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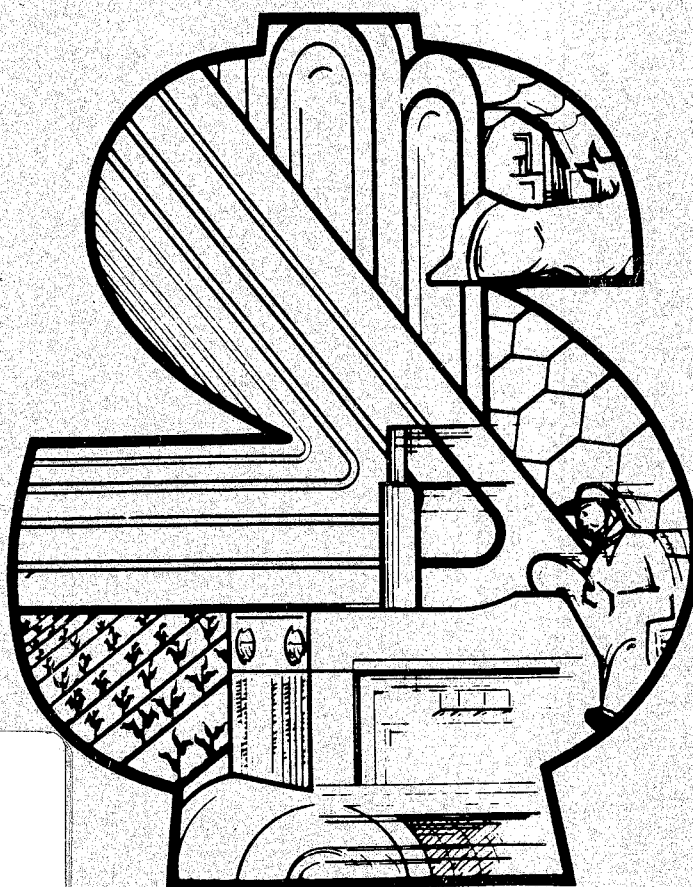
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# Economic Impact of the Conservation Reserve Program in North Dakota

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The authors remain solely responsible for any errors in form or substance that may remain.

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## ECONOMIC IMPACT OF THE CONSERVATION RESERVE PROGRAM IN NORTH DAKOTA

Timothy L. Mortensen, Randal C. Coon, Jay A. Leitch,  
F. Larry Leistritz, and Brenda L. Ekstrom\*

The Conservation Reserve Program (CRP), authorized by Congress in the 1985 Food Security Act (Public Law 99-198), has an objective of encouraging soil conservation by retiring 45 million acres of erodible land by 1990. Nationally, this program had reached about one-half its goal (22,150,025 acres) through the fifth sign-up period (July 1987). North Dakota ranked seventh among the states, with 1.3 million acres or 4.8 percent of the state's total cropland (U.S. Bureau of Census 1982 and Dicks et al. 1988) contracted through the fifth sign-up (Figure 1).

Questions have arisen regarding the effectiveness of the program in achieving its objectives. The restrictions and rules regarding eligibility of only erodible land imply that the program's major objective is erosion control. Achieving this objective also, at least partially, helps to meet other objectives such as protecting the nation's long-term food-producing capability, reducing sedimentation, creating wildlife habitat, and improving water quality. In fact, Ribauldo (1989) estimated water quality benefits of \$41.20 per CRP acre enrolled through the fifth sign-up over the 10-year contract life. The present value (at a 4 percent discount rate) of acres enrolled through the fifth sign-up is \$53.6 million in improved water quality benefits attributable to CRP participation in North Dakota.

Production control is more difficult to assess. Rational farmers offer their least productive land in response to the CRP incentives (Martin et al. 1988). This allows more management and capital to be employed on remaining acres which may result in increased productivity on those acres. However, one could also assume that rational farmers were producing at their optimum levels before entry into the program, in which case no increase in intensity of inputs on other acres would be economically justified.

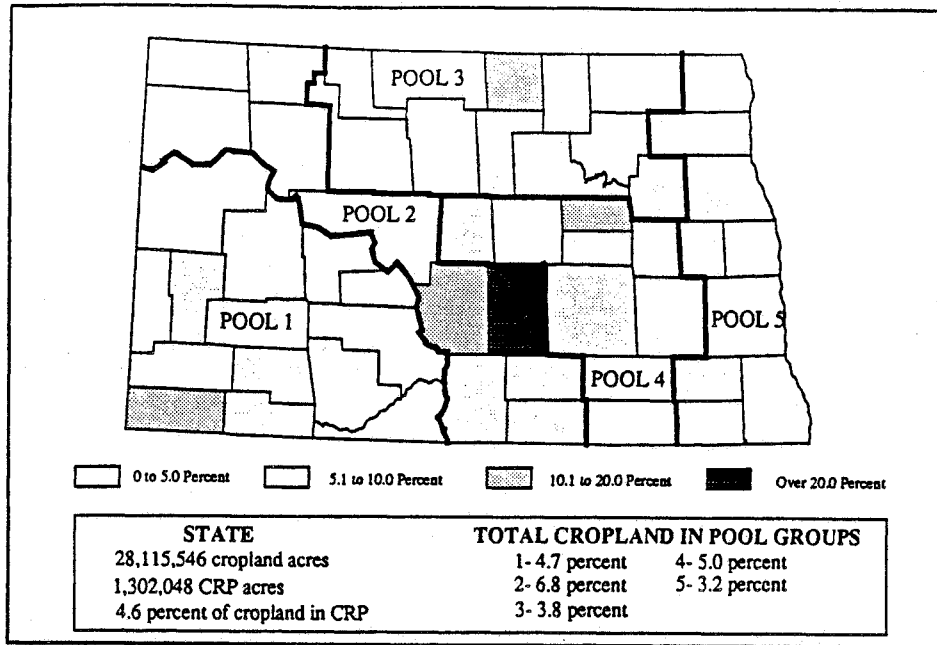
Rural areas, and North Dakota in particular, have experienced adverse economic conditions in agriculture during the 1980s. While changes in farm commodity programs may have short-term effects on income and employment in the state economy, the CRP may cause substantial long-term changes. This report will estimate the economic impact of the CRP on the five pool groups in the state (Figure 1). Impacts include changes in business volume (both direct and indirect), employment, and tax receipts.

### Method of Analysis

North Dakota's economy consists of 17 sectors (Table 1) among which energy and agricultural production are the principal basic (export-oriented) activities (Coon et al. 1985). Input-output techniques were used to analyze changes in the basic components of the state's economy resulting from

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\*Mortensen is research assistant, Coon is research specialist, Leitch is associate professor, Leistritz is professor, and Ekstrom is research associate, Department of Agricultural Economics, North Dakota State University, Fargo.



SOURCE: USDA Soil Conservation Service, 1988.

Figure 1. Percentage of Total Cropland enrolled in CRP through the fifth signup by category.

TABLE 1. SECTORS OF THE NORTH DAKOTA INPUT-OUTPUT MODEL AND TYPE OF IMPACT RESULTING FROM THE CRP PROGRAM

Sector	Affected directly by CRP	Affected directly and indirectly by CRP
( 1) Ag, Livestock	NO	YES
( 2) Ag, Crops	NO	YES
( 3) Nonmetallic mining	NO	YES
( 4) Construction	NO	YES
( 5) Transportation	NO	YES
( 6) Communications & Public Utilities	NO	YES
( 7) Ag Processing & Misc. Mfg.	NO	YES
( 8) Retail Trade	YES	YES
( 9) Finance, Ins., & Real Estate	YES	YES
(10) Business & Personal Services	YES	YES
(11) Professional & Social Services	NO	YES
(12) Households	YES	YES
(13) Government	YES <sup>a</sup>	YES
(14) Coal Mining	NO	NO
(15) Thermal-Electric Generation	NO	NO
(16) Petroleum Exploration and Extraction	NO	NO
(17) Petroleum Refining	NO	NO

<sup>a</sup>USDA agencies have been affected directly--workload increased--new hires by ASCS, SCS, and etc.

implementing CRP. Input-output is a quantitative technique that describes the interrelationships (economic linkages) within a state or regional economy.

Crop production is a basic economic activity that brings dollars into a community (or region) by exporting commodities to the outside. Revenues received from these crop exports are used to purchase production inputs from other sectors of the economy. Input suppliers, in turn, use revenue derived from sales to farmers to purchase other inputs or raw materials. The original dollars resulting from the export of a product (e.g., wheat) are exchanged among sectors of the local or state economy in continuing rounds of sales and purchases down the supply chain. These additional rounds are called indirect requirements of the original sector. Excess revenues over costs (profits) in each sector are returned to households as personal income, which is also spent and respent to support living requirements of individuals. Input-output analysis is the mathematical tool that traces these linkages among the basic sectors and calculates the total business activity resulting from a direct impact in a basic sector. Employment changes can be estimated using productivity ratios (the ratio of gross business volume to employment) because the number of employees in a sector is directly related to the sales volume of that sector. Certain taxes also may be estimated by using gross business volumes from various sectors. A complete discussion of the North Dakota Input-Output model can be found in Coon et al. (1985).

Several sectors of the state's economy are particularly important when examining farm expenditures and income. Those sectors are (1) the retail trade sector; (2) the finance, insurance, and real estate sector; and (3) the business and personal services sector (Table 2). In addition to these farm input sectors, the household sector also is important since dollars in this sector are personal income, which represents wages, salaries, rents, dividends, and business profit.

TABLE 2. PURCHASES FROM THE SECTORS OF THE NORTH DAKOTA ECONOMY THAT ARE AFFECTED BY THE CRP PROGRAM

Sector	Items Purchased
(8) Retail trade <sub>.44</sub>	Fertilizer, fuel, oil, seed, chemicals, machinery, hardware.
(9) Finance, insurance, and real estate <sub>&gt;.12</sub>	Crop insurance, property insurance, borrowed capital.
(10) Business and personal services	Machinery repairs, custom farm operations, legal and accounting services.
(12) Households <sub>.24</sub>	Net income from farm operations and payments to hired labor.

## Data Sources

The flow chart in figure 2 outlines the various segments of data analysis and operations for estimating CRP impacts. Three main sources of data were used: (1) county CRP survey data (Mortensen et al. 1988), (2) North Dakota agricultural statistics (NASS 1988), and (3) county data from the state Agricultural Stabilization and Conservation Service (ASCS).<sup>1</sup> Initially compiled on a county-by-county basis, the resulting data fall into three main categories: (1) reduced input expenditures, (2) reduced federal commodity payments, and (3) increased CRP contract payments and upkeep costs.

## Prices

Statewide average annual prices (Figure 3) received by farmers for 1987 crops were used in calculating net returns from cropping operations (NASS 1988). The prices used do not reflect federal commodity program payments for wheat and feed grains, which were treated separately.

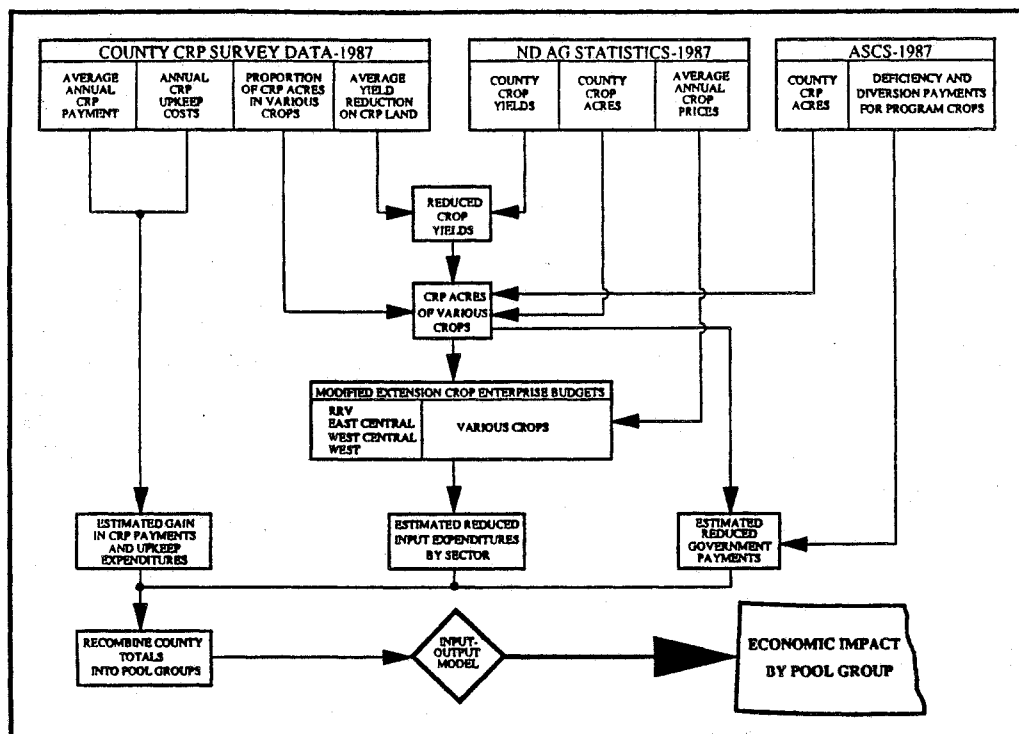




Figure 2. Method of Analysis Used in Estimating CRP Impacts

<sup>1</sup>Impacts of the CRP were analyzed using 1987 data on farm prices, yields, and costs, and CRP acres through the fifth signup due to availability of data and the abnormal nature of the 1988 drought. However, it should be recognized that not all acres that were enrolled through July 1987 were taken out of production that year.

CROP	Price <sup>a</sup>	CROPPING AREA			
		RRV	E. Central	W. Central	West
Wheat (fallow)	\$2.60/bu.				
Wheat (continuous)	\$2.60/bu.				
Durum (fallow)	\$3.05/bu.				
Durum (Continuous)	\$3.05/bu.				
Barley (fallow)	\$1.50/bu.				
Barley (continuous)	\$1.50/bu.				
Sunflower	\$8.00/cwt				
Flax	\$3.30/bu.				
Oats	\$1.55/bu.				
Corn (grain)	\$1.70/bu.				
Corn (silage)	\$11.83/T				
Summerfallow	---				
Soybeans	\$5.35/bu.				
Hay	\$35.50/T				
Dry Edible Beans	\$12.00/cwt				
Rye	\$1.15/bu.				
			Grown		Not Grown

<sup>a</sup>1987 state average price. SOURCE: NASS 1988.

Figure 3. Crops Grown and Prices Used in Each of Four Cropping Areas

### Yields

Average crop yields for 1987 (NASS 1988) were reduced (or increased) according to proportions indicated by survey respondents for each county. Adjusted yields were then used in enterprise budgets to calculate gross returns for up to 16 crops (depending on pool group).

### Crops

Three steps were involved in calculating acres of various crops planted on CRP acres. First, crop acres for each county were used to calculate the proportions of summer fallow or continuous cropping for wheat, durum, barley, and corn for both grain and silage (NASS 1988). Second, survey data were used to allocate the proportion of each crop that was planted on CRP acres in each county. Finally, the proportions of each crop were applied to county CRP acres reported by ASCS. The results derived are used in enterprise budgets to estimate reduced crop input expenditures and also to estimate reduced government program payments.

### Enterprise Budgets

NDSU Extension Service enterprise budgets (Reff 1987) for each of the four cropping areas were modified to accommodate summer fallow and continuous cropping practices and other anomalies such as adjustments for age of machinery used in the farming operation. Budgets for the 16 crops (Appendix A) that CRP survey respondents reported as being grown on CRP acres are included for each of four cropping areas: (1) Red River Valley, (2) East Central, (3) West Central, and (4) West (Figure 4).

Modified crop yields and CRP acres for various crops were combined with the appropriate enterprise budget for each county. In addition, production expenditures were categorized by economic sector to estimate reduced input expenses by county.

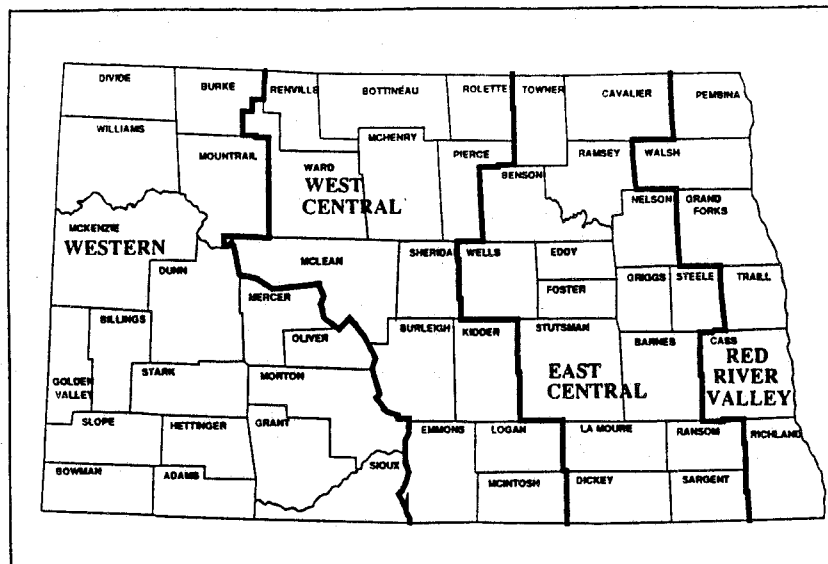


Figure 4. North Dakota Cropping Areas

### Commodity Program Payments

Another component of the overall impact of CRP is the effect of changes in government payments to the farm operator for reduced participation in commodity programs. Federal program payments for wheat and feed grains were obtained and categorized by county (ASCS 1988). Total county acres of each program crop (NASS 1988) were used to determine per-acre payments for wheat, barley, oats, and corn. Per-acre payments were then applied to the program acreages in each county assuming a 100% participation rate.

### CRP Contract Payments

The final component of the overall impact includes the infusion of federal dollars as payment for land retirement and expenditures by landowners for upkeep of CRP land. Payments received by landowners were obtained from survey results (Mortensen et al. 1988).

### Results

The North Dakota Input-Output model, originally developed to analyze economic impacts in the eight state planning regions, was reaggregated to conform to the five CRP pool groups. Sales for final demand were compiled for eight years (1980 to 1987) and adjusted to 1987 base dollars by economic sector (Table 3 and Appendix B).

Examining the relative importance of agriculture in each pool group shows that agriculture (crops and livestock) accounts for only 19.1 percent of sales for final demand in pool group one (Table 3) where energy-related activity accounts for a substantial portion (62.9 percent) of export sales. Pool group four is much more dependent on the agricultural sector, which accounts for nearly 63 percent of its export base. Pool group one, however, accounts for over 30 percent of the state's total export base; and pool group four makes up only about 12 percent.

TABLE 3. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR (1987=BASE DOLLARS), 1980-1987 AVERAGE, BY POOL NORTH DAKOTA CONSERVATION RESERVE PROGRAM GROUP.

POOL	(1) AG LVSTK	(2) AG CROPS	(4) CONSTR	(7) AG PROC & MISC MFG	(8) RETAIL TRADE	(10) BUS & PERS SERV	(12) HOUSE HOLDS	(14) COAL MINING	(15) THERMAL- ELEC GEN	(16) PET EXP/EXT	(17) PET REFINING	TOTAL
-----MILLION DOLLARS-----												
1	271.2	222.0	19.9	69.2	30.1	10.1	336.1	80.0	164.91	1022.8	360.4	2586.7
2	183.0	309.6	19.2	73.2	37.8	12.6	421.7	18.8	61.0	221.0	35.0	1392.9
3	101.0	611.8	15.6	83.6	42.1	14.0	469.1	--	--	117.6	--	1454.8
4	132.5	473.8	7.5	64.7	22.9	7.6	254.8	--	--	--	--	963.8
5	94.2	989.3	39.5	362.5	69.3	23.1	773.5	--	--	--	--	2351.4
STATE	782.0	2606.5	101.7	653.1	202.2	67.4	2255.2	98.8	225.9	713.6	116.9	7823.3
-----PERCENTAGE OF TOTAL-----												
1	10.5	8.6	0.8	2.7	1.2	0.4	13.0	3.1	6.4	39.5	13.9	100.00
2	13.1	22.2	1.4	5.3	2.7	0.9	30.3	1.3	4.4	15.9	2.5	100.00
3	6.9	42.1	1.1	5.7	2.9	1.0	32.2	---	---	8.1	---	100.00
4	13.7	49.2	0.8	6.7	2.4	0.8	26.4	---	---	---	---	100.00
5	4.0	42.1	1.7	15.4	2.9	1.0	32.9	---	---	---	---	100.00
STATE	10.0	33.3	1.3	8.3	2.6	0.9	28.8	1.3	2.9	9.1	1.5	100.00

#### Direct Effects of CRP

Payments to North Dakota landowners totaled nearly \$50 million based on acreage enrolled through the fifth signup. However, when reduced input expenditures and crop returns are included, the state net direct effect is a decline of \$56 million in production expenditures with over \$35 million impacting the retail sector (Table 4). Pool groups two, four, and five have the highest net impact at about \$12 million each. The household sector is positively impacted in pool groups one, two, and three primarily because the CRP rental payments exceeded farm income and government program payments.

#### Direct and Indirect Effects

Direct expenditure and household income changes were analyzed using the input-output model. Tables 5 through 10 summarize baseline business activity, CRP business activity, and net change by sector for the state and the five pool groups. The impact of \$56 million in direct effects resulting from the CRP translates into about \$141 million in reduced business activity for the state or an overall multiplier of 2.56. This total is spread among 13 sectors of the state's economy with the retail sector absorbing the greatest impact--about 40 percent of the state total. Households are adversely affected by about \$34 million or 23.9 percent of the total.

TABLE 4. ACRES ENROLLED IN THE CRP AND THE ASSOCIATED  
LOSS OF PRODUCTION EXPENDITURES AND CHANGE IN INCOME,  
BY CRP POOL GROUP, 1987

POOL GROUP	5th SIGNUP ACRES	---REDUCED RETAIL (8)	EXPENDITURES FIRE (9)	--- B&P SERV (10)	CHG IN INCOME HOUSEHOLDS (12)	NET CHANGE
-----000s-----						
1	244,518	-4940	-1787	-1619	10	-8236
2	381,409	-8539	-3074	-2649	2033	-12229
3	260,548	-6563	-2406	-1961	755	-10175
4	240,997	-7986	-2541	-1950	-92	-12569
5	174,975	-7262	-2112	-1772	-1448	-12594
STATE	1,302,048	-35291	-11919	-9951	1258	-55803
STATE TOTAL						
(PERCENTAGE OF						
SECTORS 8, 9 & 10)		61.7%	20.9%	17.4%		

TABLE 5. AVERAGE 1980-1987 BASELINE BUSINESS ACTIVITY  
AND BUSINESS ACTIVITY ASSOICATED WITH REDUCED PRODUCTION  
EXPENDITURES AND INCOME CHANGE RESULTING FROM CRP ACRES  
BY ECONOMIC SECTOR, NORTH DAKOTA, 1987

SECTOR	BASELINE BUSINESS ACTIVITY*	---CRP BUSINESS ACTIVITY--- PRODUCTION EXPENDITURES	INCOME CHANGE	NET CHANGE
-----000s-----				
( 1) Ag, Livestock	1,469,058	-4,254	85	-4,169
( 2) Ag, Crops	3,662,184	-1,709	33	-1,676
( 3) Nonmetallic Mining	49,420	-186	7	-179
( 4) Construction	730,076	-2,650	113	-2,537
( 5) Transportation	91,330	-627	12	-615
( 6) Communications & Public Utilities	659,314	-4,540	133	-4,407
( 7) Ag Processing & Misc. Mfg.	2,143,329	-2,670	52	-2,618
( 8) Retail Trade	5,321,801	-57,505	937	-56,568
( 9) Finance, Ins., & Real Estate	1,110,927	-16,731	211	-16,520
(10) Business & Personal Services	488,715	-12,056	76	-11,980
(11) Professional & Social Services	521,151	-2,442	124	-2,318
(12) Households	7,955,811	-35,685	1,953	-33,732
(13) Government	679,028	-3,437	136	-3,301
(14) Coal Mining	134,774	0	0	0
(15) Thermal-Electric Generation	225,900	0	0	0
(16) Petroleum Exploration & Extraction	883,623	0	0	0
(17) Petroleum Refining	120,864	0	0	0
TOTALS	26,247,305	-144,492	3,872	-140,620

\*Economic base business activity is based on the 1980-1987 average sales for  
final demand in terms of 1987=BASE DOLLARS.



TABLE 6. AVERAGE 1980-1987 BASELINE BUSINESS ACTIVITY AND BUSINESS ACTIVITY ASSOCIATED WITH REDUCED PRODUCTION EXPENDITURES AND INCOME CHANGE RESULTING FROM CRP ACRES BY ECONOMIC SECTOR, POOL GROUP 1, 1987

SECTOR	BASELINE	---CRP BUSINESS ACTIVITY---		
	BUSINESS ACTIVITY*	PRODUCTION EXPENDITURES	INCOME CHANGE	NET CHANGE
-----000s-----				
( 1) Ag, Livestock	409,027	-611	1	-610
( 2) Ag, Crops	418,940	-248	0	-248
( 3) Nonmetallic Mining	12,245	-28	0	-28
( 4) Construction	227,154	-391	1	-390
( 5) Transportation	32,992	-91	0	-91
( 6) Communications & Public Utilities	156,012	-676	1	-675
( 7) Ag Processing & Misc. Mfg.	356,263	-387	0	-387
( 8) Retail Trade	989,371	-8,233	7	-8,226
( 9) Finance, Ins., & Real Estate	214,297	-2,501	2	-2,499
(10) Business & Personal Services	87,158	-1,934	1	-1,933
(11) Professional & Social Services	104,672	-362	1	-361
(12) Households	1,581,150	-5,300	16	-5,284
(13) Government	136,215	-511	1	-510
(14) Coal Mining	106,394	0	0	0
(15) Thermal-Electric Generation	164,900	0	0	0
(16) Petroleum Exploration & Extraction	1,157,811	0	0	0
(17) Petroleum Refining	363,426	0	0	0
TOTALS	6,518,027	-21,273	31	-21,242

\*Economic base business activity is based on the 1980-1987 average sales for final demand in terms of 1987=BASE DOLLARS.

TABLE 7. AVERAGE 1980-1987 BASELINE BUSINESS ACTIVITY AND BUSINESS ACTIVITY ASSOCIATED WITH REDUCED PRODUCTION EXPENDITURES AND INCOME CHANGE RESULTING FROM CRP ACRES BY ECONOMIC SECTOR, POOL GROUP 2, 1987

SECTOR	BASELINE	---CRP BUSINESS ACTIVITY---		
	BUSINESS ACTIVITY*	PRODUCTION EXPENDITURES	INCOME CHANGE	NET CHANGE
-----000s-----				
( 1) Ag, Livestock	297,680	-1,051	137	-914
( 2) Ag, Crops	474,453	-424	54	-370
( 3) Nonmetallic Mining	8,407	-46	12	-34
( 4) Construction	131,395	-668	183	-485
( 5) Transportation	16,463	-157	19	-138
( 6) Communications & Public Utilities	112,636	-1,150	214	-936
( 7) Ag Processing & Misc. Mfg.	310,287	-665	85	-580
( 8) Retail Trade	865,044	-14,152	1,514	-12,638
( 9) Finance, Ins., & Real Estate	181,883	-4,292	342	-3,950
(10) Business & Personal Services	80,217	-3,185	123	-3,062
(11) Professional & Social Services	88,218	-619	200	-419
(12) Households	1,348,328	-9,036	3,156	-5,880
(13) Government	112,696	-870	220	-650
(14) Coal Mining	28,516	0	0	0
(15) Thermal-Electric Generation	61,000	0	0	0
(16) Petroleum Exploration & Extraction	246,110	0	0	0
(17) Petroleum Refining	35,938	0	0	0
TOTALS	4,399,271	-36,315	6,259	-30,056

\*Economic base business activity is based on the 1980-1987 average sales for final demand in terms of 1987=BASE DOLLARS.

TABLE 8. AVERAGE 1980-1987 BASELINE BUSINESS ACTIVITY AND BUSINESS ACTIVITY ASSOCIATED WITH REDUCED PRODUCTION EXPENDITURES AND INCOME CHANGE RESULTING FROM CRP ACRES BY ECONOMIC SECTOR, POOL GROUP 3, 1987

SECTOR	BASELINE	---CRP BUSINESS ACTIVITY---		
	BUSINESS ACTIVITY*	PRODUCTION EXPENDITURES	INCOME CHANGE	NET CHANGE
-----000s-----				
( 1) Ag, Livestock	223,559	-806	51	-755
( 2) Ag, Crops	777,125	-327	20	-307
( 3) Nonmetallic Mining	9,360	-36	4	-32
( 4) Construction	135,455	-513	68	-445
( 5) Transportation	16,755	-120	7	-113
( 6) Communications & Public Utilities	127,055	-881	80	-801
( 7) Ag Processing & Misc. Mfg.	325,227	-512	31	-481
( 8) Retail Trade	1,057,210	-10,871	562	-10,309
( 9) Finance, Ins., & Real Estate	217,736	-3,341	127	-3,214
(10) Business & Personal Services	97,814	-2,372	46	-2,326
(11) Professional & Social Services	101,962	-474	74	-400
(12) Households	1,563,653	-6,944	1,172	-5,772
(13) Government	132,682	-669	82	-587
(14) Coal Mining	35	0	0	0
(15) Thermal-Electric Generation	0	0	0	0
(16) Petroleum Exploration & Extraction	129,137	0	0	0
(17) Petroleum Refining	0	0	0	0
TOTALS	4,914,765	-27,866	2,324	-25,542

\*Economic base business activity is based on the 1980-1987 average sales for final demand in terms of 1987=BASE DOLLARS.

TABLE 9. AVERAGE 1980-1987 BASELINE BUSINESS ACTIVITY AND BUSINESS ACTIVITY ASSOCIATED WITH REDUCED PRODUCTION EXPENDITURES AND INCOME CHANGE RESULTING FROM CRP ACRES BY ECONOMIC SECTOR, POOL GROUP 4, 1987

SECTOR	BASELINE BUSINESS ACTIVITY*	---CRP BUSINESS ACTIVITY---		
		PRODUCTION EXPENDITURES	INCOME CHANGE	NET CHANGE
-----000s-----				
( 1) Ag, Livestock	228,749	-942	-6	-948
( 2) Ag, Crops	619,313	-377	-2	-379
( 3) Nonmetallic Mining	6,497	-39	-1	-40
( 4) Construction	83,254	-571	-8	-579
( 5) Transportation	10,960	-136	-1	-137
( 6) Communications & Public Utilities	86,153	-973	-10	-983
( 7) Ag Processing & Misc. Mfg.	276,879	-586	-4	-590
( 8) Retail Trade	743,866	-12,770	-69	-12,839
( 9) Finance, Ins., & Real Estate	153,833	-3,575	-15	-3,590
(10) Business & Personal Services	67,242	-2,399	-6	-2,405
(11) Professional & Social Services	69,633	-524	-9	-533
(12) Households	1,061,053	-7,672	-143	-7,815
(13) Government	92,968	-738	-10	-748
(14) Coal Mining	0	0	0	0
(15) Thermal-Electric Generation	0	0	0	0
(16) Petroleum Exploration & Extraction	0	0	0	0
(17) Petroleum Refining	0	0	0	0
TOTALS	3,500,400	-31,302	-284	-31,586

\*Economic base business activity is based on the 1980-1987 average sales for final demand in terms of 1987=BASE DOLLARS.

TABLE 10. AVERAGE 1980-1987 BASELINE BUSINESS ACTIVITY AND BUSINESS ACTIVITY ASSOCIATED WITH REDUCED PRODUCTION EXPENDITURES AND INCOME CHANGE RESULTING FROM CRP ACRES BY ECONOMIC SECTOR, POOL GROUP 5, 1987

SECTOR	BASELINE	---CRP BUSINESS ACTIVITY---		
	BUSINESS ACTIVITY*	PRODUCTION EXPENDITURES	INCOME CHANGE	NET CHANGE
-----000s-----				
( 1) Ag, Livestock	320,101	-844	-98	-942
( 2) Ag, Crops	1,376,352	-335	-39	-374
( 3) Nonmetallic Mining	15,660	-35	-8	-43
( 4) Construction	222,668	-505	-131	-636
( 5) Transportation	25,844	-122	-13	-135
( 6) Communications & Public Utilities	209,355	-859	-153	-1,012
( 7) Ag Processing & Misc. Mfg.	880,990	-519	-60	-579
( 8) Retail Trade	1783,426	-11,478	-1,078	-12,556
( 9) Finance, Ins., & Real Estate	368,038	-3,024	-243	-3,267
(10) Business & Personal Services	165,145	-2,165	-88	-2,253
(11) Professional & Social Services	170,119	-460	-142	-602
(12) Households	2606,615	-6,736	-2,248	-8,984
(13) Government	222,935	-649	-156	-805
(14) Coal Mining	0	0	0	0
(15) Thermal-Electric Generation	0	0	0	0
(16) Petroleum Exploration & Extraction	0	0	0	0
(17) Petroleum Refining	0	0	0	0
TOTALS	8,367,248	-27,731	-4,457	-32,188

\*Economic base business activity is based on the 1980-1987 average sales for final demand in terms of 1987=BASE DOLLARS.

The largest net change occurred in pool group five where business activity is reduced by over \$32 million (Figure 5). While accounting for only 13.4 percent of the total CRP acres in the state (through the fifth signup), the pool group has nearly 23 percent of the reduced business activity (Table 11). Similarly, pool group four represents 22.5 percent (\$31.6 million) of the reduced business activity and has about 18.5 percent of the CRP acres. Pool groups one, two, and three account for 18.2, 21.4, and 15.1 percent of the total economic impact, respectively.

Although the net impact of the CRP on North Dakota's current and immediate future economy is negative, household income increased for some pool groups. The gain occurs primarily because the CRP contract payments are greater than the reduction in returns from farming and commodity program payments. This is generally the case in western and northern North Dakota in pool groups one, two, and three (Figure 5).

The overall impact to the state's economy is \$141 million. In percentage terms, business activity for the state declines by about one-half percent (Figure 6). Pool group four is impacted most on a percentage basis; nearly one percent of its baseline business activity is reduced as a result of the CRP. Pool one is impacted the least at about one-third percent.

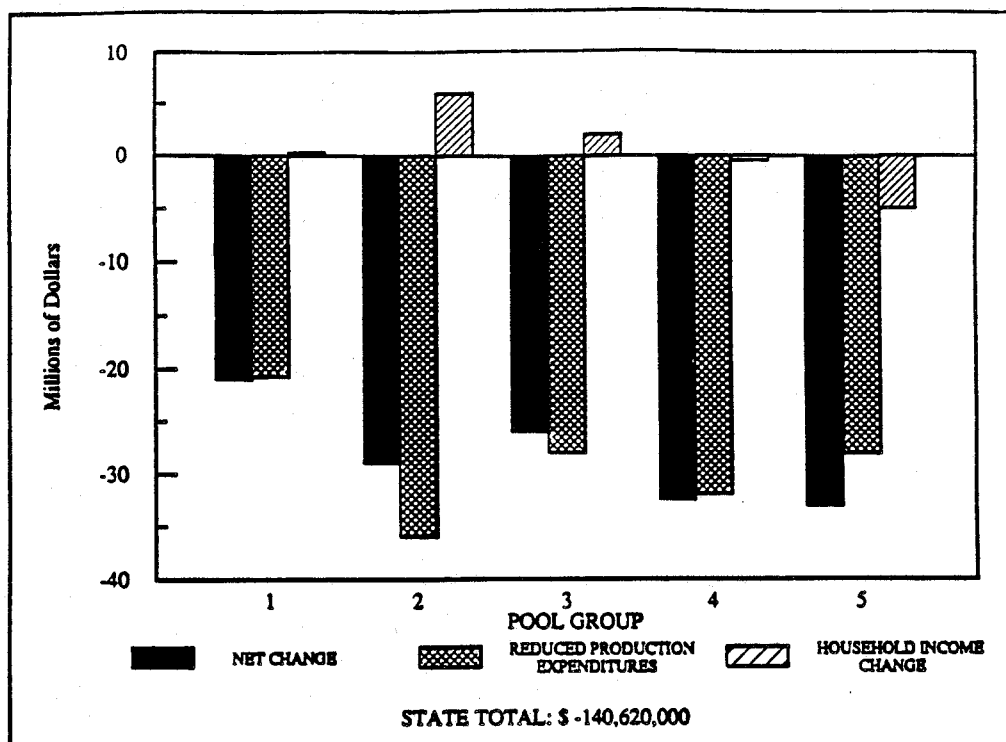


Figure 5. Business Activity Associated with Reduced Production Expenditures by Pool Group

TABLE 11. PERCENTAGE OF CRP ACRES, POOL BASELINE AS PERCENTAGE OF STATE TOTAL, POOL GROUP IMPACT AS PERCENT OF STATE IMPACT, AND NET IMPACT AS PERCENT OF TOTAL POOL BASELINE.

POOL GROUP	PERCENT OF CRP ACRES	POOL TOTAL BASELINE AS % OF STATE TOTAL BASELINE	POOL GROUP IMPACT AS PERCENTAGE OF STATE TOTAL IMPACT	CRP NET IMPACT AS PERCENT OF POOL BASELINE BUSINESS ACTIVITY
1	18.8	24.8	15.1	-0.326
2	29.3	16.8	21.4	-0.683
3	20.0	18.7	18.2	-0.520
4	18.5	13.3	22.5	-0.902
5	13.4	31.9	22.9	-0.385
STATE	100.0	100.0	100.00	-0.536

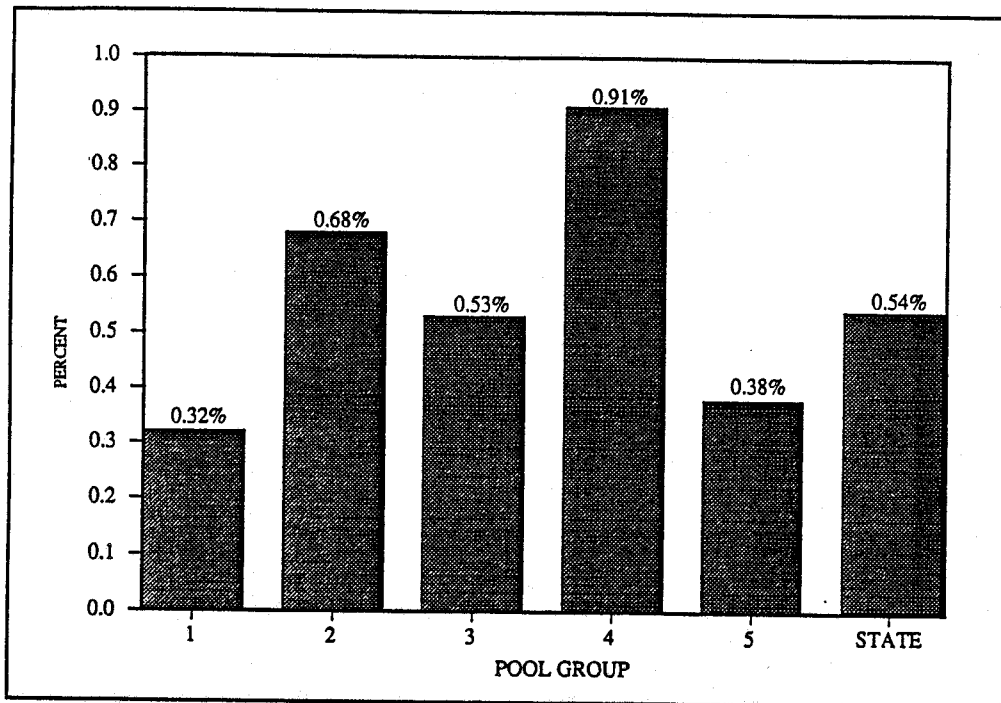


Figure 6. Percent Impact of CRP on Economic Base by Pool Group

#### Secondary Job Changes

Perhaps a more poignant result shown by the analysis is the potential for secondary job loss due to the CRP if business activity remains at these reduced levels. The state could lose as many as 2,400 secondary jobs (Table 12). While job reductions are not shown for individual industries, the retail sector certainly would be among the hardest hit since it accounts for the largest dollar volume of CRP impact. Pool group two, which could potentially lose 552 jobs, is impacted the most among the pool groups (Figure 7).

Potential job reductions are tempered somewhat by increased employment by administering agencies such as ASCS and SCS. The net increase in employment by ASCS is unknown, but in general, additional jobs were (or are) temporary. A case in point is Kidder County ASCS which hired five additional temporary employees during the 5th signup period (February 1987) and now have only one temporary position expressly for CRP. SCS officials indicate that 30 employees were added to handle the additional work load in North Dakota (March 1989). Wages of \$600,000 result in about \$2 million in direct and indirect economic activity and provided an additional 16 induced jobs.

TABLE 12. BASELINE BUSINESS ACTIVITY, BUSINESS ACTIVITY ASSOCIATED WITH CRP PROGRAM, PERCENT OF BUSINESS ACTIVITY LOST, AND SECONDARY EMPLOYMENT LOSS, BY POOL GROUP, 1987

POOL GROUP	BASELINE BUSINESS ACTIVITY	CRP-ASSOCIATED BUSINESS ACTIVITY	CRP AS A PERCENT OF BASELINE BUSINESS ACTIVITY	SECONDARY JOB CHANGE
	---million dollars---		percent	no.
1	6,518	21	0.32	-371
2	4,399	30	0.68	-552
3	4,914	26	0.53	-453
4	3,500	32	0.91	-523
5	8,367	32	0.38	-517
STATE	26,247	141	0.54	-2,434

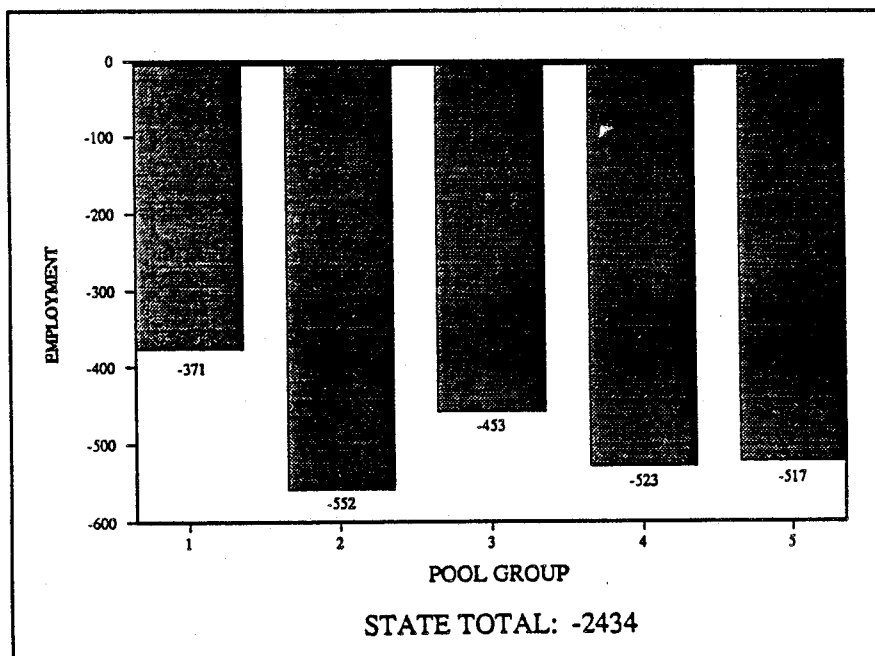


Figure 7. Impact of CRP on Employment by Pool Group

#### Per-Acre Effects

Moving west to east, the effect of each acre of CRP land on the state's economy increases because the intensity of farming increases. The total direct effect of enrollment in CRP is about \$34 per acre in pool group one (Figure 8). While the direct effect is slightly less for pool group two, the effects become gradually larger negative values moving to pool groups three, four, and five where the direct effect of one acre is nearly \$72 per acre. This is primarily due to the more intensive nature of farming in the eastern part of the state. Similar trends are seen when examining the combined direct and indirect impacts (Figure 9).

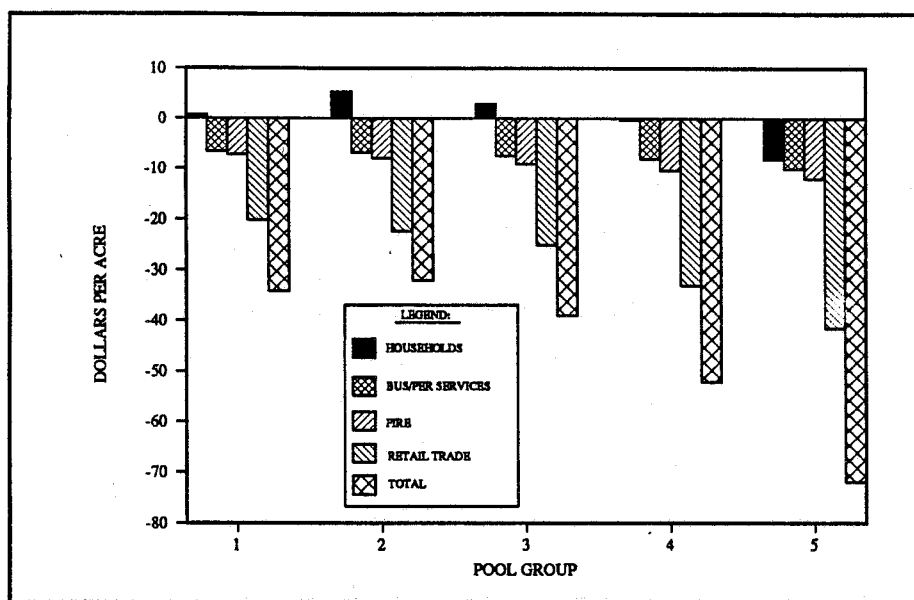


Figure 8. Net Direct Effects Per Acre of CRP by Pool Group

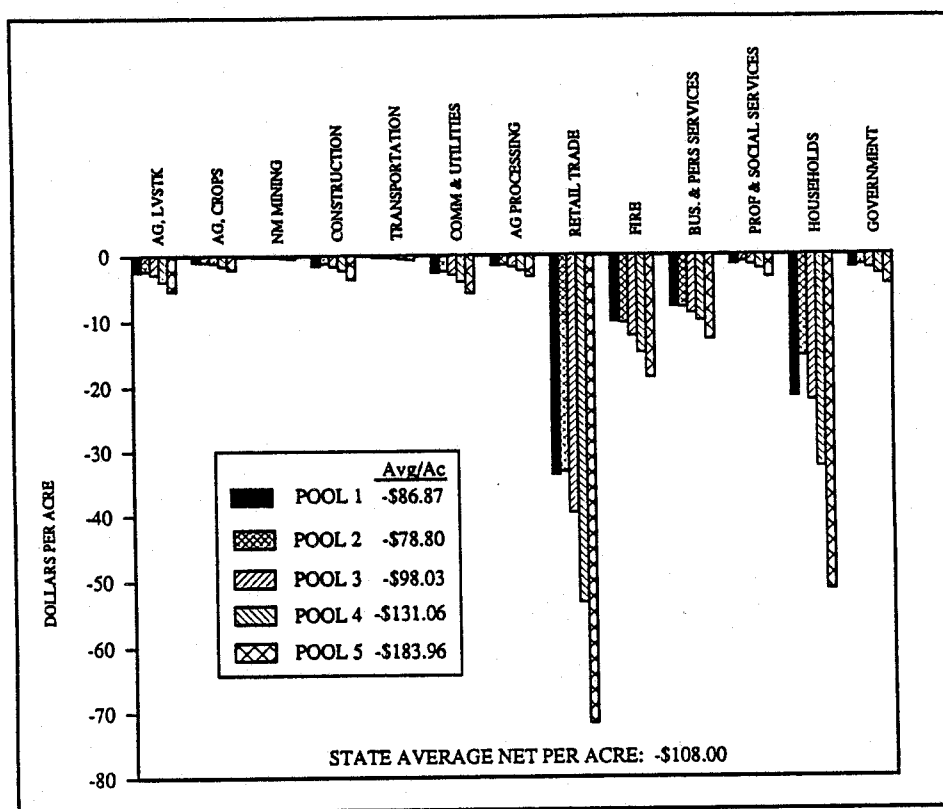


Figure 9. Combined Direct and Indirect Per Acre Impacts of CRP by Economic Sector

## Property Taxes

Farm property in North Dakota is taxed at its productivity value, which is determined by calculating returns to landowners via the North Dakota tax assessment model. CRP payments had little or no effect on property taxes in 1988 (Johnson 1989). About \$616 million in federal farm program payments were received by North Dakota landowners and CRP payments accounted for only \$21 million of this total. As CRP payments are capitalized into the value of farmland in counties where CRP income exceeds returns to landowners, there may be an impact on property values and hence taxes in future years.

## Sales, Personal Income, and Corporate Income Taxes

Reductions in sales and use taxes were estimated based on a 5.5 percent tax rate on direct expenditures for ordinary taxable items and a 3.5 percent rate for machinery replacement. Sales and use taxes are reduced \$1,371,525 for the state (Table 13).

The impact of CRP on personal income tax collections is estimated using historic data to arrive at a multiplication factor for personal income (Coon et al. 1985). The factor was adjusted to reflect changes in the North Dakota personal income tax rates since 1985. State personal income tax collections were estimated to be 3 percent of personal income. The estimated potential reduction in personal income tax collections is \$1,011,960 for the state (Table 13).

Similarly, corporate income tax is estimated at 0.31 percent of gross business volume of all business sectors, according to the relationship found in Coon et al. (1985). The estimated corporate tax change for the state is a decline of \$296,159 (Table 13).

TABLE 13. CHANGES IN SALES, PERSONAL INCOME, AND CORPORATE INCOME TAX DUE TO CRP IMPLEMENTATION

Pool Group	Personal Sales and Use Tax	Corporate Income Tax	Personal Income Tax
1	288,256	158,520	45,173
2	369,266	176,400	57,893
3	272,073	173,160	52,068
4	274,904	234,450	67,757
5	227,025	269,520	73,234
STATE TOTAL	\$1,371,525	\$1,011,960	\$296,159



### Summary and Implications

The Conservation Reserve Program has the potential to noticeably affect numerous aspects of U.S. agriculture and associated businesses. Its foremost objective, that of reducing soil erosion, is being met. (In addition, estimates of program influence on water quality indicate noticeable benefits on a national and regional level.) (Wildlife benefits are naturally implied by cover and habitat establishment along with improved water quality.) (Production is probably not reduced to the full extent of realized enrollment, but nevertheless the reduced crop acres are noticeable especially in a drought year such as 1988.)

This study focused on the economic impact due to changing land use from crops to permanent cover in North Dakota. CRP participant survey information and secondary data were used along with the North Dakota Input-Output model to estimate the impact of CRP on the state's economy. Nearly \$56 million in net direct effects resulted in about \$141 million in reduced baseline business activity for the state. However, not all sectors were impacted the same.

Certain business sectors were affected more severely than others. The retail sector accounted for over 40 percent (\$57 million) of the net change, and the household sector comprised about 24 percent (\$34 million). The net change in the finance, insurance, and real estate sector was about 12 percent (\$17 million). Impacts were tempered during the first contract year due to expenditures made for cover establishment.

Although accurate values cannot be calculated for individual counties, the ones with the highest enrolled acreages are impacted to a greater degree. Kidder, Burleigh, Bowman, Eddy, and Rolette counties all had more than 10 percent of their total cropland acres enrolled in CRP through the fifth signup (July 1987). Businesses in these counties (especially agriculture related) have felt impacts to a greater degree than counties with lower enrollment rates.

Although employment is slow to react to changes in business volume, there is a potential that up to 2,400 jobs may be lost due to CRP. These employment impacts are not distributed uniformly among economic sectors or communities. The retail sector accounted for more than 40 percent of the reduced business volume, and counties with the highest enrollment will experience the greatest impacts. Potential employment reductions are tempered by increased employment of the administering agencies--SCS and ASCS.

Concern has been expressed regarding leakage of CRP payments out of state (e.g., persons moving to warmer climate for the winter). Survey results indicate only 3.5 percent of participants intend to spend CRP income either to retire or travel out of state (Mortensen et al. 1988). In addition, 55 percent indicated they will use CRP payments for living expenses.

Nearly 21 percent of survey respondents indicated that enrolling land in the CRP was a factor that enabled them to continue farming (Mortensen et al. 1988). The \$50 million in contract payments arising from acreage enrolled through the fifth signup is a positive factor for CRP participants in general but especially so for financially troubled farmers.

(Overall, the CRP program has had many positive impacts. Society is better off due to the numerous benefits derived from reduced soil erosion, CRP participants are better off because they have the benefit of contract payments that often more than replace lost crop income and also reduce risk. The primary effect of the program rests with its impact on rural communities and

businesses, a detrimental but necessary side effect of the resource adjustment.

Because the CRP is a 10-year program, researchers have an opportunity to continually update baseline characteristics and estimate impacts. Information gathered can be used as a policymaker's guide for future program implementation.

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## APPENDIX A



APPENDIX TABLE A1. CROP BUDGETS FOR THE RED RIVER VALLEY CROPPING AREA, 1987

ITEM	SECTOR	WHEAT FALLOW	WHEAT CONT	DURUM FALLOW	DURUM CONT	BARLEY FALLOW	BARLEY CONT	SUN FLOWER	FLAX
Percent of total acreage in region		13.50%	31.00%	0.30%	0.80%	0.50%	14.80%	10.70%	0.20%
Market Price/unit		\$2.60	\$2.60	\$3.05	\$3.05	\$1.50	\$1.50	\$0.08	\$3.30
AVERAGE YIELD/acre		37.7	38.8	29.5	32.1	53.1	53.2	1378.4	16.9
DIRECT COSTS									
SEED	RETAIL	\$5.50	\$5.50	\$6.50	\$6.50	\$4.90	\$4.90	\$8.00	\$5.25
FERTILIZER	RETAIL	\$9.05	\$18.59	\$9.05	\$18.59	\$8.50	\$15.60	\$10.00	\$6.00
CUSTOM APPLICATION	BUS/PER	\$2.18	\$4.35	\$2.18	\$4.35	\$2.18	\$4.35	\$4.35	\$4.35
PESTICIDES	RETAIL	\$12.28	\$12.28	\$12.28	\$12.28	\$14.22	\$14.22	\$7.50	\$15.57
FUEL, LUBE, & DRYING	RETAIL	\$7.65	\$7.65	\$7.65	\$7.65	\$7.65	\$7.65	\$12.62	\$7.65
REPAIRS	BUS/PER	\$7.86	\$7.86	\$7.86	\$7.86	\$7.86	\$7.86	\$6.78	\$7.86
HIRED LABOR	HOUSEH	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
INSURANCE & INTEREST	FIR	\$12.54	\$13.48	\$12.62	\$13.56	\$12.61	\$12.54	\$13.58	\$12.72
DEPRECIATION	RETAIL	\$11.86	\$11.86	\$11.86	\$11.86	\$11.86	\$11.86	\$12.87	\$11.86
TOTAL COSTS		\$68.91	\$81.57	\$70.00	\$82.65	\$69.77	\$78.98	\$75.71	\$71.25
RETURNS OVER COSTS	HOUSEH	\$29.11	\$19.19	\$19.95	\$15.29	\$9.90	\$0.86	\$27.95	(\$15.39)

## RED RIVER VALLEY, CONTINUED

ITEM	SECTOR	OATS	CORN GRAIN	CORN SILAGE	FALLOW	SOYBEANS	HAY	DRY BEANS	RYE
Percent of total acreage in region		1.40%	8.20%	0.90%	11.50%	1.70%	1.50%	1.30%	1.50%
Market Price/unit		\$1.55	\$1.70	\$11.83	0.0	\$5.35	\$35.50	\$0.12	\$1.15
AVERAGE YIELD/acre		60.0	92.6	7.5	0.0	26.1	1.5	1173.7	10.1
DIRECT COSTS									
SEED	RETAIL	\$4.50	\$15.60	\$12.60	\$0.00	\$14.30	\$4.40	\$39.00	\$3.00
FERTILIZER	RETAIL	\$14.60	\$13.04	\$17.24	\$0.00	\$13.30	\$8.00	\$7.85	\$14.30
CUSTOM APPLICATION	BUS/PER	\$4.35	\$6.64	\$6.64	\$0.00	\$2.29	\$2.29	\$2.29	\$4.35
PESTICIDES	RETAIL	\$5.63	\$21.84	\$20.38	\$0.00	\$23.42	\$0.00	\$24.88	\$0.90
FUEL, LUBE, & DRYING	RETAIL	\$7.11	\$19.68	\$13.89	\$4.40	\$10.42	\$7.40	\$8.81	\$5.85
REPAIRS	BUS/PER	\$7.71	\$9.71	\$9.63	\$1.50	\$9.36	\$3.46	\$7.77	\$4.65
HIRED LABOR	HOUSEH	\$0.00	\$0.00	\$5.50	\$0.00	\$0.00	\$5.60	\$0.00	\$0.00
INSURANCE & INTEREST	FIR	\$12.45	\$18.84	\$13.51	\$2.26	\$16.28	\$8.90	\$19.75	\$11.47
DEPRECIATION	RETAIL	\$11.50	\$18.30	\$19.31	\$5.93	\$14.96	\$8.36	\$14.16	\$10.58
TOTAL COSTS		\$67.85	\$123.65	\$118.70	\$14.09	\$104.33	\$48.41	\$124.50	\$55.11
RETURNS OVER COSTS	HOUSEH	\$25.14	\$33.84	(\$29.68)	(\$14.09)	\$35.08	\$5.91	\$15.17	(\$43.54)

APPENDIX TABLE A2. CROP BUDGETS FOR THE EAST CENTRAL CROPPING AREA, 1987

ITEM	SECTOR	WHEAT FALLOW	WHEAT CONT	DURUM FALLOW	DURUM CONT	BARLEY FALLOW	BARLEY CONT	SUN FLOWER	FLAX
Percent of total acreaage in region		12.80%	17.10%	9.90%	11.20%	0.90%	9.90%	11.30%	2.40%
Market Price/unit		\$2.60	\$2.60	\$3.05	\$3.05	\$1.50	\$1.50	\$0.08	\$3.30
AVERAGE YIELD/acre		29.0	24.9	28.5	24.9	42.9	43.4	1335.2	15.0
DIRECT COSTS									
SEED	RETAIL	\$5.50	\$5.50	\$6.50	\$6.50	\$4.90	\$4.90	\$8.00	\$3.94
FERTILIZER	RETAIL	\$6.10	\$12.80	\$6.10	\$12.80	\$4.70	\$13.80	\$10.00	\$4.40
CUSTOM APPLICATION	BUS/PER	\$2.00	\$2.00	\$2.00	\$2.00	\$0.00	\$2.00	\$2.00	\$0.00
PESTICIDES	RETAIL	\$9.38	\$12.38	\$9.38	\$12.38	\$5.00	\$5.00	\$7.50	\$16.37
FUEL, LUBE, & DRYING	RETAIL	\$7.65	\$7.65	\$7.65	\$7.65	\$7.20	\$7.20	\$13.03	\$6.86
REPAIRS	BUS/PER	\$7.86	\$7.86	\$7.86	\$7.86	\$7.86	\$7.86	\$6.91	\$7.57
HIRED LABOR	HOUSEH	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
INSURANCE & INTEREST	FIR	\$11.97	\$12.75	\$12.05	\$12.83	\$11.12	\$11.20	\$13.20	\$11.86
DEPRECIATION	RETAIL	\$11.10	\$11.10	\$11.10	\$11.10	\$9.90	\$9.90	\$10.89	\$9.75
TOTAL COSTS		\$81.56	\$72.04	\$62.64	\$73.12	\$50.68	\$61.86	\$71.54	\$60.75
RETURNS OVER COSTS	HOUSEH	\$13.90	(\$7.20)	\$24.40	\$2.80	\$13.68	\$3.22	\$28.87	(\$11.11)

## EAST CENTRAL, CONTINUED

ITEM	SECTOR	OATS	CORN GRAIN	CORN SILAGE	FALLOW	SOYBEANS	HAY	DRY BEANS	RYE
Percent of total acreaage in region		4.60%	3.80%	1.20%	10.10%	0.90%	2.20%	0.00%	1.90%
Market Price/unit		\$1.55	\$1.70	\$11.83	0.0	\$5.35	\$35.50	\$0.12	\$1.15
AVERAGE YIELD/acre		51.6	77.0	6.6	0.0	24.6	1.5	0.0	31.5
DIRECT COSTS									
SEED	RETAIL	\$4.50	\$15.60	\$12.60	\$0.00	\$14.30	\$4.40	\$39.00	\$3.00
FERTILIZER	RETAIL	\$11.20	\$9.80	\$11.45	\$0.00	\$11.00	\$8.00	\$7.10	\$12.00
CUSTOM APPLICATION	BUS/PER	\$2.00	\$2.00	\$2.00	\$0.00	\$2.00	\$2.00	\$2.00	\$2.00
PESTICIDES	RETAIL	\$0.90	\$19.31	\$17.85	\$0.00	\$23.42	\$0.00	\$24.88	\$0.90
FUEL, LUBE, & DRYING	RETAIL	\$6.93	\$21.77	\$13.21	\$4.40	\$9.50	\$7.40	\$8.81	\$5.85
REPAIRS	BUS/PER	\$7.57	\$10.48	\$8.36	\$1.50	\$8.12	\$3.46	\$7.77	\$4.65
HIRED LABOR	HOUSEH	\$0.00	\$0.00	\$5.50	\$0.00	\$0.00	\$5.60	\$0.00	\$0.00
INSURANCE & INTEREST	FIR	\$11.37	\$18.04	\$11.81	\$2.26	\$15.90	\$8.87	\$19.51	\$11.10
DEPRECIATION	RETAIL	\$9.72	\$16.67	\$15.11	\$5.93	\$14.96	\$8.36	\$12.84	\$10.58
TOTAL COSTS		\$54.19	\$113.67	\$97.89	\$14.09	\$99.20	\$48.09	\$121.90	\$50.09
RETURNS OVER COSTS	HOUSEH	\$25.86	\$17.16	(\$19.57)	(\$14.09)	\$32.63	\$6.22	\$0.00	(\$13.85)



APPENDIX TABLE A3. CROP BUDGETS FOR THE WEST CENTRAL CROPPING AREA, 1987

ITEM	SECTOR	WHEAT FALLOW	WHEAT CONT	DURUM FALLOW	DURUM CONT	BARLEY FALLOW	BARLEY CONT	SUN FLOWER	FLAX
Percent of total acreaage in region		19.60%	17.80%	7.10%	5.00%	1.70%	10.40%	5.70%	3.40%
Market Price/unit		\$2.60	\$2.60	\$3.05	\$3.05	\$1.50	\$1.50	\$0.08	\$3.30
AVERAGE YIELD/acre		23.8	18.9	20.2	15.3	39.5	34.4	1,357.1	13.4
DIRECT COSTS									
SEED	RETAIL	\$5.50	\$5.50	\$6.50	\$6.50	\$4.90	\$4.90	\$8.00	\$3.94
FERTILIZER	RETAIL	\$2.10	\$8.20	\$2.10	\$8.20	\$0.00	\$7.60	\$8.20	\$4.40
CUSTOM APPLICATION	BUS/PER	\$0.00	\$2.00	\$0.00	\$2.00	\$0.00	\$2.00	\$2.00	\$0.00
PESTICIDES	RETAIL	\$5.11	\$6.63	\$5.11	\$6.63	\$5.00	\$5.00	\$7.50	\$4.75
FUEL, LUBE, & DRYING	RETAIL	\$7.05	\$7.05	\$7.05	\$7.05	\$7.45	\$7.45	\$10.54	\$6.32
REPAIRS	BUS/PER	\$7.36	\$7.36	\$7.36	\$7.36	\$7.36	\$7.36	\$5.86	\$9.02
HIRED LABOR	HOUSEH	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
INSURANCE & INTEREST	FIR	\$9.61	\$10.38	\$9.69	\$10.46	\$9.05	\$9.82	\$11.56	\$8.85
DEPRECIATION	RETAIL	\$8.02	\$8.02	\$8.02	\$8.02	\$9.44	\$9.44	\$9.80	\$9.76
TOTAL COSTS		\$44.75	\$55.14	\$45.83	\$56.22	\$43.20	\$53.56	\$63.47	\$47.04
RETURNS OVER COSTS	HOUSEH	\$17.18	(\$5.88)	\$15.74	(\$9.49)	\$16.09	(\$1.92)	\$38.59	(\$2.78)

## WEST CENTRAL, CONTINUED

ITEM	SECTOR	OATS	CORN GRAIN	CORN SILAGE	FALLOW	SOYBEANS	HAY	DRY BEANS	RYE
Percent of total acreaage in region		5.70%	0.50%	0.90%	19.60%	0.0	1.10%	0.10%	1.30%
Market Price/unit		\$1.55	\$1.70	\$11.83	0.0	\$5.35	\$35.50	\$0.12	\$1.15
AVERAGE YIELD/acre		44.4	71.0	6.4	0.0	0.0	1.5	1,373.6	22.4
DIRECT COSTS									
SEED	RETAIL	\$4.50	\$15.60	\$12.60	\$0.00	\$14.30	\$4.40	\$33.00	\$3.00
FERTILIZER	RETAIL	\$9.00	\$7.60	\$7.60	\$0.00	\$6.00	\$6.00	\$3.00	\$8.20
CUSTOM APPLICATION	BUS/PER	\$2.00	\$2.00	\$2.00	\$0.00	\$2.00	\$2.00	\$2.00	\$2.00
PESTICIDES	RETAIL	\$1.50	\$15.71	\$15.71	\$0.00	\$17.92	\$0.00	\$24.88	\$0.90
FUEL, LUBE, & DRYING	RETAIL	\$6.80	\$19.59	\$14.39	\$3.60	\$8.20	\$6.20	\$7.88	\$5.25
REPAIRS	BUS/PER	\$7.92	\$9.61	\$8.63	\$1.30	\$7.30	\$3.20	\$7.02	\$4.65
HIRED LABOR	HOUSEH	\$0.00	\$0.00	\$5.50	\$0.00	\$0.00	\$4.80	\$0.00	\$0.00
INSURANCE & INTEREST	FIR	\$9.02	\$16.58	\$11.61	\$2.05	\$13.00	\$7.45	\$17.21	\$8.28
DEPRECIATION	RETAIL	\$9.01	\$14.95	\$16.45	\$4.85	\$12.69	\$8.36	\$12.84	\$8.02
TOTAL COSTS		\$49.75	\$101.64	\$94.48	\$11.80	\$81.41	\$42.41	\$107.83	\$40.31
RETURNS OVER COSTS	HOUSEH	\$19.11	\$19.02	(\$18.46)	(\$11.80)	\$0.00	\$11.90	\$55.63	(\$14.53)

APPENDIX TABLE A4. CROP BUDGETS FOR THE WESTERN CROPPING AREA, 1987

ITEM	SECTOR	WHEAT FALLOW	WHEAT CONT	DURUM FALLOW	DURUM CONT	BARLEY FALLOW	BARLEY CONT	SUN FLOWER	FLAX
Percent of total acreage in region		22.80%	7.80%	10.20%	1.70%	4.80%	6.50%	1.90%	0.60%
Market Price/unit		\$2.60	\$2.60	\$3.05	\$3.05	\$1.50	\$1.50	\$0.08	\$3.30
AVERAGE YIELD/acre		24.1	19.9	23.1	17.4	35.6	33.3	1,179.0	14.2
DIRECT COSTS									
SEED	RETAIL	\$5.50	\$5.50	\$6.50	\$6.50	\$4.90	\$4.90	\$8.00	\$3.94
FERTILIZER	RETAIL	\$3.14	\$9.28	\$3.14	\$9.28	\$0.00	\$7.00	\$8.20	\$4.00
CUSTOM APPLICATION	BUS/PER	\$0.00	\$2.00	\$0.00	\$2.00	\$0.00	\$2.00	\$2.00	\$0.00
PESTICIDES	RETAIL	\$5.11	\$6.63	\$5.11	\$6.63	\$5.11	\$10.97	\$7.50	\$4.75
FUEL, LUBE, & DRYING	RETAIL	\$6.78	\$6.78	\$6.78	\$6.78	\$6.85	\$7.34	\$10.23	\$6.32
REPAIRS	BUS/PER	\$7.36	\$7.19	\$7.36	\$7.19	\$7.36	\$8.07	\$5.86	\$9.02
HIRED LABOR	HOUSEH	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
INSURANCE & INTEREST	FIR	\$8.57	\$9.33	\$8.65	\$9.41	\$7.92	\$9.21	\$11.54	\$8.27
DEPRECIATION	RETAIL	\$7.83	\$7.83	\$7.83	\$7.83	\$9.36	\$9.36	\$9.80	\$9.76
TOTAL COSTS		\$44.30	\$54.55	\$45.38	\$55.63	\$41.50	\$58.85	\$63.13	\$46.07
RETURNS OVER COSTS	HOUSEH	\$18.37	(\$2.82)	\$25.13	(\$2.64)	\$11.83	(\$8.88)	\$25.52	\$0.86

## WEST, CONTINUED

ITEM	SECTOR	OATS	CORN GRAIN	CORN SILAGE	FALLOW	SOYBEANS	HAY	DRY BEANS	RYE
Percent of total acreage in region		12.30%	0.30%	0.80%	23.80%	0.0	5.40%	0.0	1.30%
Market Price/unit		\$1.55	\$1.70	\$11.83	0.0	\$5.35	\$35.50	\$0.12	\$1.15
AVERAGE YIELD/acre		44.5	62.2	7.3	0.0	0.0	1.5	0.0	24.2
DIRECT COSTS									
SEED	RETAIL	\$4.50	\$15.60	\$12.60	\$0.00	\$0.00	\$4.40	\$0.00	\$3.00
FERTILIZER	RETAIL	\$9.00	\$7.60	\$7.60	\$0.00	\$0.00	\$6.00	\$0.00	\$8.20
CUSTOM APPLICATION	BUS/PER	\$2.00	\$2.00	\$2.00	\$0.00	\$0.00	\$2.00	\$0.00	\$2.00
PESTICIDES	RETAIL	\$1.50	\$15.71	\$15.71	\$0.00	\$0.00	\$0.00	\$0.00	\$0.90
FUEL, LUBE, & DRYING	RETAIL	\$6.80	\$19.59	\$14.39	\$3.60	\$0.00	\$5.80	\$0.00	\$5.25
REPAIRS	BUS/PER	\$7.92	\$9.61	\$8.63	\$1.30	\$0.00	\$3.01	\$0.00	\$4.65
HIRED LABOR	HOUSEH	\$0.00	\$0.00	\$5.50	\$0.00	\$0.00	\$4.60	\$0.00	\$0.00
INSURANCE & INTEREST	FIR	\$8.48	\$15.50	\$11.61	\$2.05	\$0.00	\$6.85	\$0.00	\$8.28
DEPRECIATION	RETAIL	\$9.01	\$14.95	\$16.45	\$4.85	\$0.00	\$8.36	\$0.00	\$8.02
TOTAL COSTS		\$49.21	\$100.56	\$94.48	\$11.80	\$0.00	\$41.02	\$0.00	\$40.31
RETURNS OVER COSTS	HOUSEH	\$19.71	\$5.13	(\$7.93)	(\$11.80)	\$0.00	\$13.30	\$0.00	(\$12.45)

## APPENDIX B



APPENDIX TABLE B1. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, NORTH DAKOTA CONSERVATION RESERVE PROGRAM, POOL GROUP 1, (1987=BASE DOLLARS), 1980-1987

YEAR	(1) AG LVSTK	(2) AG CROPS	(4) CONSTR	(7) AG PROC & MISC MFG	(8) RETAIL TRADE	(10) BUS & PERS SERV	(12) HOUSE HOLDS	(14) COAL MINING	(15) THERMAL- ELEC GEN	(16) PET EXP/EXT	(17) PET REFINING	TOTAL
-----MILLION DOLLARS-----												
1980	396.6	107.7	29.1	81.9	29.5	9.9	345.3	53.7	120.5	737.7	314.2	2226.1
1981	244.8	229.7	19.2	81.4	29.8	10.0	352.1	54.9	128.1	1529.3	506.6	3185.9
1982	233.3	249.0	12.9	65.6	29.3	9.8	280.0	55.0	139.1	1363.8	439.8	2877.6
1983	252.8	272.1	17.6	64.4	33.1	11.0	326.5	70.2	162.2	1291.6	393.6	2895.1
1984	261.7	241.7	23.9	66.2	28.7	9.6	346.3	85.0	180.1	1233.6	367.9	2844.7
1985	259.5	243.4	21.2	65.4	29.9	9.9	346.8	117.1	201.5	1055.7	331.3	2681.7
1986	243.4	221.2	19.6	64.3	29.8	9.9	349.8	106.6	196.7	461.5	259.0	1961.8
1987	277.7	211.4	16.0	64.7	30.9	10.3	341.5	97.4	191.1	508.8	271.1	2020.9
AVE	271.2	222.0	19.9	69.2	30.1	10.1	336.1	80.0	164.9	1022.8	360.4	2586.7

APPENDIX TABLE B2. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, NORTH DAKOTA CONSERVATION RESERVE PROGRAM, POOL GROUP 2, (1987=BASE DOLLARS), 1980-1987

YEAR	(1) AG LVSTK	(2) AG CROPS	(4) CONSTR	(7) AG PROC & MISC MFG	(8) RETAIL TRADE	(10) BUS & PERS SERV	(12) HOUSE HOLDS	(14) COAL MINING	(15) THERMAL- ELEC GEN	(16) PET EXP/EXT	(17) PET REFINING	TOTAL
-----MILLION DOLLARS-----												
1980	236.1	270.4	28.0	86.5	37.1	12.4	433.3	12.7	44.5	155.3	30.9	1347.2
1981	171.7	383.1	18.5	86.0	37.4	12.4	441.8	13.0	47.3	276.2	49.1	1536.5
1982	173.2	345.6	12.5	69.4	36.8	12.2	351.5	12.9	51.4	267.5	42.6	1375.6
1983	180.0	351.7	17.1	68.1	41.5	13.9	409.6	16.5	60.0	269.7	38.1	1466.2
1984	180.4	270.7	23.0	69.9	36.1	12.0	434.6	20.0	66.6	272.9	35.7	1421.9
1985	174.3	287.3	20.5	69.0	37.6	12.5	435.3	27.4	74.5	257.5	32.1	1428.0
1986	162.9	316.7	18.9	68.0	37.4	12.5	438.9	24.9	72.8	119.8	25.1	1297.9
1987	185.7	251.4	15.4	68.4	38.7	12.9	428.6	22.8	70.7	149.2	26.3	1270.1
AVE	183.0	309.6	19.2	73.2	37.8	12.6	421.7	18.8	61.0	221.0	35.0	1392.9

APPENDIX TABLE B3. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, NORTH DAKOTA CONSERVATION RESERVE PROGRAM, POOL  
GROUP 3, (1987=BASE DOLLARS), 1980-1987

YEAR	(1) AG LVSTK	(2) AG CROPS	(4) CONSTR	(7) AG PROC & MISC MFG	(8) RETAIL TRADE	(10) BUS & PERS SERV	(12) HOUSE HOLDS	(14) COAL MINING	(15) THERMAL- ELEC GEN	(16) PET EXP/EXT	(17) PET REFINING	TOTAL
-----MILLION DOLLARS-----												
1980	136.1	571.2	22.8	98.8	41.3	13.7	482.1	--	--	104.8	--	1470.8
1981	97.7	732.6	15.1	98.3	41.6	13.9	491.5	--	--	187.5	--	1678.2
1982	92.7	686.5	10.1	79.3	40.9	13.6	390.9	--	--	155.2	--	1469.2
1983	99.9	658.1	13.8	77.7	46.1	15.4	455.7	--	--	131.6	--	1498.3
1984	98.5	568.6	18.7	79.9	40.1	13.4	483.5	--	--	129.8	--	1432.5
1985	94.1	684.4	16.6	79.0	41.7	13.9	484.2	--	--	111.8	--	1525.7
1986	88.4	524.6	15.3	77.6	41.6	13.8	488.2	--	--	54.5	--	1304.0
1987	100.8	468.0	12.5	78.2	43.1	14.4	476.7	--	--	65.9	--	1259.6
AVE	101.0	611.8	15.6	83.6	42.1	14.0	469.1	--	--	117.5	--	1454.8

APPENDIX TABLE B4. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, NORTH DAKOTA CONSERVATION RESERVE PROGRAM, POOL  
GROUP 4, (1987=BASE DOLLARS), 1980-1987

YEAR	(1) AG LVSTK	(2) AG CROPS	(4) CONSTR	(7) AG PROC & MISC MFG	(8) RETAIL TRADE	(10) BUS & PERS SERV	(12) HOUSE HOLDS	(14) COAL MINING	(15) THERMAL- ELEC GEN	(16) PET EXP/EXT	(17) PET REFINING	TOTAL
-----MILLION DOLLARS-----												
1980	160.8	408.6	11.0	76.5	22.4	7.6	261.9	--	--	--	--	948.8
1981	134.6	569.1	7.2	76.0	22.6	7.5	267.0	--	--	--	--	1084.0
1982	125.3	535.9	4.8	61.3	22.2	7.4	212.4	--	--	--	--	969.3
1983	131.0	519.4	6.7	60.2	25.1	8.4	247.5	--	--	--	--	998.3
1984	126.9	491.3	9.0	61.8	21.8	7.2	262.7	--	--	--	--	980.7
1985	125.6	483.4	8.0	61.1	22.7	7.6	263.0	--	--	--	--	971.4
1986	119.5	399.4	7.4	60.1	22.6	7.5	265.2	--	--	--	--	881.7
1987	136.2	383.2	6.0	60.5	23.4	7.8	259.0	--	--	--	--	876.1
AVE	132.5	473.8	7.5	64.7	22.9	7.6	254.8	--	--	--	--	963.8

APPENDIX TABLE 85. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, NORTH DAKOTA CONSERVATION RESERVE PROGRAM, POOL  
GROUP 5, (1987=BASE DOLLARS), 1980-1987

YEAR	(1) AG LVSTK	(2) AG CROPS	(4) CONSTR	(7) AG PROC & MISC MFG	(8) RETAIL TRADE	(10) BUS & PERS SERV	(12) HOUSE HOLDS	(14) COAL MINING	(15) THERMAL- ELEC GEN	(16) PET EXP/EXT	(17) PET REFINING	TOTAL
-----MILLION DOLLARS-----												
1980	143.5	1006.6	57.5	428.5	68.1	22.7	795.0	--	--	--	--	2521.9
1981	91.3	1000.3	38.1	426.2	68.6	22.9	810.5	--	--	--	--	2457.9
1982	86.3	894.8	25.5	343.6	67.4	22.5	644.6	--	--	--	--	2084.7
1983	86.0	1148.0	35.0	337.1	76.2	25.4	751.4	--	--	--	--	2459.1
1984	85.3	954.1	47.2	346.4	66.1	22.0	797.3	--	--	--	--	2318.4
1985	83.6	1031.4	41.9	342.3	68.8	22.9	798.4	--	--	--	--	2389.3
1986	83.0	934.8	38.8	336.5	68.6	22.9	805.1	--	--	--	--	2289.7
1987	94.6	944.4	31.6	339.0	71.0	23.7	786.1	--	--	--	--	2290.4
AVE	94.2	989.3	39.5	362.5	69.3	23.1	773.5	--	--	--	--	2351.4

APPENDIX TABLE 86. SALES FOR FINAL DEMAND, BY ECONOMIC SECTOR, NORTH DAKOTA CONSERVATION RESERVE PROGRAM, NORTH  
DAKOTA, (1987=BASE DOLLARS), 1980-1987

YEAR	(1) AG LVSTK	(2) AG CROPS	(4) CONSTR	(7) AG PROC & MISC MFG	(8) RETAIL TRADE	(10) BUS & PERS SERV	(12) HOUSE HOLDS	(14) COAL MINING	(15) THERMAL- ELEC GEN	(16) PET EXP/EXT	(17) PET REFINING	TOTAL
-----MILLION DOLLARS-----												
1980	1073.2	3364.5	148.4	772.1	198.5	66.2	2317.5	66.3	165.0	563.7	102.1	7837.5
1981	740.1	2914.9	98.2	767.9	199.9	66.7	2362.9	67.9	175.4	1212.4	164.2	8770.5
1982	710.8	2711.7	65.9	619.1	196.6	65.5	1879.4	68.0	190.5	1008.1	142.6	7658.2
1983	749.7	2949.3	90.1	607.4	222.2	74.1	2190.6	86.8	222.2	885.5	127.6	8205.5
1984	752.7	2526.5	121.7	624.2	192.8	64.2	2324.4	105.0	246.8	785.0	119.3	7862.6
1985	737.1	2729.8	108.2	616.7	200.6	66.8	2327.7	144.5	276.0	649.6	107.5	7964.5
1986	697.1	2396.7	100.0	606.4	200.0	66.6	2347.3	131.5	269.6	283.9	84.0	7183.1
1987	795.0	2258.4	81.5	610.8	207.1	69.1	2291.9	120.2	261.8	320.4	87.9	7104.1
AVE	782.0	2606.5	101.7	653.1	202.2	67.4	2255.2	98.8	225.9	713.6	116.9	7823.3





## APPENDIX C



TABLE C1. SALES FOR FINAL DEMAND (1980 TO 1987 AVERAGE),  
BY POOL GROUP

POOL GROUP	AG LVSTK	AG CROPS	AG TOTAL	POOL GROUP TOTAL	AGRIC AS % OF POOL TOTAL	POOL TOTAL AS % OF STATE TOTAL
-----million dollars-----				-----percent-----		
1	271.2	222.0	493.2	2586.7	19.1	29.6
2	183.0	309.6	492.6	1392.9	35.4	15.9
3	101.0	611.8	712.8	1454.8	49.0	16.6
4	132.5	473.8	606.3	963.8	62.9	11.0
5	94.2	989.3	1083.5	2351.4	46.1	26.9
STATE	782.0	2606.5	3388.5	8749.6	38.7	100.0