support from the remaining landowners, the project area had been reduced by one-third, to an unofficial total of 241,000 acres, with an unknown acreage of irrigated cropland. Thus, the actual magnitude of the remaining irrigated cropland problem in the GPADP may be **substantially smaller** than the 94,692 acres calculated by the *Sustainable Alternative*.

2. The Corps claims (Main Report, p. 31) that the existing 15,556 acres of on-farm irrigation storage reservoirs are 8 feet average depth, yet calculates the storage capacity of these existing reservoirs using 5.43 feet average depth (Main Report, p. 68). The *Sustainable Alternative* assumes that, if 5.43 feet is the actual, current average depth, the reservoirs could be upgraded to 8 feet average depth by excavation or raising the levees. If the reservoirs already are 8 feet deep, the $9.5 million upgrade cost would be saved.

3. The Corps states (p. 44) that the existing 15,556 acres of on-farm reservoirs have a capacity of 84,525 acre-feet, and that the entire volume is available for irrigation. In contrast, the Corps states (p. 68) that only 73,188 acre-feet of the 84,525 acre-feet total volume are available for irrigation use. The *Sustainable Alternative* took the conservative step of using the smaller number in "The Shrinking Problem" worksheet. If the entire volume actually is available for use, or could be made available for use, per the Corps' statement on page 44, the extra 11,337 acre-feet difference would be sufficient to irrigate **another 7,765 acres**, at 80 percent efficiency, or **another 8,275 acres** at 85 percent efficiency.

4. The Corps claims in the Main Report that the sustained yield of the Alluvial Aquifer is 35,574 acre-feet (e.g., p. 23). Elsewhere in the General Reevaluation Report, in Vol.3, App. B, Section I (page IV-5) regarding the Peralta groundwater model, the Corps states that the sustainable yield of the Alluvial Aquifer is 40,000 acre-feet per year. In stark contrast, elsewhere in the Main Report the Corps cites an annual recharge rate for the Alluvial Aquifer of 100,000-130,000 acre-feet per year (p. 68). The 35,574 to 40,000 acre-feet range for sustainable yield appears quite inconsistent with an annual recharge rate of 100,000 to 130,000 acre-feet per year. Thus, the actual **sustainable yield of the Alluvial Aquifer could be substantially higher** than the 40,000 acre-feet used in the *Sustainable Alternative*.

ESTIMATED MAXIMUM COSTS OF THE SUSTAINABLE ALTERNATIVE

	Total Cost	Federal Cost (65% cost-share)
Irrigation Efficiency [from 60 to 80% on 148,600 ac]		
Tailwater recovery [5 ac/100 ac, $2250/ac]	**$16,717,500**	**$10,866,375**
Underground pipe [1 mi/160 ac; $7/ft for 12”]	**$34,326,600**	**$22,312,290**
Multi-inlet pipe [$10/ac/yr, 10-yr agreement]	**$14,860,000**	**$9,659,000**
Reservoirs, new: Corps’ estimated 1,379 acres [@ 2,880/ac]	**$3,971,520**	**$2,581,488**
Reservoirs, new: Potential additional acres		
5,000 additional ac [@ $2,880/ac]	**$14,400,000**	**9,360,000**
Reservoirs, upgraded (if needed; see Discrepancy #2.) [$240/ ac-ft X 15,556 ac X 2.57 ft]	**$9,594,941**	**$6,236,712**
Wetlands Reserve Program		
[50,000 acres @ $1,000/acre]	**$50,000,000**	**$50,000,000**
TOTALS	**$143,870,561**	**$111,015,865**