

# Economic Considerations for Playa Management Alternatives

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*Selected Paper prepared for presentation at the Southern Agricultural Economics Association Annual Meeting, Orlando, FL, February 6-9, 2010*

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## **Abstract**

Playa lakes are very important to the Texas High Plains. They provide habitat for a wide variety of wildlife, and are Ogallala Aquifer's primary recharge source. Plowing and sedimentation have caused substantial damage to the overall health of many playas. A need exists to protect this resource for future generations. Several government programs are available to assist landowners with playa preservation including CP23A, the Wetlands Reserve Program, and the Wildlife Habitat Incentive Program. This study evaluates each conservation program and weighs the economic benefits and costs of program implementation.

## **Introduction**

Playa lakes are shallow, natural basins that dot the landscape of a large portion of the Southern Great Plains. Playas are important because they store water in a part of the country that receives little rain and has few permanent rivers or streams. They also support an astounding array of wildlife. Two million waterfowl commonly winter in playa lakes regions. Lake forage is also very attractive to mule deer, whitetail deer, and several species of quail and songbirds. Many local economies generate significant income from wildlife enthusiasts and hunters who take advantage of playa habitats.

Playas help support Southern Great Plains agriculture by seasonally recharging the Ogallala Aquifer. They are a primary recharge source, contributing 95 percent of the overall return of water. Regional dependence on the aquifer for farm and municipal use has caused a drastic water table decline over the past century. Maintaining the natural functions and cycles of playas is crucial for sustaining economies and communities in the High Plains.

Like the aquifer, playa lakes are a threatened resource. Of the more than 25,000 playa wetlands in the plains, at least 70% of those have been altered from their natural state through plowing or sedimentation. Less than one percent of the region's playas are found on public lands. This situation places the resource's fate predominately in the hands of ranchers, farmers, and private landowners. This study evaluates playa conservation alternatives available to landowners in the Texas High Plains, and weighs the economic benefits and costs of each decision.

## **Documentation**

*Texas Wetland News* lists several conservation practices that can protect playa lakes. Establishing native grass buffers around lake perimeters helps filter out soil and agricultural contaminants present in runoff. Filling in man-made pits allows water to reach the entire basin and recharge pores. In rangeland, playas can be fenced off to prevent excess trampling of vegetation by livestock. Government cost share programs are available for many of these practices. However, participation is low due to a lack of overall education and understanding. Only 8% of all playas are enrolled in some form of conservation program.

The 2006 High Plains Landowner Survey analyzed landowner knowledge of playa preservation, and determined their willingness to implement conservation practices. This survey was commissioned by the Playa Lakes Joint Venture (PLJV) and based on 429 respondents. Survey results revealed that although landowners are concerned about the Ogallala Aquifer's future, not all understand playas' crucial role in groundwater recharge. Approximately 50% responded that they did not know playas recharged groundwater. Sixty eight percent indicated that playas are an "overall positive" feature on the landscape, with wildlife being a top benefit.

Landowners indicated a willingness to apply conservation practices such as removing invasive plant species (52%) and implementing grazing management plans (48%). The majority was also willing to plant native grass buffers (74%) if given a financial incentive to do so. In fact, the most popular incentive for all types of landowners was some form of financial remuneration, augmented by knowledge that their actions helped land and water resources. Many respondents were not aware that programs exist to provide financial support for implementation of conservation measures.

Several government programs are available to assist landowners with playa preservation including the CP23A, the Wetlands Reserve Program, and the Wildlife Habitat Incentive Program. The United States Department of Agriculture describes the CP23A as a special incentive Conservation Reserve Program (CRP) that restores wetland complexes and playa lakes devoted to agricultural use. Eligible lands must have a cropping history and hydric soils. A buffer of at least 50 feet wide and up to four times the wetland acres must also be enrolled. Contracts run approximately 10 years with grazing or haying prohibited. Owners are allowed recreational uses such as hunting and fishing.

The Farm Service Administration (FSA) oversees CP23A. This agency pays up to 50% cost-share for installation of eligible practices, which include earthmoving, seeding and water control structures. Fencing is only eligible if required for exclusion (crops or cattle) purposes. Two additional program payments are also available to some landowners. Lands that qualify for continuous CRP receive a Practice Incentive Payment (PIP). PIP reimburses up to 40% of additional implementation costs. Lands not previously enrolled in any Conservation Reserve Program receive a Sign-Up Incentive Payment (SIP). SIP is calculated by multiplying \$10 times the number of acres times the contract length (usually 10 years). FSA will also pay \$2 per acre per year for long-term land maintenance. Mickey Woodard of the Texas Farm Service Agency estimates that there are currently 3,000 acres eligible for CP23A in Texas and 600 acres enrolled.

The Wetlands Reserve Program (WRP) provides incentives for farmers and ranchers to stop cultivating areas that were once playas and make them wetlands again. Landowners are not required to have a cropping history under this program. The Natural Resource Conservation Service (NRCS) administers WRP, which provides three participation options. Option One is a ten-year cost share agreement that reimburses up to 75% of eligible restoration expenses. Option Two requires landowners to enter into a thirty-year conservation easement with the NRCS. It pays 75% of easement value and 75% of restoration costs. Option Three is a permanent easement that pays 100% of easement value and 100% of restoration expenses. Easement payments are the lesser of: the fair market value of the land, an established geographic rate cap, or an amount offered by the landowner.

WRP has an annual restoration payment cap of \$50,000, and no easement can be created on land that has changed ownership during the preceding seven years. Under all three options, landowners are granted use for recreational activities such as hunting and fishing. They also maintain the right to lease the recreational uses of their land for financial gain. Grazing is not allowed under normal conditions. Texas currently has 64,380 acres enrolled in the Wetlands Reserve Program.

The Wildlife Habitat Incentive Program (WHIP) encourages the creation of high quality wildlife habitats. NRCS employees work with participants to develop a wildlife habitat development plan (WHDP). This plan becomes the basis for an up to 75% restoration cost-share agreement. Contract lengths run from a minimum of one year after implementation of the WHDP to a maximum of ten years. Common practices include wildlife upland habitat

management, brush management, range seeding, prescribed burning, livestock exclusion, and wetland development. Grazing, recreational hunting, and hunting leases are allowed under this agreement. WHIP has an annual payment cap of \$50,000 per person per year. In 2009, Texas was awarded approximately 105 WHIP contracts and \$4 million in funding.

## **Methodology**

This analysis assesses the economic impact of shifting playa lake acres away from production and into a conservation program. CP23A is evaluated by determining the amount of annual income necessary for continued production that must be generated through return over variable costs or a cash lease. A CRP payment of \$32 per acre per year is assumed, plus an additional \$2 per acre maintenance cost reimbursement. Maintenance costs are annual expenses incurred to keep the playa within program specifications. Cost estimates are \$12 per acre per year, resulting in a net annual income of \$22 per acre. Net income is then subtracted from establishment expenses that are pro-rated over contract life. Projected opportunity cost is 6% and factored into establishment expenses. Opportunity cost is the cost of passing up the next best choice when making a decision. Money invested in CP23A land restoration could be used for investment purposes at a 6% return. Sensitivity tables show annual establishment costs at different expense levels and contract lengths. Establishment costs are program implementation expenses such as planting buffers, earth moving, etc. The Farm Service Administration shares up to 90% of these expenses. Estimated producer costs are \$10 to \$60 per acre depending on practices implemented and percentage of cost-shared. A final sensitivity table projects the annual income needed for continued production.

Option One of the Wetlands Reserve Program (WRP) is a ten-year restoration cost share agreement with the Natural Resource Conservation Service (NRCS) paying up to 75% of eligible expenses with no other payments made. A sensitivity table determines the amount of money needed from wildlife revenues to make up for crop or pasture income losses. Producers enrolled in WRP are no longer eligible to farm or graze playa acres. This situation results in an income reduction that must be overcome through wildlife revenues. In other words, breakeven income at different net restoration costs per acre and net losses per acre is determined. Restoration costs are program expenses necessary to restore degraded playas and include fencing, earth moving, and grass planting. Implementation costs will potentially be higher under WRP than CP23A because the maximum cost share is 75% versus 90%. Estimated restoration expenses are \$25 to \$100 per acre.

WRP Option Two is a 30-year conservation easement. NRCS pays 75% of easement value and 75% of restoration costs. WRP Option Three is a permanent easement. NRCS pays 100% of easement value and 100% of restoration costs. Easement value is the lesser of: the fair market land value, an established geographic rate cap, or an amount offered by the landowner. This study assumes an easement rate of \$300 per acre based on estimates from the Texas A&M Real Estate Center. Opportunity costs relating to retaining land rights through a 30-year easement versus giving up those rights in a permanent easement are evaluated. A sensitivity table calculates what the land will cost in future dollars based on differences in net restoration costs and easement values at three opportunity levels. Results show the money that will be given up by choosing the 30-year option and paying 25% of restoration expenses and receiving 75% of the easement value versus choosing the permanent option and paying 0% of restoration expenses and receiving 100% of the easement value.

The Wildlife Habitat Incentive Program (WHIP) involves an up to 75% restoration cost-share agreement. Contract length runs between 2 and 10 years. A sensitivity table determines necessary revenues to break even at 6% opportunity cost. Pro-rated restoration costs over the contract life based on different expenses per acre and contract lengths are calculated. Estimated restoration costs are \$25 to \$100 per acre.

## Results

The CP23A program is evaluated as an alternative to dryland farming or cash renting playa acres. Annual income from program participation is approximately \$22 per acre. Establishment costs are pro-rated over the contract life, and subtracted from net income to determine revenue needed for continued production. Table 1 provides a sensitivity analysis that shows annual establishment costs based on different expenses per acre and contract lengths. Opportunity cost of capital used for establishment expenses is 6%.

Table 1. Pro-rated annual establishment costs based on contract length and various levels of establishment costs

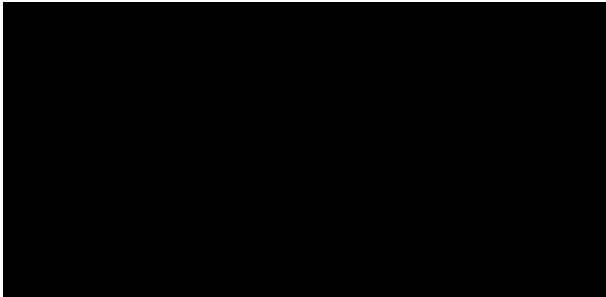
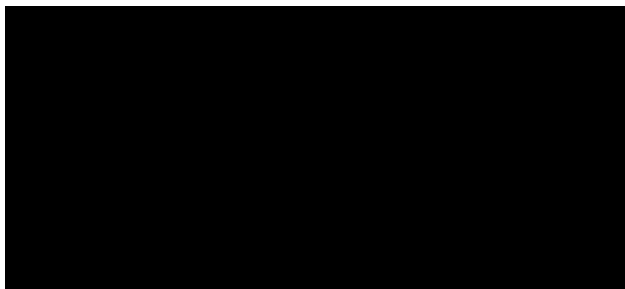
A large black rectangular redaction box covering the content of Table 1.

Table 2 exhibits the level of revenue that must be met to justify continued production. Revenues vary between \$20.65 per acre on a 10-year contract with low establishment costs to \$13.90 per acre on a 10-year contract with high establishment costs. Texas AgriLife Extension budget data estimates return over variable costs from 2000 through 2009 to be \$29.27 per acre on dryland wheat and \$10.16 per acre on dryland sorghum. Dryland acres on playa land are often more difficult to farm and have lower yields than traditional acres. Enrolling in the CP23A program could show an economic advantage over row crop production in some instances.

Table 2. Break-even revenue needed for continued production at various establishment cost levels and contract lengths

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Wetlands Reserves Program (WRP) Option One is a ten-year cost share agreement with the NRCS up to paying 75% of eligible expenses. A sensitivity table estimates the income needed from wildlife revenues to overcome crop and pasture income losses (Table 3). Farming and ranching operations are both eligible for WRP. Marginal pasture would presumably fall on the lower end of the loss scale, whereas good cropland could show a loss greater than \$20 per acre. Results indicate that as loss levels and restoration costs increase, the amount of wildlife revenues needed to break-even rises as well.

Table 3. Revenues needed from wildlife revenues to overcome crop/pasture income losses

Restoration Costs	\$0 Loss	\$5 Loss	\$10 Loss	\$15 Loss	\$20 Loss
\$25/Acre	\$3.37	\$8.37	\$13.37	\$18.37	\$23.37
\$50/Acre	\$6.75	\$11.75	\$16.75	\$21.75	\$26.75
\$75/Acre	\$10.12	\$15.12	\$20.12	\$25.12	\$30.12
\$100/Acre	\$13.50	\$18.50	\$23.50	\$28.50	\$33.50

WRP Options Two and Three are evaluated by determining the opportunity costs relating to retaining land rights through a 30-year easement versus giving up those rights in a permanent easement. Option Two (30-year easement) requires landowners to pay 25% of restoration costs, whereas Option Three (permanent easement) has no out of pocket expenses. Table 4 shows estimated restoration costs for Option Two, which range from \$25 to \$100 per acre. Differences in easement payments are also evaluated under the two alternatives. Assuming the playa easement has an appraised land value of \$300 per acre, a \$75 easement loss exists between Option Two and Option Three. Table 4 exhibits the total economic impact of choosing the 30-year versus permanent easement option. Future value of each impact level is calculated over a 30 year time period at various opportunity costs. For example, if \$100 were invested today rather than being spent on restoration costs, in 30 years it would be worth \$574.30 assuming a 6% return on investment. Futures values indicate landowners could be at significant economic disadvantage by selecting the 30-year versus permanent easement option unless land values inflate at a similar rate. However, some producers would rather absorb this loss than face the possibility of giving up permanent land production rights.

Table 4. Opportunity costs of retaining land for the 30-year easement option

Restoration Costs	75% Easement Diff	Total Impact	4% Opp Cost	6% Opp Cost	8% Opp Cost
\$25/Acre	\$75/Acre	\$100/Acre	\$324.30	\$574.30	\$1,006.20
\$50/Acre	\$75/Acre	\$125/Acre	\$405.37	\$717.87	\$1,257.75
\$75/Acre	\$75/Acre	\$150/Acre	\$486.45	\$861.45	\$1,509.30
\$100/Acre	\$75/Acre	\$175/Acre	\$567.52	\$1,005.02	\$1,760.85

The Wildlife Habitat Incentive Program (WHIP) involves an up to 75% restoration cost-share agreement. A sensitivity analysis determines breakeven income at different expense levels and contract lengths at 6% opportunity cost (Table 5). Breakeven revenue varies between \$3.37 per acre on a 10-year contract with low restoration costs to \$54.50 per acre on a 2-year contract with high restoration costs. Unlike CP23A and WRP, grazing is allowed under the WHIP agreement. Revenue can therefore come from several sources rather than be limited to wildlife income.

Table 5. Revenue needed to break even at 6% opportunity cost at various expense levels



## Summary and Conclusions

Playa lakes are very important to the Texas High Plains. They provide habitat for a wide variety of wildlife, and are the Ogallala Aquifer's primary recharge source. Plowing and sedimentation have caused substantial damage to the overall health of many playas. A need exists to protect this resource for future generations. Several government programs provide conservation incentives to landowners. The CP23A is a special incentive Conservation Reserve Program (CRP) that restores wetland complexes and playa lakes. An annual CRP payment is received, as well as establishment cost sharing of 50% to 90%. Estimated net income from this program is often greater than the historical return over variable costs for dryland wheat and sorghum in the Texas High Plains. Therefore, CP23A may appeal to many producers in this region.

The Wetlands Reserve Program (WRP) provides incentives to farmers and ranchers to stop cultivating areas that were once playas and make them wetlands again. Landowners are not required to have a cropping history to qualify for WRP. There are three sign-up options available. Option One is a ten-year cost share agreement with the Natural Resource Conservation Service (NRCS) paying up to 75% of restoration expenses. The attractiveness of this option seems to depend on the ability to generate enough wildlife revenues to offset restoration costs and crop and pasture income losses. Option Two is a 30-year conservation easement with the NRCS paying 75% of easement value and 75% of restoration expenses. Option Three is a permanent easement with the NRCS paying 100% of easement value and 100% of restoration expenses. This study evaluates the opportunity costs relating to retaining land rights versus giving up those rights. Total impact of each decision is calculated by determining the net difference in restoration costs and easement payments for the two scenarios. Then, the future value of each impact level is calculated over a 30-year period at various opportunity costs. These values indicate that landowners could be at a significant economic disadvantage by selecting the 30-year versus permanent easement option.

The Wildlife Habitat Incentive Program (WHIP) encourages the creation of high quality wildlife habitats. NRCS employees work with participants to develop a wildlife development plan that becomes the basis for an up to 75% restoration cost-share agreement. The average contract period is 2 to 10 years. Revenues needed to break even at 6% opportunity cost at various restoration expense levels and contract lengths are calculated. Results indicate that WHIP is a more desirable program at lower restoration cost levels and/or longer contract lengths. This paper presents different alternatives for each conservation program offered. A decision by individual landowners concerning which program is the most beneficial, or whether to continue production is outside the scope of this study. These choices should be handled on a case-by-case basis through the Farm Service Administration or Natural Resource Conservation Service.

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