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Conservation Reserve Program and Wetland Reserve Program

*Primary Land Retirement Programs for
Promoting Farmland Conservation*

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Conservation Reserve Program and Wetland Reserve Program: Primary Land Retirement Programs for Promoting Farmland Conservation

Jeffrey Ferris and Juha Siikamäki *

Introduction

The Conservation Reserve Program (CRP) and Wetland Reserve Program (WRP) are the two primary agricultural land retirement programs in the United States. In addition to being central in agricultural conservation, these federal programs are more broadly among the most important national conservation tools. For example, CRP is currently the largest public-private partnership for conservation and habitat protection in the United States, and its nearly \$2 billion annual budget comprises almost one third of all federal funding for land conservation and recreation. WRP is smaller in scale—its annual expenditures are roughly one tenth of CRP's—but it is nevertheless important for its specific role in preserving wetlands. The general importance of agricultural conservation is highlighted also by the prevalence of agriculture as land use. Cropland alone covers about 440 million acres, or about 19.5 percent of total U.S. land area. Considering all agricultural purposes, including cropland, grassland pasture and range, and grazed forests, agricultural lands cover nearly 1.2 billion acres, that is, over half (52 percent) of total U.S. land area (Lubowski et al. 2006).

CRP and WRP were established in the mid-1980s through the early 1990s, but agricultural land retirement policy has a much longer history. The first wave of land retirement programs took place in the 1930s and 1940s following a downturn of crop prices. This led to the Agricultural Adjustment Act of 1933, and the retirement of about 40 million acres. The Soil Bank program (1956–1972), which also followed a slump in crop prices, provided farmers with 3- to 10-year contracts to convert agricultural lands from crop production to soil conserving uses. Representing a third wave of land retirement programs, CRP emerged in the mid-1980s. Similar to earlier programs, in addition to addressing environmental goals CRP was motivated by the desire to support crop prices by reducing crop production (Claassen et al. 2008; Smith 2003; Heimlich et al. 2003.)

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In comparison to CRP, the origins of WRP represent a more fundamental policy shift. Starting from the Swampland Acts between the 1840s and 1860s and continuing with various cost-sharing and technical assistance programs in place until 1977, federal programs had traditionally encouraged and financed the conversion of wetlands to agricultural production. However, this policy shifted in the 1970s toward encouraging the preservation of wetlands (Heimlich et al. 2003). In 1970, the Water Bank Program was the first agricultural program specifically designed to protect wetlands. Using 10-year contracts and annual and cost-share payments, the Water Bank Program enrolled some 700,000 acres of wetlands. The Water Bank Program was terminated after 1990, when its enrollees could sign up for the newly established WRP.

CRP is designed to establish long-term conservation covers and local ecosystem improvements on American farmland. The program pays producers a rental payment for establishing long-term plant cover to improve water quality, control soil erosion, and improve wildlife habitat. CRP enrollment is voluntary, contract duration is from 10 to 15 years, and most contracts are awarded through competition. Administered by the U.S. Department of Agriculture (USDA), the CRP has a current enrollment of 34.7 million acres on 430,000 farms. In 2009, the USDA is prepared to distribute \$1.8 billion in CRP payments (FSA 2008). CRP is one of many USDA programs funded directly through the Commodity Credit Corporation as approved by the 2008 Farm Bill.

WRP provides technical and financial assistance to eligible farmers to promote conservation on American wetlands.¹ WRP was established with the 1990 Farm Bill and is authorized in its current form in the 2008 Farm Bill. Although the USDA Natural Resources Conservation Service (NRCS) manages and finances WRP, the program is administered by the states. Within general guidelines, each state can determine specific enrollment criteria and contract selection. This is in contrast to the CRP, the largest working lands conservation program, which is both financed and administered federally. In another contrast to CRP, which uses conservation easements with limited durations, almost 80 percent of WRP easements are permanent. WRP is currently extended through 2012, and the 2008 Farm Bill expanded its maximum enrollment cap from 2.275 million acres to 3.041 million acres. The increase in the cap is timely, as in 2008 total enrollment in WRP reached two million acres.

¹ Unless otherwise noted, information on WRP is based on NRCS website and documents NRCS 2007a -2009c in the list of references.

In the rest of this backgrounder we provide more detailed overviews of CRP and WRP, including their history, organization, funding, enrollment, environmental benefits, and potential future directions. We first explain CRP, then describe WRP, and thereafter conclude with a brief discussion.

Conservation Reserve Program

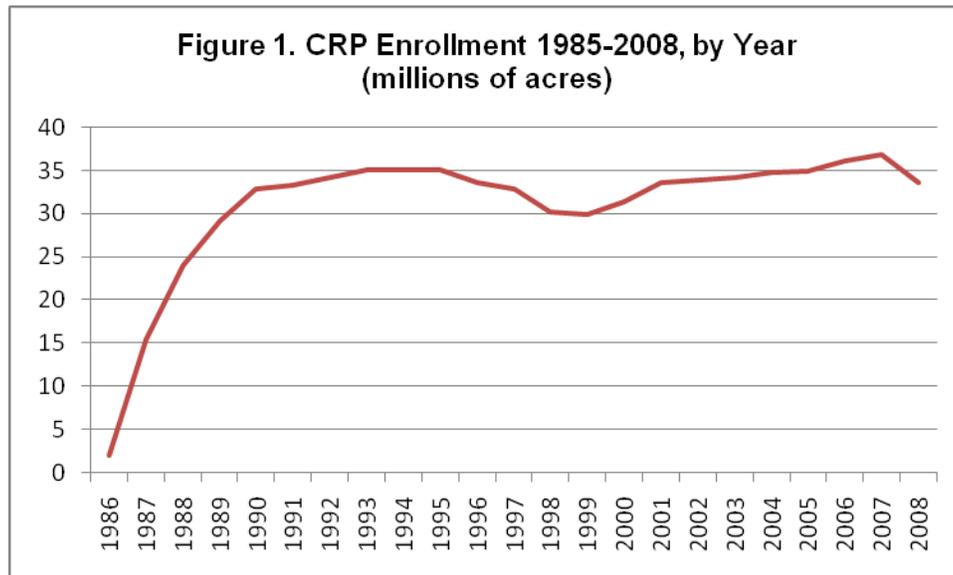
Background

By 1985, erosion and poor water quality were becoming increasing concerns for much of the farming regions of the United States. Furthermore, owing to developmental pressures, North American wetlands, which provide habitat for many species such as different waterfowl, continued to disappear.² Simultaneously, Congress was considering a new amendment to the 1985 Farm Bill, the CRP, which would pay farmers an annual payment to retire unproductive land from production for a set duration of time (typically between 10 and 15 years). The original intent of CRP was to address widespread soil erosion issues on American farm lands, while also removing vast tracts of land from production and thereby raising commodity prices. The approval of the 1985 Farm Bill soon led to tens of millions of acres of farmland being retired from cropping.

Since it was introduced in 1985, CRP was reinitiated and expanded by the 1990, 1996, 2002, and 2008 Farm Bills. Beginning with an enrollment of 2 million acres, CRP acreage ballooned in 2007 to an all-time high of just under 37 million acres.³ With a 2007 budget of almost \$2 billion, CRP is the largest federally funded conservation program (FSA 2007). With the approval of the 2008 Farm Bill, the CRP is reauthorized through FY2012. Figure 1 shows CRP yearly enrollment from 1986 through 2008.

² Prior to the arrival of Europeans, there were approximately 221 million acres of wetlands in North America; by 1985 nearly 53 percent of these lands had disappeared.

³ Since 2007, CRP acreage has dropped to 33.6 million acres.



Organization

CRP is a voluntary program in which farmers agree to improve land cover and temporarily retire land from agriculture in exchange for annual rental payments and cost-share assistance from the federal government. CRP is unique among federally funded conservation programs in that it seeks limited-duration conservation easements rather than the outright purchase of land or conservation easements into perpetuity. CRP applicants enroll land in either 10- or 15-year contracts, with the option of extension when contracts expire.⁴ Currently, early release from CRP is possible; however, producers would be required to refund the federal government for cost-share payments and pay a 25 percent penalty on all annual rental payments.

Eligible Land

To be eligible for CRP, land must be either cropland (cropped in four out of six years prior to 2008) or marginal pasture land in riparian areas. In addition, land needs to meet at least one of the following criteria:

- Be highly erodible land
- Be located in national or state CRP conservation priority areas

⁴ Land with the highest EBI scores could be reenrolled with either 10- or 15-year contracts; other less valuable land could opt for extensions of 2, 3, 4, or 5 years.

- Be included in an expiring CRP contract
- Be considered cropped wetland, or associated with surrounding noncropped wetlands
- Be devoted to highly beneficial environmental practice (e.g., wetland restoration, streamside buffers, or conservation buffers)

Total acreage of CRP lands is limited, and the 2008 Farm Bill caps maximum total acreage at 32 million. Furthermore, in any given county, a maximum 25 percent of total farmable land may be enrolled in CRP or WRP (exceptions are given to Conservation Reserve Enhancement Program [CREP] applicants).

Environmental Benefits Assessment of Candidate Areas

Each CRP candidate area of land is issued an Environmental Benefits Index (EBI) score, which indicates the perceived conservation value of an applicant's land. Using the EBI score, different CRP offers are ranked in funding priority. The EBI system did not exist until 1991,⁵ and since then, it has been reformulated on several occasions in order to reflect current conservation priorities and to improve targeting of CRP (Ribaud et al. 2001; Claassen et al. 2008).

With the approval of the 2008 Farm Bill, the Farm Service Agency issues an EBI based on the projected benefits to wildlife, water quality, erosion control, and air quality. In addition, the EBI also considers the predicted longevity of environmental benefits beyond the contract period as well as any potential payment reductions (relative to the maximum rental rates) accepted by the producer. Each contract proposal is evaluated by using these criteria, and an overall EBI score is calculated as the sum of points awarded for different factors. Wildlife, water quality, and erosion control are given equal weights in the calculation of the EBI score, whereas air quality benefits, longevity of environmental benefit beyond the contract period ("Enduring Benefits Factor"), and the cost factor are given relatively lower weights. The current calculation of the EBI uses the following points for different factors:

- **Wildlife Factor Benefit: 0 to 100 points**
 - Points are based on the perceived benefit to wildlife, including benefits to wildlife habitat cover and wildlife enhancement and whether the project is in a wildlife priority zone.

⁵ Prior to 1991, CRP focused on quickly enrolling large acreages rather than targeting land based on cost-effectiveness considerations (Claassen et al. 2008).

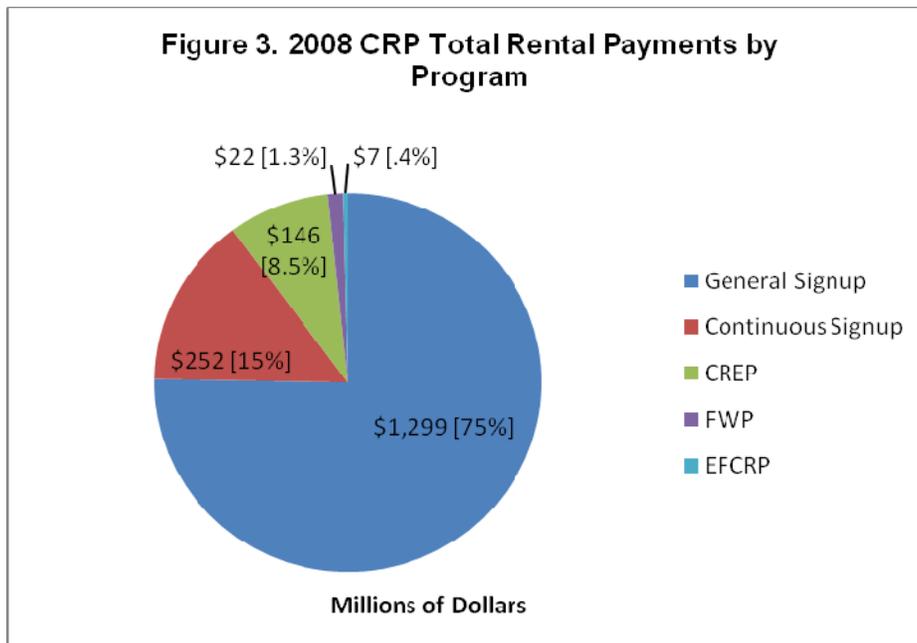
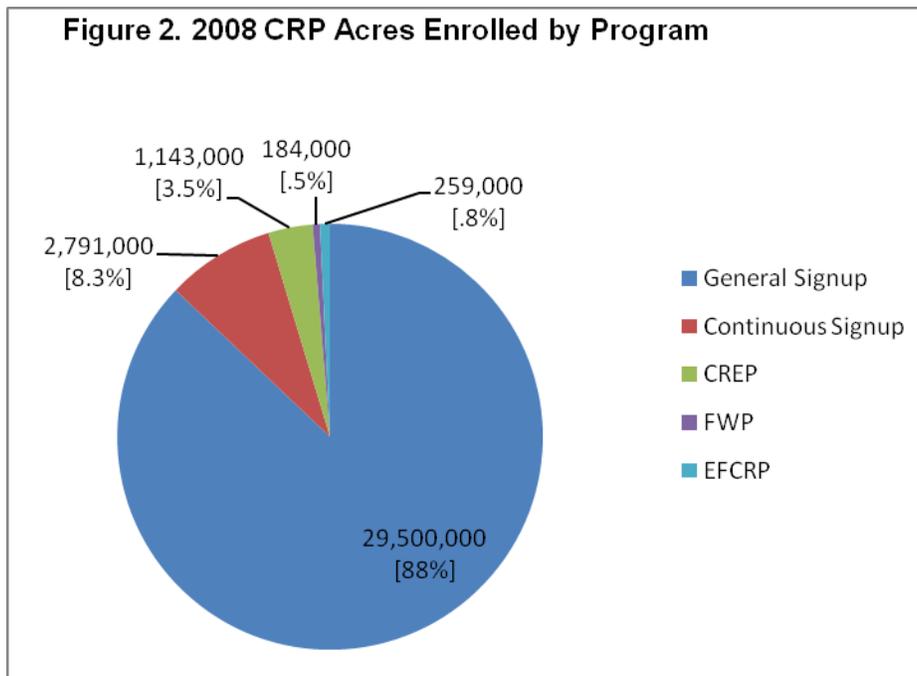
- **Water Quality Benefits: 0 to 100 points**
 - Points are based on the perceived impact that CRP may have on surface water and groundwater quality from reduced erosion, runoff, and leaching.
- **Erosion Factor: 0 to 100 points**
 - Points are based on the land's potential to be eroded by wind and water.
- **Enduring Benefits Factor: 0 to 50 points**
 - Points are based on the likelihood for certain CRP practices to endure beyond the expiration of the CRP contract.
- **Air Quality Benefits: 0 to 45 points**
 - Points are based on the perceived air quality benefits from reduced soil erosion.
- **Cost: 0 to 35 points**
 - Higher point scores are awarded to applicants willing to accept less than maximum rental rates or those willing to forego cost-share assistance.

CRP Subprograms

Under the umbrella of CRP, several subprograms operate that target specific natural resources at risk. There are five distinct CRP programs:

1. General Signup
2. Continuous Signup
3. Conservation Reserve Enhancement Program (CREP),
4. Farmable Wetland Program (FWP)
5. Emergency Forest Conservation Reserve Program (EFCRP).

Each of the above subprograms works in a similar fashion: CRP pays farmers an annual rental fee for removing land from agricultural production. In addition to rental payments, farmers may receive cost-share assistance for the implementation of high-priority conservation practices. Figures 2 and 3 display current CRP acreage and rental payments by program as of December 2008. The subprograms are described in more detail below.



General Signup

General Signup is the largest of all CRP programs, representing 50 percent of all contracts, 88 percent of all CRP acreage, and 75 percent of CRP payments as of December 2008. General Signup is reserved for farmers willing to enroll whole fields or entire farms. Application to the General Signup program is competitive; applicants with the highest EBI score are given priority.

Continuous Signup

Continuous Signup is reserved for high-priority conservation practices. Eligible conservation practices include the establishment of riparian buffers, filter strips, grass waterways, upland bird habitat, bottomland hardwood trees, long leaf pine, and Prairie Pothole duck nesting. Farmers willing to offer such services are enrolled without competition during non-designated signup periods. Furthermore, the annual payment per acre for Continuous Signup applicants is twice that of the General Signup. In general, Continuous Signup involves only small portions of a farmer's field and represents a fraction of the total CRP acreage. As of December 2008, Continuous Signup represented 40 percent of contracts, 8.3 percent of total CRP acreage, and 15 percent of the total CRP payments.

Conservation Reserve Enhancement Program

CREP is a joint state–federal program that targets specific agriculture-related environmental issues that are significant at the state or national level. CREP is administered by the General Signup office, and enrollment is extended to partial fields as well as whole fields. Priority is given to applicants who are willing to implement high-priority conservation practices (based on local and national precedence). Compared to the other national CRP programs, CREP is relatively small; it represents 9 percent of all contracts, 3.5 percent of all CRP acreage as of 2008, and 8.5 percent of the total CRP payments.

Farmable Wetland Program

FWP is a program designed to help conserve sensitive wetland ecosystems. A maximum of one million acres may be enrolled in FWP at any given time; furthermore, individual states must restrict FWP to a maximum of 100,000 acres.⁶ A maximum of 40 wetland acres and 30 acres of wetland buffer may be enrolled in FWP per farm. Annual acreage payments for FWP are commensurate with those of the Continuous Signup program (roughly twice that of the General Signup).

As of 2008, eligible wetland must meet one or more of the following criteria:

- The land was cropped during at least 3 of the preceding 10 years and must have continuous buffer acreage used to protect the wetland.

⁶ This maximum may be increased to 200,000 acres (FSA 2008).

- The land that will have wetland built on it will receive flow from row-crop agriculture that will provide nitrogen removal, in addition to other wetland-related benefits.
- The land was devoted to commercial pod-raised aquaculture during any years between 2002 and 2007.
- The land is intermittently flooded and was cropped for three years between 1990 and 2002, when it was subject to natural overflow of prairie wetland.

FWP is restricted to wetland areas, and as of 2008, 14 states account for all of the program acreage.⁷ Most FWP contracts are in the Prairie Pothole Region,⁸ which is an important breeding zone for North American waterfowl. Iowa, a state within the Prairie Pothole Region, alone accounted for nearly 40 percent of all FWP acreage. In 2008, FWP represented 1.4 percent of all contracts, 0.5 percent of all CRP acreage, and 1.3 percent of the total CRP payments.

Notice that in addition to FWP, wetlands are separately addressed also by the WRP, which is not part of the CRP, and which is summarized in the second part of this report.

Emergency Forest Conservation Reserve Program

EFCRP was established in 2006 as a means of providing relief for landowners who lost timber in the Gulf of Mexico during hurricanes. Landowners must have lost at least 35 percent of merchantable timber in order to be eligible. Applicants enroll in 10-year contracts and receive annual rental payments; high-priority land may also be eligible to receive up to 50 percent cost-share assistance for the installation of high-priority conservation practices. As of April 2008, 180,000 acres were enrolled.

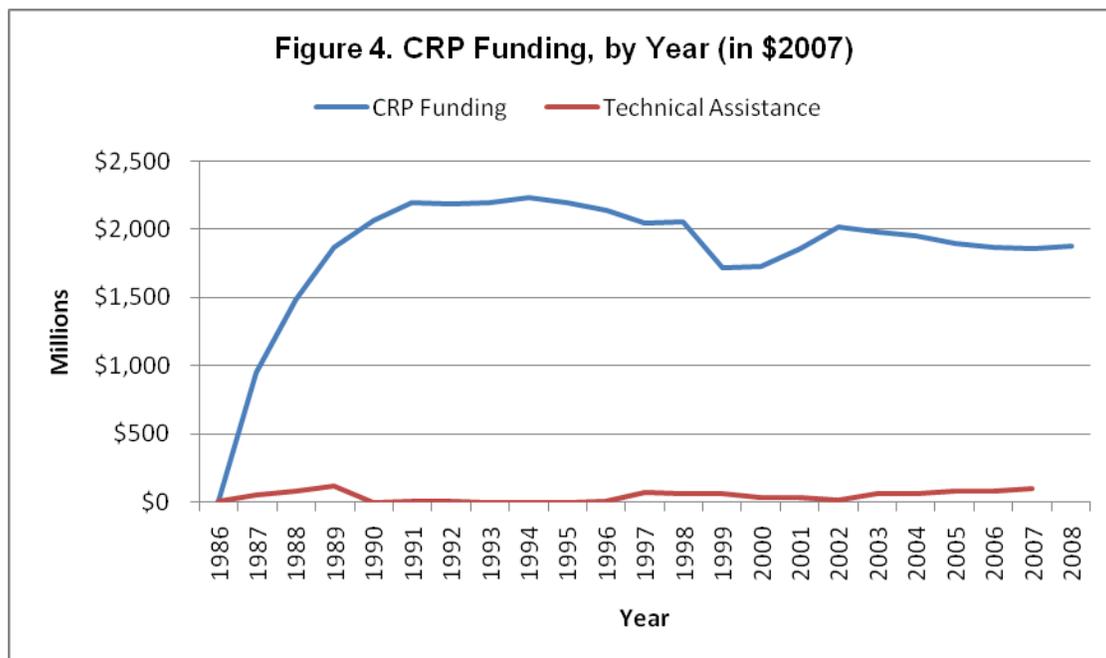
Funding and Payments

CRP is funded entirely through the Commodity Credit Corporation of the USDA. CRP is administered primarily by the Farm Service Agency, which is responsible for the rental and cost-share payments. Additionally, the NRCS and Forest Service provide technical assistance to farmers and state agencies.

⁷ Those states include Illinois, Indiana, Iowa, Kansas, Maryland, Michigan, Minnesota, Missouri, Montana, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

⁸ U.S. states that are considered a part of the Prairie Pothole Region include Montana, North Dakota, South Dakota, Iowa, and Minnesota. Canadian provinces that are in the Prairie Pothole Region include Alberta, British Columbia, Manitoba, and Saskatchewan.

Aside from CRP cost-share programs,⁹ CRP remains entirely federally funded and does not receive matching funds from any state or local agencies. After its implementation in 1986, CRP quickly grew into the largest federally funded conservation project, approaching \$2 billion for FY2007. Figure 4 illustrates the 2007 inflation-adjusted trend in CRP funding since 1986.¹⁰



By far the largest component of CRP spending on a yearly basis is rental payments to farmers.¹¹ From 1986 to 2007, rental payments averaged approximately 84.5 percent of total annual CRP spending (FSA 2007).

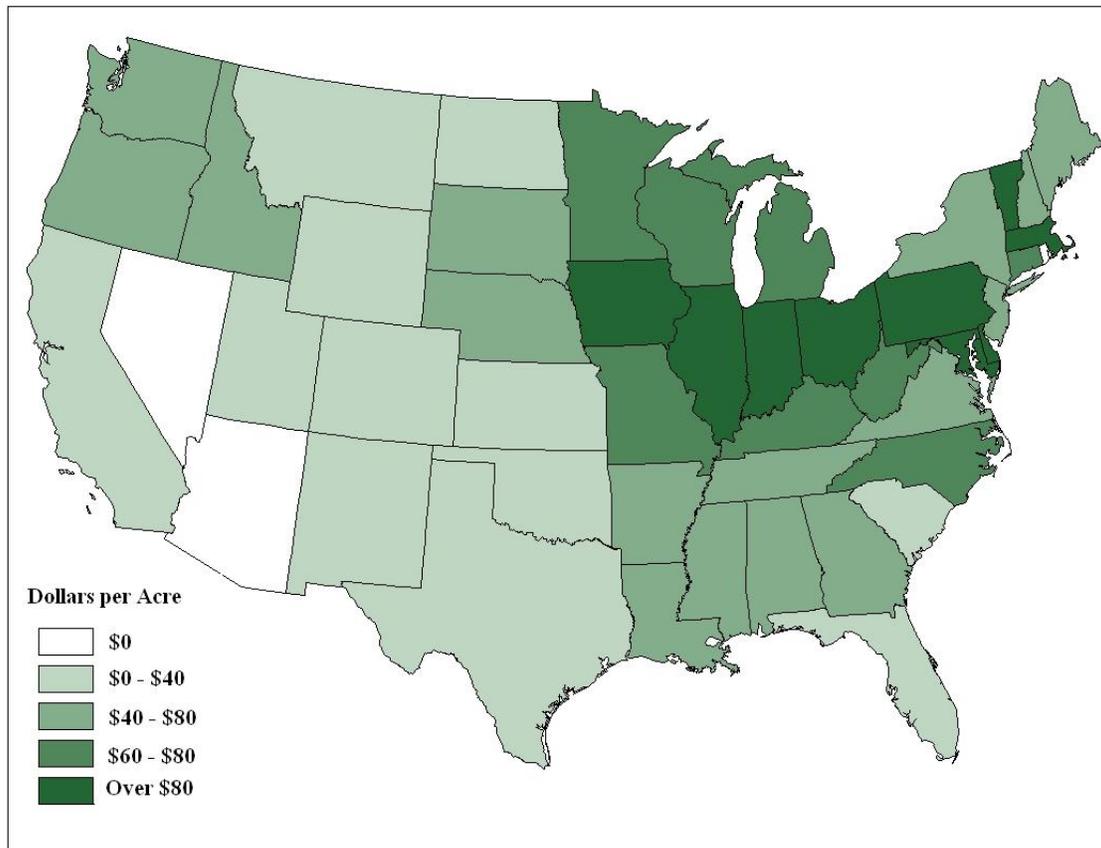
CRP rental rates are determined at the county level and are based on the relative productivity of the soil within each county. Information on county level CRP rental payments is available to applicants prior to signing a contract. An applicant may elect to apply for the maximum county level rental rate, or bid for a reduced rate in exchange for a greater probability of acceptance into the CRP program. Rental rates are fixed for the duration of the contract and may not be renegotiated. Figure 5 displays average CRP rental rates by state for 2007.

⁹ In 2007, cost-share programs accounted for \$90 million of all CRP funding (FSA 2008).

¹⁰ Figure 4 shows CRP funding until 2008 and technical assistance funding until 2007. As of June 15, 2009, data on funding for technical assistance for 2008 were not available.

¹¹ From 1986 to 2007, rental payments averaged approximately 84.5 percent of total CRP spending (FSA 2007).

Figure 5. Average CRP Rental Rates by State in 2007

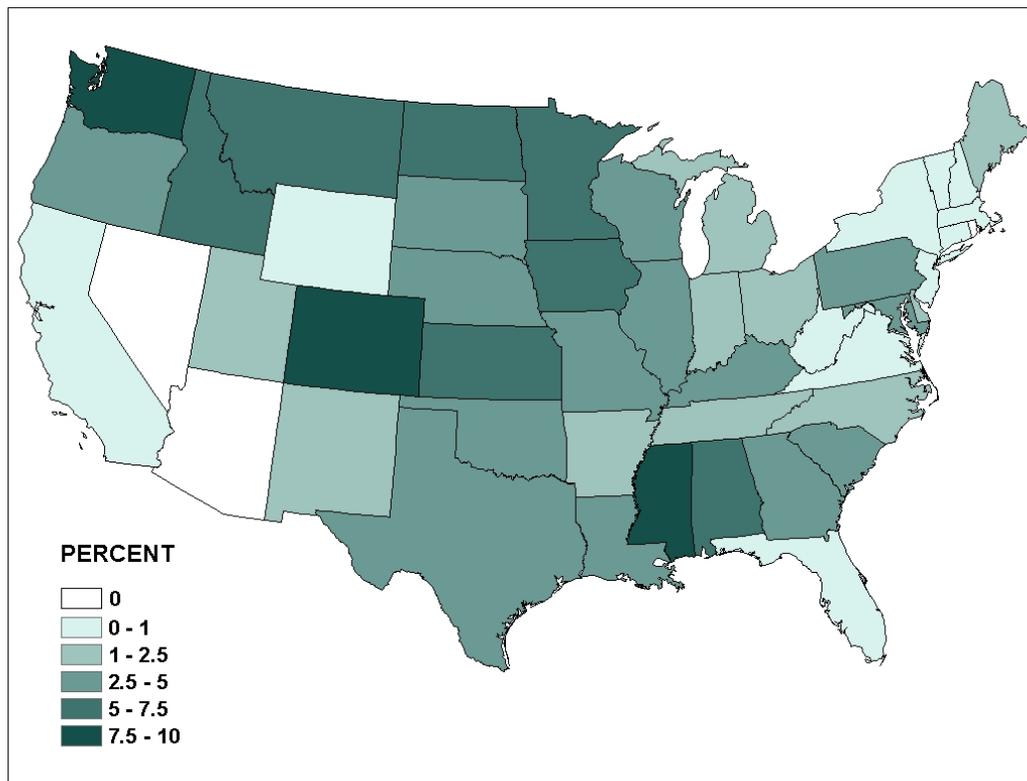


Program Outcomes

CRP currently enrolls 33.6 million acres, over eight percent of all cropland in the United States. This land, an area slightly smaller than the state of Iowa, provides a variety of environmental benefits that ranges from general ecosystem services, such as the reduction of soil erosion and the sequestration of carbon dioxide, to habitat improvements for a variety of species and the provision of recreation opportunities across the United States.

Figure 6 displays 2007 CRP acreage as a percentage of arable land by state. The map demonstrates the geographically wide importance of CRP; it enrolls in conservation practices a considerable percentage of arable land across the entire United States.

Figure 6. 2007 CRP Acreage as a Percentage of Arable Land by State



Ecosystem Benefits

Land removed from agricultural production may provide a natural filter, removing pollutants from water runoff, reducing soil erosion, and even providing for the sequestration of carbon dioxide. Furthermore, through technical assistance and cost-sharing programs, the environmental productivity of CRP land can be enhanced by educating farmers in conservation practices and helping to install environmentally friendly conservation interventions (e.g., riparian buffers and filter strips). In an effort to quantify the environmental impacts of CRP lands, the Farm Service Agency provides yearly estimates of the ecosystem services of CRP. Table 1 displays FSA's estimates of the environmental benefits from CRP in 2004–2007.

Table 1. Cumulative CRP Environmental Benefits (FSA 2007)¹²

Environmental Benefits	2004	2005	2006	2007
Reduced nitrogen (millions of lbs)	452	456	471	480
Reduced soil erosion (millions of tons)	454	455	464	470
Reduced phosphorus (millions of lbs)	102	103	106	108
Sequestered carbon dioxide (millions of metric tons)	47	48	49	50

In the future, CRP or a program similar to it may become even more environmentally relevant in efforts to reduce the amount of greenhouse gases, such as carbon dioxide, in the atmosphere. By retiring land from cropping, CRP helps to store carbon dioxide sequestered in the soil. In general, the longer land is left dormant, the greater the amount of carbon that is sequestered; hence the longer land is enrolled in CRP, the greater the environmental benefit. Currently, of all federally administered programs, CRP is the largest contributor of carbon sequestration benefits (FSA 2007). However, if CRP lands are returned to crop production, much of the carbon sequestered in the soils would relatively quickly return to the atmosphere.

Habitat Improvement

Among wildlife, probably the greatest beneficiaries from CRP are waterfowl in the Prairie Pothole Region. This area of the United States has a unique topography: when the glaciers that covered this region retreated 10,000 years ago, millions of shallow depressions were left behind that became modern-day wetlands. Waterfowl use these wetlands for breeding and for cover, and due to its importance to waterfowl this region is sometimes referred to as the “duck factory.” In 1985 the North American waterfowl population was at its lowest level in over 30 years; however, with the initiation of CRP in 1985, this trend began to reverse. The Farm Service Agency estimates that the establishment of CRP directly resulted in an increase in the duck population by nearly 30 percent (FSA 2007). In addition to CRP, several other federal programs, including the North American Wetland Conservation Act, have contributed to the growth of waterfowl populations.

Conserving cropland benefits the populations of many other species that depend upon these habitats. For example, according to the Farm Service Agency, in prime pheasant habitat, a

Drawn from FSA’s 2007 report, “Annual Summary: Conservation Reserve Program—Summary and Enrollment Statistics.”

4 percent increase in CRP grassland cover was associated with a 22 percent increase in pheasant counts. Also considered largely thanks to CRP lands, threatened sage grouse populations in Eastern Washington have stopped their decline (FSA 2007).

Recreation

Recreational benefits were not a central concern when CRP was first commissioned, but the program has considerably benefited recreation across the United States. CRP lands may sometimes be used directly for recreation purposes for activities such as hiking, hunting, or fishing. In addition, even when CRP lands are not available for recreation, they support wildlife, providing at least some spillover benefits on non-CRP recreation areas. Though recreation benefits from CRP lands often are not directly marketed and thus are not priced by the market, researchers have sought to estimate their magnitude by using nonmarket valuation techniques.

Since 1985, several studies have been commissioned by the Economic Research Service in order to gauge the total social benefit of CRP lands to outdoor recreation, including studies conducted by Ribaud et al. (1990), John (1993) and Feather et al. (1999). Most recently, Feather et al. (1999) estimated that for every acre enrolled in CRP, about \$15 (in \$2007) of recreation value is accrued. In comparison, the CRP rental rate is approximately \$50 per acre enrolled. This study also estimates that during the period 1992 to 1999, CRP provided yearly recreation benefits of approximately \$555 million. These benefits originate mostly from wildlife viewing. Table 2 displays the estimated annual recreation benefits of CRP land by recreation activity during the period 1992 to 1999.

**Table 2. Annual Recreation Benefit from CRP 1992–1999
(based on Feather et al. 1999; all estimates in 2007 dollars)**

Recreation	Economic Benefit (Billions)
Water-based recreation	\$43.1
Pheasant hunting	\$95.72
Wildlife viewing	\$416.38
Total	\$555.17

A recent survey commissioned by the Farm Service Agency examined to what extent CRP lands were used for recreation in the summer of 2007.¹³ Using a random sample of 4,000 CRP landowners, the survey found that over half (57 percent) of program enrollees used part, or all, of their CRP lands for outdoor recreation. Of those whose CRP lands were used for outdoor recreation, more than half (55 percent) indicated that outdoor recreationists included people other than landowners' families or friends. The most popular activity that was pursued on CRP lands was hunting, followed by wildlife viewing, hiking, and fishing, respectively.

Of those individuals who did not allow use of their CRP lands for recreational purposes, the most common reason given was that they were opposed to allowing access to people they did not know. However, many landowners (about 38 percent of those not allowing recreation on their lands) also indicated that they were never asked for access, suggesting that some CRP land currently not used for outdoor recreation might be potentially available for it.

Additionally, some landowners, about five percent of all respondents, reported receiving income from recreational use of their acreage by charging a fee to access their land. The study estimates that nationally in 2007, landowners received \$21.3 million from recreation activities due to their enrollment in CRP.

Wetland Reserve Program

Organization

WRP is a voluntary program that offers landowners financial and technical assistance to protect, restore, and enhance agricultural wetlands. In comparison to CRP, WRP emphasizes long-term conservation, providing landowners with options of either permanent or 30-year land-retirement easements. In addition, landowners have the option of applying for cost-share funding for wetland restoration projects with a minimum 10-year commitment period.

Eligible Land

Eligible land includes:

- Farmed wetlands
- Land that was previously converted from wetlands

Recreation Use & Economics of Conservation Reserve (CRP) Acreage: A National Survey of Landowners.. (Southwick Associates and D.J. Case and Associates 2008)

- Crop or grassland that was used for agricultural production prior to natural flooding.¹⁴

Land may not be enrolled if it has changed ownership in the preceding seven years or if a farmer had an average adjusted gross income exceeding \$2.5 million for the three previous fiscal years.¹⁵ At the county level, WRP and CRP acreage may not exceed 25 percent of a county's farmable acreage, and WRP may not exceed 10 percent (ERS 2009).

Although WRP is federally funded, it is administered by state conservation services. In each state, ranking criteria of candidate areas are developed on the basis of national conservation guidelines. The national guidelines for the acceptance of WRP offers include:

- The extent to which the purposes of the state's conservation program would be achieved
- The productivity of the land
- On- and off-farm environmental threats of using land for agricultural production
- The potential environmental benefits of enrollment
- The relative cost-effectiveness of enrolling an applicant's land
- Whether the land owner offers to contribute financially to the cost of the easement

Landowners may apply for one of three primary WRP options (subprograms): a permanent easement, a 30-year easement, or a restoration cost-share agreement. After an application is received, an NRCS representative visits the site, collects data associated with the ranking process, and creates a preliminary restoration plan. Each WRP subprogram—described in more detail below—contains provisions regarding restoration cost-share agreements to restore or enhance the environmental services of wetlands enrolled in WRP. Besides the conservation easement, the landowner retains full control of the WRP land, may pursue recreational activities (including fishing and hunting), and may sell or lease the land. By permission, landowners may use WRP lands also for other purposes, provided that these activities do not interfere with the conservation goals of the easement.

¹⁴ Lands converted from wetland to agricultural production after December 23, 1985, are not eligible for WRP.

¹⁵ Exceptions may be granted if over 75 percent of income was derived from farming, ranching, or forestry.

**Table 3. WRP Enrollment and Expenditures, 1992–2007, by Subprogram
(adapted from NRCS 2009a)**

Program	<u>Acres</u>		<u>Expenditures</u>			<u>Contracts</u>	
	<i>Number</i>	<i>Percent</i>	<i>Millions</i>	<i>Percent</i>	<i>Per acre</i>	<i>Number</i>	<i>Percent</i>
Permanent easement	1,491,228	77.6	\$1,942.3	89.8	\$1,302	7,570	74.5
30-year easement	255,774	13.3	\$171.7	7.9	\$667	1,392	13.7
Restoration cost-share	174,134	9.2	\$51.1	2.4	\$293	1,202	11.8
Total	1,921,136	100	\$2,164.1	100	\$1,126	10,164	100

Permanent Easement

Landowners enrolling in the permanent easement subprogram agree to withdraw from all farming, ranching, and foresting practices into perpetuity on the land subject to the WRP easement. In exchange, they receive a payment that equals the lowest of the following:

- The difference in the fair market value of the land with and without the easement
- The geographic area rate cap as determined by the Secretary of Agriculture
- The landowner's offer

In addition to easement payments, WRP pays up to 100 percent of the restoration costs. Permanent easements account for 77 percent of acres, 90 percent of payments, and 74 percent of contracts (Table 3).

Thirty-Year Easement

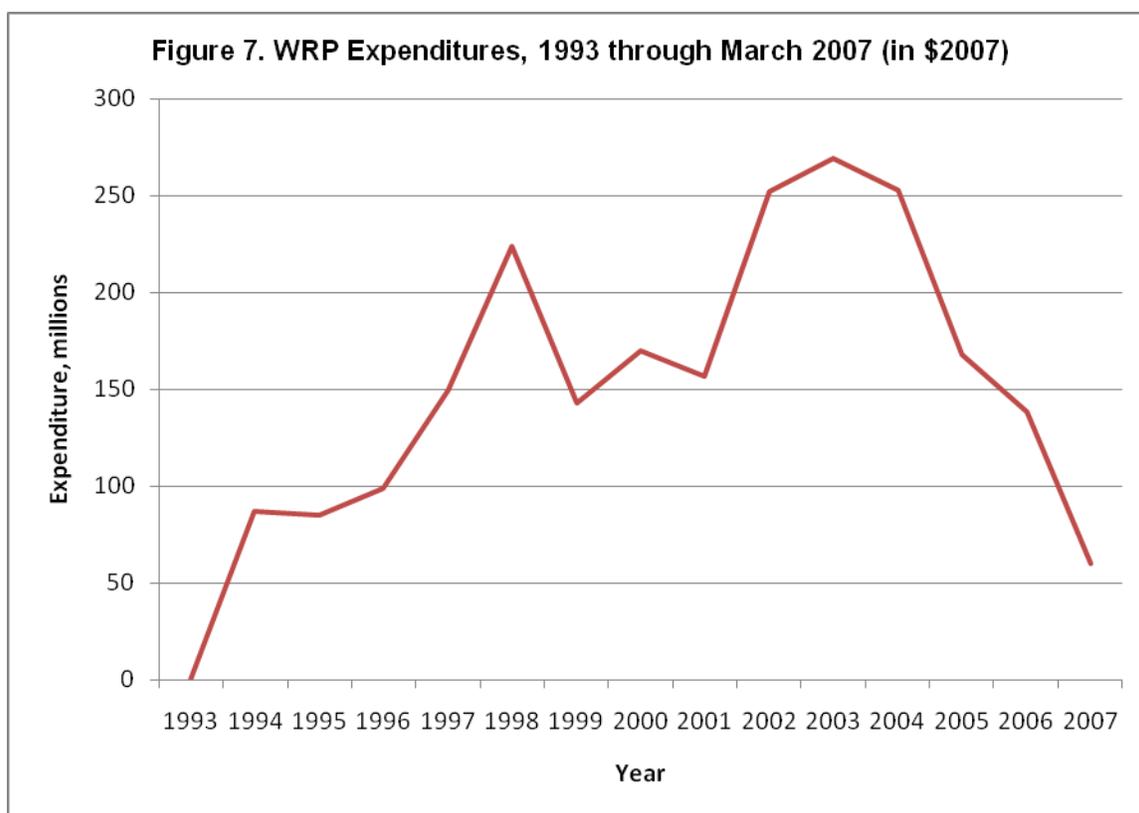
The 30-year easement program requires retiring the land from agriculture for at least 30 years. WRP pays landowners up to 75 percent of the payment under a permanent easement. In addition, WRP pays up to 75 percent cost-share of restoration costs associated with the land. Thirty-year easements represent 14 percent of WRP acreage, 8 percent of payments, and 14 percent of contracts (Table 3).

Restoration Cost-Share Assistance

Restoration cost-share assistance contracts (typically for a minimum of 10 years) landowners to reestablish degraded or lost wetland functions and values. Under this subprogram, landowners do not place their land into easements, but may continue agricultural production on enrolled acres. However, WRP provides up to 75 percent cost-share assistance for restoration projects. Restoration cost-share assistance makes up 9 percent of WRP acreage, 2 percent of payments, and 12 percent of contracts (Table 3).

Funding

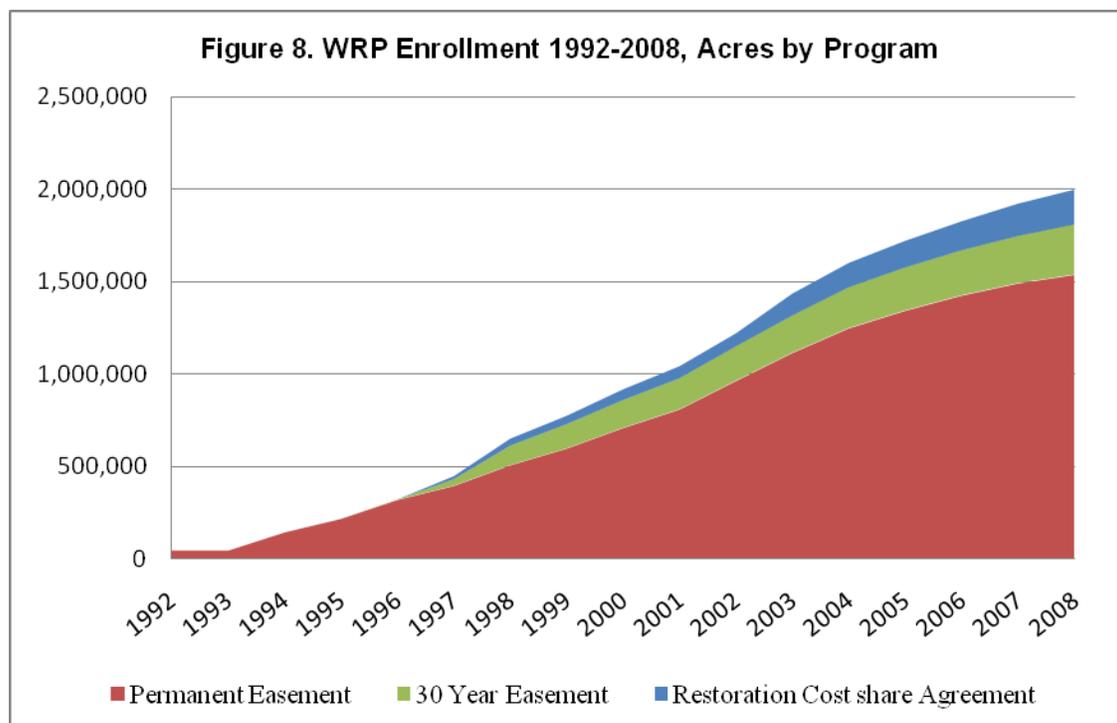
WRP is funded through the USDA Commodity Credit Corporation. Because WRP has a maximum acreage limitation rather than a funding limitation, annual program expenditures fluctuate depending on enrollment levels. Allocation of funding across states is determined by NRCS on the basis of the prior year's WRP performance and ecological considerations, such as the number of wetland acres lost in the state, effects on migratory birds, water quality conditions, and the number of threatened and endangered species in the state. Figure 7 presents annual WRP expenditures from 1993 through March 2007 (in 2007 inflation-adjusted dollars).¹⁶ Looking forward, the 2008 Farm Bill approves a total of \$1.3 billion of WRP funding from 2009 through 2012.



¹⁶These data are drawn from ERS (2009), and data posted at <http://www.ers.usda.gov/Briefing/ConservationPolicy/images/wrpexpenditures.htm>

Program Enrollment

WRP enrollment has steadily increased at an average rate of over one hundred thousand acres a year since the program was first introduced in 1992 (Figure 8). As of 2008, nearly two million acres were enrolled in the program. Although the 2008 Farm Bill downsized several other federal land conservation programs, such as the CRP, it raised WRP cap acreage from 2.275 million acres to 3.041 million acres through 2012.



As of 2008, WRP funds projects in all 50 states and Puerto Rico, totaling 2,000,169 acres under program easements. Figure 9 displays cumulative WRP enrollment by state in 2007. Louisiana has the largest share of WRP acreage, with 221,449 acres, followed by Arkansas with 207,117 acres, Florida with 160,415 acres, Mississippi with 151,787 acres, and California with 102,189 acres (NRCS 2009c).

Figure 10 by NRCS (2008b) shows 2008 WRP acreage as a percentage of arable land by state. It illustrates that WRP has preserved the highest percentage of arable land in the eastern half of the United States. Although enrollment in the western states is fairly large in terms of the number of acres (Figure 8), they represent a relatively small share of the total amount of arable land in the western states.

Figure 9. WRP Cumulative Acreage by State in 2007 (NRCS 2008b)

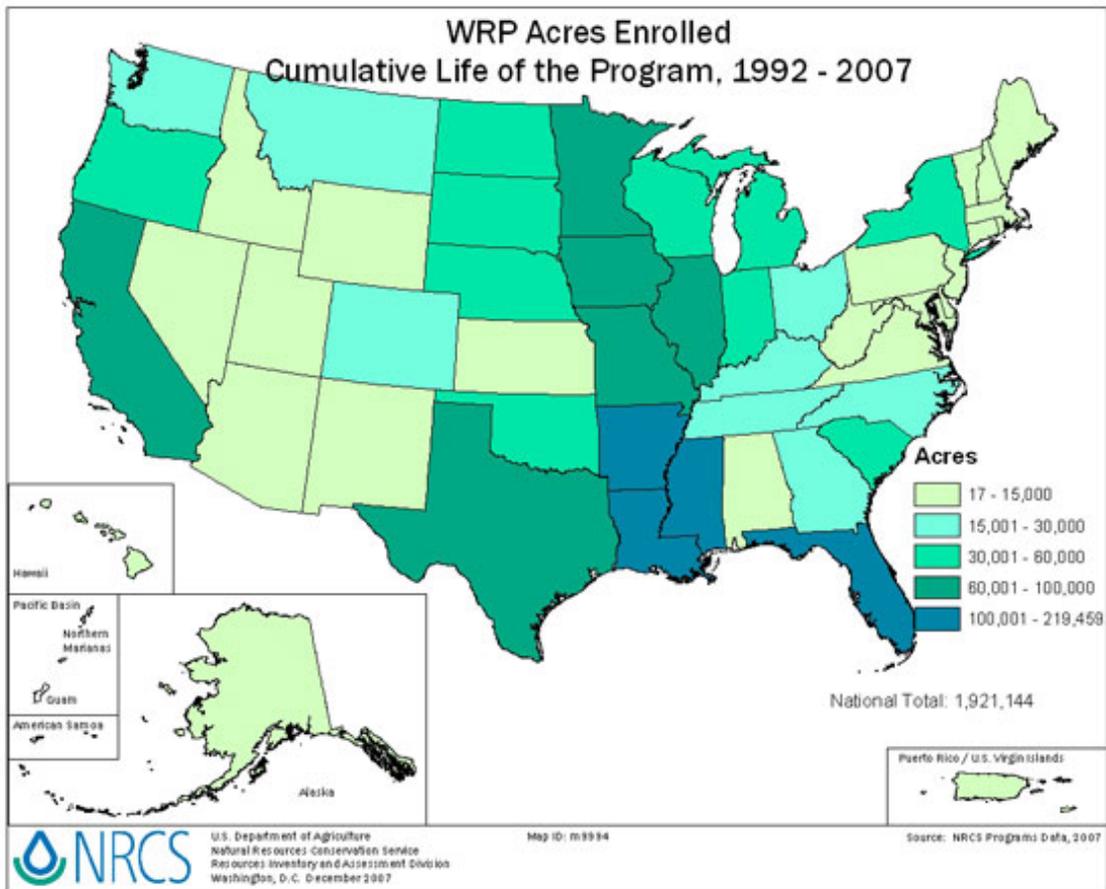
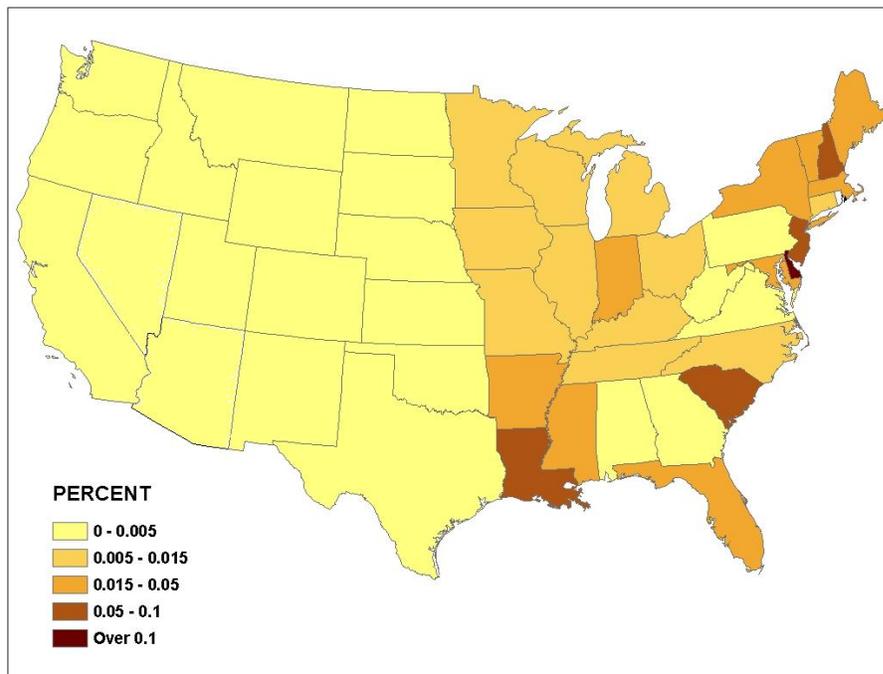


Figure 10. 2008 WRP Acreage as a Percentage of Arable Land by State¹⁷

Program Benefits

The environmental benefits from WRP are similar to benefits from other land conservation programs, such as CRP. WRP improves soil and water quality, increases wildlife populations, and improves recreational opportunities. However, in addition to retiring land from agriculture, WRP also emphasizes wetland restoration. Furthermore, NRCS partners with federal, state, and private entities to improve conservation targeting.¹⁸

Soil and Water Quality

The retirement of WRP land from agriculture and the conversion of cropland into a native cover of trees and grass have numerous environmental benefits, such as reduction in soil erosion,

¹⁷ WRP acreage information is provided by the Natural Resources Conservation Service (2009c). Arable land statistics are available through the National Agricultural Statistics Service.

¹⁸ Those entities include the Cooperative State Research, Education, and Extension Service, USDA Forest Service, EPA, U.S. Fish and Wildlife Service, state fish and wildlife agencies, state foresters, and nongovernmental organizations such as Ducks Unlimited (NRCS 2009b).

improving the quality of top soil, and reducing the sediment, nutrient, and other chemical load running into waterways. WRP also helps to sequester carbon in the soil and flora covering WRP lands.¹⁹

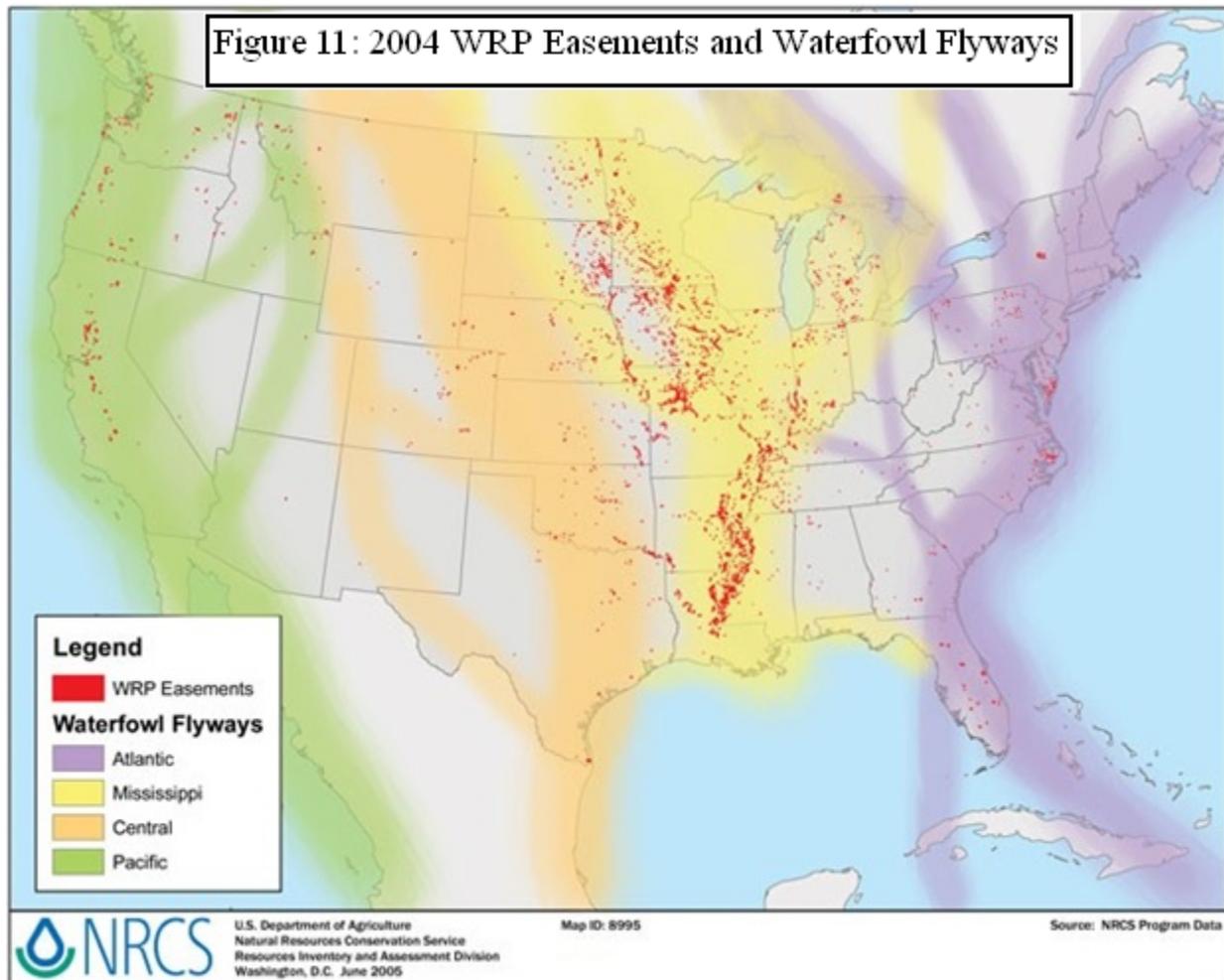
Besides reducing sediment and chemical loads to waterways by retiring land from agriculture, WRP can improve wetlands' ability to act as natural filters by removing excess pollutants such as nitrogen and phosphorus as well as by reducing sedimentation and turbidity from upstream sources and improving the quality of the water flowing downstream. Wetlands also provide floodwater storage to protect against excessive runoff and flooding.

Habitat Development

WRP provides breeding and migratory grounds for many species of animals. Many endangered and threatened species, such as the Louisiana black bear, Mississippi rattlesnake, bog turtles, and pallid sturgeon, use WRP lands for habitat. WRP also has helped the establishment of uninterrupted complexes of restored wetlands and, in some cases, the conversion of agricultural cropland to a permanent wetland habitat. This has the potential to benefit amphibians and other species, such as area-sensitive forest birds, that are vulnerable to habitat fragmentation. Studies, including Hicks (2003) and Harris (2001), suggest that WRP wetlands overall are at least as productive as non-WRP wetlands for wildlife habitat (Rewa 2005).

WRP projects have specifically targeted migratory water fowl such as ducks, geese, and swans by supporting large migratory pathways across the United States (NRCS 2009b). Figure 11 displays migratory bird pathways overlaid on 2004 WRP projects, demonstrating that WRP protects wetlands in waterfowl breeding and migratory zones. By doing so, WRP has promoted waterfowl populations, contributing to their generally increasing trends during the 1990s and 2000s (Fish and Wildlife Service 2008).

¹⁹ Approximately 600,000 acres of WRP lands support growing trees, which sequester large quantities of atmospheric carbon. For example, Birdsey (1996) proposed that bottom hardwood trees, one of the many species of trees planted on WRP lands, sequester 2,566 pounds of carbon each year (NRCS 2009b).



Recreation

Recreational activities, such as hunting, fishing, hiking, and wildlife viewing, on WRP lands benefit from their restoration. NRCS reports that recreational hunting continues to expand on WRP lands, contributing income to landowners selling hunting rights (NRCS 2009b). In addition, WRP generates spillover benefits outside enrolled areas by providing habitat for migratory species of animals, such as waterfowl, that are sources of recreation benefits across the country.

Economic Assessments

Table 4 displays NRCS estimates of the budgetary costs and environmental benefits of WRP under three alternative scenarios: baseline scenario, scenario 1, and scenario 2. Baseline scenario stands for the continuation of the 2002 Farm Bill provisions, including assumptions that

per acre enrollment costs remain at the 2007 levels and that the program acreage expands to 2.275 million acres (the 2002 Farm Bill program cap). Scenario 1 denotes a Farm Bill 2008 scenario, which gradually (150,000 acres per year) achieves a total enrollment of 2.581 million acres from 2009 through 2012. Scenario 2 also denotes a 2008 Farm Bill scenario, this time with a 3.041-million-acre total cap achieved by 2012 with an annual enrollment of 265,000 acres.

Scenarios 1 and 2 also reflect changes in the bid valuation methodology introduced in the 2008 Farm Bill. Whereas rate caps were determined in 2006 and 2007 primarily on the basis of appraisals of the fair market value of the parcel with the easement, the 2008 Farm Bill proposes a return to the regional or market-wide valuation methodology used as the primary valuation method prior to 2006. As a result, NRCS predicts that the cost per acre of easements will decline as more acres in areas with low easement values are expected to be enrolled in the program.

Table 4: NRCS Estimates of Aggregate WRP Enrollment, Budgetary Costs, and Economic Benefits, by Scenario (in 2007 dollars; NRCS 2009a)

Scenario	Enrollment (Million Acres)	Costs (Billions)	Benefits (Billions)	Net Benefits (Billions)
Baseline	2.275	\$ 0.767	\$ 1.626	\$ 0.859
Scenario 1	2.581	\$ 1.283	\$ 3.315	\$ 2.032
Scenario 2	3.041	\$ 2.267	\$ 5.857	\$ 3.591

Regardless of the scenario, NRCS projects that WRP benefits exceed its budgetary costs. Estimated net benefits are highest under scenario two and lowest under baseline. Benefits in scenarios 1 and 2 are similar per acre, but scenario 2 comprises a large total enrollment and therefore generates greater total net benefits than scenario 1. The above benefit estimates rely on a meta-analysis by Randall et al. (2008) of studies for the valuation of wetlands in the United States. The study estimated that on average, the public's willingness to pay for protecting an acre of typical fresh water marsh is about \$425 annually.

Several limitations apply to the above assessment. For example, the benefit estimate comes from a meta-analysis of a large number of valuation studies, so any limitations in them also are transmitted to the meta-estimate. In addition, although the benefit estimate relates to the conservation of wetlands, it is difficult to assess how well a uniform value per acre reflects the value of wetlands actually enrolled in WRP. Wetlands differ in type and quality, and benefits from their protection likely vary by location, even considerably. Using a uniform value estimate may be necessary on the basis of the available literature, but as a consequence, any benefit variability associated with the type, location, quality, and other features of wetlands, such as

species populations and recreational uses of WRP lands, is overlooked. In addition, the benefit assessment assumes that wetlands generate marginal benefits at a constant rate per acre, though in reality marginal benefits per acre may vary depending on the program size and configuration. Finally, the NRCS benefit–cost assessment attributes to WRP all the benefits from lands enrolled in the program. In reality, it is not clear that all WRP acres would return to agriculture in the absence of WRP. For example, if some WRP lands would remain wetlands even in the absence of the program, their benefits should not be attributed to WRP.

The benefit–cost assessment includes limitations also in the cost estimates. For example, using program expenditures for the opportunity cost of WRP lands may overestimate their true opportunity cost (minimum acceptable payment for enrollment). When the payment received exceeds the minimum acceptable payment, the difference between the actual payment and the minimum payment is a simple transfer from the government to the landowner (“producer surplus”), which should not be included in social benefit–cost calculations. But on the other hand, it is not clear that the cost calculations of NRCS fully account for the management and administration costs of the program, which can be considerable.

These limitations are symptomatic of broader challenges with the benefit–cost assessments of conservation programs. Some of these challenges are methodological; for example, the estimation of nonmarket benefits from conservation programs entails a variety of challenges subject to research. In addition, lack of valuation studies for different locations and types of habitats forces benefit–cost assessments to adopt uniform, average benefit measures. Though practical, this leads to ignoring any variability in the benefits by location and type of habitat protected, as discussed above.

Despite its limitations, the above NRCS study provides a potentially useful assessment of WRP. At the minimum, it might give a rough estimate of the magnitude of potential benefits from the program. Given the program costs, NRCS estimates that the benefit–cost ratio of WRP ranges between 2 and 2.5. In other words, assuming that the cost estimates are accurate, the actual benefits of WRP could be 50 percent lower for the program to break even in a benefit–cost sense. Alternatively, if the benefit estimate is accurate, program costs could roughly double without changing the net benefits from positive to negative.

Discussion

Land retirement programs have a long history in the United States. Starting from the 1930s, they have typically emerged after a downturn of producer prices. By removing land from agriculture, land retirement programs meet the goals of reducing agricultural supply and

supporting producer prices while simultaneously promoting agricultural conservation. CRP and WRP originally were motivated by similar considerations, though in the long term these programs have shifted more toward emphasizing conservation.

After about 25 years of CRP and nearly 20 years of WRP, these programs continue to be viewed positively by both conservation and agricultural communities. From the perspective of farmers, CRP is beneficial, because it is voluntary, does not transfer property rights, provides guaranteed income for the length of the contract, and has the potential for supporting commodity prices by removing some land from production. From the perspective of conservationists and outdoor enthusiasts such as hunters, CRP has contributed toward habitat improvements, supported wildlife, and provided various other ecosystem benefits. Perhaps reflecting this broad support, funding for CRP has remained relatively stable since its establishment.

Changes in agricultural commodity markets necessarily affect land retirement programs, and make their management challenging. For example, mounting food prices in 2007–2008 triggered demands to reduce land retirement, especially the size of CRP, to make more land available for the production of crops. Moreover, as a response to rising commodity prices and without any modifications to the program, farmers reduced reenrollment in CRP. From October 2007 to December 2008, CRP acreage was reduced by 3.1 million acres, an area roughly the size of Connecticut. In North Dakota alone, over 400,000 acres were removed from CRP during 2007, approximately 12 percent of total CRP acreage in that state. These reductions of CRP land reduce budgetary pressures, but they also have inevitable environmental consequences. Reduced reenrollment may be especially detrimental from environmental perspectives, because the environmentally most valuable CRP lands often are those that have been enrolled the longest. These lands have established wildlife habitats, improved vegetative cover to prevent erosion, and relatively large amounts of carbon sequestered in soils. Many of these benefits may quickly erode when the land is returned to farming.

Although land-retirement programs have long been favored in agricultural policy, the focus of agri-environmental policy is gradually shifting toward working lands conservation. For example, the 2008 Farm Bill considerably increased the role of the Environmental Quality Incentives Program (EQIP). The goal of EQIP is to make farming more environmentally friendly without completely retiring land from agriculture. Working land programs broaden the scope of agricultural conservation beyond land retirement, and their prominence in agri-environmental policy likely will continue to increase.

Improving cost-effectiveness and environmental targeting have been central goals of land-retirement programs for more than a decade. For example, environmental benefit–cost

targeting was already authorized by the U.S. Congress in 1990, and in 1996, the USDA was directed to maximize environmental benefits per dollar of expenditures under EQIP (Claassen et al. 2008; Osborn 1993). Improved environmental targeting is imperative to achieving greater cost-effectiveness of CRP. For example, Feather et al. (1999) estimated that the shift to environmental targeting nearly doubled the annual benefits of CRP (from about \$460 million to about \$830 million) while leaving program costs virtually unchanged.

Despite the use of the EBI to prioritize spending under CRP, various assessments of the program continue to suggest improvements to the targeting of land for conservation. For example, Babcock et al. (1995) found that a great majority of the benefits of all CRP lands could have been realized with only a small fraction of the land enrolled, suggesting that the benefits from the enrollment of the rest of the acres are marginal. Ribaud et al. (2001) concluded that the targeting of spending would benefit if the EBI system would include actual on-site assessments of environmental benefits. However, creating an EBI that is both site-specific and appropriately weights the different benefits of CRP is difficult.

Several studies have suggested modifications to CRP in order to maximize its benefits and minimize its costs. For example, Kirwan et al. (2005) suggest that CRP could more effectively price discriminate its contracts by offering rental rates that vary by EBI. If higher EBI scores would result in a greater rental rate, the overall efficiency of CRP funding might be improved. In another study, Roberts and Lubowski (2007) note that acres currently enrolled in CRP are less likely to be cropped in the future, even after removal from CRP. Therefore, these authors suggest CRP could reduce program costs by differentiating payments for existing and new enrollees by providing new program participants a one-time signing bonus.

Another major concern for CRP is the influence that the program might have in encouraging farmers to crop marginal land that would otherwise have been left idle, a phenomenon known as “slippage.” Wu (2000) proposed that the existence of slippage could offset 20 percent of CRP acreage in the central U.S. However, a study by Roberts and Bucholz (2006) indicates that the actual effect of slippage may be smaller than Wu’s original estimates.

Moving forward, it will be important that both CRP and WRP continue to improve their effectiveness in generating benefits per dollar invested in the program. Although this generally requires better understanding the benefits and costs of potential CRP and WRP lands, program implementation may also help improve its cost-effectiveness. For example, it has been suggested that WRP could further reduce program costs by establishing a reverse-auction to enroll acreage. Under a reverse-auction, eligible applicants could submit per acre bids along with information about the eligible lands’ potential for environmental benefits. If the environmental benefits of

each potential contract could be reliably assessed, WRP could select lands with the greatest potential environmental benefits for the least cost.

After over two decades since its start, CRP remains well funded and broadly supported. In spite of some potential shortcomings and future challenges, CRP, in one form or another, likely will remain a predominant force in farmland conservation. Experiences accumulated during CRP's existence have helped improve the program and have also provided insights into the design and implementation of other conservation programs that use economic incentives for the promotion of environmental conservation and provision of environmental services. The significance of WRP to conservation also is large. Together with CRP, WRP is one of the chief conservation programs in the United States. It has been in place nearly as long as CRP and has helped protect two million acres of wetlands. Both CRP and WRP have evolved over time, with each new Farm Bill bringing about changes to the programs. These changes have often involved increasing the environmental emphasis of the programs, and this trend seems likely to continue.

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