

The Impacts of the Conservation Reserve Program on Rural Communities: The Case of Three Oregon Counties

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Using an economic input/output model, the community personal income impacts of participating in the Conservation Reserve Program were analyzed for three rural Oregon counties. While individual farmers may benefit from participation, there may be net adverse impact on the community if the retired land is relatively productive or if the inputs that are no longer purchased would have been purchased locally. These negative effects may be exacerbated if participating farmers quit farming and leave the local area or if the Conservation Reserve Program benefits go to absentee landowners. The Conservation Reserve Program may then represent a conflict between community and national policy objectives.

Key words: community economic impacts, Conservation Reserve Program, input/output analysis, personal income, policy evaluation, program participation.

Since the late 1970s U.S. agriculture has been plagued by persistent surplus production, resulting at least in part from excess production capacity. This has caused downward pressure on commodity prices, declining farm incomes, and increasing costs of federal farm commodity programs. Over the last several years the cost of farm programs has averaged in excess of \$25 billion annually. In December 1985 the Congress passed and the president signed into law a new farm bill, officially titled the Food Security Act of 1985 (FSA-85). This act extended a number of traditional commodity programs and included programs that attempt to (a) enhance demand for U.S. agricultural products and (b) reduce excess supply of U.S. agricultural products. An important component in the supply-reduction portion of the FSA-85 is the Conservation Reserve Program,

which is aimed at reducing production capacity in agriculture for at least a ten-year period of time.

The principal objective of the Conservation Reserve Program (CRP) is to remove from production between 45 and 50 million acres of land currently under cultivation. In essence the federal government will rent land from farmers for this long-term set-aside program. According to Schaller et al., programs such as the CRP have traditionally combined soil conservation and supply management objectives. Integrating conservation and supply management objectives serves to make CRP more politically palatable to urban taxpayers. Thus, only highly erodible or fragile soils can be enrolled in CRP.

The program works as follows: farmers who are eligible may submit bids to their local U.S. Department of Agriculture, Agricultural Stabilization and Conservation Service (ASCS) office, indicating the amount that they would accept in annual payment per acre to set aside their crop producing lands.¹ Each county has

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¹ The term "farmer" is used here to include individuals who actually control the land and thus have the decision-making authority with respect to placing it under the CRP.

a designated amount of land that is qualified to be bid into the CRP. County ASCS officials select the lowest bids and, in effect, write contracts with those producers committing that land to the long-term set-aside. The amount of land eligible for CRP participation is limited to a maximum of 25% of the cropland in each county.

Through the spring of 1988 six bid opportunities had been available to farmers, and approximately 28.9 million acres of land had been committed to the CRP. According to the ASCS, on a nationwide basis the average payment per acre now stands at about \$48.39 per year. On average, the land accepted into the CRP has a soil erosion rate of about 19 tons per acre per year.²

The CRP represents an interesting policy initiative under U.S. agricultural policy. First, it contains some potential internal contradictions. The most striking of these is that it intends to reduce production capacity by offering farmers incentives to remove the least productive acres from production. Thus, to maintain the conservation component, the supply reduction effects of CRP may be minimized. The acres being entered often are among the low-yielding acres now in production. On a national basis, this is a bit of an overstatement in that lands subject to wind erosion may well be highly productive. Nonetheless, it seems reasonable to assume that rational farmers will choose to offer their least productive acres. The CRP lands that are the subject of this study were all in low-yield wheat production prior to CRP.

Second, the CRP presents a vexing conflict between national or sectoral policy objectives and local community economic development impacts. The CRP aims at raising the prices of agricultural commodities and reducing federal outlays for commodity programs. If successful, it should result in reduced production of principal agricultural commodities like wheat and corn. This should increase grain prices to those farmers who remain in production and reduce government expenditures under the Non-Recourse Loan and Deficiency Payments Programs.

There are, however, some potentially negative side effects. The agricultural marketing

and input industries that have serviced producers in regions where fragile lands are farmed will now experience business declines as a result of the removal of this land from production. Seed dealers, fertilizer dealers, and implement dealers, as well as grain handlers will no longer be needed in numbers that existed prior to the imposition of CRP.

It should also be noted here that CRP participants will incur some cost associated with planting and maintaining a soil-conserving cover crop. Thus, in the initial phase seed dealers experience increase demand for certain specialized grass seeds. Once established, however, the use of maintenance inputs on CRP enrolled acres will be considerably less than when the land was under normal cultivation. Thus, it is expected that communities that have acted as trade centers to provide such inputs and services will be adversely affected by the decline in economic activity associated with CRP-induced reductions in grain production.

Because the CRP is limited to farmers on fragile land, those communities that happen to be located in fragile land farming areas will carry much of the indirect adjustment cost associated with this program. The benefits, then, if CRP works will likely accrue broadly to the sector and to taxpayers nationwide, while the negative externalities will accrue to specific communities in farming areas that may have few economic alternatives. These communities, however, should benefit from transfer payments associated with the "rental fees" paid to farmers participating in the CRP.

This paper investigates the impacts of the CRP on a fragile land subregion in rural Oregon. The primary objective is to measure the net effects of declining agricultural production, declining agricultural marketing activities, and increased transfer payments on three rural counties—Gilliam, Morrow, and Umatilla. These counties are in the eastern half of the state along the Washington border.

These particular counties were selected for the following reasons. First, they appear to be representative of the types of counties or subregions likely to be most affected by the CRP. Agriculture is a major component in the economic base for each of these counties. According to the U.S. Census Bureau, they are among the most agriculturally dependent counties in the nation.

Second, these are counties with relatively few alternatives to agriculture and with few

² These numbers were provided by the USDA-ASCS office in Portland, Oregon. For more details regarding CRP and its nationwide impacts, see Dicks, Llacena, and Linsenber.

Table 1. Statistical Profile of Gilliam, Morrow, and Umatilla Counties in Oregon, 1986

	County		
	Gilliam	Morrow	Umatilla
Agricultural sales (\$ × million)	16.6	90.1	120.5
Wheat's share of sales (%)	74.1	22.2	33.4
Livestock's share of sales (%)	21.1	32.6	26.2
Cropland (acres × 1,000)	278.4	442.3	737.6
Cropland eligible for CRP (acres × 1,000)	69.6	110.6	184.4
Harvested acres (× 1,000)	152.3	267.7	431.7
Wheat's share of harvested acres (× 1,000)	95.1	76.1	76.1
Estimate summer fallow (acres × 1,000)	109.0	203.0	260.0
Land enrolled in CRP (after 6th sign-up) ^a (acres × 1,000)	67.8	107.4	87.5
Percent of eligible acres	92.0	95.0	39.0

Sources: *Oregon County and State Agricultural Estimates—1986*; U.S. Department of Agriculture, Agricultural Stabilization and Conservation Service.

^a Updated to July 1988.

agricultural alternatives other than traditional production of grain and livestock (table 1). In the extreme northern portion of these counties, some agricultural diversification has occurred because of the availability of relatively low-cost irrigation from the Columbia River. However, agriculture in the southern sections of these counties is almost exclusively in summer fallow wheat and livestock production. The two primary trading centers in this subregion are located in Umatilla County (Hermiston and Pendleton). Gilliam and Morrow counties each have a single, small trading center located in the southern part of the county. Because of the remote location and scarcity of other resources, the economy of the southern portion of these counties is based almost exclusively on agriculture.

Third, a public opinion survey recently conducted in this area suggests that local leaders and the general citizenry are clearly and seriously concerned about their economic future (Survey Research Center, Oregon State University). The economies in these counties have suffered a severe setback largely as a result of the national agricultural recession that began in 1981. Many believe that the CRP will exacerbate an already difficult situation.

Study Procedures

Input/Output Model Development

Economic input/output (I/O) models are often used to estimate the impact of resource changes

or to calculate the contributions of an industry to the local economy. The basic premise of the input/output framework is that each industry sells its output to other industries and/or final consumers and, in turn, purchases primary factors of production. Therefore, the economic contribution of an industry can be evaluated in terms of changes in both final demand and interindustry relationships.

I/O models can be constructed using surveys of a regional economy. Construction of a survey data I/O model involves obtaining data on the sectoral distribution of local purchases and sales to final demand of every sector of the economy and on the imports purchased and exports sold by each sector. The amount of data needed to construct an I/O table and the associated time, cost, and technical skill requirements are enormous.

I/O models can also be constructed using published data to estimate the level and structure (or composition) of local economic activity. The U.S. Forest Service has developed a computer program named IMPLAN that can be used to construct county or multicounty I/O models for any region in the United States. (See Siverts, Palmer, and Walters.) The regional I/O models used by the Forest Service are derived from technical coefficients of a national I/O model and localized estimates of total gross outputs by sectors. The computer program (IMPLAN) adjusts the national level data to fit the economic composition and estimated trade relationships of a chosen region.

The IMPLAN data consists of two major parts: (a) estimates of final demand, gross out-

put, and employment for 466 industrial sectors; and (b) a national-level technology matrix. The data represents 1977 county-level activity in Version I and 1982 activity in Version II. Compared to development of survey data models, the IMPLAN system is very inexpensive to use. (For more detailed information, see Radtke, Detering, and Brokken.) Regional input/output models based on IMPLAN were constructed for the three rural Oregon counties in the study.

Representative Farm Survey

In order to estimate the local personal income impacts resulting from the CRP program, it was necessary to conduct a survey of area farmers. Representative farms of different sizes and ownership types were selected and surveyed to determine the level of production, the mix of inputs purchased from off the farm, and the source of those purchases. Data were reconciled on a per-acre-of-production basis. A typical budget was then developed to represent the expenditure patterns for wheat production in each of the three counties. This allowed for the determination of the changing production-related spending patterns in each county that are likely to occur as land is removed from cultivation under the CRP. Through the sixth sign-up period, about 489,000 acres of fragile land had been enrolled in the CRP in the State of Oregon. Nearly 54% of the state's total CRP acreage is in the three selected counties. County-level wheat acreage and CRP enrollment are provided in table 1.

The survey of farmers also determined the first market for their output and the distribution of their production expenditures. A secondary data input/output model was utilized to estimate the impacts of changes in production spending, changes in spending income generated through marketing services, and changes in economic activity associated with consumer-oriented spending resulting from government transfer payments under CRP.

Local Impacts of Wheat Production

The type of expense, the percent of total expenditure category, and the appropriate total income coefficient were used to estimate total local income impacts. The size of the total income coefficient will vary with the size and the structure of the local economy. Unless there

are basic differences in the structure of economies being compared, the larger the local economy, the fewer dollars tend to "leak out" to other areas. For agricultural producing areas, a crucial factor in the size of the total income coefficients is the geographic location of sources of inputs such as machinery, fertilizer, seed, and fuel.

Local personal income is defined as the amount of salaries, wages, or proprietary income that is directly and indirectly generated from an increase or decrease in sales. The amount that a farmer spends on wages or receives as profits in order to produce wheat for market is defined as the direct impact. In addition, purchases made by the farmer will cause suppliers to purchase inputs of labor or management, which are called indirect impacts. As workers and entrepreneurs receive wages, salaries, and profits from these activities, they spend money in the local area for a variety of goods and services. The wages and profits created by these expenditures are the induced impacts. The total local income impact is the sum of all three impacts. Thus, local impact is estimated by the use of the total income coefficient for each specific expenditure category.

The IMPLAN model was designed to include all production sectors in its transaction matrix. From the inverse of the transaction matrix, Type I coefficients and multipliers were developed. Although the household sector was exogenous to the transactions matrix, the expenditure patterns of consumers were used in the IMPACT phase of IMPLAN to create the Type II coefficients and multipliers. It is this IMPACT phase that allows analysis of changes in expenditure patterns of production or consumption.

A representative wheat budget, including total income coefficients used in the analysis for Gilliam County, is shown in table 2. For the purposes of the input/output analysis, it is assumed that the total revenue of \$152.99 is totally distributed among the various expenditure categories and returns to operator labor and management. The figures in table 2 represent the returns and expenditure per tilled acre. Since virtually all wheat in the area is grown under a wheat-fallow system, the \$152.99 also includes a \$2.77 expense that is incurred for maintaining one fallow acre. All subsequent analysis will be on a per-tilled-acre basis.

According to our budget, a typical Gilliam

County wheat farmer spent \$20.52 on fertilizer and herbicides. Gilliam County has no fertilizer-producing industry. However, it does require transportation and retail/wholesale participation to get these imports to Gilliam County. It is because of the relatively large amount of "leakage" that these fertilizer and herbicide expenditures generated only \$5.90 of local income. The resulting estimated income for the residents of Gilliam County from all expenditures was \$83.24. The fixed costs (\$63.25 for conservation practice, land charge, and depreciation and interest on machinery) generated \$23.08 of total local income.

Similar calculations were made to estimate the contribution to local personal income of the wheat industry for Umatilla and Morrow counties. For Morrow County, it was estimated that a total of \$132.92 of revenues and resulting expenditures per tilled acre generated a total of \$69.58 of local personal income. Umatilla County has a larger population and business base that reduces leakage to the outside. Also, the average soil conditions in Umatilla County create large yields that are partly the result of greater expenditures for a variety of inputs. The increased revenues of \$205.13 that resulted from greater yields were estimated to create a total of \$187.78 of local personal income in Umatilla County.

Analysis of Impacts of the CRP Program

By participating in the CRP program, a wheat farmer takes designated land out of production and makes no expenditures on items such as fertilizer, fuel, and machine repair. Fixed costs would continue, however. Land charges (mortgage payments for land and taxes) would still have to be made. Depreciation and interest on machinery would continue as long as the farmers continue to farm or are unable to sell excess machinery. Also, a small amount of work on the land (conservation practices) would continue.³

Under the CRP program, farmers in the study area received an average cash payment

³ Actual costs of maintaining a grass cover were not collected in the survey, so the conservation expense for fallow land was used as a proxy. While absolute estimates of CRP benefits may be slightly overestimated as a result, relative differences among counties should not be significant because the same ground cover practices are used in all three counties. Furthermore, the cost of maintaining ground cover under CRP should be relatively small compared to the other fixed costs.

Table 2. Representative Budget for a Wheat Farm in Gilliam County, Total Personal Income Coefficients for Selected Expenditures and Resulting Total Income Generated per Tilled Acre

Cost	Average Expenditure per Tilled Acre	Total Income Coefficient	Total Income Generated
Fertilizers/ herbicides	\$20.52	.288	\$5.90
Wheat sales	5.13	.602	3.09
Gas/oil/lube	8.40	.420	3.53
Mach. repair	9.03	.541	4.89
Crop insurance	2.35	.929	2.16
Conservation practice	2.77	.465	1.29
Hired labor	5.07	1.321	6.70
Miscellaneous	4.61	.976	4.50
Operating capital interest	5.04	.385	1.94
Machinery insurance, fees	2.31	.286	.66
Land charge	36.98	.393	14.24
Interest on machinery	9.72	.385	3.74
Machinery depreciation	13.78	.276	3.81
Operator labor	8.58	1.321	11.33
Management	4.33	1.321	5.72
Marketing	14.37	.677	9.73
Total	152.99		83.24

of \$50 per acre, which resulted in \$100 per tilled acre since it takes one fallow acre per year to match each cultivated acre. After deducting the \$63.25 fixed costs outlined earlier, the remaining \$36.75 of the CRP payment is viewed as household income to be spent on the upkeep of the household:

(1) \$100 CRP payment - \$63.25 fixed costs (conservation practice + land charge + interest on machinery + depreciation) = \$36.75 net additional household income from CRP.

The income coefficient for household expenditures in Gilliam County is 1.321. That is, for every dollar of net income that is received, another \$.32 of income is created by the expenditures of the household on items such as food, medical services, auto upkeep, etc.; therefore, \$48.55 local income is generated:

(2) \$36.75 (1.321 personal income coefficient) = \$48.55 local income generated from household income increase.

Table 3. Possible Impacts on Local Personal Income of the CRP Program per Tilled Acre on Three Oregon Wheat-Producing Counties

	Expenditures for Wheat Production	Total Local Personal Income Generated ^a	Net Income Gain (loss) of CRP Program if 20% of the Farmers Leave	Net Income Gain (loss) of CRP Program if 20% of the Farmers Leave
 (\$)			
Gilliam	152.99	83.24	(11.61)	(38.03)
Morrow	132.92	69.58	23.32	(1.65)
Umatilla	205.13	187.78	(81.99)	(109.59)

^a Umatilla County has a larger regional economy than either Gilliam or Morrow counties. From the surveys, wheat producers reported that most of the input purchases occurred outside of Gilliam and Morrow County. Also, because of the smaller economies, both Gilliam and Morrow counties experience greater "leakages" in their indirect and induced impacts.

For each tilled acre of land enrolled in the CRP program (two acres total land), a total of \$71.63 of personal income was created by the CRP transfer payments:

(3) $\$48.55 + \23.08 local income generated by fixed costs = \$71.63 total local income generated by the CRP payment.

This compared to \$83.24 of total personal income generated by the input sales by one acre that was in wheat production. Thus, should the farmer stay in the area, there would be an \$11.61 loss of local income as a result of the CRP program:

(4) $\$71.63 - \83.24 total local income generated by wheat production = \$(11.61) net income loss generated by the CRP program.

Because the average soil in Morrow County is less productive, the net effect of retiring wheat land was estimated to be more beneficial—a \$23.32 gain of local income per tilled acre. Umatilla County has more productive wheat land than Gilliam or Morrow County. The per-acre production revenues and expenditures were also higher. In Umatilla County, with its more productive land, an idle two acres under the CRP program resulted in an \$81.99 loss of local personal income. While the CRP transfer payments may be a positive direct impact on the wheat producer, the indirect and induced impacts on the dependent community would be negative.

Table 4. Total Estimated Income Gain (Loss) of the CRP Program Under Two Different Assumptions

County	No Movement away from the Area	Twenty Percent Movement away from the Area
 (\$)	
Gilliam	(393,579)	(1,289,217)
Morrow	1,252,284	(88,605)
Umatilla	(3,587,063)	(4,794,563)

Note: The figures in this table were obtained by multiplying one-half of the total enrolled CRP acreage from table 1 times the per-tilled-acre net effects in table 3.

The assumption on the behavior of farmers as a result of the CRP program was crucial in this analysis. For the above analysis, it was assumed the farmer retired only part of his or her land and did not move from the area. Most of the resulting expenditures for personal consumption, therefore, originate in the three study counties. Under the assumption that 20% of the farmers may choose to relocate (or that 20% of the payments would go to absentee owners and their personal consumption expenditures are made in counties outside the study area), Gilliam County could experience a loss of local personal income of \$38.03 per tilled acre. Morrow could experience a \$1.65 loss; while Umatilla, with its more productive land, could experience a \$109.59 decrease of local income for every acre taken out of wheat production (table 3).

Because many of the purchases for agricultural inputs are made outside the local economy in the smaller counties of Gilliam and Morrow, the CRP program that reduces agricultural inputs would have a relatively small aggregate effect on these economies. Depending on the assumption about movement of farmers away from the area, the county-wide effect ranged from a \$1.25 million gain in Morrow County to a \$1.29 million loss in Gilliam County (table 4). However, for the larger Umatilla County, the CRP program could have a substantial negative effect—a \$4.79 million loss if there is a 20% movement away from the area.

Results and Findings

The simple finding of this analysis suggests that in aggregate the net impacts of CRP on

Morrow County could be positive. In Gilliam County there is likely to be a relatively small negative effect compared to the personal income impact of continuing to grow wheat. Umatilla is the only county where measurable net negative effects are likely to accrue. This is the case because Umatilla County serves as a subregional supply center for agricultural input and marketing services and because the land taken out of production in Umatilla County is more productive than the land in the other areas. It is essential, however, to recognize that the results of this analysis are sensitive to a number of important variables and assumptions.

First, in the base scenario, we assumed that farmers who participate in CRP will continue to live in their communities and spend their CRP transfer payment incomes in the communities where they previously made production-oriented expenditures. It is reasonable to expect, however, that with the ten-year set-aside program, certain farm families will choose to relocate in other areas. The larger the proportion of families making this choice, the smaller the positive impacts and the greater the likelihood of long-term negative economic consequences for local communities.

Second, this study presumed that when spending patterns shift away from production-related purchases toward consumer spending by farm households, the local community economies will be able to provide new services demanded to replace those for which demand has declined. This is a heroic assumption indeed. Small communities that have been providers of agriculture-related inputs and service may not be able to generate economies of scale or sufficient critical mass to provide consumer-oriented services or products. For example, a farmer in Heppner, Oregon (Morrow County), who no longer demands tractor tires may now demand entertainment that the local community cannot provide. Thus, it is likely that a certain portion of the income generated by transfer payments under CRP will not be spent in the community but rather will be spent in larger, urban areas.

Third, the expected shifts from production-related to consumer-related spending in these local economies could result in long-term structural changes. New industries might emerge or other non-farm-related local business activities might expand. An evaluation of such long-term structural dynamics within

these communities, however, is beyond the scope of this study.

Finally, it is very important to recognize that whatever the aggregate net outcome, these communities will experience painful adjustments as agricultural production declines and federal transfer payments become a principal form of income generated for farm families.⁴ Many resources, particularly human resources, are not easily convertible out of agriculturally related employment to some other use. Those experiencing unemployment problems as a result of declines in the agriculture-related economy may simply not be able to find employment in consumer-related growth in local industries. Thus, these communities are likely to experience both economic adjustment pains and individual psychological pains associated with a fundamental restructuring of their local economies.

It is important to note that the economy in many of these subregions has been in a depressed state for five to six years. There are those who believe that the imposition of CRP will accelerate the demise of many rural communities.

Casual conversations with a number of farmers who have opted to participate in the CRP indicates that they find themselves in a difficult situation as well. As individual entrepreneurs, they recognize that participation in a CRP is a rational business decision. But many of these individuals are also community leaders, who sense that their decision to participate could seriously damage the communities in which they have been residents and leaders for many years. Thus, they find themselves trapped between their sense of civic responsibility and their individual business judgments.

Summary and Conclusions

The Conservation Reserve Program (CRP) has the potential to alleviate some of the problems associated with excess production and excess capacity in American agriculture. It also has the potential to preserve fragile lands from the serious soil erosion that has been occurring over the last several decades. If it succeeds, it should have a noticeable impact on agricul-

⁴ Without a major increase in the wheat price, the combination of deficiency payments and now CRP payments will result in transfer payments being the dominant sources of farm income.

tural prices and agricultural incomes for farmers who continue to produce grain. It should also ultimately result in some reduction in federal expenditures associated with commodity programs. However, it has a number of other implications that may prove deleterious to rural America.

This paper analyzes the implications of the CRP for local communities for which agricultural production has been the mainstay for their economic viability. The analysis suggests that under certain conditions Morrow County could benefit from the CRP program and Gilliam County could have relatively minor adverse effects. The third county, Umatilla, will most likely suffer serious adverse effects. It is difficult to generalize absolute results from this study to other areas. On a relative basis, however, it would indicate that areas with comparatively productive land, albeit highly erosion prone, are more likely to be adversely effected by the CRP program. Also likely to be hurt are rural areas that are relatively self-sufficient with regard to providing their own agricultural inputs because funds for these inputs will no longer be spent in the local economy.

The results also suggest that the benefits or net costs associated with CRP are very sensitive to a number of variables including the decision on the part of participants to continue to live and spend in their local communities. Moreover, the conversion of many of these county economies from a production-oriented to a transfer payment-oriented economy may result in noticeable adjustment pains. In this

regard, then, the CRP represents a conflict between local county or community economic objectives and broader national and sectoral policy objectives. It brings broad agriculture policy into potential conflict with rural development policies, strategies, and programs.

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