

# Conservation Reserve Program May Be Good for the Environment, Farms, and Rural Communities

*Farmers who participate in the Conservation Reserve Program (a voluntary program that removes highly erodible cropland from production) may be able to supplement their annual government payment by renting out their land to hunters, fishers, birdwatchers, or wildlife photographers. Those recreational activities may boost income and employment in the larger region by raising retail spending in nearby towns. And society still benefits from reduced soil erosion, reduced stream sedimentation, and enhanced wildlife habitat.*

**E**CONOMIC trade-offs between resource-based production activities such as agriculture, forestry, and mining and activities based on environmental quality amenities such as recreation, habitat preservation, and wetlands conservation are increasingly important issues. Expenditures on activities that depend on environmental quality tend to increase with income while expenditures for agricultural, forest, and mineral products do not. As a result, the demand for environmental goods is growing faster than the demand for resource goods in the United States. This differential rate of growth in demand will have important implications for future land-use patterns and environmental restrictions, with some land being permanently removed from its current uses.

The Conservation Reserve Program (CRP) represents an ideal example of this type of trade-off between the production of commodities and amenities. The CRP was established by 1985 farm legislation and extended by 1990 farm legislation (which also established a Wetlands Reserve Program patterned after the CRP). The CRP is a voluntary acreage set-aside program under which farmers are given an annual "rental" payment by the United States Department of Agriculture (USDA) to replace crops with permanent vegetative cover on highly erodible soils for a 10-year period. Crop production on highly erodible soils (and wetlands) leads to environmental damage associated with soil erosion and downstream pollution. Permanent vegetative cover not only reduces environmental damage, but can also lead to improvements in environmen-

tal quality. Improvements in environmental quality can, in turn, lead to new amenity-based activities such as outdoor recreation.

The national objective is to enroll 40-45 million acres in the CRP (including wetlands) by 1995. By mid-1992, about 35 million acres were enrolled in the CRP at an average annual payment of almost \$50 per acre. The average acreage enrolled per contract is about 100 acres, and the annual reduction in soil erosion is about 19 tons per acre. Enrollment in the CRP is concentrated in the Midwest, Southeast, and Mississippi Delta. Average annual CRP payments vary from about \$38 per acre in Wyoming to more than \$81 per acre in Iowa. Figures 1 and 2 and table 1 summarize CRP enrollment data. The spatial disparities in enrollment and payments are due to differences in the location and yield potential of highly erodible soils.

## Economic Impacts on Rural Communities

The CRP does not have explicit economic development objectives for rural communities, although it does limit the number of acres enrolled in any county to 25 percent of total cropland unless a waiver is obtained from the Secretary of Agriculture. This provision is intended to limit possible adverse economic impacts on rural communities.

A legitimate question arises regarding the economic impacts of a program like the CRP on rural communities, States, and the Nation. These impacts may be negative or positive because they include not only the costs associated with reduced crop production and the benefits associated with payments to farmers, but also the benefits associated with economic activity genera-

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ted by the establishment and maintenance of vegetative cover, and activities associated with increased outdoor recreation stimulated by the CRP.

Increases in recreational activity on CRP land are anticipated but, to date, their size is unknown. An important question is whether it is reasonable to expect the CRP's beneficial impacts to offset its negative impacts and leave the rural economy no worse off. The break-even level of beneficial recreational activity would exactly offset the reductions in economic activity resulting from the program itself.

The break-even approach is applicable for States or for larger or smaller regions and for other commodity-amenity trade-offs such as the protection of endangered species or enhancement of water quality at the expense of logging or mining operations.

### CRP-Induced Trade-Offs Between Commodities and Amenities

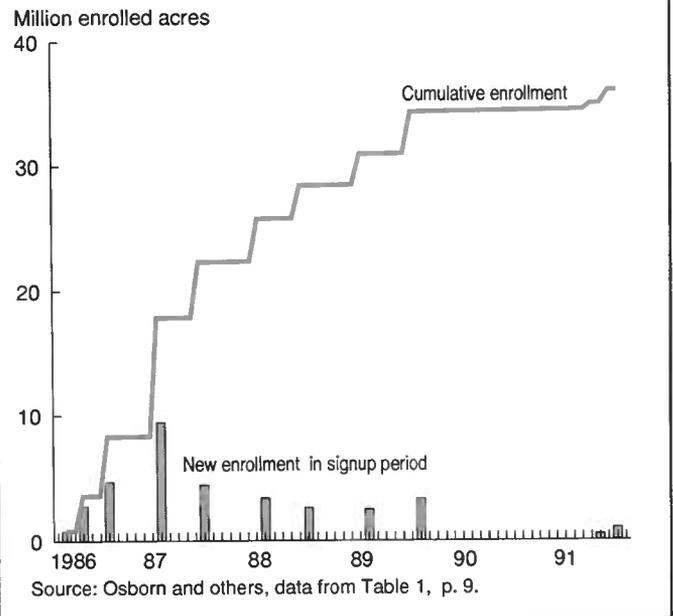
The CRP was designed to provide farmers with additional incentives to substitute vegetative cover for crop production on highly erodible soils. Farmers voluntarily enter into a bidding process administered by the Agricultural Stabilization and Conservation Service (ASCS) of the USDA. They bid for an annual "rental" payment as compensation for income losses from reduced crop production and the maintenance costs of the vegetative cover. If the USDA accepts the bid, farmers are reimbursed for half the expenses of establishing the vegetative cover in addition to annual payments for the duration of the 10-year contract. In principle, farmers should be no worse off economically (and possibly better off) when voluntarily enrolling in the CRP.

Acceptable permanent vegetative cover practices include grasses, trees, and wildlife habitats. Nationally, about 75 percent of the vegetative cover on CRP land is grasses, while trees and wildlife habitats each account for about 7 percent of the cover. The remaining 11 percent includes various combinations of grasses, trees, and wildlife habitats.

From an ecological perspective, any cropland converted to permanent vegetative cover enhances wildlife habitat and, in turn, from an economic perspective enhances the potential for new recreational opportunities. Land retired to the CRP also tends to enhance wildlife habitat and the potential for new recreational opportunities in adjacent meadows, wooded areas, and waterways. Wildlife habitat and recreational potential vary regionally and are determined by the type of vegetative cover, land-use practices on adjacent areas, and demand for recreational use of the land and water

Figure 1  
Acres enrolled in CRP by signup period and cumulatively

The 35 million acres achieved with the 11th signup period leave 5-10 million acres more to be enrolled by 1995 to reach mandated levels



by the local population and visitors to the region. Wildlife habitats usually consist of a mixture of native grasses and herbaceous species that provide wildlife with cover and food. Wildlife species associated with farmland include pheasant, quail, rabbit, and deer, along with other small mammals and ground-nesting birds.

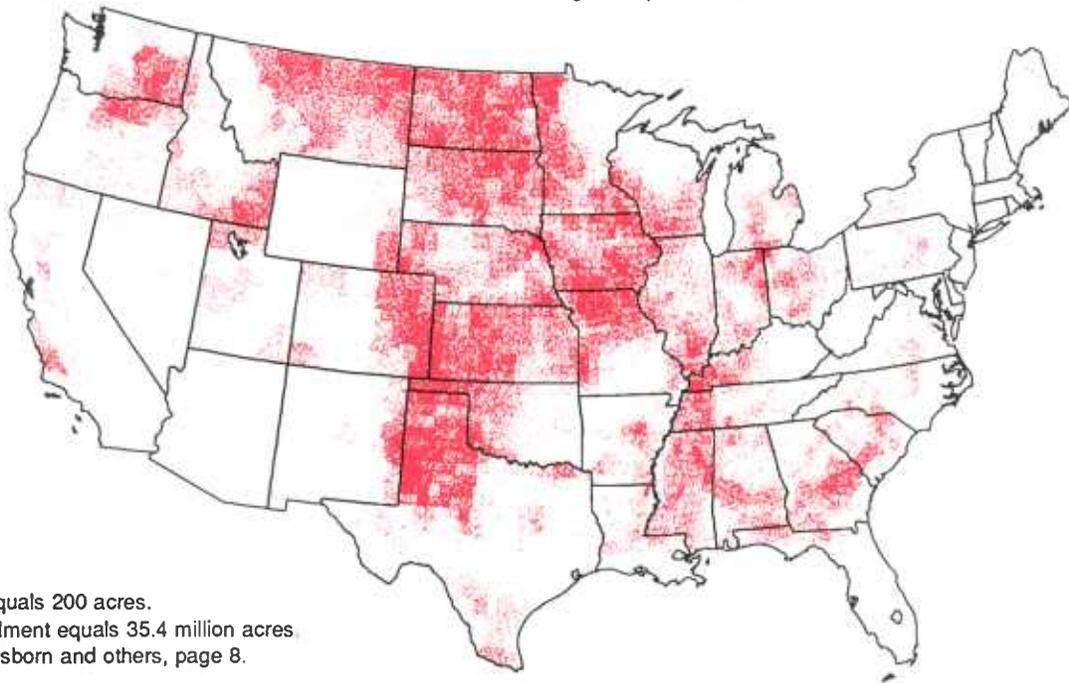
Although harvesting, grazing, or other agricultural (crop or livestock) use of vegetative cover is prohibited during the CRP contract period, recreational activity is permitted on retired CRP land. Allowed recreational activities include hunting and fishing, bird-watching, wildlife photography, hiking, and picnicking. As a result, farmers might be able to supplement their income by renting land for recreational activities or by charging access fees. Renting rooms to vacationers or setting up bed-and-breakfast operations could also increase farmers' incomes. Taking advantage of these new onfarm recreational opportunities would require that farmers provide greater access to their land and homes.

The required vegetative cover can also stimulate new off-farm recreational opportunities. It reduces erosion-related pollution that impairs water-based recreation like swimming, boating, fishing, and waterfowl hunting in public waterways. Where CRP enrollments of erodible cropland are high, the downstream quality of streams, estuaries, lakes, bays, and wetlands should be enhanced. This should, in turn, lead to increases in

Figure 2

**Conservation Reserve Program enrollment, signup periods 1-11**

Acres enrolled is concentrated in the Midwest and down through the panhandles of Oklahoma and Texas.



recreational activity on waterways and surrounding areas. These off-farm environmental quality improvements can enhance existing recreational enterprises and create opportunities for new enterprises.

Studies conducted by the USDA predict a significant increase in wildlife-based and water-based recreational activity resulting from the CRP (see Ribaudo and others and Young and Osborn in *For Additional Reading...*). They estimate that a fully implemented 45-million acre CRP should generate about \$10 billion in natural resource benefits; about \$4 billion from improved wildlife habitat and its effect on hunting and fishing, another \$4 billion from reduced sedimentation damage and related improvements in recreational fishing, and the remaining \$2 billion from increased soil productivity, improved air quality, and improved groundwater quality.

#### Measuring Economic Impacts of the CRP

Economists use two major techniques to analyze the effects of government programs: benefit-cost analysis and economic impact analysis. A primary difference between the two approaches is that nonmonetary benefits and costs are assigned dollar values in benefit-cost analysis, while economic impact analysis includes only monetary changes in income and employment. For an example of a benefit-cost analysis used to estimate the CRP-induced increase in benefits received by recreationists, see Ribaudo and others.

In economic impact analysis of the CRP, the income and employment generated by recreationists spending money in the pursuit of recreational benefits, including the supply of goods and services (for example, food and lodging, guides, automotive services, and fuel), are estimated along with the regional effects of the changes in farm household activities. Total economic impacts of the CRP result from:

- (a) changes in farm expenditures on crop production,
- (b) changes in farm expenditures for the establishment and maintenance of vegetative cover,
- (c) changes (if any) in farm household expenditures on consumption goods and services after receiving CRP payments as compensation for income losses from reduced crop production,
- (d) changes in farm household expenditures on consumption goods and services after receiving payments by recreationists, and
- (e) changes in expenditures by recreationists on goods and services in the community.

Although there is some uncertainty about the dollar values of changes in farm household expenditures (a, b, and c), fairly good estimates can be made. Changes in expenditures caused by recreational activities (d and e), however, are in most cases unknown. One solution is to use a break-even approach to estimate the changes in expenditures on recreational activities that would just offset the negative economic impacts associated with reduced overall farm expenditures.

Table 1

**Conservation Reserve Program enrollment by State, signup periods 1-11**

Iowa has the most contracts and the highest payment per acre, Texas has enrolled the most acres, and New Mexico has the highest average erosion reduction.

State	Contracts	Acres enrolled		Average rental rate per acre per year	Average erosion reduced per acre per year
		Total	Average per contract		
		-----Number-----		Dollars	Tons
United States	356,723	35,395,289	99.2	49.29	19
Alabama	9,662	550,617	57.0	42.41	18
Alaska	40	25,348	633.7	36.62	5
Arkansas	3,196	245,960	77.0	48.86	14
California	508	187,122	368.4	48.60	14
Colorado	6,150	1,968,755	320.1	41.08	25
Connecticut	1	10	10.0	50.00	12
Delaware	30	995	33.2	66.00	8
Florida	2,364	129,321	54.7	41.84	15
Georgia	14,307	689,028	48.2	43.02	13
Hawaii	1	85	85.0	80.00	4
Idaho	3,694	846,132	229.1	45.61	16
Illinois	17,502	734,488	42.0	75.98	20
Indiana	10,447	420,198	40.2	73.04	16
Iowa	33,490	2,107,871	62.9	81.44	18
Kansas	30,536	2,911,466	95.3	52.82	16
Kentucky	7,747	434,219	56.0	59.03	34
Louisiana	1,712	142,213	83.1	43.96	12
Maine	934	38,217	40.9	49.48	7
Maryland	664	19,422	29.3	72.61	9
Massachusetts	5	32	6.4	47.65	7
Michigan	6,175	255,919	41.4	58.78	11
Minnesota	26,555	1,899,389	71.5	55.37	17
Mississippi	12,920	800,071	61.9	42.65	20
Missouri	21,280	1,625,272	76.4	62.92	19
Montana	7,744	2,815,032	363.5	37.38	13
Nebraska	13,993	1,395,751	99.7	55.51	22
Nevada	10	3,123	312.3	40.00	16
New Jersey	28	661	23.6	53.51	16
New Mexico	1,515	482,676	318.6	37.84	42
New York	1,630	60,858	37.3	55.32	12
North Carolina	6,241	145,765	23.4	45.74	16
North Dakota	18,401	3,169,988	172.3	38.38	14
Ohio	7,392	324,499	43.9	69.35	11
Oklahoma	8,575	1,183,199	138.0	42.48	23
Oregon	1,981	528,012	266.5	49.06	11
Pennsylvania	2,570	98,139	38.2	63.28	16
South Carolina	6,544	272,119	41.6	42.47	13
South Dakota	12,329	2,099,595	170.3	41.63	10
Tennessee	10,416	458,236	44.0	51.70	23
Texas	19,033	4,046,981	212.6	39.51	35
Utah	990	233,571	235.9	40.03	16
Vermont	10	193	19.3	50.00	13
Virginia	3,078	77,223	25.1	52.39	17
Washington	4,227	1,017,120	240.6	50.08	14
West Virginia	34	610	17.9	48.78	10
Wisconsin	19,261	692,289	35.9	66.84	13
Wyoming	793	257,022	324.1	38.43	13

Note: Arizona, New Hampshire, and Rhode Island are not listed because they had no farms enrolled during signup periods 1-11.

Source: C. T. Osborn and others, pp. 10-11.

Figure 3  
**Regional economic effects of CRP enrollment**

Farm households reduce their purchases of agricultural supplies needed for the crops they were producing on the land and no longer have the income to spend from the return on those crops, but they gain CRP payments from USDA which they, in turn, spend on supplies needed for the cover vegetation and on personal consumption. Recreationists are a possible source of regional income through payments to farmers for use of the reserve land and to local suppliers of recreation-related supplies and services.

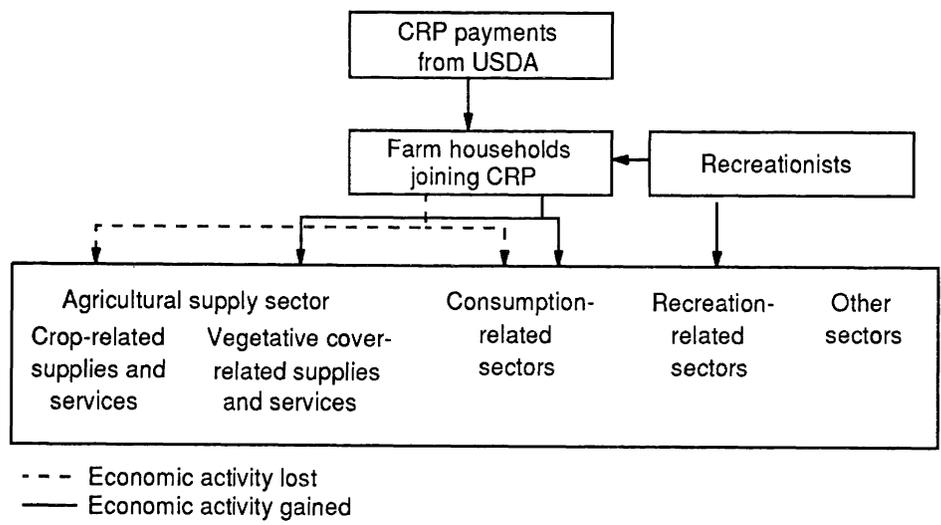


Figure 3 summarizes the flow of economic impacts of the CRP. The dotted lines show economic flows without the CRP (the loss of which are negative economic impacts of the CRP), while the solid lines show the economic flows with the CRP (the CRP's positive impacts). Note losses (gains) to agricultural supply sectors from crops (cover), the offsetting effects on farm household consumption, and the introduction of recreation-based sectors and the CRP payments by USDA.

Input-output models are the most frequently used analytical framework for economic impact analysis. Several economic impact studies of the CRP have been carried out using the Forest Service's IMPACT PLANNING (IMPLAN) input-output model. The model consists of a national technology matrix that allows analysts to measure total economic impacts in terms of income and employment at the county level for 528 agricultural, manufacturing, and service sectors (including both private and public providers of goods and services).

These studies of the CRP, largely because of different approaches, have predicted a wide array of impacts (for examples, see Broomhall and Johnson, Hyberg and others, and Martin and others). Overall, however, most suggest rather small net negative effects on aggregate economic activity at the community level. When recreation, forestry, and other potential uses of the land are considered, rural communities may actually benefit from the program.

### Application of the Break-Even Approach to Virginia

A major concern of the Commonwealth of Virginia is water quality in the Chesapeake Bay, one of the most important ecosystems in the United States. The Chesapeake Bay supports numerous recreational activities, and its adjoining wetlands are important habitats for migratory birds and waterfowl. Cropland contributes about two-fifths of the nitrogen and about one-tenth of the phosphorous nonpoint pollution in the Chesapeake Bay. Virginia has used the federally funded CRP to complement existing State programs designed to improve water quality in the Chesapeake. However, CRP enrollment levels have been relatively low in areas that are major contributors of cropland-based pollution to the Chesapeake Bay. To encourage increased enrollment in targeted areas, Virginia and the USDA have offered additional incentives to farmers, including enrollment bonuses and higher annual payments.

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We used the IMPLAN input-output model to carry out an economic impact analysis of the CRP in Virginia. In applying the break-even approach, all the State's counties were combined into a statewide unit of analysis. Economic impacts were measured for 38 sectors associated with the economic activities described in (a) through (e) on page 27 and in figure 3.

From a statewide perspective, changes in farm household expenditures without recreation activities negatively affect employment and income. These results are consistent with other economic impact studies of the CRP in other States.

As mentioned previously, we assume that farmers expect a neutral or positive economic impact on themselves, otherwise they would not voluntarily enroll in the program. Thus the question to be asked for the break-even analysis is: How much "new spending" on recreational expenditures must be generated to offset the negative region-wide economic impacts of each acre enrolled by farmers in the CRP?

Our model results suggest that, to achieve break-even levels of income and employment for the Virginia economy, CRP-induced environmental quality improvements would have to generate an average of

about \$10 per acre of new spending on recreational activities. Levels of this magnitude for new spending on recreational activities in Virginia seem to be feasible and, in many parts of the State, quite likely.

Alternatively, rental payments from recreationists or increased CRP payments to farmers of about \$12 per acre could also achieve regional break-even levels of employment and income, if these extra payments were spent in the State (and not saved or spent elsewhere). The break-even amounts for recreational activity and payments to farmers differ by \$2 because the economic multiplier is greater for recreational expenditures; a greater percentage of each dollar spent stays in the region to pay for locally produced goods and services.

The break-even analysis does not consider the distributional impacts on individuals or firms because the IMPLAN input-output model does not differentiate between firms within a sector. That is, some individuals and firms in the retail sales sector might lose business from reduced production of crops, whereas other individuals and firms in the retail sales sector might gain from increases in recreational activities.

### Implications and Prospects

From the perspective of farmers contemplating participation in the CRP, the income-generating potential of recreation on their land makes enrollment in the CRP more attractive and may even reduce their minimum acceptable bids for USDA payments. That is, a farmer should be indifferent between earning income from crop production, CRP payments, and rental payments from recreationists. Any combination of CRP payments and rental payments from recreationists that compensates farmers for income lost from reduced crop production should, in theory, lead to a break-even from the farmer's perspective.

From a region-wide perspective, if increased CRP enrollment is accompanied by moderate amounts of increased onfarm and/or off-farm recreational activity, then the impacts of this recreation can offset negative region-wide economic impacts from reductions in crop production. As more and more farmers participate in the CRP, the region-wide economic impacts become an increasingly important issue. This is because farmers' decisions to participate or not participate in the program have important implications for other citizens in the region. This is an issue to be considered by policymakers attempting to achieve environmental quality objectives.

Many farmers are not aware of potential recreation-based benefits from the CRP. This lack of information may be a major obstacle to increased farmer participation in the CRP. To increase enrollment in the CRP,

farmers should be provided with information on the financial and nonfinancial benefits from enhanced recreational opportunities and the appropriate procedures to avail themselves of recreational fees.

In a recent national survey of CRP participants, about half of the respondents indicated that they would be willing to plant a different vegetative cover on their CRP acres to improve wildlife habitat if cost-sharing was provided for these new plantings (see Nowak and others). Cost-sharing could be accomplished with user fees. However, many farmers still have negative attitudes about public access to their land and refuse to permit recreational activity on their land (see Miller and Bromley). Some change in farmers' attitudes may be needed to exploit the CRP's potential for income-generating recreational activity.

Currently, some States have programs that provide farmers with information and financial incentives to improve wildlife habitat and recreational activity (see Hawn and Getman). The Private Lands Program in Montana and the Private Lands Habitat Improvement and CRP Bonus Programs in Tennessee are examples of how farmers are encouraged to choose a vegetative cover that is beneficial to wildlife habitat and are offered financial incentives to take such actions. These programs require the cooperation of ASCS, the U.S. Fish and Wildlife Service, and State soil conservation and wildlife agencies.

### For Additional Reading...

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