

Introduction

The Conservation Reserve Program (CRP) was established by the Food Security Act of 1985 (the 1985 Act) and began enrolling farmland in 1986. Under this voluntary program, the U.S. Department of Agriculture (USDA) establishes contracts with agricultural producers and landowners to retire highly erodible and environmentally sensitive cropland and pasture from production for a period of 10-15 years.¹ Enrolled land is planted to grasses, trees, and other cover, thereby reducing erosion and water pollution, providing other environmental benefits, and reducing the supply of agricultural commodities. CRP rental payments give participants a stable source of revenue and CRP's impact on production increases the market price of commodities for other crop farmers. The program's benefits to the environment, CRP participants, and other crop farmers have made it a recurring focus of subsequent farm program legislation. From its beginning, however, the program's potential effect on farm communities has been a concern.

As with other farmland retirement programs, enrollment in CRP can reduce demand for farm inputs and agricultural marketing services. As land is taken out of production, purchases of farm inputs such as seed, fertilizer, pesticides, herbicides, farm machinery, and labor decline unless cultivation is expanded by an equivalent amount elsewhere (either on new land or through more intensive use of existing cropland). Furthermore, if local agricultural production declines, there is less need for grain elevators, packing and processing facilities, and related transportation and marketing services. While CRP rental payments compensate participants for the losses they incur from idling their land, CRP does not reimburse businesses for associated reductions in demand for farm inputs and services. As a result, if cultivation on nonenrolled land does not increase as CRP land is taken out of production, parts of the local economies of rural counties can be adversely affected. If alternative economic activities (such as hunting, fishing, and outdoor recreation) do not develop as farmland is taken out of production, farm-dependent communities with high CRP enrollment can experience economywide slowdowns. For this reason, enrollment in CRP is normally capped at 25 percent of each county's cropland acreage. Whether the 25-percent cap has been effective at limiting adverse community impacts remains an open question.

The CRP may have other unintended consequences as well. As CRP participants enroll more of their land, their financial dependence on farming declines, allowing them to more easily retire from farming completely. Not only do these "whole-farm" enrollments reduce demand for farm inputs and services, but if the participant chooses to move elsewhere, the local economy is also deprived of the CRP rental payments. There are concerns that the CRP may have spurred a cycle of population decline in some communities, with a drop in the farm population leading to a decline in retail and government services, which encourages still others to leave the community. As population declines, it becomes harder for local retailers to survive and it becomes more expensive (per capita) for local governments to maintain public services such as education, police protection, and infrastructure. While casual observation supports the notion that many of the communities most dependent on CRP rental payments as a source of income are

¹ The primary focus of the CRP is to retire cropland from production. A limited amount of pasture has been enrolled in the program as riparian buffers for water-quality enhancement. Currently, around 250,000 acres of marginal pasture is enrolled in CRP, amounting to less than 1 percent of total enrollment.

losing population, it is not clear whether CRP enrollment is a cause of their decline or merely a symptom.

By providing additional competition for agricultural land, the CRP may also affect the ability of established farmers to expand their operations and of beginning farmers to lease or purchase farmland. Since the program is voluntary, CRP rental rates need to be sufficient to reimburse participants for the losses they would otherwise incur from taking land out of production. And, since environmentally sensitive land targeted by CRP is not necessarily of marginal productivity, CRP can sometimes retire highly productive land, leaving expanding operations and beginning farmers competing for less productive land at rental rates that are higher than would be the case in the program's absence. In areas where CRP participation is high, it has been hypothesized that beginning farmers may have a difficult time becoming established and farm operations that depend heavily on rented land may be disadvantaged.

Implicit in all of these concerns is the notion that CRP enrollment influences individual and market behavior. That is, CRP could depress local economies *if*, in the absence of CRP, more local land would have been farmed. CRP could affect local populations *if*, in the absence of CRP, more farmers and local business owners would have retained residence. But, at least in some cases, it is likely that a farmer's behavioral choices were largely unaffected by the decision to enroll in CRP. Then too, the range of possible choices open to program participants changes with economic circumstances, so the impacts of the CRP when the farm sector and the rural economy are in recession are likely to be different from the program's impacts during an economic expansion. Blanket statements about CRP's impacts may not apply equally well to all communities or time periods, so any analysis of CRP's impacts is necessarily sensitive to prevailing market conditions and a host of other factors.

This report examines concerns about CRP's unintended consequences by evaluating the program's effects over the first 10-15 years of its life on counties where CRP rental payments made up a relatively large share of total household income, or where CRP enrollment comprised a relatively high proportion of cropland. Since administration of the CRP has changed over time, along with the economic choices facing potential enrollees and their communities, this report also estimates the potential economic and land-use effects that discontinuing the program would have in regions of the country that were heavy participants as of 2000.

An Overview of the Conservation Reserve Program

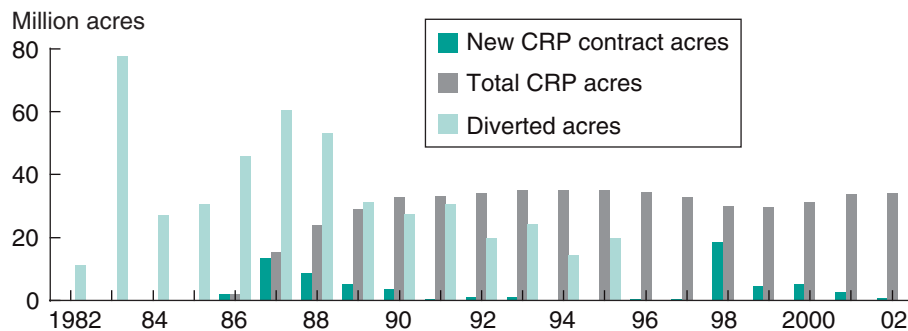
The CRP was not the first farmland retirement program operated by the Federal Government, nor was it the only land-diversion program operating at the time of its enactment. In 1956, a Soil Bank Program was instituted to retire farmland from production for 3-10 years, with conservation cover maintained on the idled land. Primarily a supply control program (erodible land was not targeted), the Soil Bank Program was phased out in favor of idling a portion of a producer's cropland base to establish commodity support program eligibility. The last Soil Bank Program contracts expired in the early 1970s, but annual paid land-diversion and Acreage Reduction Program (ARP) requirements continued through 1995. As can be seen in figure 2.1, diverted acres outnumbered CRP enrollment until 1990. While land-diversion requirements varied from year to year, they affected the supply of cropland available for production and may have had some of the same effects as CRP enrollment.²

Unlike other land-diversion programs, which focused on supply control, the primary goal of the CRP in the years immediately following its creation in 1985 was to reduce soil erosion on highly erodible cropland (Osborn et al., 1995). But, given the financial crisis facing the farm sector at the time, curbing production of farm commodities and providing income support for CRP participants were also important program goals (Dicks, 1987; Martin et al., 1988). Other objectives included protecting the Nation's long-term ability to produce food and fiber, reducing sedimentation, improving water quality, and fostering wildlife habitat. Subsequent legislative and regulatory actions altered the weight given these various objectives and spurred other important changes in the way CRP contracts are awarded.

Enrollment in CRP increased rapidly once the program got underway (fig. 2.1). Nearly 34 million acres were enrolled between 1986 and 1989. In exchange for retiring eligible land for 10-15 years, participants received an

² Since CRP enrollments influenced land-diversion requirements through their impact on production decisions and commodity prices, analyses of CRP's impacts over 1986-1995 should ideally reflect the impact that these requirements had as well. Between 1982 and 1985, paid land diversion and ARP averaged 37 million acres annually—slightly more than the level retired by CRP at its height.

Figure 2.1
CRP enrollment and other diverted acreage, 1982-2002



Source: Farm Service Agency, CRP Summary Statistics and U.S. Land-Use Summary

annual rental payment that averaged roughly \$50/acre, and were reimbursed for half of the cost of establishing permanent cover (usually grasses or trees).

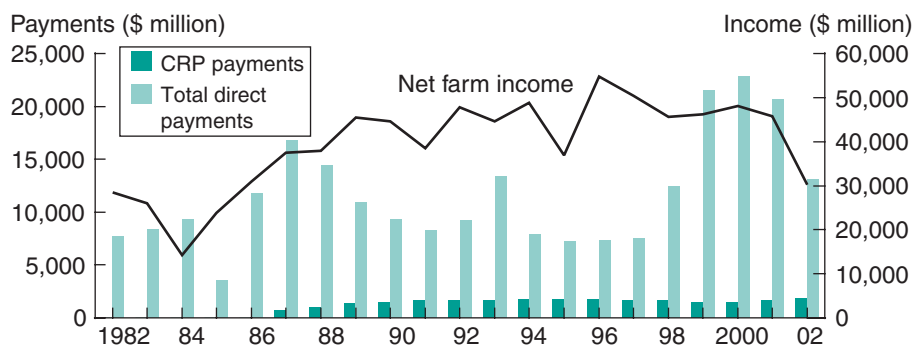
Farm operators and nonoperator landowners with highly erodible land could apply during any signup period, indicating the field(s) or portions of fields they wished to enroll and the annual rental payment they required. USDA determined the maximum acceptable rental rate for each bid pool (comprised of all the bids from multicounty areas with similar farm production and land characteristics). Bids at or below this rate were accepted (subject to a 25-percent county acreage cap) and those above the maximum rental rate were rejected. While the maximum rental rate was not pre-announced, bidders quickly estimated what it was likely to be for their area and began offering rental rates close to the maximum (Shoemaker, 1989).³

The program's early focus on erodible land, its award structure, and the frequency of signup announcements made it reasonably easy for potential bidders to determine their eligibility for, and their costs and benefits of participating in, CRP. In essence, USDA was willing to enroll all eligible land that farm operators and nonoperator landowners were willing to offer at or below the area's maximum rental rate (Plantinga et al., 2001; Smith, 1995). As a result, program participation grew rapidly and the farm sector benefited from a stable source of Federal financial support, as can be seen in figure 2.2. One of the major drawbacks to this approach was the program's inability to target all environmentally sensitive lands for retirement. The use of an areawide maximum rental rate meant environmentally sensitive but highly productive land was unlikely to be retired, and the government overpaid for the least productive land being enrolled (Cooper and Osborn, 1998; Daniels, 1988; GAO, 1989). As the program grew and pressure to quickly enroll more acreage eased, program eligibility and bid acceptance rules began to change.

With enactment of the Food, Agriculture, Conservation, and Trade Act of 1990 (the 1990 Act), eligibility for CRP was broadened to include more environmentally sensitive land, but not necessarily highly erodible land. The 1990 Act extended eligibility to land in conservation priority areas (the Chesapeake Bay, Long Island Sound, and Great Lakes watersheds) and State water quality priority areas as well as generally smaller plots of land

³ Nonetheless, among eligible farmers who chose not to participate in the CRP, survey results indicate that non-bidders tended to underestimate the maximum rental rate applicable in their area (Esseks and Kraft, 1988).

Figure 2.2
CRP payments, total direct farm payments, and net farm income, 1982-2002



Source: Farm Service Agency, CRP Summary Statistics; Economic Research Service, Farm Income and Costs Briefing Room.

adopting high-priority conservation practices (Barbarika, 2001). USDA also began ranking bids based on the environmental benefits they offered (using an environmental benefits index, or EBI), and set maximum allowable rental rates based on a soil-specific estimate of the rent earned on comparable local cropland. The EBI gave weight to water quality and other environmental benefits in addition to soil erosion. When coupled with soil-specific maximum rental rate, these changes enabled USDA to enroll environmentally sensitive—but highly productive—land into the program. When combined with limits on the number of acres that could be enrolled, the result was a much more competitive but complex bidding process.⁴

During 1991-94, an additional 2.5 million acres were added to the CRP. While this had little impact on the program as a whole, the revised eligibility and bidding rules did have an influence on the type of land that was added over this period. Relatively fewer accepted bids came from the Great Plains as enrollment shifted eastward (Osborn and Heimlich, 1994).

Starting with signup 13 in 1995, the EBI score and soil-adjusted maximum rental rates were announced to potential bidders ahead of time, making the bidding process much more transparent. In addition, after passage of the Federal Agriculture Improvement and Reform Act of 1996 (the 1996 Act), USDA added wildlife habitat to the EBI and provided other options for farmers to participate in CRP. A continuous signup was initiated for acreage devoted to specific conservation practices, such as filter strips, riparian buffers, grassed waterways, field windbreaks, shelterbelts, living snow fences, salt-tolerant vegetation, shallow-water areas for wildlife, and well-head protection (Osborn, 1997). These practices involve relatively small parcels of land but provide large environmental benefits (Smith, 1999). Farm operators and nonoperator landowners adopting these practices can enroll in the CRP at any time without competing in the EBI ranking process. In return, they receive up to the maximum soil-adjusted rental rate and may be eligible for special signup and other maintenance and practice incentive payments.

In 1997, USDA also established the Conservation Reserve Enhancement Program (CREP), a Federal-State partnership designed to encourage farm conservation practices that meet specific State and National conservation and environmental objectives (Smith, 2000). CREP participants receive payments similar to those available to CRP continuous signup participants as well as additional incentives. As of 2002, slightly over 2.1 million acres had been enrolled under the continuous signup and CREP provisions, receiving an average per-acre payment rate well over twice that for acres enrolled through the general signup process (USDA, 2002).

Following the 1996 Act, contracts on acreage enrolled during the early years of the program began expiring. Most contracts were for 10 years, but while new regulations were being implemented and new signups established, contract holders were allowed to extend their contracts for 1 year. In addition, to provide USDA with flexibility, selected CRP participants were offered the choice of terminating their contracts early. As a result, signup 15, conducted in 1997, was the largest ever, with over 16 million acres accepted into the program. The size of subsequent signups conducted in 1997-1999 was also reminiscent of the early years of the program, together

⁴ While the original legislation envisioned the program retiring 40-45 million acres, enrollment authority was capped at 38 million acres in 1992 and reduced to 36.4 million acres in 1996. In 2002, CRP's enrollment authority was increased to 39.2 million acres.

accepting nearly 13 million acres. Unlike the early signups, competition was keen and all bids were ranked on the basis of the environmental benefits they offered and their cost. As a result, there was no guarantee that expiring contract holders would be allowed to re-enroll their CRP acreage.⁵

While most expiring CRP contract holders who wished to remain in the program were successful in doing so, some were not.⁶ Previous CRP contract holders were facing the EBI ranking process for the first time, which now placed equal weight on erosion control, water quality, and wildlife habitat. Furthermore, because of expansion in program eligibility over the years, an estimated 240 million acres of farmland had the environmental attributes needed to qualify for post-1996 CRP signups, compared with roughly 100 million acres eligible for the program when it was implemented in 1986 (Osborn, 1997). While nearly all eligible bids requesting rental payments below the maximum were accepted into the program in the 1980s, the relative cost of each bid was now a factor in the selection process. As a result, the distribution of CRP enrollment shifted somewhat during the 1990s, environmental benefits (as measured by the EBI and subsequent analyses) increased, and the per-acre cost of the program declined. This shift means that, to some extent, the characteristics of enrolled acres and their impact on surrounding communities may have changed over time. As a result of program shifts and changing agricultural commodity market conditions, CRP's community impacts are likely to be time sensitive.

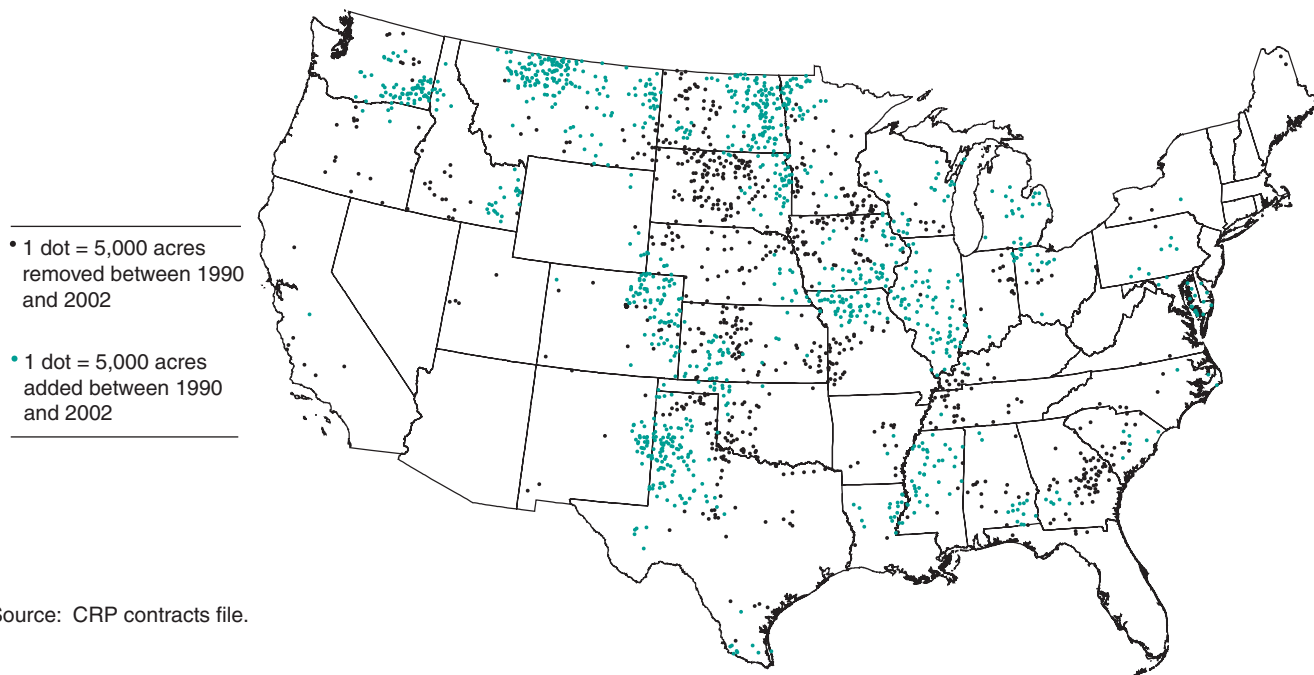
Figure 2.3 shows the change in the geographic distribution CRP enrollment at the end of 2002 compared with enrollment at the end of 1990, prior to adoption of the EBI and soil-specific rental rates. Of the nearly 34 million acres enrolled in the program in 2002, 17 percent represented net additions to county CRP acreage (shown as blue dots on the map). And of the nearly 33 million acres enrolled in 1990, a net 14 percent was dropped from the

⁵ The Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act of 1997 precluded the automatic extension of expiring CRP contracts beyond 1 year.

⁶ For example, during 1997, contracts were due to expire on roughly 21 million acres of CRP land. For signup 15, conducted in March, a total of 23.3 million acres was bid, of which 16.1 million acres was accepted, including nearly 12 million re-enrolled acres and a little over 4 million new acres (Osborn, 1997). Roughly 55 percent of all acres enrolled in CRP at the end of 2001 was re-enrolled acreage (Barbarika, 2001).

Figure 2.3

Change in the geographic distribution of CRP acres between 1990 and 2002



Source: CRP contracts file.

program by 2002, based on county aggregate enrollments (shown as black dots).⁷ While there were roughly equal numbers of counties that gained and lost CRP acreage due to such factors as program changes and shifting market conditions, there was very little redistribution of acreage at the regional level. Table 2.1 shows the number of counties gaining and losing more than 5,000 enrolled acres during the 1990s among the ERS farm resource regions (fig. 2.4). While the number of counties involved in shifts of this size was considerable, the regional distribution of enrolled acres was remarkably stable. Enrollment rose slightly in the Northern Great Plains and declined in the Heartland (probably due to the lower rental rates requested

⁷There was a much higher percentage of turnover on specific parcels of land, but from a community development perspective it is the net change in local enrollment that is likely to be important, not whether parcel A or parcel B is enrolled.

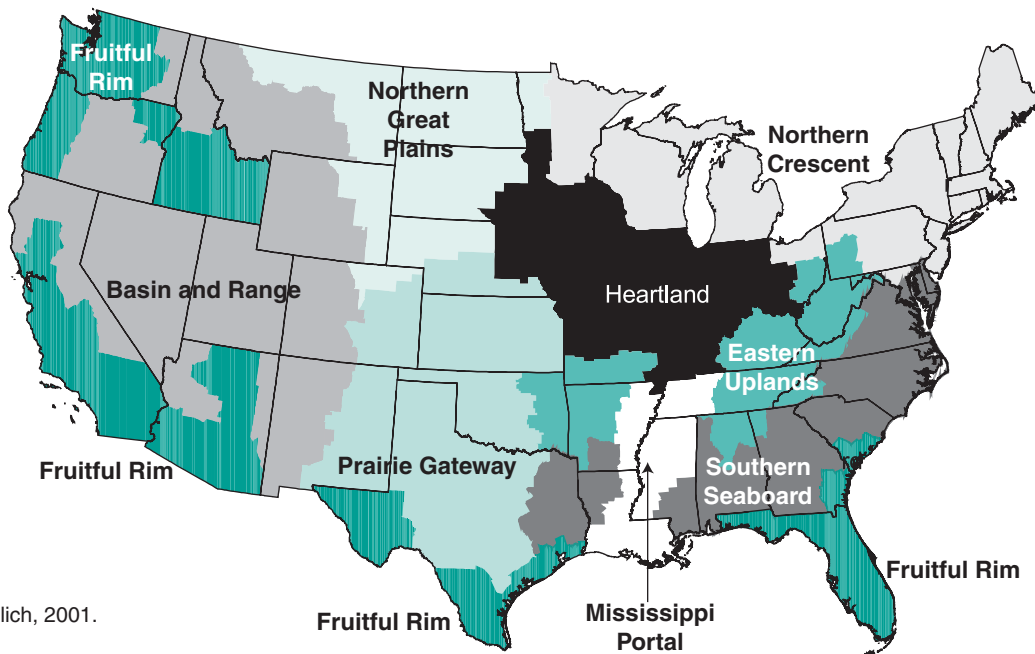
Table 2.1—Regional shifts in CRP enrollment and payments, 1990-2002

Farm resource region	Counties with more than 5,000 acres enrolled in CRP			Distribution of total CRP			
	Total*	Losing*	Gaining*	Acres		Payments	
	1990-2002	1990-2002	1990-2002	1990	2002	1990	2002
	Number	Percent		Percent			
Heartland	364	20	21	19	18	28	32
Northern Crescent	91	9	26	4	4	4	5
Northern Great Plains	158	30	41	26	28	19	21
Prairie Gateway	256	31	23	30	30	28	23
Eastern Uplands	23	22	4	1	1	1	1
Southern Seaboard	113	25	13	5	4	4	3
Fruitful Rim	69	26	23	6	6	7	6
Basin and Range	56	23	20	5	5	5	5
Mississippi Portal	96	10	18	4	4	4	4
U.S.	1,226	23	23				

*The first set of columns focus on counties that had more than 5,000 acres enrolled in the program at some point during 1990-2002 and the percentage that either lost or gained more than 5,000 program acres during 1990-2002. The final set of columns focus on the regional distribution of total CRP acres and payments, including those in counties with 5,000 acres or less in CRP.

Source: ERS analysis of FSA CRP Contracts file. Regions are delineated in figure 2.4.

Figure 2.4
Farm Resource Regions



Source: Heimlich, 2001.

by Plains bidders) and the Southern Seaboard (where many CRP acres planted in trees were not offered for re-enrollment). However, the payment distribution was more volatile due to changes in the way maximum rental payments were determined and the way bids were evaluated. The Heartland registered the largest increase in regional share of program receipts while the Prairie Gateway registered the largest decline.

The Farm Security and Rural Investment Act of 2002 (the 2002 Act) increased the CRP's enrollment authority to 39.2 million acres, while USDA continued its policy of reserving roughly 4 million acres for continuous signups. Eligibility requirements on cropland were tightened, but managed haying and grazing restrictions and cover requirements on marginal pasture were eased.

The 2002 Act also expanded CRP's Farmable Wetland Pilot Program, established by the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2001. Enrollment of wetland and associated buffers is now authorized in all States through the continuous signup process, subject to a 100,000-acre limit for each State and an overall limit of 1 million acres. As of August 2003, 86,000 acres of farmable wetland had been enrolled in the program, out of a total of 34 million CRP acres (USDA, 2003).

Characteristics of Farm Operators Participating in the CRP

Based on USDA's Agricultural Resource Management Survey (ARMS), roughly 279,000 (or 13 percent) of all farm operators had acres enrolled in CRP during 2001, the most recent year for which data is available (see box, "Farm Operators and CRP Participants" for a comparison of ARMS with other sources of data used in this report). Since enrollment of eligible land in the CRP is voluntary, participation is a function of the bid selection process and the potential net benefits from enrolling eligible land. The principal benefit from the participant's perspective is a guaranteed annual rental payment for 10-15 years that can initially equal or exceed the land's cash rental value at the time of enrollment. Participants often cite other advantages, including reduction in soil erosion, increased wildlife hunting and viewing opportunities, improved air and water quality, more scenic landscapes, and increased future income potential (Allen and Vandever, 2003).

The principal disadvantage is the extended length of time land use and rents are "locked in" without inflation adjustments. Additional drawbacks include the possible proliferation of weeds and pests, the potential fire hazard and unkempt appearance of CRP cover, and conservation cover maintenance requirements (Hodur et al., 2002). How these advantages and disadvantages are weighed depends on the participant's circumstances, expectations, and goals. For example, farm operators wishing to transition out of farming, either into retirement or to pursue off-farm opportunities, may find the CRP appealing because it provides a steady source of income and requires relatively little operator involvement, but allows the operator to retain ownership of enrolled property. Such participants often want to enroll as much land as they can to speed up the transition while maintaining ties to the farm, perhaps as a homestead or an investment.

Farm Operators and CRP Participants

Eligible land can be enrolled in the CRP by the landowner or by a producer who has control of the land, but the vast majority of CRP participants own their enrolled land since few tenants have control of the land they rent for the entire 10-year CRP contract period. In assessing the characteristics of CRP participants, we rely on two sources of information: the 2001 ARMS survey and the Census of Agriculture (used in the next section where county-level information is needed). Both ARMS and the Census of Agriculture collect information from and about the principal operator of any farm from which \$1,000 or more of agricultural products (crops and livestock) were sold or normally would have been sold during the year under consideration. Data are not collected from nonoperator owners of farmland, so information from either ARMS or the Census of Agriculture fails to cover all CRP participants. The differing definitions of a farm and a CRP participant among the various databases make precise calculations impossible, but a comparison of FSA's CRP contracts file (covering all participants) and CRP data reported in ARMS and the 1997 Census of Agriculture suggests that most CRP participants are considered farm operators while nonoperator landowners are less frequent. Farm operators can be landowners, tenants, or both.

For this report, information on the characteristics of CRP participants or farms in general (e.g., young and short-tenure farmers) excludes nonoperator landlords. However, when the CRP contract file is analyzed to evaluate the size and distribution of program acres, all enrollees, including nonoperator landowners, are included. While the CRP contracts file does not include the rich detail on farm finances and operator characteristics found in the ARMS data, it does include all enrollees and provides the county-level data needed to assess CRP's local socio-economic impacts. Nonetheless, since ARMS and the CRP contracts file use very different concepts of "farm" and "CRP enrollee," care needs to be taken when moving from one data source to the other. For ARMS, a farm generally encompasses all of the land controlled by a farm operator. For the CRP contracts file, a farm is a tract of land used to determine eligibility for farm programs. One farm operator can easily control more than one "CRP farm." One result is that FSA reports nearly 100,000 additional "farms" participating in CRP when compared with ARMS farm operator data, only a small portion of which can be attributed to nonoperator landowners.

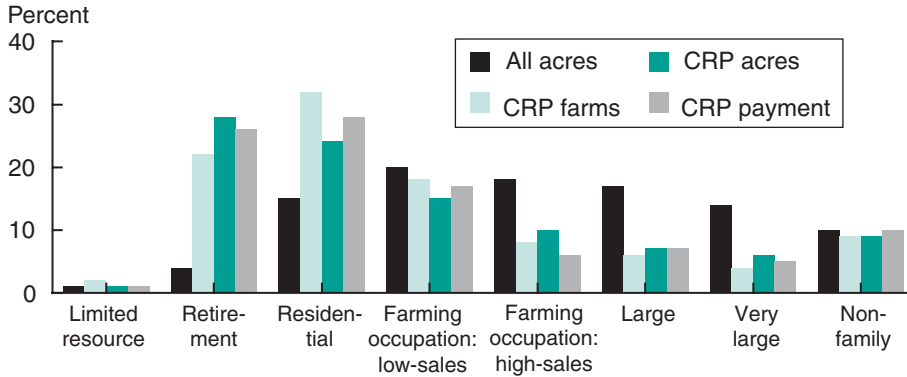
Farm operators who have no interest in transitioning out of farming may find enrollment in the CRP appealing as a way of diversifying risk, improving the productivity of adjacent fields (by reducing wind erosion, for example), and satisfying conservation compliance requirements. Such participants are likely to be much more selective about the amount and type of land enrolled in the CRP. Figure 2.5 shows the distribution of farm operators participating in the CRP by ERS farm typology.⁸ The majority of farm operator participants can be characterized as either retirement or residential farm operators. Retirement farms are operated by those who identify themselves as "retired." Residential farms are operated by those who identify something other than farming as their principal occupation. These two farm categories also included a majority of CRP acres and received a majority of the payments. Earlier research found that older, part-time farmers also made up a sizeable percentage of initial CRP enrollees (Hatley et al., 1989).

While retired farm operators are disproportionately represented among CRP enrollees, residential farm operators participate less than would be expected

⁸ The ERS farm typology combines farm characteristics, including operator occupation and size of farm, to develop homogeneous groups of farmers (Hoppe et al., 1999). The different categories reflect an operator's expectations and goals from farming, stage of life, dependence on agriculture, and size of operation. In addition to retirement and residential farms mentioned above, the typology categorizes small farms (those with under \$250,000 in sales) as either limited-resource, farming occupation/low sales, or farming occupation/high sales, depending on level of sales and the primary occupation of the operator. Large (\$250,000-\$499,999 in sales), very large (over \$500,000 in sales), and nonfamily (corporate or cooperative) farms round out the typology.

Figure 2.5

Farm operator participation in CRP, by farm type, 2001



Source: Agricultural Resource Management Survey, 2001. All acres refers to the percentage of total farmland controlled by each farm category. The remaining bars refer to the percentage of all participating farm operators, enrolled acreage, and CRP payments accounted for by each farm category.

given the distribution of all farms among the typology groups (not shown in fig. 2.5). Nonetheless, it appears that both residential and retired farm operators have more *acres* enrolled than would be expected as these two groups, on average, enroll a higher percentage of their eligible land in CRP than do other types of farms. The desire to limit the number of hours spent working on the farm may help explain why retired and residential farm operators comprise most of CRP’s whole-farm enrollees. But figure 2.5 also shows that CRP is used by a wide range of farm operators.⁹ Larger farms participate in the CRP at higher rates (not shown in fig. 2.5), but they enroll a smaller proportion of their land. By definition, they are partial-farm enrollees, often using CRP to maximize returns on farm assets.

From a community development perspective, it is useful to synthesize the diversity of program participants into two groups—“whole-farm” enrollees and “partial-farm” enrollees—even though these two groups each encompass a wide range of farms. We use two definitions for “whole-farm enrollee” in this report, but the one that comes closest to reflecting the farm operator’s involvement in the agricultural sector includes farm operators who had acres enrolled in the CRP and did not produce farm commodities in 2001.¹⁰ Whole-farm enrollees may have received other government program payments or had sales of agricultural commodities in 2001 by selling inventories remaining from the previous year, but produced no farm commodities in 2001. According to the ARMS data, about 7 percent of U.S. farm operators (and over half of farm operators participating in the CRP) are whole-farm enrollees using this definition (table 2.2). Other farm operators use the CRP as part of an ongoing farm business. These “partial-farm” enrollees are those with acres enrolled in the CRP and farm commodity production in 2001; they account for another 6 percent of U.S. farms.

Enrolled acres are split roughly evenly between whole- and partial-farm enrollees, but more than 60 percent of the acres operated by whole-farm enrollees (and over 95 percent of their cropland) is in the CRP, compared with only 12 percent of the acres operated by partial-farm enrollees (and 20

⁹ Konyar and Osborn (1990) found that young farmers were more likely to participate in CRP, even though their small number makes them less prevalent among participants.

¹⁰ The second definition of “whole-farm enrollees” is based solely on the percentage of cropland enrolled in CRP. At best, it is a proxy for whether the enrollee continues his or her involvement in farming after enrolling in the CRP. Using the FSA definition of a farm, it is entirely possible that a whole-farm enrollee could be an active farmer on other tracts he owns or rents, and so should be considered a partial-farm enrollee. Likewise, a partial-farm enrollee may not actively farm the nonenrolled portion of his or her farm, and so should be considered a whole-farm enrollee.

Table 2.2—Characteristics of farm operators, by CRP participation, 2001

Item	CRP enrollees		Non-enrollees	All farms
	Whole-farm	Partial-farm		
Percent of farms	7	6	87	100
Acreage (per farm):				
Operated	257	1,129	419	454
Owned	305	640	235	266
Rented in	14*	526	197	207
Rented out	62*	37	14	18
CRP acreage:				
Per farm	159	138	0	19
Percent of total CRP acres	54	46	0	100
Percent of acres operated	62	12	0	4
Percent of cropland acres operated	96	20	0	10
Production specialty (percent of farms):				
Cash grains	4**	46	15	17
Other crops (including CRP)	94	21	22	26
Livestock	2**	33	63	57
Beef cattle	—	26	42	38
Farm operator:				
Age (years)	61	56	54	55
Primary occupation (percent of farms):				
Farming	4**	69	41	40
Retirement	38	9*	11	12
Nonfarm job	58	23	48	47

Single (*) and double asterisks (**) indicate a coefficient of variation between 25 and 50, and greater than 50, respectively.

Source: ERS analysis of the 2001 Agricultural Resource Management Survey. Whole-farm enrollees were defined as farm operators who had acres enrolled in the CRP program and did not produce farm commodities in 2001. Partial-farm enrollees were defined as farm operators with acres enrolled in the CRP and farm commodity production in 2001.

percent of their cropland).¹¹ On average, whole-farm enrollees operate smaller operations than nonenrollees (farms not enrolled in the CRP), while partial-farm enrollees have substantially larger operations. Should their CRP contracts end, most partial-farm enrollees appear positioned to convert their CRP land to grain production or cattle grazing fairly easily should it make economic sense to do so. In contrast, whole-farm enrollees are not engaged in crop or livestock production, and thus are likely to be less equipped or able to bring CRP acreage back into production themselves. Although whole-farm acreage which is not planted to trees could be brought back into production relatively quickly if it were rented or sold to other farm operators, given the number of residential farm operators within the whole-farm group, it seems likely that some CRP enrollees would choose not to have their land farmed intensively even in the absence of CRP.

Whole-farm enrollees are, on average, older than partial-farm and nonenrollees and are far less likely to report farming as their primary occupation. The majority of whole-farm enrollees report off-farm work as their primary occupation, and nearly 40 percent are retired. This is consistent with patterns reported in figure 2.5. The average age of whole-farm enrollees masks a pronounced difference between retired farm operators, averaging 70 years, and residential farm operators, averaging 49 years. The majority of gross cash farm income generated by whole-farm enrollees is from government payments, with CRP payments representing most of this (table 2.3).

¹¹ The non-CRP land left idle by whole-farm enrollees includes pasture and range land, cropland left fallow, and parcels too small to be farmed efficiently.

Partial farm enrollees rely on government payments less than whole-farm enrollees, but still more than the national average.

Despite the difference in farm income among whole-farm, partial-farm, and nonparticipating farm operators (net farm income of partial-farm enrollees in 2001 was more than double that of nonenrollees and nearly five times larger than that of whole-farm enrollees) total household income is much the same. The average household income of the three groups ranged from \$64,000 to about \$68,000 in 2001. The difference in farm income is offset by a much higher level of off-farm income earned by the households of whole-farm enrollees and non-enrollees.

While farm sector coverage and the definition of whole-farm enrollees differ, an earlier study found similar patterns in the characteristics of CRP participants. Relying on the USDA's 1991 Farm Costs and Returns Survey (FCRS), the forerunner to the ARMS survey used above, whole-farm enrollees were found to be older than average, supplied little operator labor, did not consider farming as their primary occupation, and received most of their household income from off-farm sources. In contrast, partial-farm enrollees were more likely to consider farming their primary occupation, and received most of their household income from farming (Dodson and McElroy, 1995). Thus, while the program has changed over the years, the

Table 2.3—Financial characteristics of CRP farm operations, 2001

Item	CRP enrollees		Non-enrollees	All farms
	Whole-farm	Partial-farm		
Farm income statement (\$ per farm):				
Gross cash income	9,636	169,341	86,041	86,395
Livestock sales	0	55,099	32,454	31,785
Crop sales	—	66,324	37,706	37,078
Government payments	7,215	28,533	5,655	7,229
CRP payments	6,535	5,126	0	758
Other farm-related income	2,400*	19,384	10,227	10,303
Cash expenses	4,653	124,377	70,446	69,605
Net cash farm income	4,982	44,964	15,596	16,790
Net farm income ¹	7,418	35,977	14,689	15,582
Farm balance sheet (\$ per farm):				
Assets	261,984	907,734	565,223	567,391
Liabilities	10,871*	127,435	59,645	60,811
Equity	251,114	780,299	505,578	506,580
Debt/asset ratio (percent)	4*	14	11	11
Return on equity (percent)	3.0	4.6	2.9	3.1
Farm household income (\$ per hh):				
Total household income	66,104	67,539	64,132	64,465
Farm business income ²	3,307*	21,215	3,010*	4,205
Off-farm income	62,795	44,132	59,729	58,894
Earned sources	42,798*	25,846	44,603	43,286
Unearned sources	19,997	18,286	15,127	15,608

Notes: Whole-farm enrollees were defined as farm operators who had acres enrolled in the CRP program and did not produce farm commodities in 2001. Partial-farm enrollees were defined as farm operators with acres enrolled in the CRP and farm commodity production in 2001.

— indicates insufficient data for legal disclosure; single asterisks (*) indicates a coefficient of variation between 25 and 50.

¹Net farm income is net cash farm income less costs for depreciation and non-cash benefits for hired workers, plus the value of the inventory change in 2001 and any non-money income. Non-money income includes the value of farm products consumed on the farm and an imputed rental value for the farm operator dwelling.

²Farm business income is that portion of farm income that is accrued by the farm household. Farm business income is net cash farm income less costs for depreciation, wages paid to the farm operator, and farmland rental income. The total is then adjusted to reflect any other households that share in the farm business income.

Source: ERS analysis of the 2001 Agricultural Resource Management Survey.

marked differences between whole- and partial-farm enrollees seem to have remained fairly constant. These two types of participants are likely to react very differently to major changes in the CRP, and may affect their surrounding communities differently.

Geographic Dispersion of Whole-Farm Enrollees

What is not clear from the ARMS/FCRS data is the extent to which the mix of whole- and partial-farm enrollees varies from one county to another. Based on the CRP contracts file, it is possible to determine the proportion of each participating farm's cropland that is enrolled in the CRP. Unfortunately, these data do not include information on farm finances, so an acreage-based definition of whole-farm enrollees had to be developed. In order to exclude as many partial-farm enrollees as possible from the acreage-based definition of whole farms, we apply a cutoff of 95 percent or more of cropland enrolled in CRP to designate whole-farm enrollees.¹² Using this fairly strict definition of whole-farms, their prevalence in participating counties ranged from 0 to 100 percent of enrolled acres in both 1994 and 2002.¹³ In both years, whole-farm enrollments comprised more than half of the CRP acres in 1 out of 5 counties that had more than 5,000 acres enrolled in the program.

The advent of continuous signups and the other program changes that took full effect in 1997 appear to have reduced the prevalence of whole-farm enrollees somewhat. In 1994, 37 percent of enrollees had at least 95 percent of their cropland in the program. By 2002, whole-farm enrollees accounted for 28 percent of participants, but this smaller group still accounted for 40 percent of enrolled acres—essentially unchanged from its 1994 level. This is because far more farms are participating in the program now, but at lower levels. The number of participants (i.e., FSA farms with CRP enrollment) increased by 23 percent from 1994 to 2002, while the average enrollment by the typical participant fell from 44 to 31 percent of the farm's cropland over this period. By enrolling smaller plots of environmentally sensitive land, the continuous signups and more competitive general signups characteristic of the post-1997 era have broadened participation. But the generally lower bids possible by re-enrolling large tracts of less productive land (and perhaps the willingness of retired operators and absentee landowners to accept low rental rates to stay in the program) have resulted in a fairly constant proportion of whole-farm acres over the years.

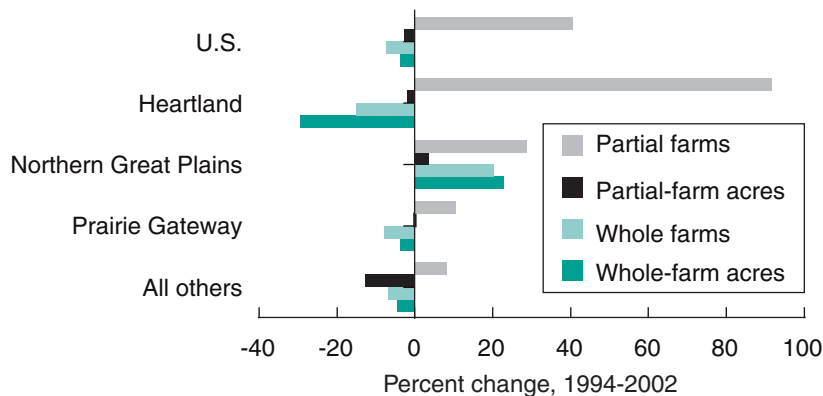
Figure 2.6 shows the change in whole- and partial-farm participation in the CRP program between 1994 and 2002, while figure 2.7 shows the mix of program participants among farm resource regions that had high CRP enrollment in both years. The Prairie Gateway currently has the largest share of its CRP acreage coming from whole-farm enrollments. Between 1994 and 2002, the number of whole farms and whole-farm acres in the Heartland dropped significantly (continuous signups have been heavily used in this region). The only Midwestern region to experience a significant increase in the number of whole-farm enrollees and whole-farm enrolled acres between 1994 and 2002 was the Northern Great Plains, where both increased by over 20 percent. The combination of low wheat prices, the lack of alternative land uses, relatively low farm rental rates, and an aging farm

¹² The CRP contracts data on farms refer to the land unit the Farm Service Agency (FSA) uses to track commodity program use and eligibility. They do not correspond to the land controlled by a farm operator (one farm operator often controls several FSA "farms"), and so are not strictly comparable with the ARMS data discussed earlier. None-theless, of the ARMS farm operators participating in the CRP, roughly 72 percent of the "whole-farm" participants had at least 95 percent of their cropland enrolled in the program while only 9 percent of the partial-farm enrollees met this cutoff.

¹³ Acreage enrolled in the CRP during the first phase of the program (1986-1995) reached its zenith in 1994, while 2002 represents the high-water mark for the second phase of the program, at the time of this study.

Figure 2.6

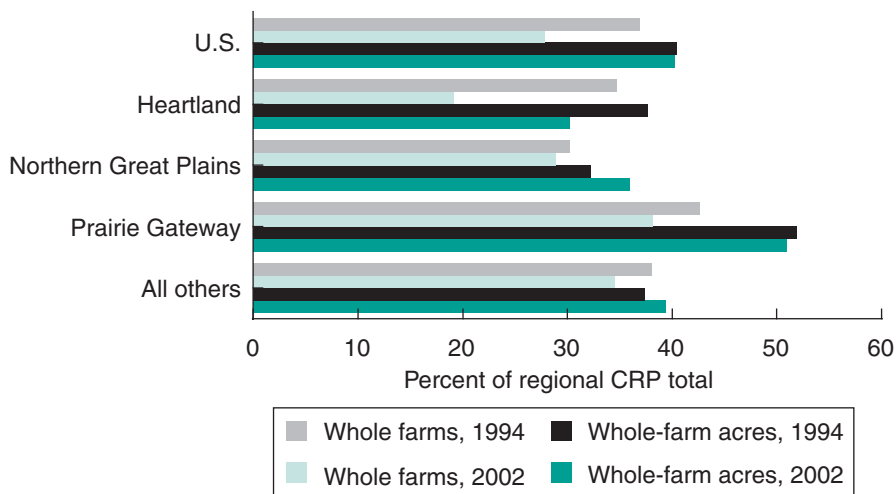
Growth in CRP farms, by type and region, 1994-2002



Whole farms are those with 95 percent or more of cropland enrolled in the CRP.
 Source: ERS analysis of the CRP Contracts file. Regions are delineated in figure 2-4.

Figure 2.7

Whole-farm participation in CRP, 1994 and 2002



Whole farms are those with 95 percent or more of cropland enrolled in the CRP.
 Source: ERS analysis of the CRP Contracts file. Regions are delineated in figure 2-4.

population may explain the popularity of whole-farm enrollments in the Northern Great Plains.

The relationship between whole-farm enrollment in CRP and local economic development is not necessarily straightforward. In parts of the Northern Great Plains, the lack of alternative sources of income might encourage whole-farm enrollments if farming becomes too risky or unprofitable. On the other hand, whole-farm enrollees tend to rely much more heavily on off-farm sources of income than other farmers. Thus, in some communities, such as those close to urban centers, whole-farm enrollment may reflect a vibrant local job market. In stagnant economies, whole-farm enrollments might further dampen economic prospects as land that might otherwise be farmed is left idle. In communities with tight labor markets, whole-farm enrollments might boost the local economy as CRP payments supplement participants' disposable incomes, as long as CRP payment

recipients retain residence and continue working in the area. Of concern, however, is the possibility that whole-farm enrollees may choose to relocate in search of better employment opportunities or living conditions.

CRP Rental Payments and Absentee Landowners

Using CRP contracts data on the location of CRP acres and where CRP payments are delivered, we can roughly gauge the degree to which CRP payments go to absentee landowners. Because of difficulties accounting for all the adjustments made to CRP payments for such things as establishing and maintaining ground cover, adopting favored conservation practices, and emergency haying and grazing, this report does not attempt to follow payment flows on specific CRP enrollments. Figure 2.8 presents information from 2001 on the *net* flow of CRP payments into and out of each county.¹⁴ Net payments equal the CRP rental payments mailed to a county's CRP enrollees minus the rental payments received on a county's CRP land. A positive figure indicates the county receives CRP payments (inflows) on land enrolled elsewhere, while a negative figure indicates that CRP payments are flowing out of the county (presumably to absentee landowners). Of counties with at least 5,000 acres enrolled in CRP, 30 percent experienced net outflows of CRP payments exceeding \$250,000 (averaging 37 percent of the funds earned on their CRP acreage). As would be expected, most of these counties were located in the central United States, where CRP enrollment is highest.

Table 2.4 details the interregional flow of CRP payments. While counties in all regions experienced net inflows and outflows of CRP funds, three regions experienced aggregate net outflows of CRP payments: the Northern

¹⁴ Since it is far easier to ascertain where CRP payments were delivered than it is to estimate each acre's contribution to this payment stream, the total amount of payments is roughly 5 percent higher than the payment estimates based on the location of CRP acres. To get a clearer picture of which areas gain (or lose) more than they "contribute" to the program, figure 2.8 and table 2.4 use adjusted payment streams which equalize net payment inflows and outflows for the Nation as a whole.

Figure 2.8
Geographic distribution of net CRP payments, 2001

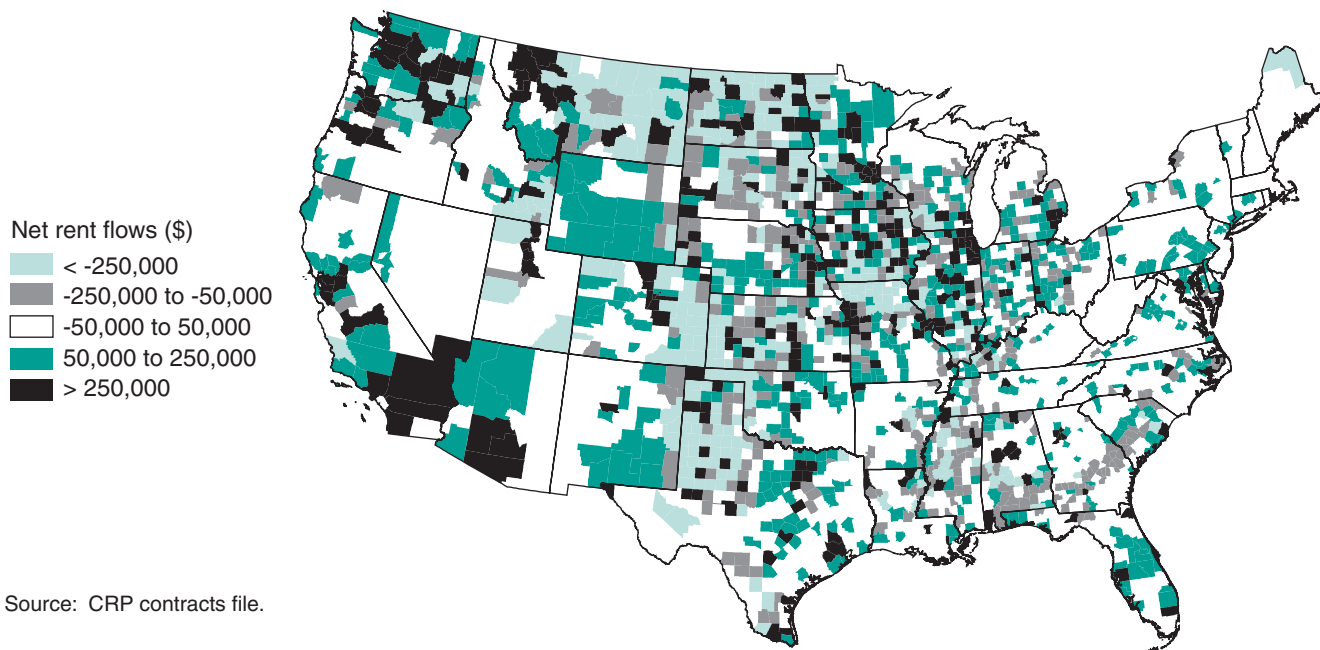


Table 2.4—Interregional flow of CRP payments, 2001

Farm resource region	Net flow of payments		Counties with net flows over \$250,000		
	\$ millions	Percent of base CRP	Number	Percent of all counties*	
				Outflow	Inflow
Heartland	26.9	5	173	14	18
Northern Crescent	17.2	19	32	2	6
Northern Great Plains	-46.7	-15	96	38	16
Prairie Gateway	-34.3	-10	140	24	12
Eastern Uplands	8.2	40	10	0	3
Southern Seaboard	1.7	3	29	3	4
Fruitful Rim	30.1	36	60	6	16
Basin and Range	2.5	45	36	11	10
Mississippi Portal	-6.4	-10	28	12	6
U.S.	0	0	604	11	10

*Net flow of payments is the amount of CRP rental payments delivered to each region (or county) minus the estimated payments earned on that region's (or county's) CRP enrollment. Base CRP refers to the estimated CRP payment generated by the region's enrolled acres. The final two columns report the percentage of all counties in the region that generate or receive CRP payments that have net outflows or net inflows exceeding \$250,000.

Source: ERS analysis of CRP Contracts file. Regions are delineated in figure 2.4.

Great Plains, the Prairie Gateway, and the Mississippi Portal. Net outflows there amounted to 10 percent or more of the CRP payments attributable to enrolled acres within their territory. But, even in the Northern Great Plains where outflows were highest, 85 percent of CRP rental payments stayed within the region.

Most counties that benefited from net inflows of CRP payments were located close to areas with CRP enrollment, and often contained CRP enrolled acreage. There were also a number of metropolitan centers which had no CRP enrollment in 2001, but which received a significant share of CRP payments that year. While these included some popular retirement locations and major cities, such as Chicago, San Francisco, and New York, they also included regional trade centers throughout the country. What is not clear is whether this pattern of payment flows is the result of CRP making residential relocation easier, or whether it merely reflects the reality of modern agriculture. That is, are net outflows of CRP payments, as measured here, different from what would happen if the CRP land was being farmed? Between 40 and 50 percent of the land being farmed in the United States is farmed by someone other than the owner (table 2.2). While many nonoperator landowners live fairly close to their farmland, others live hundreds of miles away. Since the vast majority of CRP recipients identified themselves as landowners in a recent nationwide survey (Allen and Vandever, 2003), the geographic distribution of CRP payments may simply mirror the pre-existing distribution of farmland ownership. One way to assess whether the geographic distribution of CRP payments is unique is to compare it to the distribution of farm commodity program payments.

Table 2.5 presents information on the distribution of cropland and CRP payments by the degree of urbanization of the recipient's payment location, together with similar information for Federal commodity payments based on

Table 2.5—Distribution of cropland, CRP, and select commodity program payments, 2001

Urban influence at destination*	Cropland	CRP	Corn	Cotton	Wheat
	<i>Percent</i>	<i>Percent of total payments</i>			
None	74	63	57	66	65
Low urban influence	7	9	11	9	9
Medium urban influence	8	9	11	8	9
Strong urban influence	11	19	21	18	17

* Urban influence at destination refers to the degree of urbanization in the location where the program payment was delivered. Counties are classified into four categories based on urban influence as measured by a gravity model that simultaneously accounts for population size and proximity. Urban influence increases as population size and proximity increase (or distance decreases).

Source: FSA Producer Payments Reporting System data.

historic corn, cotton, and wheat production.¹⁵ While there are differences in the geographic dispersion of payments for the various commodity programs, the overall patterns are strikingly similar. Thus, the proportion of CRP payments going to “absentee” participants appears to be no different than that of other farm programs. Payment flows most probably reflect pre-existing land ownership patterns and do not reflect much residential relocation by CRP participants.

Surveys of program participants and local officials suggest that the incidence of absentee participation is far lower than the prevalence of whole-farm enrollees, but may be roughly comparable to the proportion of net payment flows. In a 1998 survey of North Dakota CRP enrollees, roughly 10 percent of the respondents were out-of-state landowners (Mortensen et al., 1989). In a more recent survey, 13 percent of North Dakota respondents lived outside the State (Hodur et al., 2002). These results are roughly comparable to the estimated percentage of CRP fund outflows in 2001 (10.4 percent for the State as a whole), but are far lower than the 24 percent of North Dakota farms and 31 percent of North Dakota CRP acres attributable to whole-farm participants.¹⁶ Unfortunately, the limited geographic coverage of such surveys makes any generalizations about the relationships between absentee landlords and measures of whole-farm participants and net flows of CRP payments questionable for other regions or different levels of geography. Furthermore, based on simple regression models, no statistically significant relationship was found between the proportion of whole-farm enrollments and the relative size of CRP payment flows. While the lack of a formal model explaining outflows and inflows of CRP rental payments makes this finding tenuous at best, at a minimum it suggests that any relationship that exists between whole-farm enrollment and absentee owners is likely to be complex.

In summary, the characteristics of CRP participants vary widely, as do the reasons for their participation. Program participants can be divided into at least two broad groups based on the extent to which CRP enrollment displaces farming activity. Whole-farm enrollees are those who rely on CRP payments to transition out of (or in rarer cases, into) farming. They are generally older retired operators or younger “lifestyle” operators who consider their primary occupation to be something other than farming.

¹⁵ Roughly 40 percent of the land enrolled in CRP was previously planted in wheat, corn, or cotton. To the extent that CRP payments go to landowners while commodity program payments go to farm operators, one would expect a comparison of the geographic distribution of payments to show more CRP payments than commodity payments going to urban locales. This is not evident in table 2.5.

¹⁶ Of course, whole-farm participants could reside outside of the county but within the State, so this observation does not imply that local jurisdictions aren’t affected simply because absenteeism based on State residence is low.

Partial-farm enrollees are those who use CRP payments to supplement their farm income and get the best overall return on their farm assets while improving the environmental performance of their operations. They are far more likely to consider farming their principal occupation and typically derive more of their household income from farming than do other farm operators. While both forms of participation can reduce demand for farm inputs and services, the differing motivations for participating in the CRP may yield different community effects depending on the mix of whole- and partial-farm enrollment. One of the questions we will address in the next section is whether the community effects of CRP enrollment vary depending on the dominant type of program participant.

Part of the concern over whole-farm enrollees is their ability to relocate. Absentee CRP participants not only take land out of production, thereby reducing demand for local inputs and services, but they also take their CRP payments with them, potentially dampening demand for local consumer goods and services. Since many of the communities with net outflows of CRP payments are also losing population, it may be tempting to attribute both of these trends to whole-farm enrollment. Nonetheless, there does not appear to be a simple relationship between the prevalence of whole-farm CRP enrollment and loss of CRP payments. And, it seems likely that the geographic distribution of CRP payments, in large part, merely reflects the preexisting distribution of landowners and operators. Therefore, it is clearly unjustified to attribute decisions on residential location to participation in the CRP. Nonetheless, the prevalence of absentee landowners influences the local effect of *all* farm payment programs, so payment flows are included in our analyses (although caution should be used when interpreting the results).

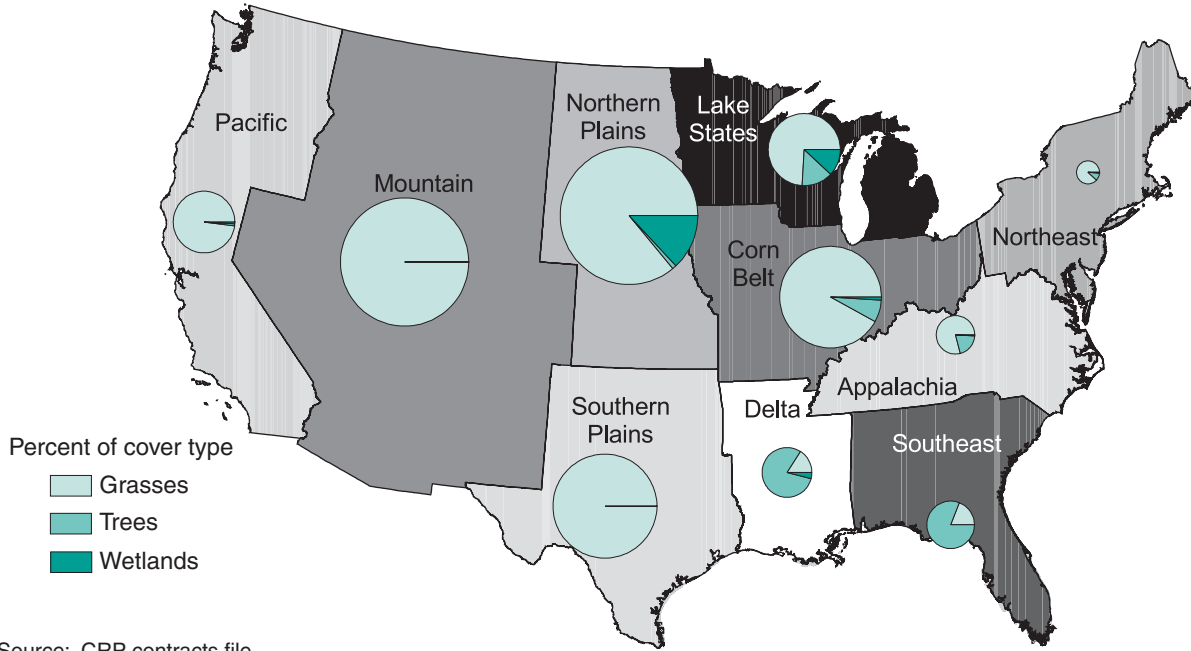
Environmental and Scenic Impacts of the CRP

When land is enrolled in the CRP, it is retired from agricultural production, planted with approved ground cover, and managed with approved conservation practices. The current mechanism for selecting land offered for enrollment evaluates the environmental benefits, thus ensuring that program objectives are addressed and environmental benefits from taking land out of production accrue to society. But, in addition to environmental impacts, the land-use choices embedded in CRP offers may also affect local economies by making the rural landscape more or less attractive to residents and tourists. The relationship between natural amenities and rural development is well established. Wirtz (2002) found that improved quality of life can translate into population and economic growth. McGranahan (1999) and Deller et al. (2001) found that population and employment growth in rural areas are sensitive to the level of a community's natural amenities, as are business location decisions (Goe, 2002; Goetz and Rupasingha, 2002). While natural amenities include many characteristics which are hard to influence, such as mountains and climate, ground cover is one attribute of natural amenities that CRP can affect.

Figure 2.9 provides information on ground cover choices on CRP land in 2001 by farm production region. (Note that farm production regions are based on State boundaries and are different from the farm resource regions discussed previously.) By far the most common ground cover adopted by CRP

Figure 2.9

CRP conservation cover in 2001, by farm production region



Source: CRP contracts file.

participants is grasses and legumes, planted on 87 percent of CRP acres nationwide. Since the bulk of CRP acres is in the Plains and Mountain regions, where tree cover is seldom an economically viable option, the popularity of more easily planted and managed forbs and grasses is not surprising. Taking land out of production and establishing permanent ground cover largely eliminates erosion originating from acres enrolled in the CRP.

Cleaner air and streams, together with the varied vistas that CRP cover can offer, can improve the appeal of nearby communities. But one consequence of relying so heavily on grasses is that most CRP acres can readily (if not always cheaply) be converted back to crop production or grazing at the end of the CRP contract. Whether they are or not depends upon development options, the outlook for profitably farming the land, business transition plans, and the landowner’s lifestyle preferences.

Trees account for only 8 percent of CRP ground cover nationwide, but are the overwhelming choice for CRP enrollments in the Delta and Southeast. The timber industry in these regions makes trees a potentially valuable cash crop, albeit one with a very long rotation period.¹⁷ Land planted in trees is far less likely to be converted back to farmland simply because the CRP contract ends. And, research has shown that people generally find forested landscapes more appealing than open spaces, at least up to a point. A recent study found that rural communities in the Upper Great Plains were far more likely to have experienced population growth in the 1990s if they had even a modest amount of forested land (Wirtz, 2002). However, additional tree cover in heavily forested areas may actually detract from the landscape’s scenic beauty and discourage wildlife diversity.¹⁸

While most of the conservation practices encouraged by CRP involve planting or maintaining grasses or trees, restoring wetlands and creating

¹⁷ In their evaluation of the community impact of planting CRP acres to trees, Broomhall and Johnson (1991) assume that trees would be harvested 20-25 years after they were planted.

¹⁸ Research has found that most people find park-like settings, with clumps of trees, open traversable fields, and water most appealing (Ulrich, 1986). With the exception of farmers, most people rank cropland fairly low in terms of its landscape appeal (Kaplan et al., 1989).

shallow-water areas for wildlife is a third option. Wetland restoration and related activities account for only 5 percent of CRP enrolled acres nationwide, but are somewhat more prevalent in the Lake States and the Northern Plains. Wetlands in and of themselves are not generally considered desirable scenery (Gourlay and Slee, 1998), but they can enhance the appeal of nearby communities through improved (and potentially lucrative) hunting, fishing, and wildlife viewing opportunities for residents and visitors.

Table 2.6 provides information on the distribution of wildlife-related CRP conservation practices together with estimates of the economic value of some wildlife-related activities. Virtually all CRP-approved ground cover is likely to support a wider array of wildlife than actively farmed land. Permanent cover greatly improves the health of wildlife ecosystems by providing nesting cover, wintering habitat, and plant and insect feeds for most indigenous wildlife species. For example, the added CRP acres in the Northern Plains have significantly increased duck populations, which require dense vegetative cover within 3 miles of wetland for successful nesting (Reynolds et al., 1994). But, it seems likely that land enrolled in the CRP specifically to enhance wildlife habitat may have wildlife-related benefits that exceed typical practices. In 2001, a total of 4.7 million acres was enrolled to provide permanent wildlife habitat, shallow water area for wildlife, wildlife food plots, riparian buffers, wetlands restoration, and rare and declining habitats (Barbarika, 2001). While this may have had a measurable affect on wildlife populations, data limitations make it difficult to reliably model the benefits of specific wildlife-related practices. As a result, the value of unique program features providing wildlife can seldom be estimated with accuracy.

Table 2.6—Selected wildlife-related practices and estimated annual CRP benefits

Farm production region ¹	Distribution of CRP enrollment		Estimated annual nonmarket benefits from:			
	Total	Wildlife	Wildlife viewing	Pheasant hunting	Total wildlife benefits	
					Overall	Per acre
<i>Percent of total</i>		<i>\$ Million</i>		<i>Dollars</i>		
Northeast	0.6	0.5	8	—	8	45
Lake States	7.8	16.3	113	19	132	52
Corn Belt	14.7	15.6	213	35	249	52
Northern Plains	26.2	44.5	33	30	63	7
Appalachia	2.8	1.0	36	—	36	41
Southeast	4.6	1.5	60	—	60	40
Delta	3.6	2.5	47	—	47	40
Southern Plains	15.4	1.2	135	—	135	27
Mountain	19.3	12.0	3	2	6	1
Pacific	5.1	4.9	1	—	1	1
U.S.			650	87	737	22

— indicates that the impact was not estimated.

¹Regions are delineated in figure 2.9. The Pacific farm production region excludes Alaska and Hawaii.

Source: Each region's percentage of national acreage using conservation practices related to wildlife habitat (establishing permanent wildlife habitat, shallow water area for wildlife, wildlife food plots, riparian buffers, wetland restoration, and rare and declining habitats) is based on 2001 enrollment (Barbarika, 2001). Benefit estimates are derived from Feather et al. (1999), adjusted for inflation to represent 2000 dollars and rounded to the nearest million dollars.

Based on available measures, selected wildlife-related benefits attributable to CRP enrollments are estimated to be approximately \$737 million per year (table 2.6).¹⁹ This represents a lower-bound estimate of wildlife benefits because it does not include improved hunting for many species and the increased protection CRP land affords to threatened and endangered species, for which good nationwide data do not exist.

Wildlife viewing represents roughly 88 percent of estimated wildlife benefits presented here. Wildlife-viewing benefits are a function of the range of activities that are affected by CRP conservation practices and the number of people that potentially benefit from improved viewing opportunities. Increases in wildlife populations have improved the quality of activities focused on wildlife viewing (e.g., bird watching and wildlife photography) as well as many outdoor activities where wildlife viewing is not the central focus (e.g., picnicking, hiking, walks in the park, and relaxing in the backyard).

Estimated wildlife-viewing benefits, which accrue to society as a whole and not just to landowners, are most significant in the Corn Belt and Southern Plains. Each of these regions has a high proportion of total CRP enrollment and is relatively populous. The importance of population in the benefits calculations is made even clearer by examining estimated wildlife-viewing benefits in the Lake States. This region has far fewer acres enrolled in the CRP than the Northern Plains and Mountain regions, but has estimated benefits exceeding \$100 million each year from CRP-induced wildlife viewing.

The estimated value of CRP-related changes in the quality of pheasant hunting is reported for 13 States—Montana and the States in the Corn Belt, Lake States, and Northern Plains regions (Hansen et al., 1999).²⁰ These benefits are relatively small since, unlike wildlife viewing, pheasant hunting is a single activity associated with a single species. Nonetheless, for the area studied, the value of CRP's impact on pheasant hunting totals over \$87 million annually.

As important as wildlife-related benefits are from a community development perspective, the primary focus of the CRP has historically been on reducing soil erosion. Permanent cover has prevented nearly all wind, sheet, and rill erosion on enrolled lands. Erosion of topsoil typically reduces productive characteristics of the remaining soil—water-holding capacity, nutrient concentration, etc.—so yields tend to fall. Increased input use can offset some of the yield loss, but at additional cost to farm operators. Increases in agricultural productivity attributable to CRP enrollments are referred to as on-site benefits. They represent the discounted present value of the net yield gains and the cost saving from decreased input use (alternatively, they represent the added costs farm operators would face in the absence of the CRP program). Soil erosion directly affects the quantity of sediment in neighboring lakes and streams and the concentration of air particulates. Increases in sediment and dust increase economic burdens (the “off-site costs”) on consumers, businesses, and government. Consumers must deal with additional costs and adverse health effects. Operating costs increase as businesses are forced to deal with the effects of water and air pollution (e.g., reduced lifespan of pumping equipment and increased water treatment costs). Governments are faced with larger outlays to mitigate the impacts of

¹⁹ Measures of all the benefits attributable to CRP's impact on wildlife populations are not available. The economic values for the environmental benefits presented in this section have been adjusted for inflation to represent 2000 dollars. Dollar-per-acre wildlife benefits, by region, are from Feather, et al. (1999). Total wildlife benefits within each region are the product of the per-acre benefit estimate and the number of CRP acres enrolled.

²⁰ While we don't have good estimates of the benefits attributable to CRP's impact on duck, quail, deer, and other game species, older estimates suggest that pheasant hunting accounts for about one-fourth of the small game hunting benefits attributable to the CRP (Ribaud et al., 1990). However, this ratio should be viewed with caution since it is based on a generalized wildlife response function that was estimated before CRP was fully implemented.

sediment and dust. By reducing these off-site costs, CRP provides off-site benefits.

Soil erosion on all agricultural lands decreased nearly 40 percent between 1982 and 1997 (Claassen et al., 2001). While improved conservation measures adopted by the farm sector following the 1985 Act are responsible for much of this decline, CRP had a significant impact as well. CRP reduced wind erosion on cropland by over 13 percent and water erosion by nearly 7 percent from what it otherwise would have been in 1997 (table 2.7). The program's greater effect on wind erosion is due to the large portion of CRP acres in drier areas of the country.

Nationwide, CRP is credited with reducing soil erosion by nearly 224 million tons a year, based on 1997 enrollments, with the largest reductions occurring in the Southern Plains, Mountain States, and Corn Belt, where CRP enrollments were highest.²¹ The Southern Plains and Mountain regions benefit most from CRP's impact on wind erosion—together accounting for 70 percent of CRP's wind erosion impact. CRP acreage in both of these regions is high and both areas have dry and windy growing conditions. On the other hand, significant rainfall and a high concentration of row crops have made agricultural lands in the Corn Belt especially sensitive to sheet and rill erosion. As a result, the Corn Belt accounts for over 40 percent of CRP's impact on water erosion.

Reductions in lake and stream sediment have increased the quality of fishing, boating, and other water-based recreation. While the benefits accrue outside the normal market mechanism, they are nonetheless real. Improvements in the quality of outdoor amenities can also have market impacts. For example, improved fishing might increase sales of fishing equipment, cabin rentals, boat purchases, and similar items. These market impacts are not included in the measures of on- or off-site benefits presented here, but, as discussed later, they can have a positive affect on local economies.

²¹ CRP erosion reduction estimates assume that conservation practices on land enrolled in the CRP would be similar to 1997 cropland practices in the program's absence and are considerably smaller than erosion reduction estimates based on comparisons of erosion rates on CRP land before and after CRP enrollment.

Table 2.7—CRP's impact on cropland soil erosion

Farm production region ¹	Wind erosion		Water erosion		Total cropland erosion	
	1997	CRP impact ²	1997	CRP impact	1997	CRP impact
<i>Million tons per year</i>						
Northeast	0.2	—	48.9	-0.6	49.1	-0.6
Lake States	134.3	-10.4	97.9	-5.7	232.2	-16.1
Corn Belt	24.2	-0.6	452.3	-37.9	476.5	-38.6
Northern Plains	191.5	-23.2	104.4	-7.2	256.2	-30.4
Appalachia	0.4	—	137.5	-6.9	137.9	-6.9
Southeast	—	—	66.9	-6.1	66.9	-6.1
Delta	—	—	90.5	-9.2	90.5	-9.2
Southern Plains	267.8	-58.3	155.3	-9.4	462.7	-67.7
Mountain	196.3	-36.7	42.8	-3.9	239.1	-40.6
Pacific	41.5	-5.3	28.5	-2.0	70.0	-7.3
U.S. Total	856.3	-134.6	1,224.9	-89.0	2,081.1	-223.5

— indicates that the impact was less than 0.05.

¹The farm production regions are delineated in figure 2.9. Note that the Pacific farm production region excludes Alaska and Hawaii.

²The reduction in erosion attributable to CRP enrollment. These impacts have already been netted out of the 1997 totals.

Source: Economic Research Service, USDA.

Table 2.8 summarizes the estimated economic value of CRP's impact on soil erosion. The on-site economic benefit of reduced soil erosion (increased soil productivity) due to the CRP is approximately \$122 million per year based on the 1997 Natural Resources Inventory (NRI). The on-site economic impacts of reduced soil erosion cover the combined effects of wind, sheet, and rill erosion. Approximately 60 percent of the productivity benefits are due to CRP's impact on future yields; the remaining 40 percent results from decreased input use when CRP acres are returned to production (Ribaud et al., 1990). Regional measures of productivity benefits reflect both the quantity and quality of soil enrolled in the CRP.

Off-site benefits from reduced wind erosion stem from particulate-related cost savings enjoyed by those living or working in areas downwind from CRP land, particularly in the more arid regions of the country (Huszar and Piper, 1986). Measures of all off-site benefits of reduced soil erosion are not available. However, based on available measures, CRP reduces off-site costs of soil erosion by approximately \$378 million per year, and decreases annual off-site damages from dust by approximately \$61 million. These benefits occur in the four western regions where measures of the costs of particulate pollution have been developed. Impacts of wind erosion in other regions are not expected to be as significant (Ribaud et al., 1990).

Sheet and rill erosion increases sediment in surface waters throughout the United States, imposing economic costs on many sectors of the economy (Hansen and Claassen, 2001). By reducing water erosion, CRP reduces these sediment-related costs by an estimated \$317 million per year. This estimate includes economic measures of sediment's impact on municipal water treatment facilities, marine and freshwater fisheries, navigation,

Table 2.8—Annual economic benefits of CRP's impact on soil erosion

Farm production region ¹	On-site benefits ²	Off-site benefits ³			Total benefits	
		Dust	Sediment	Total	Overall	Per acre
\$ Million per year					Dollars	
Northeast	1	—	8	8	8	44
Lake States	19	—	32	32	51	20
Corn Belt	39	—	136	136	175	37
Northern Plains	13	15	13	28	41	5
Appalachia	4	—	29	29	33	36
Southeast	3	—	23	23	26	17
Delta	4	—	40	40	44	37
Southern Plains	25	22	24	46	71	14
Mountain	11	18	6	25	36	6
Pacific	3	6	6	12	15	9
U.S.	122	61	317	378	500	15

— indicates that the impact was not estimated.

¹Regions are delineated in figure 2.9. The Pacific farm production region excludes Alaska and Hawaii.

²On-site benefits accrue to the owners and operators of CRP acreage (such as increased soil productivity).

³Off-site benefits accrue in areas that are indirectly affected by CRP acreage (such as cleaner water in a lake downstream of CRP acreage).

Note: All benefits estimates are adjusted for inflation to represent 2000 dollars and are rounded to the nearest million dollars. Components may not sum to total due to rounding.

Source: Economic Research Service, USDA.

flooding, industrial production, reservoirs, and water-based recreation. Because measures of the other economic impacts of sediment have not been developed, the results presented here can be viewed as lower-bound estimates. These cost savings are most significant in the Corn Belt, which accounts for over 40 percent of all sediment-related off-site benefits.

The annual benefits of the CRP’s impact on wildlife and soil erosion amount to roughly \$38 per acre for the categories we have examined (fig. 2.10). But only about 10 percent of these benefits accrue to the enrollee as on-site benefits. The remaining 90 percent accrues over a broader region. As a result, communities near affected lakes and streams benefit from CRP’s impact on sediment even though they may not be near the fields enrolled in the program. For example, as CRP reduces soil erosion, downstream communities can see catch rates and fishing incomes increase, water filtration costs decline, and sediment-related damage to cooling systems fall. This potential “disconnect” between those who make land-use decisions and those who reap the resulting environmental benefits (or incur the resulting costs) is one of the primary justifications for operating a Federally financed environmental program.²² But, in terms of measuring CRP’s economic impacts, environmental benefits complicate our analyses in three ways.

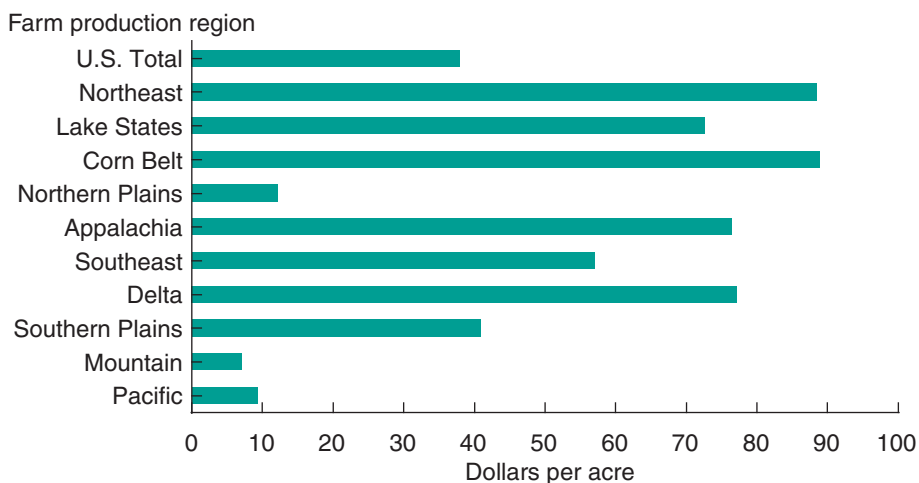
First, environmental benefits are often realized as cost savings or quality-of-life improvements rather than as more jobs or increased market activity—the usual measures of economic progress.²³ While CRP may succeed in reducing erosion, sedimentation, and windblown particulates, the resulting cost savings could reduce employment and income while increasing societal well-being. In such a case, change in the number of jobs is a misleading indicator of community well-being.

Second, as we have seen, the dollar value of the environmental benefits generated by enrolling land in the CRP varies considerably from place to place. To the extent that these benefits lead to market impacts, an acre of

²² Beck et al. (1999) point out that the “disconnect” between the distribution of land conservation program benefits and costs makes it difficult to finance such programs at the local level.

²³ Of course, environmental benefits can improve job prospects even as they improve the quality of life. See, for example, Carlino and Mills (1987) and Lewis, Hunt, and Plantinga (2002, 2003). However, job creation is not the focus of environmental programs nor is program success a function of job generation.

Figure 2.10
Selected annual nonmarket environmental benefits from CRP



Regions are delineated in figure 2.9. The Pacific farm production region excludes Alaska and Hawaii. Benefits are adjusted for inflation to represent 2000 dollars.

Source: Economic Research Service, USDA.

CRP land in one region could have very different employment impacts than an acre of CRP land enrolled elsewhere.

Finally, the considerable environmental benefits enjoyed by a community may be due to the CRP enrollment in neighboring places, making comparisons of local development trends among high- and low-CRP counties misleading.

As a result, while CRP's environmental benefits affect the quality of life in rural counties, which in turn can lead to demographic and economic change, our analyses only capture these effects indirectly and imperfectly. We may underestimate the size of the positive economic impacts and overestimate the relative size of the negative economic impacts of CRP enrollment.