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CONSERVATION RESERVE PROGRAM

Alternatives Are Available for Managing Environmentally Sensitive Cropland





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**Resources, Community, and
Economic Development Division**

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The Honorable Richard G. Lugar
Chairman
The Honorable Patrick J. Leahy
Ranking Minority Member
Committee on Agriculture, Nutrition,
and Forestry
United States Senate

In response to your request, this report presents an estimate of the amount and location of land enrolled in the Conservation Reserve Program and other environmentally sensitive cropland that should be removed from production for environmental benefits and discusses alternatives for managing this land. This report also presents similar information for Conservation Reserve Program land and other environmentally sensitive cropland that can remain in production.

We are sending copies of this report to the appropriate House and Senate Committees; interested Members of Congress; the Director, Office of Management and Budget; and other interested parties. We will also make copies available to others upon request.

If you or your staff have any questions, I can be reached at (202) 512-5138. Major contributors to this report are listed in appendix V.

A handwritten signature in black ink, reading 'John W. Harman'.

John W. Harman
Director, Food and
Agriculture Issues

Executive Summary

Purpose

If not properly managed, agricultural production on the nation's 382 million cropland acres can adversely affect the quality of water and air, the productivity of soil, and the availability of wildlife habitat. In an effort to reduce these effects by temporarily removing highly erodible cropland from production, the Congress enacted the Conservation Reserve Program (CRP) in 1985. The CRP was also designed to reduce surplus crop production and support farm income. Under the CRP, the U.S. Department of Agriculture (USDA) contracted with farmers to take 36.4 million acres out of production for 10 years in return for rental and cost-share payments of almost \$20 billion through the year 2002. These contracts will begin to expire in 1995, with the contracts for the majority of acres—22 million—expiring in 1996 and 1997.

The Chairman and Ranking Minority Member of the Senate Committee on Agriculture, Nutrition, and Forestry were concerned about the potential adverse environmental impact of crop production on CRP land after contracts expire and on other environmentally sensitive land. In anticipation of the reauthorization of the farm bill in 1995 and the expiration of CRP contracts, the requesters asked GAO to (1) estimate the amount, and identify the location of, CRP land and other cropland that is environmentally sensitive and should be permanently removed from crop production to achieve environmental benefits; (2) identify ways to modify the CRP to more effectively remove this land from production; and (3) identify CRP land and other cropland that is environmentally sensitive but can be protected by conservation practices and stay in production. GAO was also asked to describe ways the federal government can encourage the use of these practices. Although GAO was requested to focus on the CRP's environmental objective, GAO also examined six economic studies that estimate the impact on the program's production control and income support objectives if CRP land returns to production. (See app. III.)

Background

The Congress authorized the CRP and several other conservation programs in the 1985 Food Security Act. The CRP's conservation goals have been focused primarily on soil erosion and water quality. From 1985-90, USDA had enrolled 33.9 million CRP acres concentrated in the Great Plains and Mountain states, where cropland is subject primarily to erosion caused by wind rather than by water. Although both forms of erosion can reduce productivity, water-caused erosion generally results in greater off-site damages. In 1990, the Congress emphasized water quality objectives when it reauthorized the CRP in the Food, Agriculture, Conservation and Trade Act. USDA subsequently enrolled 2.5 million acres concentrated in the Corn

Belt and Lake states, where crop production primarily impairs water quality. In 1995, the CRP will again be considered as part of the farm bill's reauthorization.

Land on which crop production can result in environmental damage is considered environmentally sensitive. To identify cropland that is environmentally sensitive, USDA and environmental group officials agree that five factors should be examined: surface water; groundwater; air; soil; and wildlife habitat. To protect these factors, these officials said that dedicating a portion of a field to create a "buffer zone" between the field and the surrounding area may yield environmental benefits while leaving most of the field available for production. For example, a river adjacent to cropland can be shielded from sediment and chemicals in agricultural runoff by a grass strip next to the river. The rest of the field can then remain in production under conservation practices.

Results in Brief

No comprehensive data exist to precisely identify the amount of CRP land and other cropland that is environmentally sensitive and should be kept out of production. However, GAO's analysis of available data indicates that, depending on the environmental objectives established, less land may need to be removed from production to provide environmental benefits than the 36.4 million acres now enrolled in the CRP. For example, if a buffer-zone approach is used to protect surface water and wetlands, approximately 6 million acres nationwide would need to be removed from production. Available information also suggests that the amount of buffer zone acres needed for groundwater, air, and soil protection would likely be less than that necessary to protect surface water and wetlands. In addition to buffer zones, whole-field enrollments may be desirable to provide habitat for wildlife species that require large blocks of their native landscape.

Three modifications to the CRP could provide longer-term environmental benefits at less cost. First, modifying the CRP to focus more on creating buffer zones, rather than on removing whole fields from production, would reduce federal costs because much less land would be involved. Second, per-acre costs could be reduced if farmers could earn revenue from environmentally compatible uses of CRP land—such as producing hay—in exchange for a lower rental payment. Finally, the CRP could provide more lasting environmental benefits if, instead of 10-year contracts, it provided for the purchase of easements that restrict the use of the land for a longer period, such as 30 years, or even permanently.

Except for buffer zones, most CRP and other environmentally sensitive cropland acres can be in production without seriously harming water, air, and soil quality if farmers use appropriate conservation practices, such as reduced tillage. For those croplands, USDA's programs that require or encourage the use of conservation practices can help ensure that environmental degradation will not return to pre-CRP conditions. In addition, opportunities exist for strengthening the environmental requirements in these programs to further reduce the environmental impacts of crop production. Finally, several recent proposals suggest that environmental benefits can be increased through "green payments"—incentive payments to farmers to adopt conservation practices.

Principal Findings

A Future CRP Could Be Smaller and Cost Less

Depending on the environmental objectives established, a relatively small amount of land—compared to the 36.4 million acres currently in the CRP—may need to be removed from production to protect the environment if farmers use buffer zones and other conservation practices. GAO determined that the amount of buffer zone acres needed to protect surface water and wetlands nationwide would be approximately 6 million acres—about 255,000 CRP acres and about 5.5 million other cropland acres. These buffer zones—100-foot wide grass or tree "filter strips" adjacent to surface water or wetlands that reduce sediment and chemicals in agricultural runoff—would be concentrated in states that primarily experience water erosion, such as the Corn Belt, Lake, Delta, and Appalachian states. According to USDA officials, the amount of buffer zone acres needed to protect groundwater, air, and soil productivity—such as grass plots around public wells or strips of trees next to fields to reduce wind velocity—is probably less than that needed for surface water because conservation practices other than buffer zones can be a more appropriate means to protect these factors.

Although some wildlife species can benefit from buffer zones, others—such as grassland species—would require whole-field enrollments to provide sufficient habitat. Thus, a mix of buffer zones and whole-field enrollments may be appropriate in a future CRP. According to several recent studies, if wildlife habitat becomes a major program objective, the

amount of acreage required for whole-field enrollments could be much greater than the amount required for buffer zones.

Three modifications to the CRP would provide environmental benefits for a longer term and at less cost. First, a future CRP could be more efficient in meeting environmental objectives if it were focused more on creating buffer zones because less land is involved, thus reducing the program's total costs and leaving more cropland in production. Second, the federal cost per acre could also be reduced if USDA were to allow CRP contract holders to generate revenues by using CRP land in ways that do not impair the environment, such as harvesting hay at certain times of the year, in exchange for reduced CRP payments. Finally, the CRP could provide longer-term environmental benefits for about the same cost as current 10-year contracts by purchasing easements, under which landowners would be required to restrict activities on the land for a substantial period, such as 30 or more years.

Production on CRP Land and Other Environmentally Sensitive Cropland Can Be Managed by Appropriate Conservation Practices

The majority of CRP and other cropland acres that are environmentally sensitive can be in crop production and still protect the nation's water, air, and soil resources if farmers use appropriate conservation practices, such as reduced tillage. Most of the acres that are sensitive to surface water and groundwater quality are located in states east of the Missouri River, while most of the acres sensitive to air quality are located in the Great Plains states. Acres that are sensitive to reduced soil productivity are spread more evenly across the United States.

USDA's conservation programs other than the CRP that currently require or encourage the use of conservation practices can help ensure that environmental conditions will not return to the pre-CRP environmental degradation. Strengthening the environmental requirements in these programs could further reduce the environmental impacts of crop production. For example, the conservation compliance program, which requires farmers to implement erosion control plans on highly erodible cropland if they wish to maintain eligibility for benefits under USDA's farm program, may apply to 65 percent of CRP land—about 22 million acres. Moreover, tightening acceptable soil erosion standards in conservation compliance plans could further reduce erosion.

New proposals involving a concept known as green payments could also provide more incentives to use conservation practices. In this concept,

USDA's current price and income support programs would be augmented with incentive payments to farmers for using conservation practices.

Matters for Congressional Consideration

As the Congress debates the reauthorization of the farm bill in 1995 and contemplates the future environmental objectives of the CRP, it could consider modifying the program to (1) focus more on creating buffer zones where appropriate instead of removing whole fields from crop production, (2) allow alternative economic uses of CRP land, and (3) use long-term easements instead of 10-year contracts for any new enrollments in the program.

Agency Comments and GAO's Response

USDA raised three specific issues on a draft of this report: (1) the CRP's multiple objectives, (2) USDA's recent plans to modify the CRP in 1995, and (3) the mix of buffer zones and whole-field enrollments. With respect to the first issue, USDA believed that the report focused exclusively on the environmental objective and did not address the objectives concerning supply control and farm income. GAO's report did consider the CRP's multiple objectives, even though, in accordance with the requesters' primary concern, it focused on the environmental objective. To address the supply control and farm income objectives, GAO summarized six economic studies that estimate the impact on these objectives if CRP land returns to production. (See ch. 3 and app. III.) These studies generally concluded that federal outlays for commodity program payments will increase but will not exceed the current CRP payments. In addition, some studies concluded that adjustments to farm programs, as well as market adjustments, would mitigate the impact of lower farm prices.

With respect to the second issue, USDA believes that its recent plans to modify the CRP in 1995 will address many of the issues discussed in GAO's report. USDA's planned changes are designed to increase the CRP's environmental benefits, and GAO believes that these steps, if implemented, move the program in the right direction. However, the proposed actions will increase environmental benefits only for new CRP enrollments. Current CRP contracts may be extended even if they do not meet criteria for providing higher environmental benefits.

Concerning the final issue, USDA believes that a mix of buffer zones and whole-field enrollments is necessary for a future CRP. Depending on the environmental objectives established, GAO agrees that a mix will be necessary and has added statements to the report to clarify its position.

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USDA's full comments on the draft report and GAO's response are presented in appendix IV.

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Abbreviations

ARP	Acreage Reduction Program
ASCS	Agricultural Stabilization and Conservation Service
CRP	Conservation Reserve Program
EBI	Environmental Benefits Index
ERS	Economic Research Service
FAPRI	Food and Agricultural Policy Research Institute
GAO	General Accounting Office
HUA	hydrologic unit area
NRI	National Resources Inventory
SCS	Soil Conservation Service
SWCS	Soil and Water Conservation Society
USDA	U.S. Department of Agriculture
WRP	Wetlands Reserve Program

Introduction

If not properly managed, agricultural production on the nation's 382 million acres of cropland can adversely affect water and air quality, long-term soil productivity, and the availability of wildlife habitat. The Conservation Reserve Program (CRP), first enacted in 1985, was designed in part to address these problems. Under the CRP, the U.S. Department of Agriculture (USDA) entered into 10- to 15-year voluntary contracts with farmers to remove highly erodible cropland from production and establish a cover crop on it in return for annual federal rental payments. From 1986 to 1992, 36.4 million acres—almost 10 percent of the nation's cropland—were removed from production under 375,000 CRP contracts at an estimated total outlay of \$19.5 billion through 2002.

In October 1995, contracts for the first 2 million acres enrolled in the CRP will expire. Contracts on approximately 22 million additional acres will expire in 1996 and 1997; the remaining contracts will expire by the end of 2002. The prospect of the return of these lands to crop production has raised several concerns, especially the loss of environmental protection afforded by the CRP.

The CRP's Goals Have Evolved

The CRP's goals have changed in response to the nation's environmental concerns. The Congress initially authorized the CRP in the Food Security Act of 1985 and mandated USDA to retire 40 million to 45 million acres of highly erodible cropland from production by 1990 to improve the environment (focusing on reducing soil erosion), reduce excess supplies of commodities, and support farm income. On the basis of these 1985 goals, USDA enrolled nearly 34 million acres by 1990, principally in the Great Plains and Mountain states. These acres are subject primarily to erosion caused by wind rather than by water. Although both forms of erosion can result in reduced agricultural productivity, water-caused erosion generally results in greater off-site water quality, recreation, and wildlife damages.

To improve the environmental benefits achieved by the CRP, the Congress emphasized the program's water quality goals when it reauthorized the CRP in the Food, Agriculture, Conservation and Trade Act of 1990. Consequently, the last 2.5 million acres that were enrolled—between 1990 and 1992—were concentrated in the Corn Belt and Lake states, where cropland is subject primarily to water-caused erosion.

How the CRP Operates

USDA's Agricultural Stabilization and Conservation Service (ASCS) administers the CRP in cooperation with the Department's Soil Conservation Service (SCS) and Extension Service, state forestry agencies, and local soil and water conservation districts. Acres covered in the CRP have to meet certain criteria established in the legislation and through regulation. ASCS held periodic signup periods during which farmers could offer the number of acres they wished to voluntarily enroll in the CRP for a period of 10- to 15-years and their desired rental payment.

CRP Enrollment Criteria

Initially, only highly erodible land that had been planted for 2 of 5 years during a specified period prior to enrollment met the enrollment criteria for this program. Generally, two-thirds of the field had to be highly erodible in order for the whole field to be enrolled. The normal practice was to enroll the entire field instead of just the portion of the field that was highly erodible. Beginning with the sixth signup period in 1988, ASCS expanded enrollment criteria to allow partial-field enrollment of grass or tree strips 66- to 99-feet wide bordering waterways, without regard to erodibility. ASCS also allowed other types of partial-field enrollments, such as public water wellhead areas, beginning with the tenth signup period in 1991. Although USDA allowed some partial-field enrollments, the vast majority of CRP enrollments continued to be whole field enrollments.

In return for keeping land out of production, farmers receive federal rental payments on the CRP acreage and reimbursement for 50 percent of the cost they incur to establish a permanent cover crop, such as grass, on those acres. The rental payment amount is determined by the landowner's "bid"—the amount of money the farmer is willing to accept to retire the land—provided that the bid is within established ASCS payment limits and other enrollment criteria are met.

CRP Bid Process

ASCS has used two different methods to evaluate bids for CRP enrollment. From 1986 to 1990, for nine signups, ASCS evaluated bids using the "maximum acceptable rental rate" method. Under this method, if the farmer's bid was at or below the rate that ASCS established for that area and the land met the enrollment criteria described above, the acreage was enrolled. This approach met with criticism because (1) it did not target a broad range of environmentally sensitive land and (2) after the first few signups, farmers were able to determine the maximum acceptable rental rate and often submitted bids that were more than the land's actual market rental rate but less than USDA's maximum rate for that region.

In 1990, the Congress reauthorized the CRP and directed USDA to give priority to future CRP enrollments in areas where crop production is most likely to impact water quality. This instruction caused ASCS to turn to another method for evaluating bids. ASCS compared all bids in signup periods 10 through 12 (1991 and 1992) to the market rental rate for comparable land in the same region. Bids that were less than or equal to this rate were then evaluated using a measure of environmental benefits developed by USDA known as the Environmental Benefits Index (EBI). This index calculates seven potential environmental and other factors associated with the land on which farmers were offering CRP bids—surface water quality, groundwater quality, soil productivity, conservation compliance assistance, tree planting, Water Quality Initiative areas,¹ and conservation priority areas²—in relation to the federal costs of enrolling that land. Although USDA officials and environmental groups generally support the EBI as an improvement in the CRP enrollment process, they also agree that the EBI could include more environmental benefits, such as air quality and wildlife habitat. USDA is currently considering revisions to the EBI for any future land retirement program.

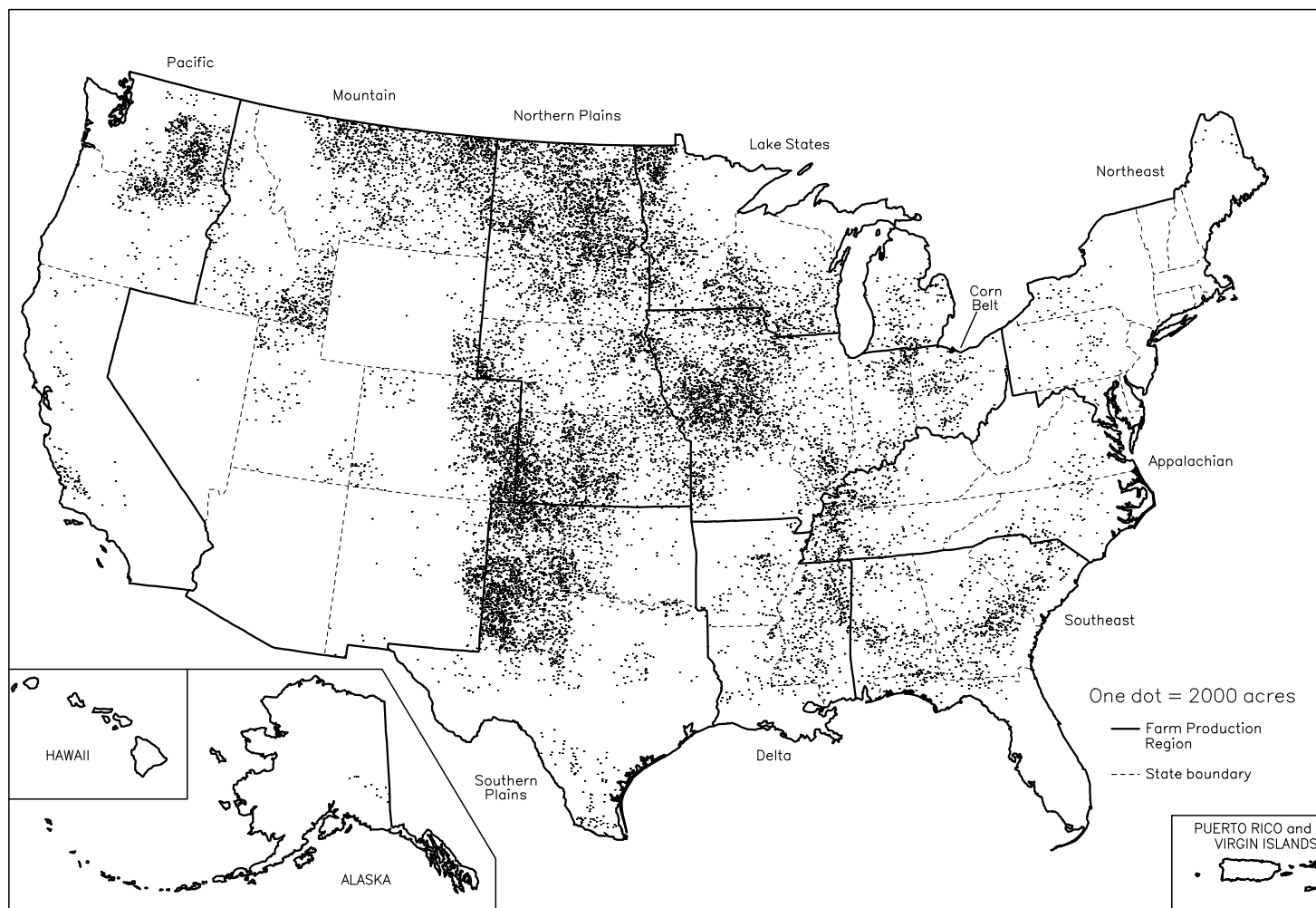
Current Status of the CRP

Currently, 36.4 million acres are enrolled in the CRP. As figure 1.1 shows, most of the CRP acres—22 million—are enrolled in the Great Plains and Mountain states.

¹Water Quality Initiative areas are areas the states have identified as having the highest priority for water quality improvement.

²These areas—the Chesapeake Bay, Great Lakes, and Long Island Sound regions—were established by the 1990 act.

Figure 1.1: Acres Enrolled in the CRP, by State and Major Farm Production Region



Source: USDA.

Table 1.1 shows, by region, the number of acres enrolled in the CRP and rental payments. The 22 million acres in the Great Plains and Mountain states account for 60 percent of all CRP land but only 51 percent of all CRP payments. This difference reflects the generally lower rental rates in these areas.

Table 1.1: Acres Enrolled in the CRP and Rental Payments, by Region

Region	Acres (percent of total CRP acres)	Annual rental payments (percent of total payments) (dollars in millions)	Rental payments per acre
Appalachia	1,158,124 (3)	\$62.5 (3)	\$53.97
Corn Belt	5,603,333 (15)	416.1 (23)	74.26
Delta	1,248,403 (3)	55.3 (3)	44.31
Lake States	3,008,337 (8)	176.5 (10)	58.68
Mountain	6,687,264 (18)	265.3 (15)	39.67
Northeast	226,411 (1)	13.4 (1)	59.29
Northern Plains	9,664,110 (27)	444.5 (25)	46.00
Pacific	1,791,182 (5)	88.8 (5)	42.71
Southeast	1,692,580 (5)	72.3 (4)	42.71
Southern Plains	5,342,989 (15)	214.7 (12)	40.18
Total	36,422,733 (100)	\$1,809.4 (100)	\$49.69

Note: Because of rounding, the percent of total payments figures do not equal 100, and rental payments per acre cannot be precisely calculated using the acre and rental payment information in the table.

Source: USDA's CRP contract data base.

Through 2002, the federal government will have spent an estimated \$19.5 billion for the CRP—approximately \$18.1 billion in rental payments and \$1.4 billion in cost-share payments to establish a cover crop on CRP land. The government's cost for the CRP is partially offset by a reduction in commodity payments that USDA would have otherwise paid on wheat, corn, barley, and other commodity acres enrolled in the CRP. A 1990 GAO report found that estimates of this offset vary depending on the assumptions made, such as the productivity of CRP land and how other acreage set-aside programs might have operated in the absence of the CRP.³ USDA has estimated the offsetting commodity program savings to be about 50 percent of total CRP outlays.

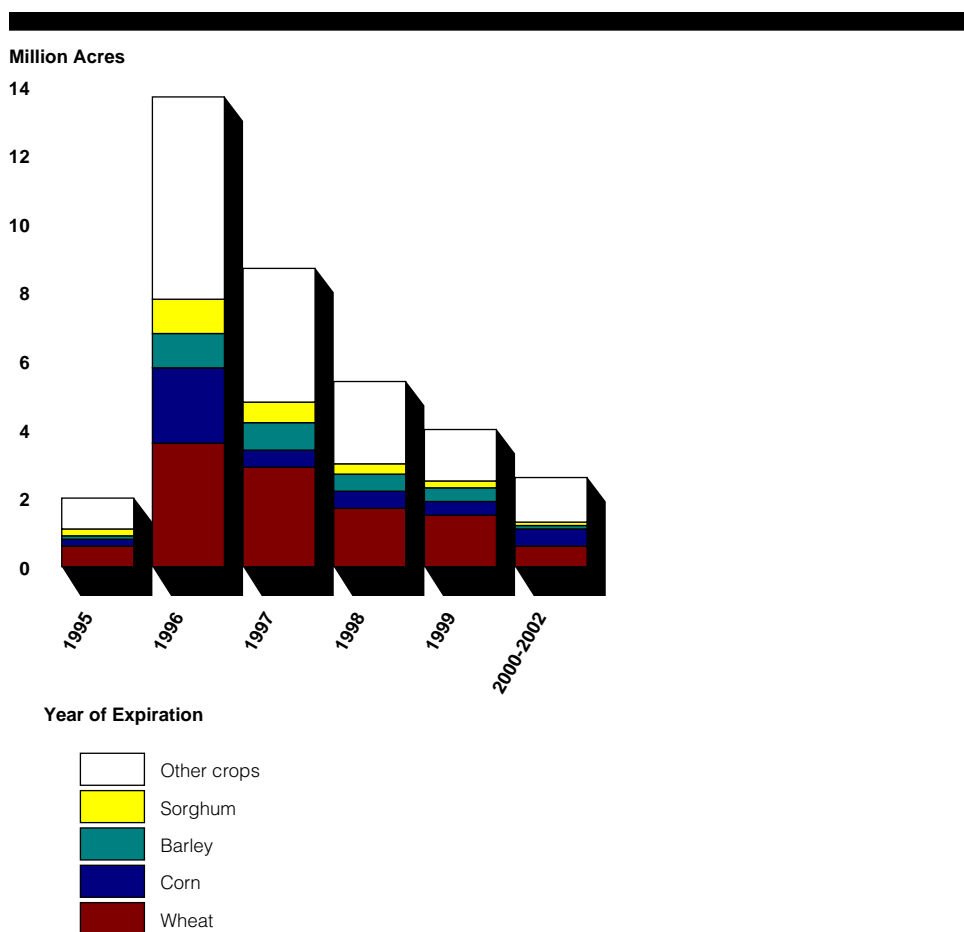
Farmers can choose a variety of cover crops for their CRP acreage. Approximately 82 percent of CRP acres—30 million—have been planted in grass. These acres could be converted to crop production once the contracts expire. Another 2.4 million acres have been planted to trees, about one-half of the CRP's tree-planting goal. These acres are less likely to return to cultivated crop production. The remaining 4 million CRP acres are devoted to other conservation practices, including wildlife ponds and food

³Conservation Reserve Program: Determining Program's Effects on Production Depends on Assumptions (GAO/RCED-90-201, July 25, 1990).

plots, landscape structures such as grassed waterways, filter strips, and windbreaks.

Contracts for the first 2 million acres will expire in October 1995.⁴ However, the majority of CRP acres—22 million—will be eligible to return to production in 1996 and 1997. Figure 1.2 shows the scheduled expiration dates for the contracts by acreage and major commodity.

Figure 1.2: Expiration Dates of CRP Contracts, by Major Commodity



Source: USDA's CRP contract data base.

⁴The Secretary of Agriculture has authorized 1-year contract renewals for these acres so that they will still be enrolled in the CRP when it comes up for reauthorization in the 1995 farm bill.

The CRP Provides Benefits, but GAO Has Questioned Its Cost-Effectiveness

The CRP has reportedly achieved substantial environmental benefits. For example, the Department of the Interior estimated that the CRP will provide a total of \$13.4 billion in environmental benefits over the program's life:⁵

- \$3.1 billion for water quality,
- \$400 million for air quality,
- \$1.3 billion in preserved soil productivity,
- \$3.1 billion for small game hunting,
- \$4.1 billion for nonconsumptive wildlife, and
- \$1.4 billion for waterfowl hunting.

These estimates, however, are based on a 1992 USDA estimate of soil erosion reductions on CRP land of almost 700 million tons per year. More recent USDA estimates derived from National Resources Inventory (NRI) data indicate that soil erosion has been reduced by only one-half of this estimate—about 370 million tons annually.⁶

Our reports have found that the CRP could have been more cost-effective for environmental benefits.⁷ For example, these evaluations point out that the CRP could have provided more environmental benefits for the same amount of federal expenditure if USDA had emphasized the program's water quality goals. These evaluations note that USDA focused primarily on meeting mandated acreage goals that were established for each signup, to the detriment of the program's environmental goals.

Related USDA Programs

In addition to the CRP, more than 20 USDA programs address the environmental impacts of crop production. About one-half of these programs were introduced in 1985 and 1990. Most of these programs are voluntary and provide technical assistance, cost-share payments, and/or incentive payments to encourage conservation practices. Both farmers who receive USDA farm program benefits and those who do not can use these programs. Appendix I lists these programs and describes their basic environmental provisions.

⁵The water quality, air quality, soil productivity, and small game hunting estimates were derived from a 1990 USDA report, *The Conservation Reserve Program: An Economic Assessment*.

⁶The NRI is the federal government's principal source of information on the status, condition, and trends of soil, water, and related resources for nonfederal lands and links this information to CRP land.

⁷*Conservation Reserve Program: Cost-Effectiveness is Uncertain* (GAO/RCED-93-132, Mar. 26, 1993); *Farm Programs: Conservation Reserve Program Could Be Less Costly and More Effective* (GAO/RCED-90-13, Nov. 15, 1989).

Objectives, Scope, and Methodology

Concerned about the potential adverse environmental impact from crop production on expiring CRP acres and on other cropland acres, the Chairman and Ranking Minority Member of the Senate Committee on Agriculture, Nutrition, and Forestry asked us to (1) estimate the amount, and identify the location of, CRP land and other cropland that is environmentally sensitive and should be permanently removed from crop production to achieve environmental benefits; (2) identify ways to modify the CRP to more effectively remove this land from production; and (3) identify CRP land and other cropland that is environmentally sensitive but can be protected by conservation practices and stay in production. We were also asked to describe ways the federal government can encourage the use of these practices.

In response to the first objective, we (1) reviewed literature on agriculture's effect on environmental quality and interviewed officials at USDA, the Environmental Protection Agency, the Fish and Wildlife Service in the Department of the Interior, representatives of farmers' organizations, soil scientists, wildlife biologists, and agricultural economists to identify what factors determine environmental sensitivity, and (2) analyzed USDA's NRI and CRP contract data bases, in cooperation with the SCS, to estimate the amount and identify the location of cropland that met USDA definitions of environmentally sensitive land for each factor. The NRI—a natural resource inventory sample compiled at 5-year intervals—is the federal government's principal source of information on the status, condition, and trends of soil, water, and related resources for nonfederal lands and links this information to CRP land.⁸ Although we did not perform a reliability assessment of the NRI data base, we did review the methods used by SCS to ensure the accuracy and completeness of the data. We determined the data are reliable for our purposes. Appendix II contains confidence intervals for estimates presented in the text of this report and a statement of reliability for confidence intervals for the maps. Confidence intervals for individual hydrologic unit areas for each map have been prepared and are available upon request.

To respond to the second objective, we (1) reviewed relevant literature, including contract-holder surveys; (2) interviewed USDA staff, agricultural economists, soil scientists, and representatives of farm, conservation, environmental, and wildlife organizations; and (3) analyzed the recommendations of a USDA CRP task force.

⁸NRI data were not available for the twelfth CRP enrollment period in which 1.1 million acres were put under CRP contracts.

We also applied the above methodologies to respond to the third objective. We conducted our work at USDA, the Environmental Protection Agency, and the Fish and Wildlife Service headquarters in Washington, D.C.; several USDA state and county offices; conservation and wildlife organizations' offices; several universities; and an on-farm demonstration project. We conducted our work from June 1993 through November 1994 in accordance with generally accepted government auditing standards. We obtained written agency comments on a draft of this report. USDA's comments and our evaluation of them appear in appendix IV.

Using Buffer Zones Can Reduce the Amount of Cropland Needed for Land Retirement

No comprehensive data are available to specifically identify the amount and location of CRP land and other environmentally sensitive cropland that should be removed from production for environmental benefits. However, depending on the environmental objectives established, only a small portion of CRP acres and other cropland may need to be removed from production. This is because the use of “buffer zones,” as well as other conservation practices such as reduced tillage, can mitigate the environmental degradation caused by crop production. Buffer zones are small portions of land that provide a buffer between fields in crop production and the surrounding environment. For example, if buffer zones were used on CRP land and other cropland to protect surface water—one of the five environmental sensitivity factors—only about 6 million acres would need to be removed from crop production. These acres are primarily located in the Corn Belt, Lake, Delta, and Appalachian states. The amount of buffer zone acres needed for groundwater, air, and soil protection would likely be less than the amount necessary for surface water and wetlands.

In addition to buffer zones, some wildlife species require large blocks of their native landscape. Therefore, if wildlife habitat enhancement is established as a major objective of a future CRP, much more land may be necessary than the amount needed for buffer zones.

While the Congress is considering reauthorizing the CRP, it could consider three modifications to the CRP that would provide longer-term environmental benefits at less cost. These modifications are (1) focusing the program more on creating buffer zones rather than on retiring whole fields of cropland; (2) allowing CRP participants to generate revenues by using CRP land in ways that do not impair the environment, such as restricted haying or grazing; and (3) purchasing easements which would restrict activities on the land for a substantial period, such as 30 years, or longer, for approximately the same cost to the federal government as the current 10-year contracts.

Buffer Zones Can Mitigate the Effects of Crop Production on Environmentally Sensitive Land

Land on which crop production can result in significant off-site and on-site environmental damages is considered environmentally sensitive. In identifying cropland that is environmentally sensitive, USDA and environment group officials we spoke with agree that five factors should be examined: surface water; groundwater; air; soil; and wildlife habitat. No comprehensive data are available to examine the effect of crop production on all factors simultaneously. Therefore, we used USDA data to estimate the

amount of environmentally sensitive land nationwide for each factor. These estimates cannot be totaled because they are not mutually exclusive. The same land may be sensitive to several of the factors, such as surface water, groundwater, and wildlife habitat.

Recent research by USDA, the Environmental Protection Agency, and the National Research Council shows that dedicating small portions of fields to create buffer zones—relatively small plots of land that provide a buffer between fields in crop production and the surrounding environment—can provide substantial environmental benefits without removing whole fields from production. Buffer zones include (1) filter strips—typically 100-foot-wide strips of grass and trees around rivers, streams, lakes, and wetlands that border cropland; these strips prevent the majority of agricultural pollutants from reaching the water;¹ (2) plots of grass surrounding public water wellheads to prevent chemicals from leaching into groundwater; (3) strips of trees and bushes that decrease wind velocity to reduce wind erosion; and (4) strips of vegetative cover—“wildlife corridors”—that connect already existing wildlife habitat areas.

To be most effective, buffer zones should be used in tandem with other conservation practices, such as reduced tillage, on cropland in production. For example, the National Research Council Board on Agriculture recently recommended the use of buffer zones as one component in soil and water quality improvement.² In addition, USDA officials agree that removing whole fields from crop production may be justified in some limited cases when buffer zones and other conservation practices are not sufficient to mitigate the environmental effects of crop production on the field.

¹The Environmental Protection Agency and USDA generally recommend 90-foot-wide filter strips for perennial bodies of water. For intermittent streams—smaller streams that do not maintain a continuous flow of water—30-foot-wide strips are generally sufficient. USDA estimates that there are approximately 5.9 million acres appropriate for filter strips adjacent to intermittent streams. However, this estimate is preliminary.

²The other components are conserving and enhancing soil quality; increasing nutrient, pesticide, and irrigation use efficiencies in farming systems; and increasing farming systems’ resistance to erosion and runoff.

Buffer Zones Require That Only a Small Amount of CRP Land and Other Cropland Be Removed From Production

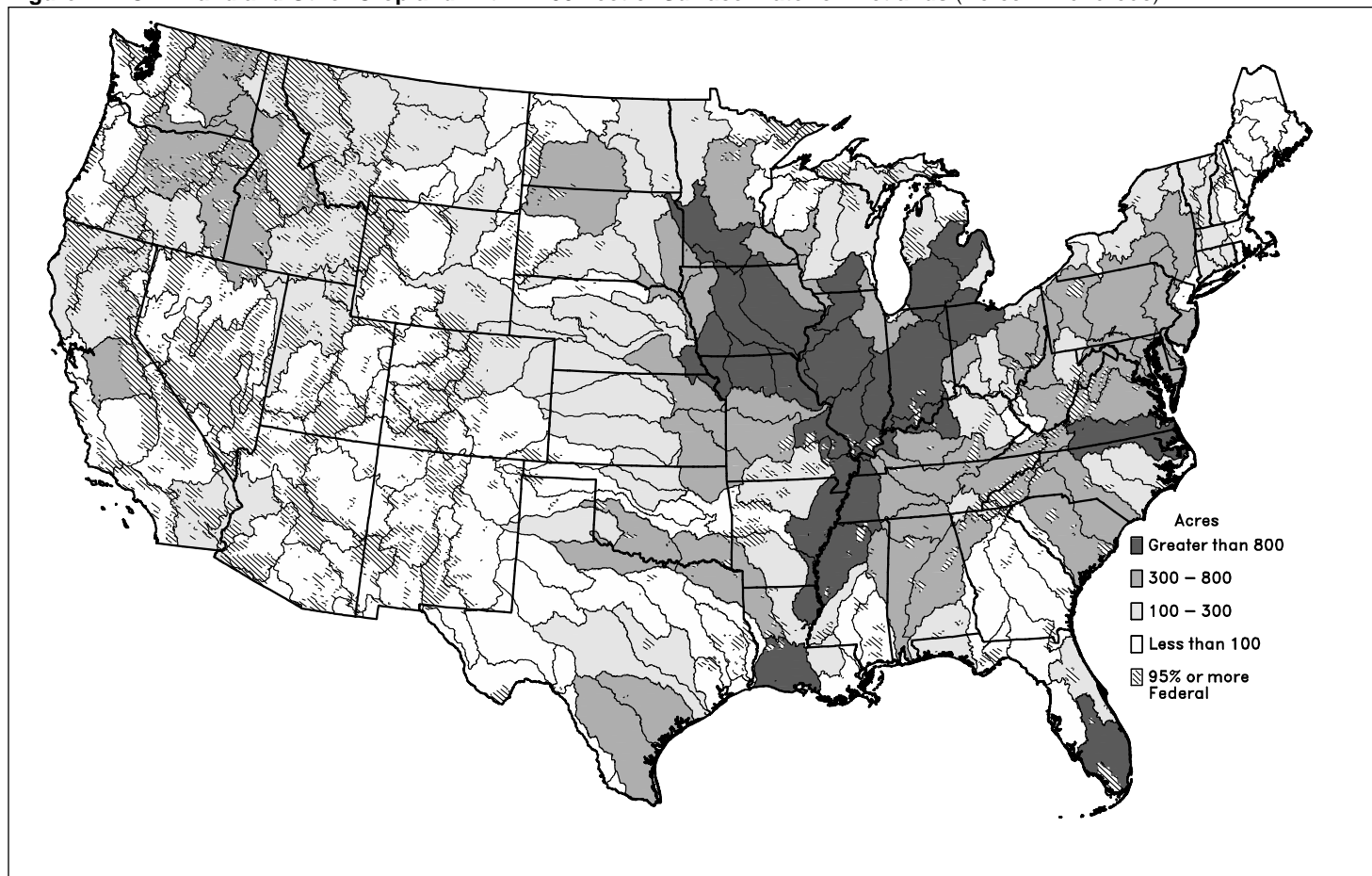
By using the buffer-zone approach to protect surface water and wetlands, only about 6 million acres nationwide—255,000 CRP acres and 5.5 million other cropland acres—would need to be removed from crop production.³ These acres would be placed in filter strips adjacent to surface water and wetlands.

Filter strips can improve the quality of (1) surface water and wetlands by removing sediment and chemicals from agricultural runoff, (2) groundwater by improving the quality of surface water that recharges groundwater aquifers, and (3) wildlife habitat for some species. For example, a USDA study found that filter strips reduce the amount of phosphorous and nitrogen that reaches surface water by 80 percent. In addition, improvements to surface water and wetlands often extend to maintaining groundwater quality because groundwater is frequently replenished by surface water and wetlands. Filter strips also provide habitat for wildlife that live near water and improve water quality for fish and other aquatic species.

Figure 2.1 shows that these 6 million acres are concentrated in the Corn Belt, Lake, Delta, and Appalachian states.

³Filter strips adjacent to wetlands would not be beneficial unless the wetland is also removed from crop production. However, there is not sufficient information available to identify how many wetland acres should be removed from crop production. Two USDA programs—the Wetlands Reserve Program and the swampbuster program—govern the protection of the estimated 10.6 million acres of wetlands on cropland. USDA estimates that approximately 667,000 wetland acres are on CRP land—about 410,000 of these acres are currently enrolled as wetlands.

Figure 2.1: CRP Land and Other Cropland Within 100 Feet of Surface Water or Wetlands (Acres in Hundreds)



Source: USDA 1992 National Resources Inventory.

While the 6 million acres in filter strips to protect surface water and wetlands are relatively easy to identify, buffer zones could also be used to protect groundwater, air quality, and two types of wildlife habitat.⁴ However, while nationwide data are not available to estimate the amount of buffer zone acres necessary to protect the environment from these perspectives, USDA officials and environmental experts agree that the amount of acres needed is likely to be less than the 6 million acres needed

⁴USDA officials and soil scientists we spoke with said that preserving soil productivity—the fifth environmental factor that we identified—can be done more efficiently through applying appropriate conservation practices rather than establishing a buffer zone or taking the whole field out of production.

to protect surface water because buffer zones are more appropriate for protecting surface water than for the other factors. The following describes how buffer zones could be used for the remaining environmental factors:

- Groundwater. Grass buffer zones can protect areas where groundwater approaches the surface, such as where wells have been drilled for a public water supply or where groundwater is replenished with water from the surface through highly porous soils, by filtering water as it leaches from the surface into groundwater aquifers.
- Air. Tree and bush buffer zones—windbreaks—can protect air quality by decreasing wind velocity, thereby reducing wind erosion.
- Wildlife Habitat. Buffer zones can be used to protect the habitat of two types of wildlife. Wildlife that live near or in water would benefit from the buffer zones that improve surface water and wetlands quality. Buffer zones would also provide habitat for wildlife such as pheasants that need small, separate plots of habitat adjacent to cropland. However, buffer zones would not offer sufficient habitat for species that require large, unbroken blocks of their native landscape, such as grassland species like the prairie chicken. These species would require whole-field enrollments to provide sufficient habitat. Therefore, a mix of buffer zones and whole field enrollments may be appropriate for a future CRP to provide benefits for a wider range of wildlife species.

In this connection, three reports issued in February 1995 suggest that, if wildlife habitat enhancement is established as a major goal of a future CRP, the acreage required for whole-field enrollments could be substantial.⁵ For example, the Wildlife Management Institute recently estimated that 27 million acres of grassland are needed in the Great Plains and eastern Mountain states to achieve regional goals of stabilizing and restoring wildlife populations. These acres would provide habitat for game birds and nongame birds. The National Audubon Society report recommends that future CRP enrollments, principally in these regions, should be targeted to areas that have the highest value to wildlife, such as acres adjacent to existing wildlife resource areas. In estimating the number of CRP acres that have the highest value to wildlife, a report by the Center for Agricultural and Rural Development states that very large wildlife benefits would likely result from converting some grassland from cropping uses but that,

⁵How Much Is Enough? A Regional Wildlife Habitat Needs Assessment for the 1995 Farm Bill, Wildlife Management Institute, February 1995. Investing in Wildlife: Multiple Benefits for Agriculture and the American People, The National Audubon Society, February 1995. Renewing CRP: Results From a Study of Alternative Targeting Criteria, Center for Agricultural and Rural Development, February 1995.

beyond some point, enrolling additional grassland is likely to yield significantly lower benefits.

Wildlife biologists have also suggested that the CRP—using buffer zones or whole field land retirement—could be targeted to provide habitat for threatened or endangered species. According to USDA, the habitat for 319 wildlife species is threatened or endangered because of agricultural development. These habitats are concentrated in the Southwest, Florida, southern Appalachia, and the northern Great Plains.

Modifying the CRP Could Provide Environmental Benefits for a Longer Term and at Less Cost

Changes to the CRP—focusing on using buffer zones, allowing alternative economic uses, and purchasing long-term easements restricting certain activities on the land—could make the program less costly to the federal government while providing longer-term environmental benefits.

Buffer Zones Could Provide Environmental Benefits at Less Cost

USDA officials and other agriculture and environment experts have recommended the use of buffer zones as one method to protect the environment while reducing the costs of the CRP. That is, the program could be modified to focus primarily on removing buffer zones from production, rather than whole fields. This program would be smaller—and therefore less costly to the federal government—than the current program. For example, if the approximately 6 million acres identified as appropriate for filter strips to protect surface water and wetlands were enrolled in the CRP at the current average rental rate of \$66 per acre for the regions where this acreage is located, total rental rates would be \$396 million per year rather than \$1.8 billion for the current 36.4 million CRP acres. At the same time, more land would be available for production.

Alternative Economic Uses Would Reduce the CRP's Cost Per Acre

USDA could reduce the federal per-acre cost of the CRP by allowing CRP participants to generate revenues on CRP land in ways that do not impair the environment, such as harvesting hay at certain times of the year in exchange for reduced CRP payments. Currently, CRP participants are only allowed to cut hay or graze cattle on CRP land during emergency periods as declared by the Secretary of Agriculture. A House bill (H.R. 3894) introduced in February 1994 proposed allowing limited uses—haymaking, grazing, producing seeds, and harvesting grass or trees for biomass fuel—in exchange for a 20-percent or greater reduction in current

rental rates. Limitations would be placed on these activities to ensure that environmental problems are minimized. While some of these activities could be conducted on buffer zones, others—such as grazing—would generally require larger plots of land. In addition, USDA officials noted in comments to a draft of this report that allowing alternative economic uses may meet opposition from producer groups because it would negatively impact the livestock and forage markets if a large number of CRP participants choose this option.

This proposal encourages CRP participants to convert their CRP land to uses other than cropping. The Congress is considering offering current contract holders this option to save money on current contracts and to encourage them to experiment with new uses of the land.

Easements Offer Long-Term Protection

Through the purchase of easements from farmers, who agree to restrictions on the use of their land, the government can ensure that land will stay out of production for longer than 10 years. Easements offer a better guarantee of long-term protection because they are an interest in the land itself and typically are for a substantial duration (such as from 10 years to in perpetuity). Because easements are recorded on the title to the land and are binding on subsequent owners, they can ensure that the restrictions on the land will be honored even if the land is sold. In addition, easements can cost less to the government than three 10-year contract renewals.⁶ For example, if the approximately 6 million acres identified as appropriate for filter strips were enrolled in easements at \$620 per acre, total program costs would be \$3.1 billion in 1994 dollars, compared to current program costs of \$18.1 billion for rental payments.⁷ Alternatively, if that land were enrolled in 10-year contracts at the current average rental rate of \$66 per acre for the regions where these acres are primarily located, total program costs for 30 years would be \$5.9 billion in 1994 dollars.⁸

Beginning with the tenth signup period in 1991, CRP participants had the option of either contracts or easements and overwhelmingly opted for

⁶USDA pays farmers for easements with a one-time payment after the easement is filed.

⁷Easement prices can vary between geographic regions and soil types. We chose \$620 per acre because USDA's experience with 30-year or permanent easements in the Wetlands Reserve Program shows that the average cost per acre is approximately \$620.

⁸USDA has found that CRP contract holders in the Great Plains and Mountain states would generally be willing to accept a reduced rental payment but that contract holders in other states would be less likely to accept a reduced rental rate.

contracts because they were reluctant to restrict the use of their land for a long term. Approximately 10,000 acres—less than 0.5 percent of the CRP enrollment in signups 10 through 12—were enrolled as easements. In contrast, USDA offered easements, but not contracts, to farmers through the Wetlands Reserve Program, and farmers more willingly accepted easements. For example, in the Wetlands Reserve Program pilot in 1992, farmers submitted bids for nearly 250,000 acres even though USDA could accept only 50,000 acres. Given the attractiveness of contracts over easements when both are offered, USDA officials believe that easements are viable only if contracts are not offered simultaneously.

Conclusions

Only a small amount of total cropland nationwide may need to be removed from crop production to protect the environment. Environmental degradation on this small amount of cropland can be managed by establishing buffer zones instead of removing entire fields from production. Under the buffer-zone approach, only 6 million acres of cropland would need to be removed from production and placed in buffer zones to protect surface water and wetlands. The buffer-zone approach can also be used to protect groundwater, air, and some wildlife habitat and is more efficient and less costly to the government because it allows more cropland to be in production. However, this approach would probably not provide for the habitat needs of all wildlife species. Therefore, if wildlife habitat enhancement is established as a major objective, a future CRP could require more acreage than that needed for buffer zones. Also, a buffer-zone oriented CRP would tend to put more land back in production and, depending on farm prices, could reduce farm income for CRP participants. Accordingly, this approach would not help achieve the current CRP's supply control and farm income objectives.

In addition, modifying the CRP could reduce federal costs and increase the amount of time the land is protected by allowing CRP participants to engage in limited uses of the CRP land for a reduced federal payment and encouraging the use of long-term easements instead of 10-year contracts.

Matters for Congressional Consideration

As the Congress debates the reauthorization of the farm bill in 1995 and contemplates the future environmental objectives of the CRP, it could consider modifying the CRP to (1) focus more on creating buffer zones where appropriate instead of removing whole fields from crop production, (2) allow alternative economic uses on CRP land, and (3) use long-term easements instead of 10-year contracts for any new CRP enrollments.

Agency Comments and Our Response

In responding to a draft of this report, USDA said that the report focused on the CRP's environmental objective and did not address the CRP's supply control and farm income objectives. We agree that this report focuses on the potential adverse environmental impact of CRP land returning to production because this was the issue the requesters asked us to address. However, we were not silent on other issues. Because we recognized that the CRP was also intended to reduce surplus crop production and support farm income, we summarized the results of six economic studies that estimate the impact of returning CRP land to production on these two objectives. (See ch. 3 and app. III.) These studies generally concluded that federal outlays for commodity program payments will increase but will not exceed current CRP payments. In addition, some studies concluded that farm program adjustments, as well as market adjustments, would mitigate the impact of lower farm prices.

In addition, USDA said that the Secretary of Agriculture's December 1994 announcement of planned CRP modifications will address many of the issues discussed in the report. USDA's actions include modifying and extending existing contracts to target environmentally sensitive land, adjusting rental rates to more accurately reflect local prevailing rental rates, and encouraging the establishment of long-term easements on CRP land. USDA also stated that a future CRP should include a mix of buffer zones and whole-field enrollments to ensure flexibility. We agree that these modifications are steps in the right direction and will improve the environmental benefits and the cost-effectiveness achieved from new CRP enrollments. These steps will not, however, make the program as cost-effective as possible because USDA will still allow current CRP land that could return to crop production without harming the environment to remain in the program. As discussed in chapter 3, most CRP land can return to production with minimal impact on water, air, and soil quality if farmers use appropriate conservation practices.

USDA also made three additional comments related to our matters for congressional consideration. USDA asserted that (1) long-term easements are more costly to the federal government than 10-year contracts, (2) easements will be less attractive to farmers than 10-year contracts, and (3) allowing alternative economic uses on CRP land may meet strong opposition from certain producer groups.

Regarding the first issue, USDA focused on an example of easements in our report and asserted that the easement price was too low. In our draft report, we recognized that easement prices are likely to vary between

geographic regions and soil types. In preparing our cost analysis, we compared expected CRP costs to an estimate of what easement prices might be. Our easement price estimate was based on the Wetlands Reserve Program—the only large-scale USDA land retirement program that purchases both partial and whole-field easements, rather than 10-year contracts. This price—\$620 per acre—is actually higher than the average expected easement price of \$583 quoted in USDA’s comments. Even using the higher price estimate, our example shows that if 6 million CRP acres were enrolled in 30-year easements rather than 3 10-year contracts, total program costs would be \$3.1 billion—53 percent of the cost of contracts.

Regarding the second issue, we found that easements are generally less attractive to farmers when 10-year contracts are offered simultaneously. Not surprisingly, when farmers are given a choice between higher government payments through 10-year contracts rather than lower payments through easements, they choose to receive the higher payments. When only easements are offered, farmer acceptance is much better. For example, our draft report cited the Wetlands Reserve Program pilot in which farmers submitted bids for five times the amount of acreage that was authorized, even though easements were the only option available to farmers.

Concerning the final issue, we agree that some producer groups may oppose allowing alternative economic uses on CRP land because they believe that it would negatively impact the livestock and forage markets if a large number of CRP participants choose this option. However, because of the potential federal cost savings and the sensitivity of this issue, we believe that it deserves congressional consideration during the 1995 farm bill deliberations.

We made minor revisions to our final report to address USDA’s comments. None of the revisions changed the message of the report or our matters for congressional consideration. USDA’s comments and our evaluation of them are included as appendix IV.

Appropriate Conservation Practices for Cropland in Production Can Be Pursued Through Current Programs or New Proposals

Except for buffer zones, most CRP land and other environmentally sensitive cropland can generally be in agricultural production without seriously harming water, air, and soil quality if farmers use appropriate conservation practices such as correct chemical application, reduced tillage, and periodic rotations to cover crops. Our analysis focused on the most environmentally sensitive cropland. In the absence of appropriate conservation practices, production on such land could result in serious environmental degradation.

Appropriate conservation practices can often be achieved through USDA's regulatory and voluntary programs, which cost less per acre to the federal government than the current CRP. With or without modifications, these programs should ensure that cropland in production will not return to pre-CRP conditions of environmental degradation. In addition, new proposals called green payments could be utilized to promote greater use of appropriate conservation practices.

Although this report is focused on CRP's environmental objective, we recognize that if CRP land returns to production it may impact this program's other two objectives—reducing surplus crop production and supporting farm income. Therefore, we examined six economic studies that estimate the impact on these objectives. (See app. III.) Most studies found that, in the short term, CRP acres returning to production may increase crop supplies thereby causing lower farm prices and income. However, the studies also found that these effects are likely to be mitigated by adjustments in federal programs and the market.

Millions of Environmentally Sensitive Acres Can Be Farmed Under Conservation Practices

Millions of CRP acres and other cropland acres nationwide that are environmentally sensitive can be in production with the use of appropriate conservation practices, such as reduced tillage, appropriate chemical application, and periodic rotations to cover crops. The following presents our estimate of the amount and location of these acres for each environmental sensitivity factor and describes USDA-recommended conservation practices to mitigate the impact of agricultural production on these environmentally sensitive acres. These estimates cannot be totaled because they are not mutually exclusive (the same land may be sensitive to several of the five factors).¹

¹The estimates for the groundwater, air, and wildlife environmental factors may include acres that are appropriate for buffer zone practices, as identified in ch. 2, and a limited number of acres in the estimate for each environmental factor may be appropriate for whole field retirement. However, nationwide data are insufficient to identify these acres.

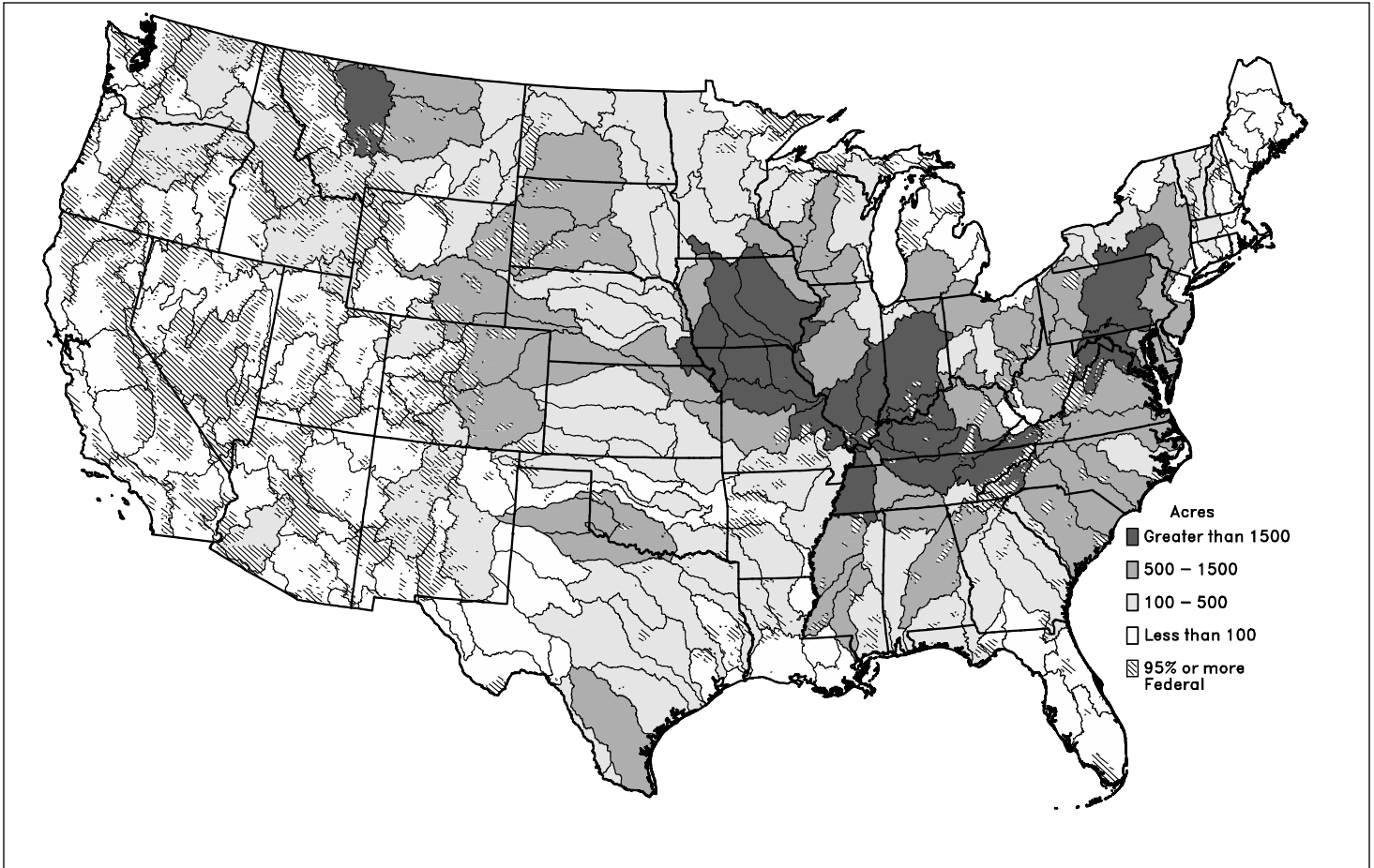
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Surface Water and Wetlands. Approximately 10 million CRP and other cropland acres—primarily in the Corn Belt and Appalachian states—are extremely erodible and between 100 and 500 feet from surface water or wetlands.² (See fig. 3.1.) According to USDA, these acres have the highest potential to contaminate surface water and wetlands through erosion caused by rainwater and the resulting runoff of sediment and chemicals. Approximately 1 million of these acres are currently in the CRP. Conservation practices that can mitigate this erosion include reduced or no tillage, periodic rotation to cover crops, and conservation structures, such as terraces.

²This estimate does not include the 6-million acre estimate of buffer zones for surface water quality presented in ch. 2.

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Figure 3.1: CRP Land and Other Cropland Between 100 and 500 Feet of Surface Water or Wetlands and With a Potential Erosion Rate of Greater Than 40 Tons/Acre/Year (Acres in Hundreds)



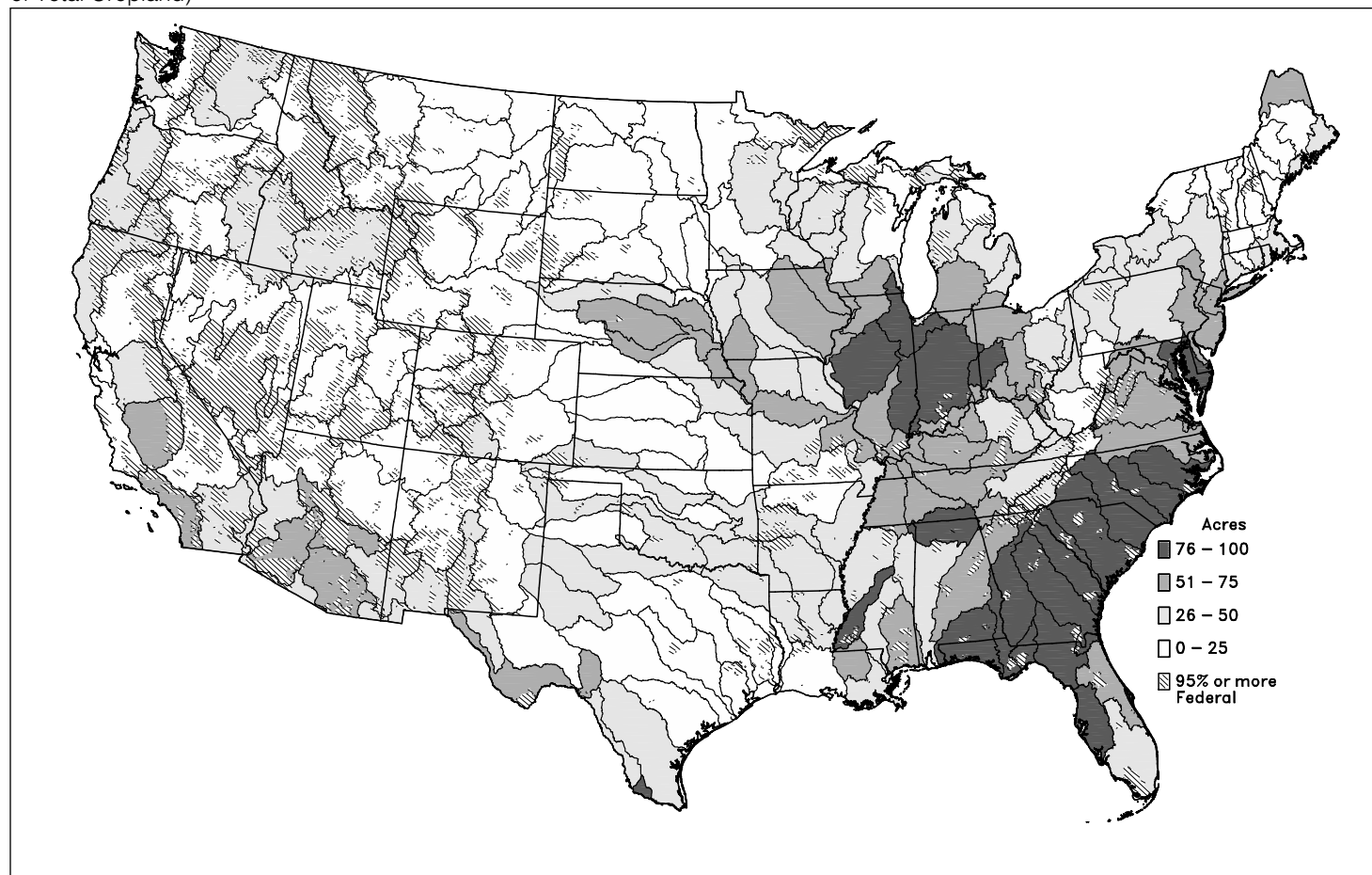
Source: USDA 1992 National Resources Inventory.

Groundwater. Approximately 149 million acres of farmland nationwide—concentrated in the Corn Belt, Lake, and Eastern states—are most likely to contaminate groundwater because of the leaching of agricultural pesticides. (See fig. 3.2.) According to a USDA index of groundwater vulnerability, these acres have the highest potential for contaminating groundwater because they have highly leachable soils and/or are subject to chemical application. Of this national total, approximately 8 million are in the CRP. Proper nutrient, pesticide, and

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herbicide applications and crop rotations can significantly abate the potential for groundwater contamination.

Figure 3.2: CRP Land and Other Cropland Scoring High on the Vulnerability Index for Groundwater Contamination (Percent of Total Cropland)



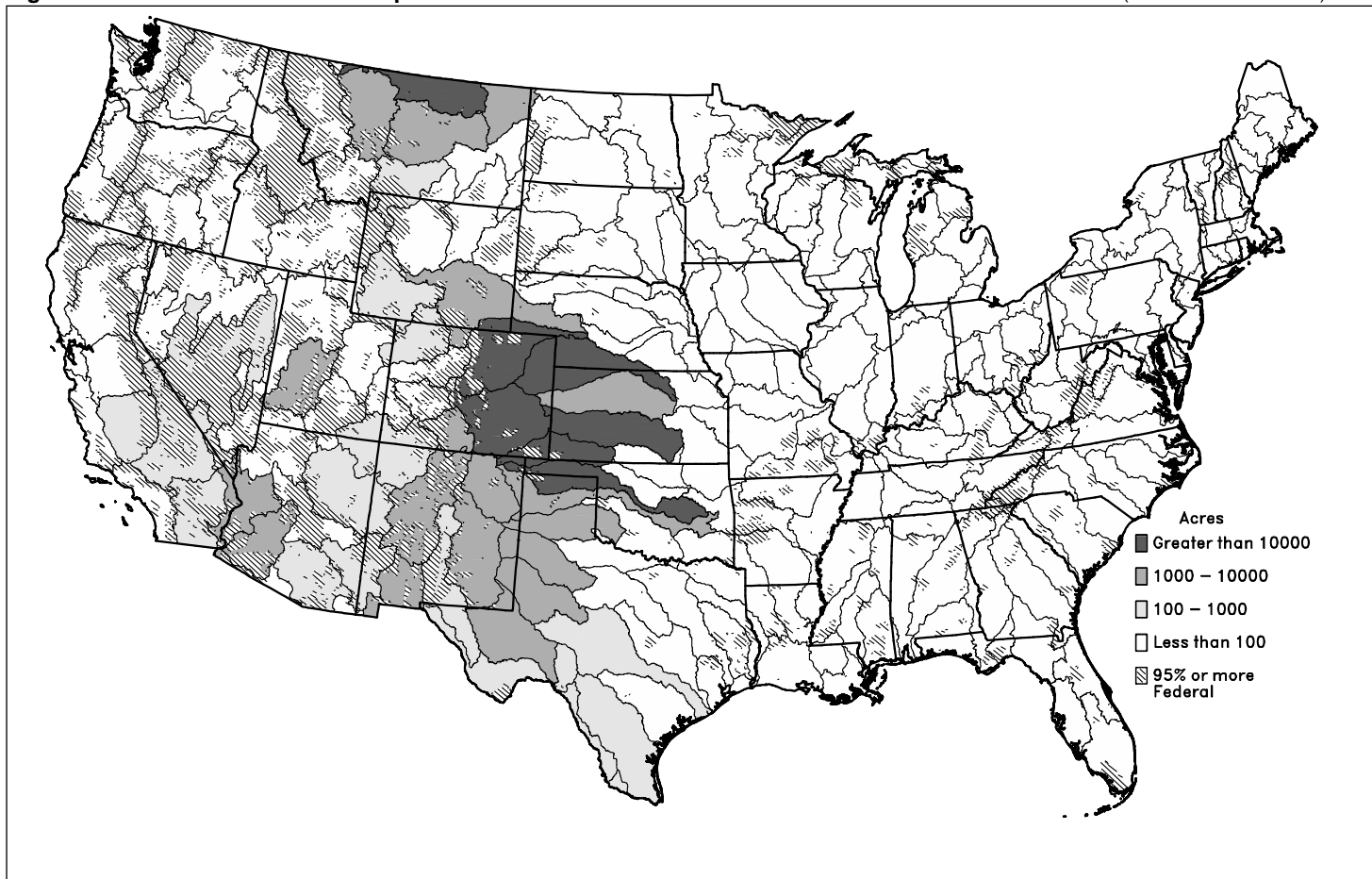
Source: USDA 1982 and 1992 National Resources Inventory.

Air. Approximately 19 million CRP acres and other cropland acres nationwide—concentrated in the Great Plains and Mountain states—have the highest potential to decrease air quality through wind erosion. (See fig. 3.3.) Approximately 6.7 million of these acres are enrolled in the CRP.

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Conservation practices such as crop rotations and reduced or no tillage can reduce the potential for wind erosion.

Figure 3.3: CRP Land and Other Cropland With Potential Wind Erosion of More Than 75 Tons/Acre/Year (Acres in Hundreds)

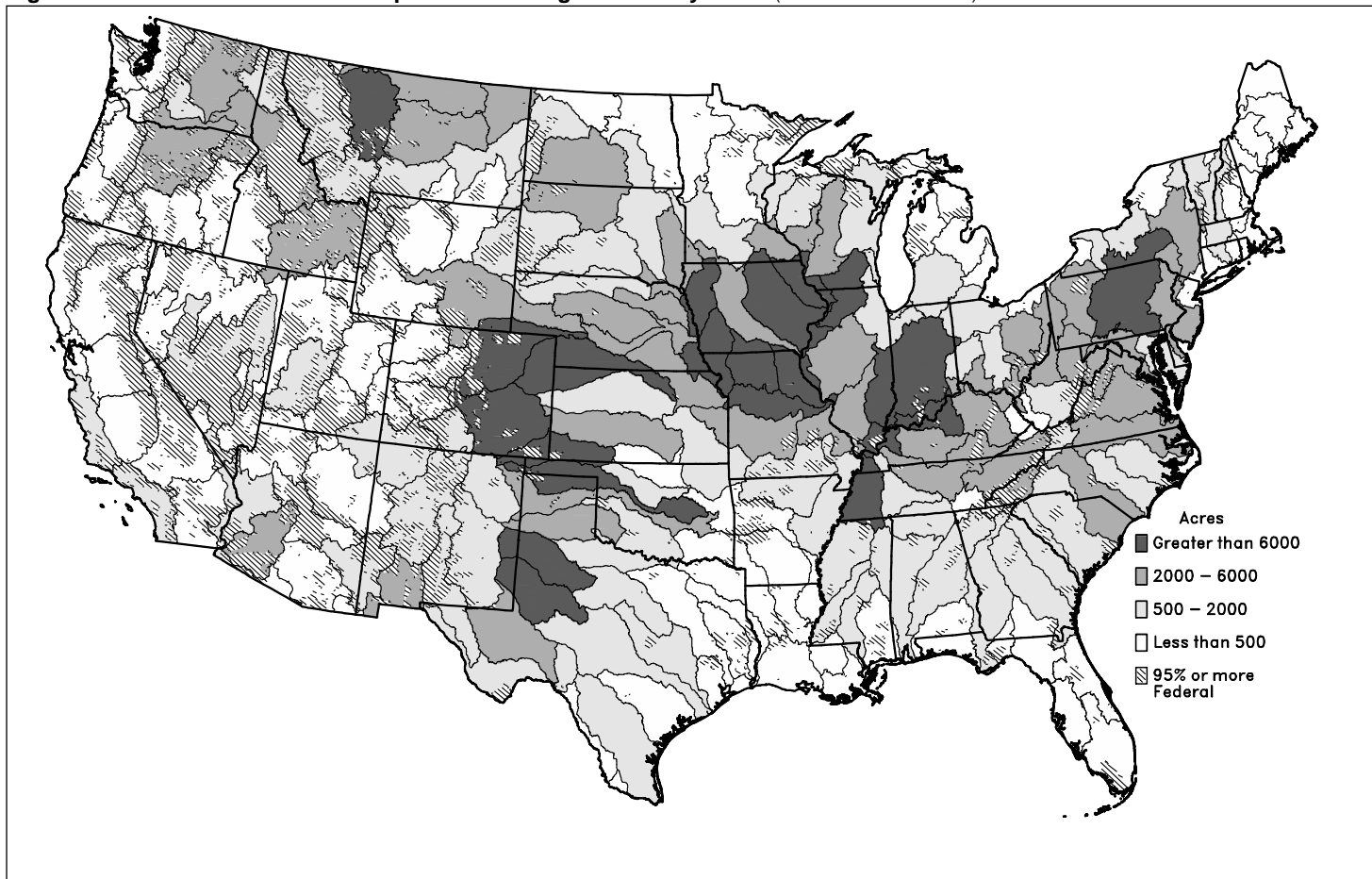


Source: USDA 1992 National Resources Inventory.

Soil. Approximately 50 million CRP acres and other cropland acres are least able to sustain soil productivity, according to USDA's erodibility index. This index, a commonly used measure of soil productivity, compares the amount of potential wind- or water-caused erosion with the amount of erosion the soil will tolerate. (See fig. 3.4.) About 8 million CRP acres are included in this estimate. Conservation practices that help sustain soil

productivity include crop rotations, reduced tillage, and appropriate chemical application.

Figure 3.4: CRP Land and Other Cropland With a High Erodibility Index (Acres in Hundreds)

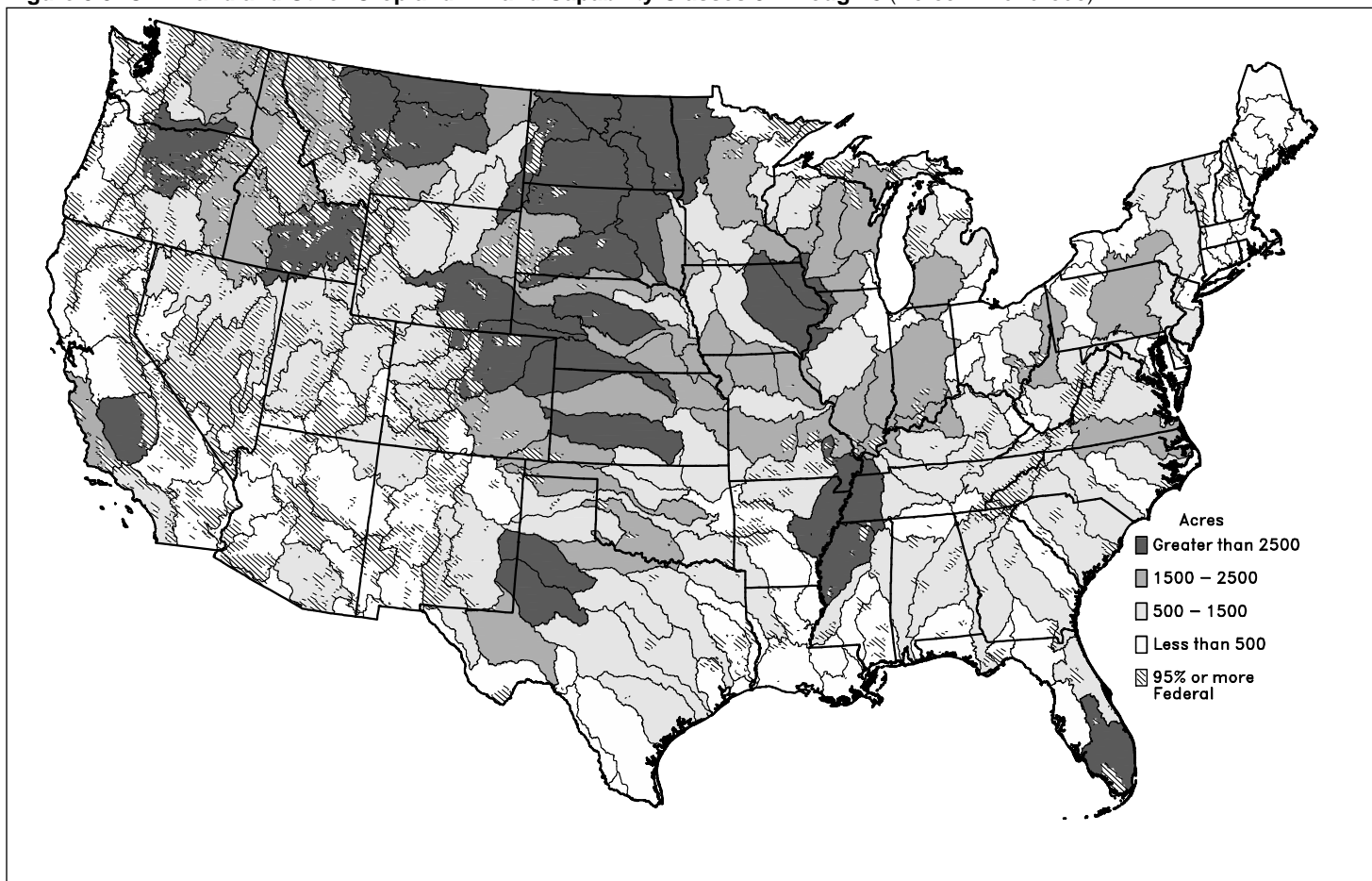


Source: USDA 1992 National Resources Inventory.

A different soil indicator—the land capability class—measures a field's suitability for crop production on a scale of 1 through 8, with 8 being the least suitable for crop production. The land capability class was one of the measures used to determine eligibility for CRP enrollment. Approximately 24 million CRP acres and other cropland acres nationwide, concentrated in the Great Plains and the Midwest, have the least suitable soil for crop

production, according to this index. (See fig. 3.5.) Approximately 4 million of these acres are in the CRP. While proper soil management techniques, including multiyear cover crop rotations, can enable some of these acres to sustain crop production, other acres may be best suited for rangeland or pastureland rather than cropland.

Figure 3.5: CRP Land and Other Cropland in Land Capability Classes 5 Through 8 (Acres in Hundreds)



Source: USDA 1992 National Resources Inventory.

While the erodibility index and the land capability class are traditional USDA measures of soil productivity, soil scientists generally agree that more complete measures of a soil's overall quality are needed. In addition

to productivity, soil quality measures would include texture, density, the ability to absorb chemicals, and the ability to retain water. USDA is currently developing soil quality measures that will examine the effects of long-term crop production on these characteristics.

Wildlife Habitat. Crop production improves the habitat for some wildlife species while adversely affecting others. Therefore, it is difficult to estimate the amount and location of environmentally sensitive cropland for this factor. Wildlife biologists agree that the effects of production on wildlife can be mitigated through the use of conservation practices such as periodic rotations of cover crops, proper cover crop management on yearly set-aside acres, and greater use of multiyear set-aside acres. However, of the five environmental factors, damage to wildlife habitat is the most difficult to mitigate while leaving the land in production.

USDA Programs Foster Conservation Practices and Could Be Strengthened

For those acres requiring conservation practices, USDA conservation programs that currently require or encourage the use of such practices can prevent a return to pre-CRP environmental conditions or could be strengthened to increase environmental benefits. For example, one program—conservation compliance—requires farmers who want to receive USDA program benefits to use appropriate erosion control practices. This program could cover nearly 65 percent of CRP land if farmers wish to return this land to production and receive program benefits. Alternatively, tightening the erosion control standards could further reduce erosion.

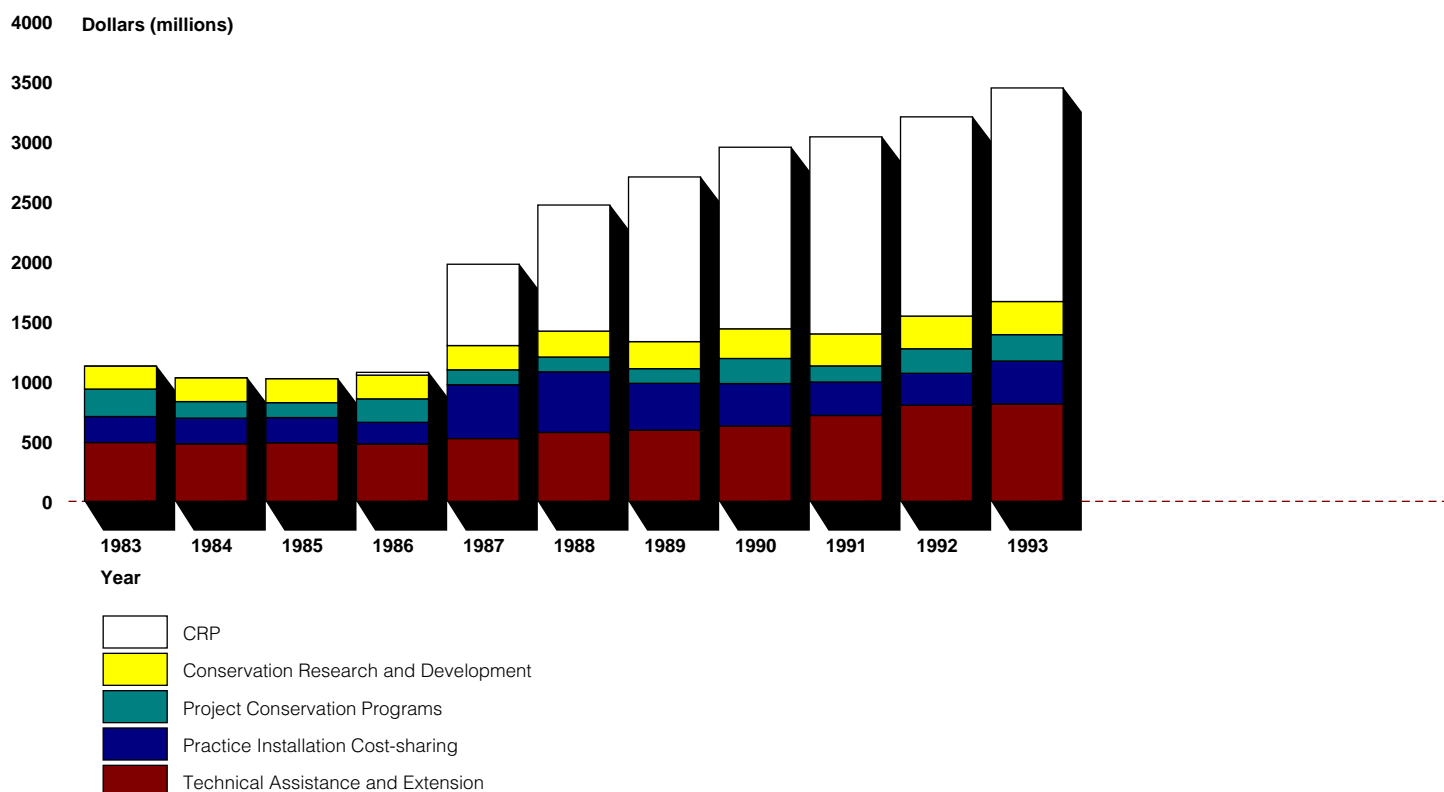
USDA Regulatory and Voluntary Conservation Programs Can Prevent a Return to Pre-CRP Environmental Conditions

USDA's regulatory conservation programs—the conservation compliance program and the swampbuster program—can ensure that environmental degradation from crop production will not return to pre-CRP levels if farmers wish to continue receiving USDA program benefits. The conservation compliance program—enacted in 1985—requires farmers to implement plans to reduce soil erosion on highly erodible cropland. These plans will be required on approximately 22 million CRP acres—65 percent of all CRP acres—if those acres return to crop production. The plans have already been implemented on over 100 million highly erodible acres currently in crop production. The swampbuster program—also enacted in 1985—prevents the conversion of wetlands to new cropland. Approximately 667,000 CRP acres are wetlands and could be subject to swampbuster; another 16 million acres of wetlands on other cropland were also subject to swampbuster as of March 1994.

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In addition, as shown in appendix I, 17 voluntary USDA environmental programs could reduce the impact of returning CRP land to production, at a lower cost per acre than the CRP. These programs generally provide technical assistance, cost-sharing, and/or incentive payments to farmers to establish conservation structures or conservation practices. For example, the Water Quality Incentives Program provides incentive payments to farmers for 3 years to encourage the adoption of water quality management practices. Another program—the Agricultural Conservation Program—provides financial assistance for approved conservation and environmental protection practices. Currently, USDA expenditures for these programs, including expenditures for the conservation compliance and swampbuster programs, are less than expenditures for the CRP. (See fig. 3.6.)

Figure 3.6: USDA Conservation Expenditures, 1983 Through 1993



Source: GAO analysis of USDA's Economic Research Service data.

Strengthening Some Current USDA Programs Could Improve Environmental Benefits

Strengthening the environmental requirements for some current USDA programs could provide greater environmental protection. While examining the entire spectrum of USDA programs could lead to potential improvements, policymakers, USDA officials, and environmental groups have discussed the following modifications:

- **Conservation Compliance.** Tightening the soil erosion tolerance standard in conservation compliance plans could further reduce erosion. For example, some environmental groups and Environmental Protection Agency and USDA officials have suggested that farmers should be required to reduce erosion to "T"—the maximum soil erosion that can occur while maintaining soil productivity. In addition, broadening conservation

compliance plans to more explicitly include water quality impacts could lessen the off-site impact of erosion. For example, a field may not have a soil erosion level high enough to fall under current compliance standards, yet may be polluting a nearby river even with a relatively low erosion level. The field, therefore, could be subject to appropriate erosion control practices.

- Acreage Reduction Program and 0/50/85 Program. Improving cover crop requirements for programs that idle a specified number of base acres annually—Acreage Reduction Program and 0/50/85—could improve environmental benefits on these acres. Currently, a cover crop is not always required on idled acres or, if required, falls short of potential environmental benefits. Requiring improved cover crop standards could reduce erosion and provide wildlife habitat and still leave the idled acreage in good condition for subsequent cropping.

Additionally, encouraging the use of multiyear planning would keep the same acreage idled for more than 1 year, thereby improving environmental benefits on that acreage, particularly for wildlife.

- Base Acres. Allowing farmers with environmentally sensitive base acres—acres for which they are entitled to receive USDA payments based on the amount of crops they produce—to sell base-acre rights to another farmer with less sensitive land could reduce the incentive to farm environmentally sensitive land. For example, under a House bill (H.R. 3894) introduced in February 1994, CRP contract holders would be allowed to offer their CRP base-acre rights for lease or sale to producers for use on cropland in the same or adjacent county in which the land is located in exchange for maintaining the land in permanent cover. However, the USDA CRP task force believes that the administrative costs of such a program would be substantial.

Green Payments Can Encourage Farmers to Make Greater Use of Appropriate Conservation Practices

Recent proposals called green payments—incentives to farmers to adopt appropriate conservation practices—suggest that environmental benefits can be increased above the level of current conservation programs. These incentive payments would augment current price and income support programs that are primarily focused on production objectives.³ While some current conservation programs, such as the Agricultural Conservation Program, could continue to assist farmers in meeting conservation goals, green payments would be available for a broader set of conservation practices, such as fencing off streams from livestock.

For example, under one green payments approach, farmers could maximize federal support for agricultural production by participating in two programs. The first program would be similar to current price and income support programs that primarily pay farmers based on the amount of production. Farmers would be eligible for support payments at 80 to 90 percent of the current level as well as other USDA support programs in exchange for meeting minimum conservation compliance standards. Whether or not they participate in this program, farmers would also be eligible for a separate green payments program that pays farmers if they use additional conservation practices beyond the minimum conservation compliance standards.

While the green payments concept is still in its formative stages, agriculture and environment researchers we spoke with agree that a green payments program should (1) consider the impact of crop production on the whole farm as well as the watershed, (2) allow state and local representatives to identify problems and allocate resources, (3) complement a regulatory approach, and (4) not be linked to participation in other USDA programs.

- Consider the impact on the whole farm and watershed. Whole-farm planning involves identifying pollution sources and developing plans to implement appropriate conservation practices uniquely tailored to fit each farm's topographical conditions and business practices. Furthermore, even with whole-farm planning, addressing conservation problems on a farm-by-farm basis does not sufficiently address the environmental problems within an entire watershed. Through watershed planning, USDA can more efficiently set conservation priorities and target technical and financial assistance to the areas with the greatest need.

³For some types of pollution, so-called green taxes may be an alternative means to achieve environmental protection. For example, Austria has a tax on fertilizers and pesticides that has reduced the use of these materials by an estimated 30 percent over 2 years. See Environmental Protection: Implications of Using Pollution Taxes to Supplement Regulation (GAO/RCED-93-13, Feb. 17, 1993).

- Allow state and local representatives to identify problems and allocate resources. Since environmental problems differ between regions, USDA officials and agriculture and environmental group representatives generally agree that local representatives may be in a better position to identify and set priorities on environmental issues and develop site-specific plans for addressing them.
- Complement a regulatory approach. The voluntary incentives should complement mandated conservation practices. According to a 1993 report by the National Research Council, the voluntary approach is most effective when the conservation practice to be implemented is also profitable to farmers. Regulatory requirements can be used to achieve a threshold level of environmental protection. Voluntary incentive payments can then be used to assist farmers in achieving higher levels of environmental protection.
- Not be linked to participation in other USDA programs. Agricultural and environmental researchers we spoke with said that participation in a green payments program should not be linked to participation in other USDA programs because the most environmentally sensitive land may not be covered by these other programs. Current agricultural support—deficiency payments, crop insurance, disaster payments, or loans—are not necessarily targeted to areas with the greatest environmental problems, according to agriculture and environmental researchers we spoke with. Therefore, conservation efforts that are only linked to current programs may not address critical environmental concerns.

CRP Acres Returning to Production May Impact Farm Prices and Income

We recognize that CRP acreage returning to production may result in surplus crop production and impact farm prices and income. Therefore, we examined several economic studies that estimate this impact. (See app. III.) While the degree of impact depends on such assumptions as agronomic conditions, market conditions, and public policy decisions, most studies found that CRP acres returning to production may lower farm prices and increase federal commodity program payments. However, total government outlays for commodity program payments probably will be less than the level of current CRP payments, resulting in net government savings. Furthermore, some studies concluded that farm program adjustments, as well as market adjustments, would mitigate the impact of lower farm prices.

Conclusions

Except for acres in buffer zones, most CRP acres and other environmentally sensitive cropland can stay in production without significantly impairing the environment if farmers use appropriate conservation practices. USDA's regulatory and voluntary conservation programs, as currently structured or with strengthened environmental objectives, encourage the use of these practices. Therefore, even if the Congress allows the CRP to expire, available programs may prevent a return to the environmental problems that existed before 1985. A green payments approach offers the potential to further emphasize conservation objectives in agricultural production.

Agency Comments and Our Response

In responding to a draft of this report, USDA said that, until the green payments concept is more fully developed, it is impossible to determine whether green payments would be a viable alternative in accomplishing those objectives currently being met by CRP. We included a discussion of green payments because our requesters specifically asked us to provide this information. We agree that this concept needs to be more fully developed, and our report states that the green payments concept is still in its formative stages. This concept is being explored to promote greater use of appropriate conservation practices that could include land retirement but would also include practices for lands in crop production.

Federal Programs Addressing the Impact of Crop Production on the Environment

Conservation compliance provision	Requires farmers with highly erodible cropland to have an approved conservation plan on that land and to fully implement the plan by January 1, 1995, to maintain eligibility for farm program benefits.
Sodbuster provision	Requires farmers who convert highly erodible land to commodity production to have an approved conservation system on that land in order to maintain eligibility for farm program benefits.
Swampbuster provision	Requires farmers who convert wetlands for the production of an agricultural commodity to do so with minimal impact on wetland hydrology and biology to maintain eligibility for farm program benefits.
Wetlands Reserve Program	Provides easement payments and cost sharing to return farmed or converted wetland into a wetland environment.
Water Quality Incentives Projects	Provides annual incentive payments for 3 to 5 years to implement water quality resource management plans.
Integrated Farm Management Program	Assists producers in adopting farm resource management plans to conserve resources and comply with environmental requirements.
Pesticide Recordkeeping Provision	Requires private applicators of restricted-use pesticides to maintain records accessible to state and federal agencies regarding products applied, amount, and date and location of application.
Forest Stewardship Program	Provides grants to state forestry agencies for expanding tree planting and improvement and for providing technical assistance in developing and implementing forest stewardship plans.
Stewardship Incentive Program	Provides cost sharing for enhancing multiple uses of nonindustrial private forest lands.
Agricultural Conservation Program	Provides financial assistance for approved conservation and environmental protection practices.
Conservation Technical Assistance	Provides technical assistance for implementing soil and water conservation and water quality practices.
Extension Service information and advice	Provided on soil conservation and water quality practices in cooperation with state extension services and state and local offices of USDA agencies and conservation districts.
Small Watershed Program	Assists local organizations in flood prevention, watershed protection, and water management.
Great Plains Conservation Program	Provides technical and financial assistance in 10 Great Plains states for conservation treatment on entire operating units.
Resource Conservation and Development Program	Assists multicounty areas in enhancing conservation, water quality, wildlife habitat, recreation, and rural development.
Water Bank Program	Provides annual rental payments for preserving wetlands in important migratory waterfowl nesting, breeding, or feeding areas.

(continued)

Appendix I
Federal Programs Addressing the Impact of
Crop Production on the Environment

Colorado River Salinity Control Program	Provides cost-sharing and technical assistance to improve the management of irrigated lands to reduce salt entering the Colorado River.
Forestry Incentives Program	Provides cost sharing for tree planting and timber improvement.
Emergency Conservation Program	Provides financial assistance to rehabilitate cropland damaged by natural disasters.
Farmers Home Administration loans	Provides loans for soil and water conservation, pollution abatement, and building or improving water systems.

Source: "Will Conservation Policy Change Course?" Agricultural Outlook, Nov. 1993, pp. 38-39.

Confidence Intervals and Statement of Reliability

Nationwide acreage estimates and information displayed on the maps in this report are based on the NRI sample and are therefore subject to sampling error.¹ USDA NRI officials said that the nationwide estimates are statistically reliable and provided confidence intervals for these estimates. (See table II.1.) These officials recommended that acreage estimates at the individual hydrologic unit area (HUA) can be used to identify broad spatial trends but indicated that these individual estimates may not be reliable. Accordingly, we used nationwide NRI estimates that are statistically reliable for all acreage estimates presented in this report. As recommended by USDA, we used estimates at the individual hydrologic unit level to create nationwide maps that indicate geographic areas of environmental sensitivity but did not present the individual acreage estimates in the report.

¹Since a probability sample was used to develop our estimates, each estimate has a measurable precision, or sampling error, which may be expressed as a plus/minus figure. A sampling error indicates how closely we can reproduce from a sample the results that we would obtain if we were to take a complete count of the universe using the same measurement methods. By adding the sampling error to and subtracting it from the estimate, we can develop upper and lower bounds for each estimate. This range is called a confidence interval. Sampling errors and confidence intervals are stated at a certain confidence level—in this case, 95 percent. For example, a confidence interval, at the 95-percent confidence level, means that in 95 out of 100 instances, the sampling procedure we used would produce a confidence interval containing the universe value we are estimating.

Appendix II
Confidence Intervals and Statement of
Reliability

Table II.1: 95-Percent Confidence Intervals for Nationwide Estimates of Environmentally Sensitive Land

Acres in millions			
Type of land	Estimate	Lower bound	Upper bound
U.S. cropland	382.3	380.4	384.2
CRP land and cropland within 100 feet of surface water or wetland	5.8	5.5	6.0
CRP land within 100 feet of surface water or wetland	0.3	0.2	0.3
Cropland within 100 feet of surface water or wetland	5.5	5.3	5.7
CRP land and cropland that is highly erodible and from 101 to 500 feet of surface water or wetland	9.9	9.6	10.2
CRP land that is highly erodible and from 101 to 500 feet of surface water or wetland	0.9	0.8	1.0
Cropland that is highly erodible and from 101 to 500 feet of surface water or wetland	9.0	8.7	9.2
CRP land and cropland with wind-caused erosion of more than 75 tons/acre/year	19.0	18.2	19.7
CRP land with wind-caused erosion of more than 75 tons/acre/year	6.7	6.0	7.3
Cropland with wind-caused erosion of more than 75 tons/acre/year	12.3	11.8	12.8
CRP land and cropland with an erodibility index of 15 or greater	49.9	49.0	50.8
CRP land with an erodibility index of 15 or greater	7.8	7.3	8.3
Cropland with an erodibility index of 15 or greater	42.1	41.3	42.9
CRP land and cropland with a land capability class of 5 through 8	24.3	23.7	25.0
CRP land with a land capability class of 5 through 8	4.2	3.9	4.5
Cropland with a land capability class of 5 through 8	20.1	19.5	20.8

Note: Separate "CRP" and "Cropland" categories may not equal combined "CRP and Cropland" categories due to rounding and statistical variation.

To determine the reliability of information for the 212 hydrologic units, we used data provided by USDA to determine, where possible, the map category based on the upper and lower bounds of the 95-percent confidence interval. When confidence intervals could be computed they frequently indicated that the category placed on the map for the HUA was unreliable. Sometimes we could not determine the reliability of the mapped category because confidence intervals could not be computed.

Each map in this report places an HUA's sample estimate into one of four different categories. For each HUA, we also determined the appropriate

Appendix II
Confidence Intervals and Statement of
Reliability

category based on first the lower and then the upper bound of the 95-percent confidence interval about the sample estimate. When both the upper- and lower-bound estimates indicated the same category as that shown on the map in this report, we deemed the HUA's mapped category to be reliable. When either the upper- or lower-bound estimate indicated a category different from the category on the map, we deemed the mapped category to be unreliable. Table II.2 shows how frequently we deemed the HUA category shown on each map presented in the report to be reliable.

Table II.2: Percent of HUAs Reliably Mapped

Map	Percent Reliable	Percent Unreliable	Percent with Unknown Reliability ^a	Percent Total
1	28	61	11	100
2	36	53	11	100
3	51	48	1	100
4	17	9	74	100
5	63	32	6	100 ^b

^aConfidence intervals could not be computed because no variation was observed in the sample.

^bDoes not add to 100 due to rounding.

Summary of Studies Estimating the Economic Impact of Returning CRP Acres to Production

We examined six economic studies that estimate the impact of CRP acres returning to production. As we noted in 1990,¹ estimates of the CRP's effect on crop production depends on the interactions among assumptions made about agronomic conditions, market conditions, and public policy decisions. Table III.1 summarizes basic features and assumptions of these models, as well as predicted effects on prices, income, and deficiency payments. In general, these studies found that CRP acres returning to production would lower farm prices while estimates of the magnitude of this effect vary widely. With all other things being equal, these lower prices would result in lower farm income, although deficiency payments would be higher. However, one USDA study estimated that total government outlays for deficiency payments would probably be less than the current level of CRP payments, resulting in a net government savings. Some studies concluded, however, that because of other farm program adjustments as well as market adjustments, negative price and income effects would be reduced in the long run.

Expected Economic Effects of CRP Land Returning to Production

Although we did not conduct an empirical economic analysis for this report of CRP land returning to production, we do have some a priori expectations of the price and income effects based on principles of economics and the economic literature. In the short run, if a significant amount of CRP land were to come back, economic theory suggests that in a competitive market, crop prices would decline. The size of the price decline is, however, an empirical matter. According to economic theory, wide price fluctuations over a short period of time can be expected if both supply and demand schedules are highly inelastic, and if either demand or supply changes sharply. In the present context of CRP land returning to production: (1) most agricultural commodities are characterized by inelastic supply and demand in the United States and (2) a considerable amount of CRP land is expected to return; however, proportionally, it may not be that significant compared with total acres in crop production. The exact amount of the price decline, therefore, would depend on how inelastic supply and demand actually were and the size of the supply shift.

As for the effects on producer income, in a competitive market, a price decline in agricultural commodities would suggest a decline in producer income. This result, however, is in the absence of any policy that holds price above equilibrium levels, such as a yearly acreage reduction program. If demand in the relevant range is inelastic, economic theory

¹Conservation Reserve Program: Determining Program's Effects on Production Depends on Assumptions (GAO/RCED-90-201, July 25, 1990).

suggests that price and total revenue vary directly. Therefore, a price decrease would decrease total revenue.

Although revenue from the market would go down, total deficiency payments would increase. On land that received deficiency payments, assuming no change in target prices, these payments would increase on a per-acre basis. Total deficiency payments would also increase since total land that was being paid deficiency payments would increase. However, on land that was not in the program, or was not subject to deficiency payments (such as flex acres), the price decline would translate into a direct decline in net returns. The overall effect would be an empirical matter and would depend on the Acreage Reduction Program (ARP) rate, the amount of land in the 0/85 program, the commodity program participation rate, and the amount of CRP land that actually came back into production.

In the long run, however, we expect that the negative effects on price and income of such an increase in supply would partially adjust. First, more marginal farmland with higher production costs that initially returned to production, may eventually go toward other uses, such as pasture. Second, other producer adjustments may occur, such as more land going into the 0/85 program. Third, there is the possibility that lower-priced agricultural commodities could increase the quantity demanded of exports and actually increase total agricultural income. Last, there may be policy adjustments, such as increases in the yearly acreage set-asides or ARPs to compensate for the decrease in prices.

Economic Studies Examined

Heimlich and Osborn used a nine-region, partial equilibrium optimization model to simulate, for wheat and corn, changes in prices, acreage, production, and in deficiency payments from a hypothetical benchmark constructed for 1995.² This benchmark consisted of a 20-percent flex-acre program, 1990 target prices, and ARP rates of 5 percent. The estimates are also based on differing assumptions for annual ARP requirements and demand conditions. For example, assuming an annual ARP of 5 percent and a demand increase of 7 percent, Heimlich and Osborn estimate that prices would decrease by 2 percent for wheat and increase by 5 percent for corn, while deficiency payments would rise by 7 percent overall.

²Heimlich, Ralph E., and C. Tim Osborn. "After the Conservation Reserve Program: Macroeconomics and Post-Contract Program Design." A Task Force Report to the Great Plains Agricultural Council, Rapid City, South Dakota, June 1993.

In contrast, Taylor and others used a large-scale econometric simulation model, AGSIM, to predict changes in price and income for 1997 to 2000, 2001 to 2004, and 2005 to 2008.³ The authors estimated these changes for all major commodities and livestock sectors under three different CRP alternatives. For these estimates, the authors assumed the acreage reduction rates and target prices established in the 1990 farm bill, the estimates of percentages of CRP returning to production developed by Osborn,⁴ a 3-percent inflation rate, and decreased farmer participation in commodity programs. For example, assuming Osborn's estimates of CRP land returning to production, the authors estimate that in the short term prices for wheat would decrease by 5 percent while income would decline by \$1.7 billion for all crops. Over the long term, however, wheat prices would decrease by only 0.5 percent and net crop income declines by \$2.5 billion. In the long term, however, consumers would benefit from lower food prices by an estimated \$3 billion annually, according to this study.

Dicks used a supply and demand model for wheat to examine price impacts of returning CRP acreage to production under a tight supply, excess supply, and a "more likely" scenario.⁵ Depending on supply conditions, with all wheat acres returning to production, price could fall by between 17 and 40 percent for the year 1990 with no other program changes. However, in a "more likely" scenario of a highly targeted 10-million acre CRP, a 1-million acre increase in the 0/85 program, and a 10-percent acreage reduction program, Dicks found a price drop of only 5 cents per bushel and a demand increase of 70 million bushels. In this case, farmers' wheat income would increase by about \$100 million annually.

A report by Abel, Daft, and Earley concludes that the expiration of CRP and other programs such as ARP and 0/85 would eventually spread the fixed costs of production across a larger output, lowering the total economic costs of production.⁶ This analysis assumes a discontinuation of ARPs, elimination of 0/85 in grains, and the return to production of land

³Taylor, C. Robert, H. Arlen Smith, James B. Johnson, and Richard T. Clark. "Aggregate Economic Effects of CRP Land Returning to Production." ES93-2. College of Agriculture and Alabama Agricultural Experiment Station, Auburn University, Alabama, September 1993.

⁴Osborn, C. Tim. "The Conservation Reserve Program: Status, Future, and Policy Options." Journal of Soil and Water Conservation, (48,4): 271-78, 1993.

⁵Dicks, Michael R. "What Happens After CRP?" Paper presented at the Southern Regional Outlook Conference, Atlanta, Georgia, September 1993.

⁶Abel, Daft, and Earley. "Large-Scale Land Idling Has Retarded Growth of U.S. Agriculture." Prepared for the National Grain and Feed Foundation, Alexandria, Virginia, May 1994.

capability classes I-III currently in the CRP. The analysis also assumes that income protection and market stabilization programs remain in place. These authors conclude that with a return to production of 38.3 million acres, 19.5 million from currently idled CRP, farm income would increase by \$4 billion by 2002/2003.

USDA's Economic Research Service (ERS) also recently examined the economic impacts of nonrenewal of CRP contracts, using its February 1994 baseline projections and assuming that 63 percent of CRP land would return to production.⁷ These estimates include (1) no other policy changes such as higher ARPs, (2) the government cost of rental payments, (3) the price effects of increased acreage in production, (4) the indirect effects of these price changes, and (5) the effects of higher deficiency payments. ERS estimates that in 2003, when nearly all CRP contracts will have expired, net farm income would be \$1.4 billion, or 3.3 percent, lower. The ERS report also concludes that \$1.3 billion in additional yearly deficiency payments would be offset by a \$1.8-billion reduction in annual CRP payments, resulting in net government savings of about \$500 million per year. The report also notes that government savings would be larger with an assumption of higher ARPs, leading to higher prices and lower deficiency payments.

The Food and Agricultural Policy Research Institute (FAPRI) study examined here started from a situation where all CRP contracts had already expired, and contracts were extended by 50 percent and 100 percent.⁸ The results on ARPs, prices, and income would be different than starting with a situation of 100 percent CRP and then reducing it by 50 percent. Here, it was reasoned that if 50 percent of CRP contracts would be extended, prices would increase from a situation of no CRP, therefore, policy makers would decrease ARPs from the FAPRI baseline of 5 percent to 2.5 percent and eventually to 0 percent in order to mitigate upward price pressure. Also, the study concludes that only a larger CRP, of 50 to 60 percent or greater would actually hold prices high enough for the program to pay for itself through greater deficiency payment savings. This analysis reports an increase in farm income (7-year average) of from \$0.66 billion for the 50-percent extension of CRP to over \$2 billion for the 100-percent extension, for eight major crops.

⁷U.S. Department of Agriculture, Economic Research Service, "Gauging Economic Impacts As CRP Contracts Expire." Agricultural Outlook. September 1994, pp. 20-24.

⁸Food and Agricultural Policy Research Institute. "Effects of Conservation Reserve Program Contract Extension on Commodity Program Costs." CNFAP#17-94, University of Missouri-Columbia, Columbia, Missouri, April 1994.

Appendix III
Summary of Studies Estimating the
Economic Impact of Returning CRP Acres
to Production

We examined other studies that looked at additional economic effects from a return to production of CRP land, such as effects on agribusiness firms and rural communities. For example, a 1993 report by the Federal Reserve Bank of Kansas City (not among the empirical studies examined in the following matrix) notes that without the CRP, spending in rural communities will shift away from consumer goods to farm supplies and services.⁹ The bank's report also concluded overall that although farm incomes might edge lower, other factors such as global markets, weather, and other larger farm programs would generally have a greater effect than a single program like the CRP. In addition, the ERS report notes that while farm income is expected to be about 3.3 percent lower with CRP expirations, local economies in areas with substantial CRP enrollment might experience significant job and income increases. Nationwide, ERS estimates that CRP acreage coming back into production would provide an additional 94,000 jobs.

Table III.1: CRP Economic Studies Reviewed

Economic studies of CRP future scenarios, author(s)	Heimlich and Osborn 1993	Taylor, et al. 1993	Dicks, 1993	Abel, Daft, & Earley 1994	ERS, USDA	FAPRI, 1994
Type of model	USARM ¹ - 9 region, partial equilibrium Optimization model	AGSIM ² - large-scale econometric simulation model	Supply and Demand model for wheat	Supply and Demand Projections; Economic Multiplier model	USDA's 1994 baseline projection	Large econometric general equilibrium model
CRP scenarios included	Looks at several different amounts of CRP land currently enrolled.	All remains in CRP; Part land returns; All in crop production	Looks at tight supply, excess supply, and most likely scenarios.	Includes 38.3 million idled acres coming back into production - ARPs, 0/85, and 19.5 million CRP acres	Use of land exiting CRP follows 1993 SWCS ³ survey - about 63% to crop production	Looks at commodity program effects of 50 and 100% extensions of CRP contracts.

(continued)

⁹Federal Reserve Bank of Kansas City. "District Agriculture Considers a Future Without the Conservation Reserve Program." Regional Economic Digest. Tenth Federal Reserve District, Third Quarter, 1993.

**Appendix III
Summary of Studies Estimating the
Economic Impact of Returning CRP Acres
to Production**

Economic studies of CRP future scenarios, author(s)	Heimlich and Osborn 1993	Taylor, et al. 1993	Dicks, 1993	Abel, Daft, & Earley 1994	ERS, USDA	FAPRI, 1994
Assumptions	No 0/85; Benchmark assumptions: 1990 target price; 1990 5% ARP; 20% NFA ⁴ . Demand: N.C., 5%↓, 7%↑, 15%↑. ARP %'s: 0% 5%, 25%, 30%	1990 FACTA ⁵ target price & ARP rates; Inflation 3%; Decreased program part. rates; Osborn's data on % of land returning to production.	"Most likely" scenario -uses FAPRI ⁶ 1993 figures; a reauthorized 10 million acre CRP, 1 million acre↑ 0/85, 10% ARP	Applies 1989-91 prices to increased production. No analysis of deficiency payment changes.	Target prices remain current levels; Wheat ARP's 7.5% & corn 2.5% in 2003; Export growth from 3.5% to 4.2%; Includes loss of rental payments.	Baseline ARPs for wheat - 5% corn - 7.5% Baseline - no extension of CRP contracts.
Predicted Effects						
Change in price	Benchmark 5% ARP; no demand change scenario: Wheat: -9% Corn: -5%	Part returns to production: Increased wheat acreage of 7% would decrease price by 5%. Longer run adjustments decrease by 0.5%.	Wheat: 1998- Boundaries: Tight supply -40% Excess supply -17% "Most likely": Price drops by 5¢	N/A ⁷	Lower grain and soybean prices. However, feed prices also lower. Feed prices 5% lower and wheat prices 9% lower in 2003/2004.	50% Extension: Corn: -1.4% to 2% Wheat: -.7% to 2.7% 100% Extension: Corn: 0% to 6% Wheat: 0% to 8.9%
Farm income	Deficiency payment change: Benchmark 5% ARP; no demand change scenario: +21%	Net crop income decreases by an average of \$1.7B over the years 1997-2000. By 2005-2008, net crop income reduced by an average of \$2.5B.	"Most Likely": \$100 million↑	Due to return to production of all 3 programs - increase in net income of \$4 billion over 8 year period for 6 crops.	In 2003, U.S. net farm income is \$1.4 billion or 3.3% lower. Offset by \$400 million to \$500 million in lower feed costs and \$800 million to \$900 million higher deficiency payments.	Farm Income: (7 year average): 0.66B(50%) to 2.01B(100%) change from baseline for 8 major crops.

(Table notes on next page)

Appendix III
Summary of Studies Estimating the
Economic Impact of Returning CRP Acres
to Production

¹U.S. Agricultural Resources Model - a 9-region partial equilibrium optimization model emphasizing government farm programs, regional differences in production, and resource use in agriculture.

²AGSIM is a large scale econometric simulation model of crop and livestock production in the U.S. The model includes linkages to the U.S. macroeconomy and the rest of the world.

³Soil and Water Conservation Society

⁴Normal Flex Acres - the mandatory 15-percent nonpayment acreage base.

⁵Food, Agriculture, Conservation, and Trade Act of 1990

⁶Food and Agriculture Policy Research Institute

⁷Not available

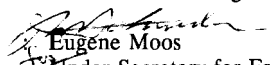
Comments From the U.S. Department of Agriculture



DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20250

JAN 01

TO : John W. Harman
Director
Food and Agriculture Issues, Resources, Community,
and Economic Development Division
General Accounting Office

FROM 
Eugene Moos
Under Secretary for Farm and
Foreign Agricultural Services

SUBJECT : Comments on Draft Report RCED-95-42, Conservation Reserve Program:
Alternatives Are Available for Managing Environmentally Sensitive
Cropland

Thank you for the opportunity to review your draft version of the subject report. The
Department's comments are enclosed.

Enclosure

AN EQUAL OPPORTUNITY EMPLOYER

DEPARTMENT COMMENTS ON
GAO DRAFT REPORT RCED-95-42, DATED DECEMBER 1, 1994, ENTITLED
"CONSERVATION RESERVE PROGRAM: ALTERNATIVES ARE AVAILABLE
FOR MANAGING ENVIRONMENTALLY SENSITIVE CROPLAND"

General Comments

GAO's recommendations address only certain aspects of the CRP and fail to address the CRP as a whole. Recommendations made to improve CRP's capability to improve water quality, for example, undermine certain aspects of CRP's ability to improve wildlife habitat. Similarly, GAO's recommendations geared toward minimizing program costs negate the CRP's objectives of reducing surplus crop production and supporting farm income. In addition, many of the alternatives proposed by GAO are based on assumptions that, although useful to clarify the stated position, were not clearly supported by the data presented.

The Department has estimated reductions of soil erosion on CRP land of almost 700 million tons per year. On page 18 of its report, however, GAO cites a more recent USDA estimate of only 370 million tons per year. It should be noted that the latter figure is based on the National Resources Inventory (NRI), which is calculated differently and used for different purposes than USDA's estimates of soil erosion. Specifically, the NRI is a "snapshot" of actual land conditions at one point in time, and is used to analyze resource trends. USDA's CRP estimate is a projection based on the land's cropping history for the five years immediately preceding CRP enrollment. The NRI used in GAO's report compared land conditions in 1982 to those in 1992. This figure did not take into account acreage enrolled during the twelfth signup period, nor did it fully reflect reductions in soil erosion realized by the tenth and eleventh signup periods, for which conservation practices had not been fully established. The Department maintains that the estimated soil erosion reduction of 700 million tons per year is a more accurate figure and should be used in this report as a gauge of CRP's success.

On December 14, the Secretary announced several actions that, subject to the availability of appropriated funds, the Department will take beginning in Calendar Year 1995 to maintain CRP enrollments and further enhance environmental and conservation benefits. These actions, which include modifying and extending existing contracts to target environmentally sensitive land, adjusting rental rates to more accurately reflect local prevailing rental rates, and encouraging the establishment of long-term easements on CRP land, will accomplish many of the objectives recommended by GAO.

Department Comments on GAO Report RCED-95-42

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Use of Buffer Zones

The Department agrees with GAO that buffer zones may be the most cost-effective form of land retirement for improving surface water quality on cropland. We are less convinced, however, that buffer zones are consistently more cost-effective than whole-field enrollments with respect to all objectives of the CRP. Approximately two-thirds of the current CRP acreage was previously subject to wind erosion, which buffer zones do not alleviate. Moreover, it is the opinion of many in the wildlife community that upland whole-field enrollments are superior to buffer zones as habitat for migratory waterfowl and other grassland wildlife species due to higher rates of predation experienced in buffer zones. Whole-field enrollments may also be the best form of land retirement for other potential program goals such as commodity supply control and farm income support. Therefore, we would conclude that the appropriate mix of buffer area and whole-field enrollments, as well as the size of any future land retirement programs, needs to be based on the goals that may be set for the program. If it is determined that improving surface water quality is the primary objective of a future CRP, then the program should actively target buffer strips and a relatively small program would be warranted. However, if wildlife habitat and the prevention of wind erosion are also priorities, then whole-field enrollments should also be allowed for that purpose, and the size of the program would be correspondingly larger.

Buffer zones, filter strips, grassed waterways, and windbreaks are among the conservation practices currently authorized under the CRP. These practices are incorporated into the participant's conservation plan for those acres that would derive the most benefit from these types of conservation measures.

Use of Long-Term Easements Instead of 10-Year Contracts for Future Enrollments

On page 29 of its report, GAO provides an example of the cost savings to be realized by establishing long-term easements instead of 10-year contracts. GAO asserts that enrolling 6 million acres of buffer zones under long-term easements would cost only \$3.1 billion, compared to an estimated cost of \$5.9 billion for using 10-year contracts. GAO bases this estimate on the average cost of a permanent easement under USDA's Wetlands Reserve Program (WRP) which implies that the cost of easements and the characteristics and value of the land under the WRP would be similar to that to be used as buffer zones. This assumption is not likely to be valid because most acreage under existing WRP easements is converted or cropped wetlands that are significantly less productive than surrounding croplands. CRP land eligible for filter strips, waterways, and similar practices generally has a value comparable to the surrounding cropland. In addition, it is believed that many of the CRP buffer zone practices promoted by GAO would be used in areas that, due to location, have highly productive soils and high land value.

See comment 5.

See comment 6.

Now on p 26.
See comment 7.

Department Comments on GAO Report RCED-95-42

3

A second reason why easement costs on buffer zones are likely to exceed those from WRP is that buffer zones are restricted to narrow strips of cropland fields along stream courses, while WRP has allowed more flexibility in the size and location of the acreage enrolled. In general, producers are reluctant to lose part of a field, especially when the remainder is awkwardly shaped or too small for production. Only 9 percent of CRP landowners responding to a 1993 Soil and Water Conservation Society (SWCS) survey question regarding permanent easements on land with special practices such as filter strips and grassed waterways indicated that they would be willing to grant such an easement. This is less than half the projected acceptance rate for easements on full parcels. The SWCS's survey indicated that the prices producers would accept for full parcel easements averaged \$583 across the United States but varied from \$199 per acre in the Mountain region to \$973 per acre in the Corn Belt.

See comment 8.

For a short period of time, producers who entered the CRP during the tenth and eleventh enrollment periods for certain conservation practices were required to provide long-term easements; however, less than 1 percent of current CRP contracts have adopted these practices. Generally, landowners were unwilling to limit their options regarding land use for the extensive time period required by the easements especially considering the fact that the restriction would apply to heirs and successors for the term of the easement.

In his December 14 announcement the Secretary announced that participants will be afforded the opportunity to establish long-term easements to ensure the protection of environmentally sensitive land; however, requiring easements on all CRP practices may discourage participation, thereby undermining the program's objectives.

Allowing Alternative Economic Uses of CRP Land

See comment 9.

In theory, allowing limited commercial uses on enrolled land can reduce Government program costs. The viability of this option would depend largely on the types of commercial uses allowed. The non-emergency haying and grazing, used as an example in GAO's report, illustrates this point.

In December 1993 the Department published in the Federal Register an advance notice of proposed rulemaking to solicit comments from the public on the feasibility of allowing non-emergency haying and grazing on CRP land. The proposal met with strong opposition from certain producer groups because it would negatively impact the livestock and forage markets and might, depending on CRP rental rates and land use alternatives, give CRP participants an unfair advantage in obtaining livestock feed. Environmental groups indicated support for the measure only if the practice was limited in scope and frequency. In April 1994, the Department withdrew the advance notice because of the divergence of strongly held opinions.

Department Comments on GAO Report RCED-95-42

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See comment 10.

A 1990 SWCS survey indicated that CRP participants were willing to accept an average 11 percent reduction (\$5 per acre) in their existing CRP rental payments in return for the option of limited haying and grazing. Nearly all the existing CRP contracts, however, cover entire fields averaging 100 acres in size. It is unlikely that producers would be as willing to accept a payment reduction for such uses if a future program is primarily limited to smaller buffer zones. For example, the size of the average CRP filter strip is only 10 acres, on which commercial use is neither expedient nor economically feasible.

See comment 11.

GAO introduces the concept of "green payments" to encourage producers to adopt conservation practices on cropland. Until this concept is more fully developed, it is impossible to determine whether green payments would be a viable alternative in accomplishing those objectives currently being met by the CRP. As noted in Appendix I of GAO's report, there are already a number of Federal programs that address environmental aspects of crop production; whether these could be incorporated into a single "green payment program" or whether green payments should become a separate initiative is not assessed in this response.

Summary

See comment 12.

The CRP has been successful in achieving its objectives of reducing soil erosion, improving water quality, curbing the production of surplus commodities, and fostering wildlife habitats. Much of this success arises from the program's flexibility, which ensures that participants establish those conservation practices that will provide the most benefits for the specific land in question. By design, the CRP easily adapts to fit the needs of specific geographic regions or land conditions. By focusing the CRP on the establishment of buffer zones, we risk overlooking other potentially significant environmental and economic benefits.

It is true that the CRP has evolved since its 1986 inception. The focus has changed from meeting legislatively mandated enrollment levels to the conservation and enhancement of the Nation's soil and water resources. As indicated by the Secretary's December 14 announcement, the Department is dedicated to ensuring that the CRP maintains its efficiency and effectiveness in synthesizing the Nation's crop production and conservation needs.

The following are GAO's comments on the U.S. Department of Agriculture's January 5, 1995, letter.

GAO's Comments

1. USDA refers to our "recommendations." This report does not make recommendations. Instead of recommendations, we raised issues that the Congress should consider when debating the reauthorization of the CRP in the 1995 Farm Bill.

As stated in the objectives, scope, and methodology section of this report, the requesters were primarily concerned about the potential adverse environmental impact of crop production on CRP lands returning to production. Therefore, the primary focus of this report is the CRP's environmental objective. However, because we recognize that the CRP has multiple goals, we also examined six economic studies that estimate the impact on the program's production control and income support objectives if CRP land returns to production. Our summary of these studies is included in chapter 3 and appendix III. While the conclusions depend on assumptions, these studies generally concluded that federal outlays for production control programs will be less than the level of current CRP payments and that farm program and market adjustments can mitigate the impact of lower farm income.

We believe that efforts to improve the CRP's capability to improve water quality through the use of buffer zones can also improve wildlife habitat. In chapter 2, we point out that buffer zones can benefit two types of wildlife—wildlife that live in or near water and wildlife that need small separate plots of habitat adjacent to cropland. However, we also acknowledge that buffer zones would not provide sufficient habitat for a third type of wildlife—species that require large, unbroken blocks of their native landscape. These species would require whole-field land retirement to provide sufficient habitat.

In response to USDA's comments, we added a statement to the matters for consideration to clarify the scope of our report and that buffer zones should be used where appropriate. In addition, we added statements to the executive summary to emphasize the potential for whole-field enrollments for wildlife habitat benefits and that a mix of buffer zones and whole-field enrollments may be appropriate for a future CRP.

2. In preparing this report, we used current information from USDA, the Environmental Protection Agency, the Fish and Wildlife Service in the

Department of the Interior, soil scientists, wildlife biologists, agricultural economists, CRP contract-holder surveys, and representatives of farm, conservation, environmental, and wildlife organizations to conduct our evaluation. We believe the analysis in this report is fully consistent with the information gathered.

3. We presented the two USDA estimates of soil erosion reduction in chapter 1 as background information on the CRP and did not state which one we believe to be more accurate. Both estimates represent significant soil erosion reduction from the CRP. However, USDA may have understated the value of the NRI in its comments. USDA's estimate of 700 million tons is based on the difference in pre-CRP erosion rates and estimates of post-CRP erosion rates that were not verified with a field inspection. In contrast, the NRI estimate of 370 million tons is based on a statistically reliable sample that includes field inspections to record actual erosion rates. The NRI estimate reflects 34 million, or 93 percent, of the CRP's 36.4 million acres.

Furthermore, a 1994 report by the Environmental Working Group, a private environmental organization, questioned USDA's 700 million tons/acre estimate. This organization found that the pre-CRP erosion rates reported by USDA's Natural Resource Conservation Service were significantly higher than actual erosion rates measured under the 1982 and 1987 NRIS.

In response to USDA's comments, we added a statement to clarify that the lower estimate of soil erosion reduction is derived from the NRI.

4. We agree that USDA's announcement of proposed actions to improve the CRP will accomplish many of the objectives we discussed. However, the proposed actions will apply higher environmental criteria only to new CRP enrollments. Current CRP contracts may be extended even if they do not meet these higher criteria.

5. Our report states that buffer zones can be designed to protect environmental factors other than surface water quality. For example, tree and bush "windbreaks" adjacent to cropland can reduce wind velocity and subsequent erosion. Other than windbreaks, researchers at USDA and Texas Tech University told us that conservation practices, such as reduced tillage, can enable most cropland that is subject to wind erosion to remain in production. These practices are a much more cost-effective means of reducing wind erosion—and the subsequent effects on air quality—than

whole-field enrollment in land retirement because they can reduce the effects of wind erosion and are less expensive to the federal government.

As we stated in our draft report, buffer zones may benefit two types of wildlife habitat. We also stated that a third type—habitat for wildlife that require large, unbroken blocks of their native landscape—would require whole-field enrollments. In response to USDA’s comments, we added a statement to the report to emphasize the potential for whole-field enrollments for wildlife habitat benefits.

We agree that the appropriate mix of buffer zone and whole-field enrollments, as well as the size of any future land retirement program, needs to be based on the goals that may be set for the program and have added statements to the report to clarify our position.

6. As we stated in our draft report, filter strips were not eligible for enrollment in the CRP until the sixth signup period in 1988. Other types of buffer zones were not eligible until the tenth signup period in 1991. Consequently, over one-half of the CRP land—22 million acres—was enrolled before filter strips were allowed, and the vast majority—nearly 34 million acres—was enrolled before the entire array of buffer zones was eligible. Currently, there are 53,000 acres of filter strips, 16,000 acres of grassed waterways, and 7,500 acres of field windbreaks enrolled in the CRP.

7. In our draft report, we recognized that easement prices are likely to vary between geographic regions and soil types and chose a conservative average per-acre price estimate based on the Wetlands Reserve Program (WRP)—the only large-scale USDA land retirement program that purchases both partial and whole-field easements, rather than contracts, on cropland. If we used the Soil and Water Conservation Society (SWCS) CRP participant survey as an example of potential easement prices on CRP land (as suggested by USDA) the comparative cost advantage of easements over CRP would be even greater. The average price indicated by CRP participants in that survey was \$583 per acre—\$37 per acre less than the average WRP price used in the example in our draft report. Even using the higher price estimate, our example shows that if 6 million CRP acres were enrolled in 30-year easements rather than 3 10-year contracts, total program costs would be \$3.1 billion—53 percent of the cost of contracts.

There is no conclusive evidence to support USDA’s assertion that producers may be reluctant to grant easements on portions of fields and that

easement prices for buffer zones along streams will be higher than for whole-field easements. On the basis of a 1993 SWCS survey question regarding permanent easements on acres with special practices, such as filter strips and grassed waterways, USDA states that only 9 percent of contract holders indicated that they would be willing to grant such an easement and that this projected acceptance rate is less than half of that for whole fields. However, the SWCS survey question was not limited to contract holders having potential filter strips and grassed waterways. This question was also asked of farmers having potential permanent wildlife habitat, field windbreaks, and shelterbelts. The survey results indicate that contract holders in regions where most of the nation's potential filter strips are located would accept easements at a rate comparable to the acceptance rate for whole fields, ranging from 14 percent in the Corn Belt to 33 percent in the Appalachian states. The survey found that those contract holders who said that they would accept easements on these acres would require an average of \$584 per acre, as compared to \$573 for those who would accept easements on whole fields. In addition, a CRP program official told us that it has not been demonstrated that farmers would require a higher price for partial field enrollments—in some instances the partial field enrollment may be cheaper because it is less valuable to the farmer.

8. In our draft report, we stated that easements are less attractive to farmers than 10-year contracts when both are offered simultaneously, as they were in CRP enrollments. However, the overwhelming farmer response to WRP enrollments—which offered easements exclusively—demonstrates that easements are more attractive when they are the only option. For example, in the WRP pilot in 1992, farmers submitted bids for nearly 250,000 acres, even though USDA could accept only 50,000 acres.

9. We recognize that some producer groups may oppose allowing alternative economic uses on CRP land. In response to USDA's comments, we added a statement to the report to acknowledge this potential opposition.

10. In our draft report, we acknowledged that only some alternative economic uses could be conducted on buffer zones whereas others would require whole-field enrollment to provide sufficient land on which to conduct the activity.

11. We were requested to include information on the green payments concept, even though the concept is not fully developed. Our discussion of green payments is based on current proposals as well as discussions with producer group representatives, environmental group representatives, and two researchers who have conducted extensive work on green payments.

12. We agree that the CRP has achieved many of its objectives, largely because of improvements since 1986. We also agree that the program must be flexible to provide the optimal mix of choices—including both buffer zones and whole field enrollments—for a given parcel of land. However, we also believe that a third option exists for protecting environmentally sensitive cropland and that USDA should recognize that millions of acres of environmentally sensitive cropland do not need to be in land retirement at all but can return to production under appropriate conservation practices.

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