



## **Conservation and the Environment**

### **June 2006**

#### **I. Introduction**

This paper is the second in a series of papers that assess general views advanced at the 2007 Farm Bill Forums held during 2005 by Secretary Mike Johanns as well as additional ideas that have emerged in recent months. In general, public comments from the Secretary's Forums were supportive of conservation programs that assist farmers and ranchers in making structural and management changes on agricultural lands in order to reduce erosion, enhance wildlife habitat, and improve water and air quality. Support was also expressed for the protection of wetlands and the preservation of farm and ranch lands. This paper discusses natural resource issues, USDA conservation programs administered by the Farm Service Agency (FSA) and the Natural Resources Conservation Service (NRCS), and policy alternatives. The alternatives represent possible approaches to addressing conservation and environmental issues on agricultural lands. They are presented for public discussion and are not being advocated.

#### **II. Background: Conservation and U.S. Agriculture**

Non-federal agricultural and forest lands occupy 1.4 billion acres or nearly 70 percent of the contiguous United States. These lands are the foundation of strong and vibrant agriculture and forest sectors. They also provide the habitat and corridors that support healthy wildlife populations, filter groundwater supplies, regulate surface waters flows, sequester carbon, and provide open space and scenic vistas that improve the quality of life for large segments of our population. These lands also support a growing population that is increasingly concerned about the effects of farming and ranching on the environment.

While many farmers and ranchers have a strong conservation ethic and produce in sustainable ways, farming and ranching can include activities that may have negative environmental consequences. Crop and animal production can affect water and air quality, water flows, and wildlife habitat. Fertilizers, insecticides, pesticides, and livestock waste can enter ground and surface water adversely affecting water quality. Overgrazing and cropping fragile lands can increase particulate matter in the air. The conversion of grasslands to cropland can increase soil erosion and reduce wildlife cover.

As the U.S. population grows, demand for land for non-agricultural uses, such as roads, shopping centers, housing, recreation, and open space increases, resulting in conversion of agricultural land to non-agricultural and non-forestry uses and fragmentation of open space. Population growth in the past few decades has been high in the West, where water supplies are generally limited and many ecosystems are fragile. Greater population densities can exert greater pressures on the environment. Population growth and affluence have also increased the demand for food and fiber produced in ways that are more in harmony with the environment. Finally, the

past year has seen an accelerated interest in the production of renewable fuels which may bring marginal cropland into production.

Conservation is a continuing process, not a threshold that once achieved can be ignored or set aside. And while conservation programs have made progress, new conservation issues continue to emerge as land use changes, population grows and becomes increasingly mobile, technology changes, and research identifies relationships between farming and ranching practices and environmental indicators. Current conservation concerns include but are not limited to: water quality, water supply, soil quality, invasive species, wildlife habitat, endangered species, agricultural land preservation, and air quality.

### **III. Federal Role in Conservation**

The effects of farming and ranching on water and air quality, wildlife habitat, and other environmental indicators do not necessarily factor into an individual producer's production decisions. In addition, farmers, ranchers, and the public may not be fully aware of the offsite effects of production practices on longer term environmental performance. These longer term effects have given rise to Federal programs that address a variety of environmental concerns on agricultural lands.

Conservation programs have been part of farm policy since the 1930s, when Congress found:

*... the wastage of soil and moisture resources on farm, grazing, and forest lands of the Nation, resulting from soil erosion, is a menace to the national welfare and that it is hereby declared to be the policy of Congress to provide permanently for the control and prevention of soil erosion and thereby to preserve natural resources, control floods, prevent impairment of reservoirs, and maintain the navigability of rivers and harbors, protect public health, public lands ...*

Historically, the bulk of conservation program funding focused largely on maintaining the productivity of cropland. Assistance primarily focused on vegetative, engineering, and crop management measures to control soil erosion. Strip cropping, terracing, drainage, crop rotation, contouring, pasture management, tree planting, and other measures became part of farm conservation plans. Programs also included watershed planning and flood prevention activities, including structural and land treatment measures.

While there were significant conservation programs from the 1930s through the 1950s, the current era of programs emerged with the 1985 Farm Bill, with succeeding Farm Bills expanding the scope and funding for conservation programs. Major pieces of legislation include:

- The 1985 Farm Bill established the Conservation Reserve Program (CRP), which provided payments to producers to put environmentally sensitive cropland into conserving uses for 10 to 15 years. The 1985 Farm Bill also included sodbuster, swampbuster, and the highly erodible land provisions that tied eligibility for farm price and income support and other program benefits to adoption of soil and wetland conservation practices on fragile lands.

- The 1990 Farm Bill created a Federal program to restore and place conservation easements on wetlands—the Wetlands Reserve Program (WRP). The 1990 Farm Bill also authorized the Water Quality Incentives Program (WQIP) that signaled the emergence of water quality as a primary environmental objective of conservation programs.
- The 1996 Farm Bill created the Environmental Quality Incentives Program (EQIP) by consolidating the Agricultural Conservation Program, WQIP, the Colorado Salinity Program, and the Great Plains Conservation Program. In addition, the 1996 Farm Bill authorized the Farm and Ranch Land Protection Program (FRPP) and the Wildlife Habitat Incentives Program (WHIP).
- The 2002 Farm Bill vastly increased funding for conservation on lands in crop and animal production, or “working lands,” by authorizing increased spending for several programs authorized under prior Farm Bills and establishing the Conservation Security Program (CSP) and the Grassland Reserve Program (GRP) for the long-term protection and restoration of grasslands.

There are four basic approaches to address conservation and environmental concerns on farm and ranch lands, including: (1) education and technical assistance, (2) economic incentive payments, (3) conservation compliance, and (4) regulatory requirements. A key difference among these approaches is the degree to which producer participation is voluntary. (See Appendix Table 1 for an overview of conservation program tools.)

### **Education and Technical Assistance**

Technical and educational assistance programs are used by USDA and the private sector to work with producers and other stakeholders to develop and implement conservation systems, sustainable production techniques, and conservation technologies that achieve natural resource objectives. Technical and educational assistance includes direct technical expertise and assistance; conservation practice standards and technology; and natural resource inventories, data, and information that USDA provides to producers and other stakeholders.

### **Financial Incentives**

Financial incentives delivered by USDA are designed to encourage and enable owners and operators to meet natural resource conservation objectives in concert with their particular economic or personal circumstances. Financial incentive programs can be grouped by objective:

- **Conservation on Working Farm, Ranch, and Forest Lands.** Payments are provided to operators and owners of working lands and forests who implement conservation measures and systems to address natural resource concerns. These may include incentive and cost-share payments for undertaking management or structural measures or stewardship payments to producers who have established and managed conservation measures and are maintaining them through their own financial resources. Conservation incentive programs for working lands, in combination with technical assistance, also are a

means of reducing the economic burden on producers from Federal and State regulations on air and water quality. In addition, Federal research and grants help stimulate the development and adoption of innovative conservation approaches and technologies.

- **Conversion of Farm and Ranch Land to Conserving Uses to Achieve Specific Environmental Benefits.** Payments for placing agricultural land into conserving uses are designed to protect sensitive, prime, and unique lands. Generally, producers receive annual rental or easement payments in return for long-term dedication of cropland to a specific environmental or resource-conserving use. Long-term land rental and easement programs are well suited for providing environmental benefits that increase with the length of time land is removed from agricultural production.
- **Protection of Agricultural Lands from Conversion to Other Uses.** Agricultural land protection programs purchase rights to certain lands in order to keep land in agricultural and forest uses. Permanent easements provide a stream of conservation and landscape protection benefits in perpetuity.

### **Conservation Compliance**

Because producers and others have a responsibility to minimize the environmental impacts of their activities, legislation has made eligibility for certain programs contingent on producers taking specific actions to address natural resource concerns. Such conservation compliance provisions were first introduced in the 1985 Farm Bill and have been included in subsequent Farm Bills. Conservation compliance objectives are designed to: (1) reduce soil erosion on the Nation's cropland; (2) protect the Nation's long-term capability to produce food and fiber; (3) reduce sedimentation and improve water quality; and (4) preserve and protect the Nation's wetlands.

Conservation compliance provisions require farmers to undertake resource conservation activities to remain eligible for price and income support payments and other USDA program benefits. Producers must apply an approved conservation plan that provides a substantial reduction in soil erosion or a substantial improvement in soil conditions on highly erodible cropland. Participants must also certify that they have not produced crops on wetlands converted after December 23, 1985, and did not convert a wetland to agricultural production after November 28, 1990. Compliance is voluntary in that producers may choose not to participate, in which case they are ineligible for USDA program benefits.

### **Regulatory Requirements**

The Federal government has also passed laws to prohibit certain actions such as impairing water or air quality, destroying wetlands, or destroying habitat of protected species. An objective of current conservation programs is to assist producers in meeting the regulatory requirements under these laws and avoid further regulatory action in the future by adopting conservation practices that provide environmental benefits. Major Federal regulations affecting crop and livestock producers include:

- The Clean Water Act (CWA) includes a number of sections that directly affect certain agricultural activities or enterprise types:
  - The National Pollutant Discharge Elimination System (NPDES) and Effluent Limitation Guidelines regulate waste handling and disposal by large concentrated animal feeding operations (CAFOs). Operations defined as CAFOs must obtain NPDES permits and face penalties for failing to meet permit terms.
  - Section 303(d) of the CWA establishes total maximum daily load (TMDL) requirements. TMDLs may indicate that certain agriculturally related pollutants need to be significantly reduced, which could affect U.S. agriculture and the forest products industry.
  - Section 404 of the CWA regulates the filling or dredging of certain wetland resources. Operators may be required to obtain permits and mitigate wetland losses.
  
- The Clean Air Act (CAA) regulates emissions of certain pollutants, a number of which can be associated with agriculture. Where agriculture is identified as a source of air pollutants in air quality non-attainment areas, State plans may require operators to reduce regulated emissions. Increasingly, state and local jurisdictions are regulating agricultural emissions that affect local air quality.
  
- The Endangered Species Act (ESA) provides for protection of species listed as threatened and endangered. Farmers and forest landowners whose lands include habitat for species listed under the ESA may find their activities restricted. Forest and farmland stewardship programs and safe harbor provisions can help land managers implement practices to reduce the effects of agricultural activities on endangered species.

#### **IV. Federal Cost of Conservation Programs and Distribution of Assistance**

This section examines Federal spending for conservation programs and the distribution of conservation enrollment and payments. Data on conservation payments by program are presented, followed by data on the distribution of conservation payments regionally and across farm types. Budget data for conservation programs are complicated because there are both payments to producers and technical assistance costs related to each program, as well as broader conservation technical assistance costs. In addition, some programs obligate funds for multiyear contracts year by year, while other programs show the multiyear obligations in the year the contract begins. For comparability, much of the data in this section is for calendar year payments to producers.

##### **Conservation Payments by Program**

The 2002 Farm Bill authorized an historic increase in funding for private lands conservation programs. Based on Congressional Budget Office estimates, the 2002 Farm Bill increased funding (budget authority) for conservation programs by over \$17 billion during FY 2002-11, as several existing programs were extended and new programs were created to address resource concerns on working lands. This expansion increased Federal funding (NRCS program obligations plus CRP outlays) of USDA's conservation programs, including technical assistance,

to \$4.7 billion in FY 2005, compared with \$3.0 billion in FY 2001. A short description of some of the key USDA conservation programs follows, with added information in Appendix Table 2.

**The Conservation Reserve Program (CRP)** places environmentally sensitive cropland in conserving uses for 10 to 15 years. In return for an annual rental payment and partial reimbursement for the cost of establishing and maintaining approved groundcover, participants agree to plant grasses, trees, and other conserving cover crops, restore wetlands, and establish buffers. Annual rental payments on land enrolled in the CRP average \$48.43 per acre and are limited to \$50,000 per person. In 2005, operators and landowners were paid about \$1.8 billion in rental payments, cost-share payments, signing incentive payments, practice incentive payments, and wetland restoration incentives on 35 million acres of enrolled land. Under the 2002 Farm Bill, enrollment in the CRP is limited to a maximum of 39.2 million acres.

Since 1996, producers have had the option of enrolling land through a continuous signup program focused on developing riparian buffers and other specific conservation practices. Two million acres of riparian buffers and grass filter strips have been enrolled to date. In 1997, USDA implemented the Conservation Reserve Enhancement Program (CREP), a Federal-State partnership that targets cropland in specific geographic areas, to further local conservation goals. Nearly 800,000 acres have been enrolled in CREP.

**The Wetland Reserve Program (WRP)** restores and preserves wetlands that have been converted to cropland. The 2002 Farm Bill authorized enrolling slightly over two million acres in WRP. WRP restores and protects wetlands through cost-share assistance and purchase of 30-year and permanent easements. Easement payments are limited to \$50,000 per person per year. This limitation does not apply to WRP payments on land enrolled in permanent easements. In 2005, farmers and landowners were paid \$161 million for easement and restoration activities. By the end of 2005, WRP enrollment was 1.7 million acres.

**The Environmental Quality Incentives Program (EQIP)** provides financial and technical assistance to help participants install or implement conservation practices on eligible agricultural land. EQIP is designed to help farmers institute conservation practices and integrate conservation structures into their farming operations. For structural or vegetative practices, EQIP can reimburse up to 75 percent of the installation costs, although the 2005 EQIP data indicate that the national average cost share rate is about 60 percent. Producers can also receive financial incentives for adopting certain management practices. EQIP payments are limited to \$450,000 per person for all EQIP contracts entered into during FY 2002-07. Under the 2002 Farm Bill, 60 percent of EQIP funds must be targeted at practices relating to livestock production. In 2005, \$444 million in EQIP funds were paid on 63,800 producer contracts to producers to implement 136,200 practices on 94.5 million acres to improve air, soil, and water quality. The EQIP program level for FY 2005 was \$950 million, reflecting current year payments and contract obligations for future years.

**The Conservation Security Program (CSP)**, authorized by the 2002 Farm Bill, rewards producers for ongoing environmental stewardship on working lands. In addition, CSP provides financial incentives for producers to adopt additional conservation practices on their farming operations. Under the program, producers agree to maintain and implement designated conservation practices for a period of 5 to 10 years. In return, participating producers receive

payments that increase as producers address additional resource concerns on a larger portion of their farm operation. The amount of payments a producer may receive over the period covered by a CSP contract varies from \$20,000 to \$45,000, depending on a producer's commitment to maintaining and adopting new conservation practices.

In 2004, the first year of the program, eligibility was limited to 18 watersheds with 2,200 farmers enrolling about 2 million acres. The number of watersheds eligible for CSP expanded to 220 in 2005, and 12,800 farmers enrolled 10.2 million acres in contracts. Producers received \$206 million in CSP payments in 2005. In 2006, 60 additional watersheds will be eligible for enrollment. The funding level for CSP has changed multiple times adding complexity to program implementation.

**The Grassland Reserve Program (GRP)** helps landowners and operators restore and protect grassland resources, including rangeland and pastureland, while maintaining the land's suitability for grazing. GRP emphasizes supporting grazing operations, enhancing plant and animal biodiversity, and preserving land containing shrubs or forbs under the greatest threat of conversion. Land must: (1) be grassland that contains forbs or shrubs, including rangeland and pastureland, or (2) be located in an area historically dominated by grassland, forbs, or shrubs with potential to provide habitat for animal or plants of significant ecological value, if the land is retained or restored to a natural condition. GRP participants must follow a conservation plan on all acres enrolled in the program.

Participants may enroll acreage in 10- to 30-year rental agreements, 30-year easements, or an easement for the maximum duration allowed under State law. Grazing is permitted in a manner that is consistent with maintaining the viability of natural grasses, shrubs, and forbs. Haying, mowing, or harvesting for seed production is also permitted. The 2002 Farm Bill authorized \$254 million in funding for the GRP during FY 2003-07.

**The Farm and Ranch Lands Protection Program (FRPP)** authorizes the Secretary of Agriculture to purchase easements for the purpose of protecting cropland by limiting nonagricultural uses of the land. FRPP provides up to 50 percent of the appraised fair market value of the conservation easement. A participating entity may provide a maximum of 25 percent, in cash, of the appraised fair market value of the easement or 50 percent of the easement's purchase price. The majority of FRPP easements acquired are permanent.

To be eligible for FRPP assistance, a State or local governmental entity or nonprofit organization must have the staffing and financial capacity to acquire, hold, and manage conservation easements. USDA solicits proposals for FRPP participation. Once the proposals and their parcels are prioritized, USDA awards funds to eligible entities. It is the responsibility of the cooperating entity to hold, manage, and enforce acquired easements.

From 1996 to 2005, 49 States received nearly \$371.5 million in FRPP funds. Approximately 449,000 acres on 2,290 farms, with an estimated cumulative easement value of nearly \$1.1 billion, have or are committed to have FRPP easements. For every Federal dollar invested through FRPP, an additional \$3 has been contributed by the participating State and local governmental entities, nongovernmental organizations, and landowners. In 2005, producers received \$112 million in payments under the FRPP.

**The Wildlife Habitat Incentives Program (WHIP)** provides technical and financial assistance to enable eligible participants to develop upland wildlife, wetland wildlife, threatened and endangered species, and other types of wildlife habitat in an environmentally beneficial and cost-effective manner. Some WHIP conservation practices enhance farm profitability by improving grazing conditions, reducing management expenses, and producing non-crop income. The program has been used to control invasive species; re-establish native vegetation; manage nonindustrial forestland; stabilize streambanks; protect, restore, develop, or enhance unique habitats; and remove barriers that impede migration of certain species. The 2002 Farm Bill authorized \$360 million in funding for WHIP during FY 2002-07. For FY 2005, \$47 million was available for financial and technical assistance.

**Conservation Operations** consists of Conservation Technical Assistance (CTA), a program that provides direct technical expertise and assistance; conservation standards and technology; natural resource inventories, data, and information; training and certification; and incentives for conservation innovation to help producers protect natural resources on non-federal lands. Grazing Lands Conservation (GLC) provides special emphasis within CTA on grazing land conservation activities. Conservation compliance activities also are carried out under CTA. CTA provides the technical interface essential for direct customized conservation planning and implementation assistance for discretionary as well as mandatory conservation programs. The FY 2005 funding (program level) for CTA was \$696 million. Additional, discrete activities conducted under CTA include: the National Resources Inventory, which surveys natural resource conditions and trends on nonfederal lands and the Conservation Effects Assessment Project (CEAP), an effort to quantify the benefits delivered through conservation actions on private land.

The 2002 Farm Bill's Technical Service Providers (TSP) provision allows certified technical assistance providers to assist landowners with conservation projects. To date, more than 2,500 TSPs have been certified and \$52 million in funding was obligated for TSPs in FY 2005.

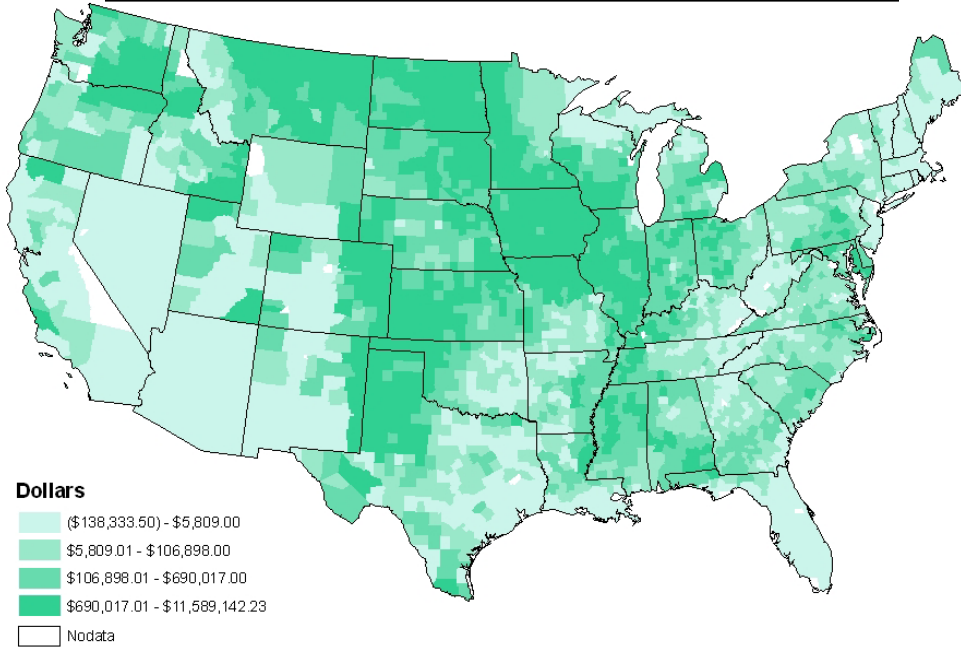
Other Conservation Operations activities include the National Cooperative Soil Survey, which provides information for understanding, managing, conserving, and sustaining the Nation's soil resources and information to protect water quality, wetlands, and wildlife habitat; the Plant Materials Program, which conducts research on native plants to help solve natural resource problems; and Snow Survey and Water Supply Forecasting, which provides western states and Alaska with information on future water supplies through collection and analysis of snowpack at more than 1,200 mountain sites.

## **Distribution of Payments**

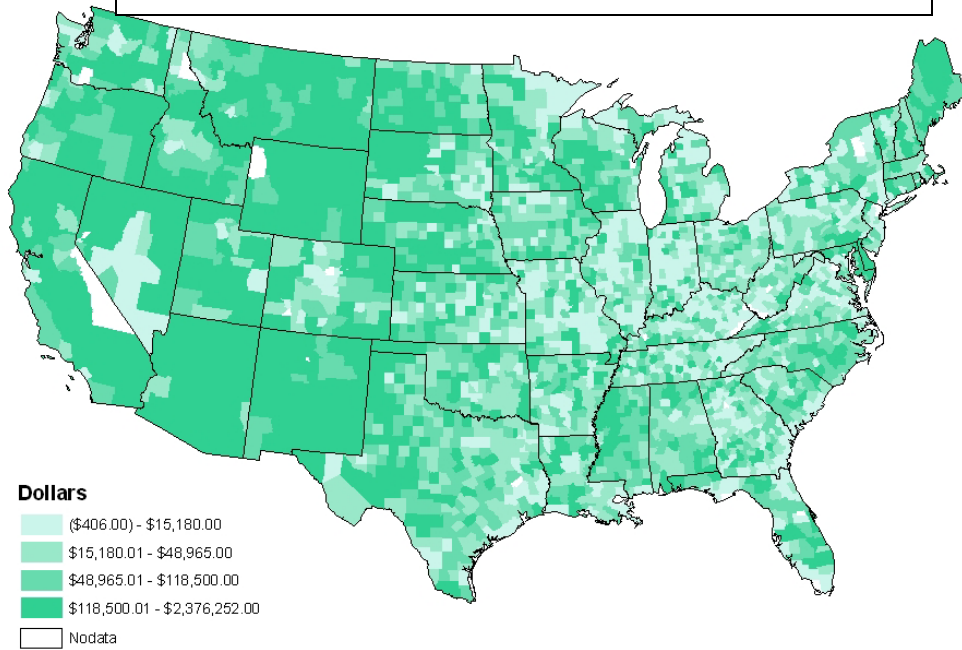
**Distribution by Region.** In calendar year 2005, nearly two-thirds of conservation payments went to farmers participating in the CRP (Appendix Table 3). CRP enrollment is concentrated in the Plains and western Corn Belt where cropland is prone to wind erosion (Figure 1).



**Figure 1. Distribution of CRP Payments, 2004**



**Figure 2. Distribution of EQIP Payments, 2004**



Eight States each received more than \$100 million in CRP payments in 2005. These States—Illinois, Iowa, Kansas, Minnesota, Missouri, Montana, North Dakota, and Texas—received 57 percent of CRP payments and about 46 percent of all conservation program payments in 2005.

EQIP payments tend to be more heavily concentrated in the Western States than CRP payments, reflecting both the distribution of cropland and the eligibility of livestock producers for assistance under EQIP. EQIP payments also appear to be slightly less geographically concentrated (Figure 2). In 2005, the top 8 States—California, Colorado, Iowa, Kansas, Minnesota, Montana, Nebraska, and Texas—received 38 percent of EQIP payments.

**Farms Receiving Conservation Payments.** The 2004 Agricultural Resource Management Survey (ARMS) provides calendar year information on conservation payments to the farm operator household. ARMS data indicate that 15 percent of all farms received conservation payments in 2004. For farms that received a conservation payment, conservation payments averaged \$5,330 per farm, with conservation payments accounting for 4 percent of gross cash farm income. Gross cash income of farms receiving conservation payments averaged \$136,545 in 2004. In comparison, gross cash income averaged slightly less than \$100,000 for all farms in 2004. Many farms that received conservation payments also received commodity program payments and other forms of government support. In 2004, government payments averaged \$4,855 per farm on all farms and \$13,262 per farm on farms that received conservation payments, with conservation payments accounting for 40 percent of total government payments.

**Distribution by Commodity Specialization.** Conservation payments were fairly similar across various commodity farm types in 2004. A farm's commodity specialization is determined by the one commodity or group of commodities that makes up at least 50 percent of the farm's total value of production. About 25 percent of cash grain and soybean farms and 38 percent of farms specializing in the production of other field crops received conservation program payments in 2004. Conservation program payments averaged \$5,462 per farm on cash grain and soybean farms and \$5,033 per farm on other field crop farms that received conservation payments.

While a lower percentage of livestock producers received conservation payments, the average payment per farm was very similar to crop farms. In 2004, about 10 percent or less of farms specializing in livestock production received conservation payments. For farms receiving conservation program payments and specializing in beef cattle production, conservation program payments averaged \$6,244 per farm; poultry, \$5,068 per farm; dairy \$4,618, per farm; and hogs, \$3,062 per farm.

**Distribution by Farm Typology.** An often used typology for grouping farms consists of three categories: *commercial farms*, with sales of \$250,000 or more and the farm operator reports farming as the major occupation (less than 10 percent of all farms); *intermediate farms*, with sales under \$250,000 and the farm operator reports farming as the major occupation (25 percent of all farms); and *rural residence farms*, for which the farm operator's major occupation is not farming or the farm is a limited resource farm (65 percent of all farms).

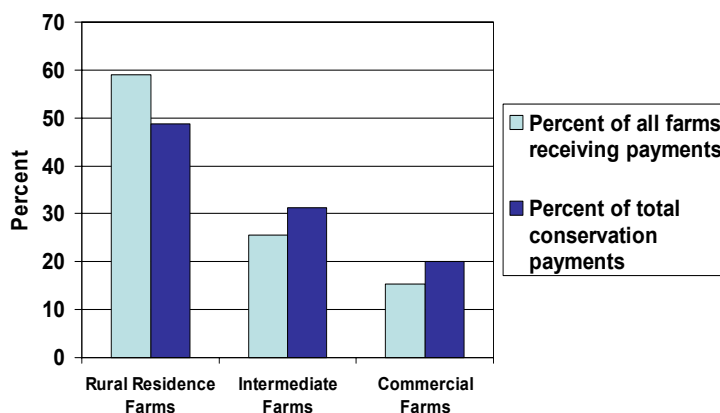
Of farms receiving conservation payments, rural residence farms were much more dependent on conservation payments as a source of income than other farm types. Fourteen percent of rural

residence farms and 16 percent of intermediate farms received conservation payments in 2004, with payments averaging \$4,414 and \$6,497 per recipient farm, respectively. Conservation payments accounted for 79 percent of all government payments and 23 percent of gross cash income on rural residence farms that received conservation payments. Conservation payments represented nearly one-half of all government payments going to intermediate farms that received conservation payments, with conservation payments accounting for 7 percent of gross cash income on these farms.

A larger percentage of commercial farms received conservation payments than rural residence and intermediate farms, but these payments made up a smaller share of total government payments and gross cash income. In 2004, 24 percent of commercial farms received conservation payments. The average conservation payment for commercial farms was \$6,904 per recipient farm, which represented 16 percent of all government payments and only 1 percent of gross cash income.

Of just the farms receiving conservation payments, rural residence farms accounted for the largest share (Figure 3). In 2004, 59 percent of farms receiving conservation payments were rural residence farms, and these farms received 49 percent of total conservation payments. Commercial farms made up 15 percent of the farms receiving conservation payments and they accounted for 20 percent of conservation payments.

**Figure 3. Farms Receiving Conservation Payments and Payments Received by Farm Typology, 2004**



The distribution of conservation payments across farms tends to reflect participation in the CRP, since CRP comprises most of total conservation payments to producers. Nearly 60 percent of CRP payments go to rural residence farms. EQIP, on the other hand, focuses on a wide range of practices on cropland and grazing land and issues related to animal feeding operations (AFOs). Compared with CRP payments, a larger share of EQIP payments go to larger farms. The percentage of farms that participate in EQIP and other conservation programs does not appear to vary greatly with farm size. Preliminary unweighted data from the 2003 and 2004 USDA

Conservation Effects Assessment Project (CEAP) surveys indicate that program participation is spread fairly evenly across farm size (Table 1).

Size class in acres	No. survey responses	CSP	EQIP	WRP	WHIP
<100	1139	0.7%	3.1%	0.2%	0.2%
101-400	1994	0.5%	3.6%	0.0%	0.0%
401-1000	3424	0.5%	3.8%	0.1%	0.0%
1001-2000	3125	0.5%	4.5%	0.2%	0.1%
2001-3000	1862	0.5%	3.7%	0.2%	0.1%
>3000	874	0.8%	2.9%	0.2%	0.0%

**Distribution by Farm and Household Income.** In 2004, 13 percent of farms with net cash farm incomes of less than \$10,000 received conservation payments in 2004, with payments averaging \$3,804 per recipient farm. These farms received 45 percent of conservation payments and accounted for 63 percent of farms receiving conservation payments. In contrast, 23 percent of farms with net cash incomes of \$100,000 or more received conservation payments and conservation payments averaged \$7,882 per recipient farm. These farms received 14 percent of conservation payments and accounted for 9 percent of farms receiving conservation payments.

Farm households with household incomes of \$200,000 or more, over 7 percent of all farm households and nearly 10 percent of all farm households receiving conservation payments, received 11 percent of conservation payments (Figure 4). Twenty-seven percent of all farm households receiving conservation payments had household income of \$50,000-\$99,999 and they received nearly 28 percent of all conservation payments in 2004. Forty-one percent of all conservation payments went to farm households with household incomes of less than \$50,000, 45 percent of all farms receiving conservation payments.

## **V. General Performance of USDA Conservation and Environmental Programs**

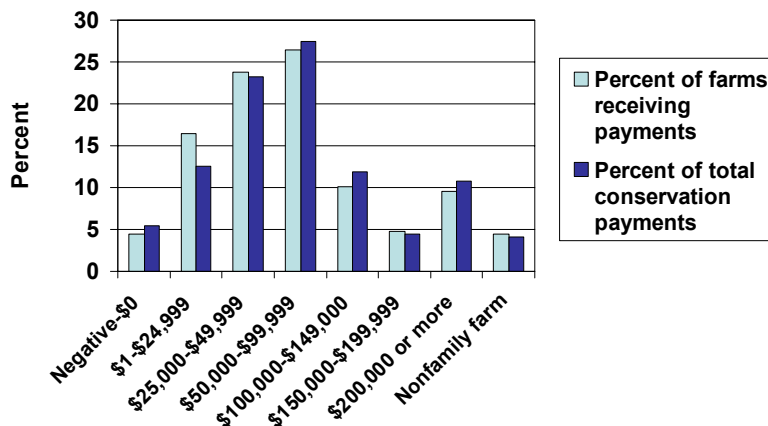
This section discusses the general performance of USDA conservation programs and identifies concerns that may guide the development of future conservation programs. Program issues addressed include: conservation and environmental benefits achieved, program costs and distribution of program assistance, economic and market impacts, and WTO implications.

### **Conservation and Environmental Benefits**

Evaluation of the environmental benefits of conservation programs is difficult. Many factors beyond technical and financial assistance or program compliance affect behavior of producers and the changes in the condition of natural resources and the environment. For example, it may not be possible to establish the relationship between a dollar of technical or financial assistance received by a producer and the quality of a water body distant from the farm. A variety of studies have used different approaches to develop environmental indicators and assess the impacts of conservation programs. Program evaluation is not attempted in this paper. Instead,

this section measures progress toward achieving environmental goals using several environmental indicators.

**Figure 4. Farms Receiving Conservation Payments and Payments Received by Household Income, 2004**



The combination of technical assistance, financial assistance, and conservation compliance programs has provided significant benefits that include the reduction of the offsite environmental effects of agricultural production, preservation of farm and ranch lands, restoration and enhancement of wetlands, and promotion of wildlife habitat. Technical assistance is used to develop the science and technology that forms the basis for conservation practices. It is essential for working with producers to plan, design, implement, and maintain conservation measures in conjunction with financial assistance and conservation compliance provisions.

**Soil erosion.** Between 1982 and 2003, total erosion on U.S. cropland fell from 3.06 to 1.75 billion tons per year, a decline of 1.31 billion tons per year, or about 43 percent. Just over half, about 700 million tons per year, was due to reductions in sheet and rill (water) erosion, while about 610 million tons per year was due to reductions in wind erosion. Conservation compliance, CRP, EQIP and its predecessor programs, and changing production practices have been the major contributors to erosion reduction. A large majority of the total reduction in erosion, almost 1.2 billion tons per year, occurred between 1982 and 1997, when major USDA soil conservation programs were first implemented. Beginning in 1985, 1.7 million conservation plans were established for 142 million acres of highly erodible land to address conservation compliance. Between 1986 and 1990, CRP enrolled about 35 million acres, and at the start of 2006, contained about 36 million acres. Of the 1.2-billion-ton reduction in soil erosion between 1982 and 1997, about one-fourth has been attributed to conservation compliance (295 million tons per year), one-fifth (224 million tons per year) to CRP, and the rest to technological changes and other programs.

Lowering soil erosion sustains land productivity and reduces the off-site effects of agricultural production, such as water quality impairment in rivers and streams. Recent preliminary

environmental benefit estimates for the CRP suggest water quality benefits from reduced sediment loads of \$266 million per year, air quality benefits of reduced dust from wind erosion of \$51 million per year, and soil productivity benefits of \$161 million annually.

**Wetlands.** Since the late 1980s, wetland protection and restoration efforts have been assessed against a goal of “no net loss” of wetland functions and values. To maintain and increase wetland area and functions, previously drained wetlands must be restored while existing wetlands are conserved and, if necessary, enhanced. Wetland losses to agriculture (gross) have steadily declined since the mid-1950s, dropping from 593,000 acres per year during 1954-74, to 26,000 acres per year during 1992-1997. Based on National Resource Inventory data, agriculture surpassed the “no net loss” objective during 1997-2003, with a net gain of more than 260,000 wetland acres.

The WRP and CRP made major contributions to wetland restoration and enhancement. By the end of 2005, WRP enrollment was 1.8 million acres, much of it in long term or permanent easements. As of April 2006, CRP included over 2 million wetland and buffer acres under 10-15 year contracts. Since 1985, the Swampbuster provision, which makes wetland conservation a condition of farm program payment eligibility, has been important in reducing wetland conversion for agriculture.

**Wildlife habitat.** Conversion of forest and grassland into cropland, roads, housing developments, and industrial uses, and increasing fragmentation of the agricultural landscape are the primary factors associated with habitat loss and endangerment of native wildlife species. Many factors influence the quality and extent of wildlife habitat on agricultural land, including management choices that sustain diversity and the protection of wetlands and associated uplands. Federal conservation programs, such as CRP, WRP, WHIP, and EQIP have made major contributions to wildlife habitat establishment and enhancement.

Research by the United States Geological Survey (USGS) has documented increases in grassland bird populations on CRP land that were in serious decline in the 1970s and 1980s. The U.S. Fish and Wildlife Service estimates that CRP has substantially increased duck and ring-necked pheasant populations. CRP is credited with the reappearance of prairie chickens in Texas, recovery of sharp-tailed grouse, and increases in Western State populations of big game elk, mule deer, white-tailed deer, and pronghorn antelope. Selected CRP wildlife-related benefits are estimated to be approximately \$737 million per year, the majority being wildlife viewing (88 percent), followed by improved pheasant hunting in 13 north central and northern plains States. This estimate excludes improved hunting for many species and increased protection of threatened and endangered species. EQIP and WHIP have been successful in improving habitat on working lands. WHIP has also contributed to aquatic species through dam removal, culvert replacement, and the installation of habitat structures that have opened spawning habitat. Targeted assistance in WHIP, GRP, and EQIP has protected 80,000 acres of sage grouse habitat.

**Livestock.** Addressing nutrient management and air quality concerns related to livestock operations, particularly CAFOs, has become an increasingly important objective of Federal conservation programs. USDA’s conservation programs assist producers in meeting regulatory requirements that deal with potential air and water quality problems of animal waste. Since 60

percent of EQIP funds are required by statute to be devoted to animal agriculture, the distribution of EQIP assistance funds closely follows the distribution of dairy, pork, poultry, and beef populations (Table 2). A key goal has been the establishment of site-specific comprehensive nutrient management plans (CNMPs). During FY 2002 through 2006, 6,398 CNMPs were applied under EQIP contracts and under another 7,372 CNMPs were applied through Conservation Technical Assistance. Livestock producers also benefit from the 2002 Farm Bill CRP provision that allows for managed haying and grazing on CRP land protected under a conservation plan. Prior to this change, only temporary haying and grazing were allowed during periods of drought or other emergencies. The GRP has preserved historic grasslands which also may be hayed or grazed.

<b>Species</b>	<b>Funding for FY 2003- FY 2005 (Mil \$)</b>	<b>Percent of total funding</b>	<b>Percent of species funding related to animal feeding operations</b>	<b>Percent of species funding related to grazing</b>
<b>Beef</b>	825.1	65	16	84
<b>Dairy</b>	248.7	20	71	29
<b>Poultry</b>	73.3	6	89	11
<b>Swine</b>	43.1	3	70	30
<b>Sheep</b>	16.9	1	12	88
<b>Horses</b>	7.1	1	35	65
<b>Other</b>	46.0	4	14	86
<b>Total</b>	1.26	100		

*Source: NRCS Protracts data.*

**Water quality.** Improving water quality is a fundamental objective of USDA conservation programs and the programs are credited with improving water quality in many watersheds. Ideally, information on reduced nutrient, pesticide, and sediment loadings into rivers, streams, and lakes would be available by year for each practice and program. However, quantifying the improvements that have occurred from conservation efforts is difficult because there are multiple sources of nutrients, sediment, and other pollutants. Additionally, the physical and chemical processes involved are complicated and storage of agricultural chemicals and sediment within a watershed, time lags, and meteorological events are all variables requiring careful analysis to identify the consequences of conservation practices. Much of the benefits of soil erosion reduction are increased water quality, as indicated by the estimated benefits of reduced sediment loads under CRP. Water quality benefits can also be attributed to conservation compliance, EQIP, and other programs to the extent they have reduced sediment, nutrient, and pesticide runoff. Swampbuster and WRP also contribute significantly to water quality because wetlands filter sediment and nutrients from the water before in reaches streams or lakes.

USDA is undertaking several efforts to better quantify the effects of conservation on water quality. One such effort, the CEAP, is a multi-agency effort to monitor, assess, and estimate the effects of conservation practices on cropland, uses NRI sampling and long-term watershed studies to build estimates of water quality responses to conservation.

**Air quality.** Air quality concerns associated with agricultural production include odors, ozone precursors, ammonia, particulate emissions, and greenhouse gases. Addressing these concerns is

an area of increasing emphasis in USDA's conservation programs. Livestock producers enrolled in EQIP can receive cost-share assistance for installing anaerobic waste digesters. These technologies significantly reduce odors associated with large animal feeding operations and, in many cases, can result in significantly lower methane emissions. EQIP also provides farmers with payments to adopt nutrient management practices that reduce nitrogen fertilizer use and thus nitrous oxide emissions and to adopt crop residue management practices that increase the organic content of soils and sequester carbon. The CSP provides enhancement payments for actions that directly benefit air quality, including: improving visibility; reducing near-surface ozone levels; reducing transport of fine and coarse particulates; decreasing livestock-related off-site odor issues; reducing the potential for airborne agricultural chemicals and volatile organic compounds to affect humans; decreasing agriculture's potential contribution to the buildup of greenhouse gases; and increasing the sequestration of carbon on crop, range, and pasture lands. USDA programs encourage farmers and ranchers to adopt practices that remove carbon from the atmosphere and sequester carbon in soil and vegetation. The CRP provides significant carbon sequestration benefits, sequestering more than 13 million metric tons of carbon annually. Wetlands restored by the WRP also sequester substantial amounts of carbon. In addition, EQIP and CSP increase the adoption of conservation tillage and other practices that sequester carbon in cropland soils. In 2003, USDA initiated an effort to target greenhouse gases through conservation programs and estimates that these efforts will result in an additional 12 million metric tons of carbon reductions by 2012.

**Key issues for future programs.** While indicators, such as erosion reduction and others, suggest environmental improvement is being made, many challenges remain and new issues continue to emerge. For example, excess nutrients impair water quality in many rivers, streams, and lakes, and hypoxia is a problem in the Gulf of Mexico, Chesapeake Bay, and other waters. In addition, conflicts over water availability for agriculture, environmental, and urban use are increasing as water demands increase. As one of the largest water users, agriculture has a vital interest in securing water quality and quantity. Addressing soil erosion has produced major benefits; however, progress may have leveled off, suggesting past strategies may be reaching their limit. An estimated one-third of the 269 million acres of U.S. cropland is eroding at tolerable rates (below "T") continues to decline in soil condition and could benefit from management systems that enhance soil organic matter. Invasive species also threaten agricultural profitability in some areas.

Conservation is bringing about important wildlife recoveries, but more can be done, particularly for wetland and aquatic systems and species. Much has also been done to protect farm and forest land from conversion, but as residential and industrial development press into rural America, more land is at risk, which could have repercussions for rural life, including benefits from recreation and tourism. Another emerging challenge is to better utilize carbon sequestration in agricultural soils as a partial solution to rising greenhouse gas concentrations in the atmosphere. Finally, interest in renewable energy using agricultural lands is rapidly emerging in importance, driven by high oil prices and demand for greater energy supply diversification, creating new conservation dimensions.

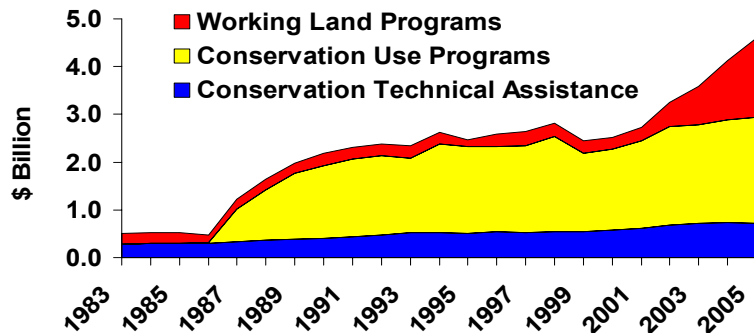


## Program Costs and Distribution of Program Assistance

The main conclusions related to program spending are: (1) funding for conservation programs has risen sharply under the 2002 Farm Bill, mainly due to expansion of programs on working lands, (2) participation in financial and technical assistance programs is fairly evenly distributed by farm size, (3) payments, relative to the overall size of the farming operation, tend to be much larger for small, rural residence farms (23 percent of gross cash income) than on large, commercial farms (1 percent of gross cash income), and (4) financial assistance varies based on geography, environmental context, and the individual conservation program.

Funding for conservation programs increased sharply following enactment of the 2002 Farm Bill. In FY 2001, Federal funding for USDA's conservation programs, including CTA, was \$3.0 billion, with the CRP accounting for \$1.7 billion (Figure 5). In FY 2005, funding increased to \$4.7 billion with CRP at \$1.8 billion. Thus, non-CRP spending accounts for nearly all of the increase, more than doubling over the period, with EQIP and CSP the fastest growing programs. CRP has also shifted toward funding of high priority, partial field practices, such as grassed waterways and edge-of-field filter strips. These practices support working lands by mitigating damage from agricultural production. About 20 percent of CRP spending is now devoted to these practices through continuous sign-up and CREP.

**Figure 5. Conservation Program Spending**



Source: USDA, Economic Research Service, *Flexible Conservation Measures on Working Land: What Challenges Lie Ahead?*

Funding for the 2002 Farm Bill's conservation programs has been an issue since the Bill's enactment. Funding for major programs, such as EQIP and CSP, have been reduced below levels authorized by the 2002 Farm Bill to meet overall budget goals.

Because many more small farms participate in conservation programs relative to large farms, the bulk of conservation payments go to smaller farms. In contrast, price and income support program payments are concentrated among larger farms. Smaller farms, however, tend to enroll a larger share of their farming operations in conservation programs, particularly whole-farm enrollment in CRP. Rural residence farms received nearly 60 percent of CRP payments in 2004 but controlled only 20 percent of cropland and 24 percent of overall agricultural land. More

research is needed to understand why these farms participate more heavily in CRP. There is some evidence to suggest that larger farms, where the operator's primary occupation is farming, are more likely to participate in working lands programs, including EQIP and CRP continuous sign-up for high priority buffer practices.

Another issue is distribution of program resources by type of environmental concern. Conservation assistance is difficult to assign to specific environmental concerns because a dollar of assistance may address multiple concerns. However, Table 3 provides some general indications of the level of attention paid to various concerns by program. During 2002-2005, the majority of resources for EQIP, CSP, and CRP, based on the subjectivity of experts' opinions, were focused on water quantity and quality, soils management, and wildlife habitat management. Wetland conservation received less support. The smallest portions of allocated resources were focused on air quality and energy conservation.

<b>Program</b>	<b>Water Mgmt</b>	<b>Soil Mgmt</b>	<b>Water Quality</b>	<b>Air Quality</b>	<b>Wetland Conservation</b>	<b>Wildlife Mgmt</b>	<b>Energy</b>	<b>Total</b>
<b>Technical Assistance</b>								
EQIP	28	24	40	2	1	5	--	100
CSP	3	39	45	3	--	6	4	100
CRP	--	24	50	1	5	20	--	100
WRP	2	--	10	--	35	53	--	100
<b>Conservation Technical Assistance</b>	24	38	13	1	6	12	6	100
<b>Financial Assistance (EQIP, GSWC, AMA, WHIP)</b>	31	21	36	2	1	9	--	100
EQIP	28	24	40	2	1	5	--	100
WHIP	1	2	3	1	3	90		100
<b>Easement Programs (WRP, GRP, FRPP)</b>	--	17	9	--	29	45	--	97
<b>Stewardship Programs (CSP, CRP)</b>								
CSP	3	39	45	3	--	6	4	100
CRP	--	34	32	1	7	26	-	100

1/ These estimates are based on individual contract purpose adjusted by program manager expert judgment. The CRP estimates are based on practice and Environmental Benefit Index component scores.

**Key issues for future programs.** Competition for Federal funds suggests there will be a growing need to find more efficient ways to design programs to meet the broad range of conservation needs and to deliver more cost-effective conservation technical assistance. For FY 2005, there were nearly 50,000 unfunded conservation program applications representing \$2.4 billion. EQIP, GRP, and WRP account for 93 percent of the applications. While the merits of these unfunded applications are unclear, they nonetheless suggest continuing substantial unmet demand for conservation program participation. Program consolidation and simplification, as well as refining conservation and environmental priority concerns, may increase program efficiency and increase environmental benefits. Energy and air quality are areas of concern receiving the least funding and may merit greater attention in future programs.

The distribution of program participation between rural residence, intermediate, and commercial farms also suggests that movement toward working lands programs could alter the distribution of payments across farm types. If the distribution of conservation program participation shifts toward intermediate and commercial farms, conservation programs may be more effective in addressing some environmental problems such as nutrient runoff, because these farms control a large share of agricultural land and livestock production. It may also mean that the distribution of participation and payments across farms will be less uniform, at least in terms of payments per farm.

### **Economic and Market Effects**

The economic and market effects of conservation programs are also difficult to measure. There may be direct effects on farm income and on commodity markets due to the receipt of a payment if programs induce changes in crop or livestock production. Conservation programs also improve producers' economic performance by providing the technical and financial means to help avoid or minimize potential production and regulatory risks. Conservation measures such as water-conserving irrigation systems can reduce production risk, comprehensive nutrient management plans can help avoid regulatory risk, and grazing land management can reduce risks related to drought and the associated income risk.

Programs that place land in conserving uses, such as the CRP and WRP, have a range of economic, market, and risk reduction impacts. By compensating landowners for placing eligible fragile lands into a long-term conservation cover, participants receive a guaranteed annual income, contributing to income stability and reduced production risk. Moreover, as large amounts of cropland are removed from production, crop production is reduced, increasing crop prices. A 2004 examination of the effect of enrolling an additional 2.8 million acres in the CRP (less than 1 percent of typically planted acreage) estimated crop price increases averaged \$0.02 per bushel for wheat, \$0.02 for corn, \$0.01 to \$0.02 for other feed grains, and \$0.06 for soybeans. The analysis estimated that an additional 2.8 million acres in the CRP would decrease government costs by a net of \$0.2 billion over 2003-12, with commodity program payments reduced by \$1.7 billion while CRP payments increased by \$1.5 billion over the period. In a freer global market, effects of removing U.S. land from production may be offset to a large degree by increased production in competitor countries.

Local economies may also be affected as additional acreage is enrolled in the CRP. As crop production is reduced, use of inputs such as fertilizer, hired labor, farm equipment, pesticides, and energy decreases. A 2004 congressionally mandated study of the CRP by USDA's Economic Research Service found that the negative effects of the CRP on rural economies tend to be small and transitory. The study did not find impacts on the rural population, government services, or tax burden. One explanation of these results may be that the increase in conservation payments to producers as additional acreage is enrolled in the CRP are invested locally supporting the rural economy. Agricultural producers and others may also benefit from the provision of environmental goods and services that generate recreation or tourism. The reduction in erosion or greenhouse gas concentrations or the increase in wetland values and functions and wildlife habitat increase environmental quality.

Financial assistance programs on working lands generally provide conservation payments to producers that may not cover the full cost of implementing conservation practices. However, producers may implement conservation practices because, with the conservation payment or know-how from technical assistance, they can meet environmental regulatory requirements, or the environmental and economic benefits the producer receives exceed the costs, or because of their conservation ethic. In some cases, market incentives may be enough for many producers to undertake conservation measures because producers expect the measures alone will result in a positive net return. Research indicates that land degradation causes productivity losses and market incentives are often sufficient to limit productivity-reducing degradation.

Conservation compliance programs require implementation of conservation measures in order to receive farm price and income support payments and other program benefits. While only 39 percent of farms receive government payments, farm price and income support covers over 265 million base acres as well as farms producing milk, sugar, wool and mohair, and other products that do not have base acres. While conservation compliance reduced the effective level of support received by some producers from price and income support programs, research also suggests that it was effective in reducing soil erosion.

**Key issues for future programs.** Conservation policy needs to balance a variety of concerns ranging from meeting regulatory requirements to farm viability. The economic impacts on individual producers and their communities must be considered along with environmental quality. In a practical sense, this need for balance raises questions about the type of policy tools that are used to encourage better environmental performance on the part of agricultural producers. Programs on working lands or lands put into conservation uses may differ in their economic impact on producers, rural communities, and the environment. Voluntary measures, such as EQIP or CRP, must also be weighed against less voluntary and compulsory actions for improving environmental performance.

Limited work has been done to develop private sector markets for environmental goods and services and use these markets to allocate more efficiently and effectively Federal and private sector funding for conservation programs. The emerging private markets for greenhouse gas offsets and mitigation banks suggest that conservation programs may become more efficient by incorporating activities that use or facilitate environmental market mechanisms, such as credit

trading, mitigation banking, and green labeling and using market mechanisms such as auctions and bidding for more effective implementation.

## **WTO Implications of Conservation and Environmental Programs**

The Uruguay Round Agreement on Agriculture (URAA) of the World Trade Organization (WTO) sets out criteria for classifying domestic farm programs by their level of production and trade distortion. This classification is important because programs that are deemed to be minimally or non-trade distorting (so-called green box) are not subject to annual limits on support, as are programs that are classified as trade-distorting (referred to as amber box). To be classified as minimally or non-trade distorting, a program must meet specific criteria spelled out in the URAA.

To be classified as green box support, a program must meet two sets of criteria. The first are fundamental requirements that the program must be publicly funded, not involve transfers from consumers, and not have the effect of providing price support to producers. In addition to these fundamental requirements, a program has to meet specific policy criteria. Annex 2 to the URAA contains policy-specific green box criteria, several of which are relevant to conservation and environmental programs. The United States already reports to (or “notifies”) the WTO several conservation programs under these policy-specific criteria:

- **Paragraph 2: General services.** This paragraph covers a wide range of government activities, and several relate to the provision of conservation and environmental services. One is research relating to environmental programs, and another is infrastructural work associated with environmental programs. Support cannot be extended for on-farm facilities or inputs, such as provision of irrigation water. Under this paragraph, the United States has reported to the WTO as green box the Conservation Operations and Resource Conservation and Development programs under NRCS, and payments under Conservation Program Technical Assistance.
- **Paragraph 6: Decoupled income support.** To be eligible for green box status, payments must be determined by clearly defined criteria such as income, landowner, use of production inputs, or production level in a defined and fixed base period. Payments cannot be related to any production, prices, or factor of production after the base period. Finally, no production can be required to receive a payment. The United States has not notified any conservation or environmental programs as green box under this paragraph.
- **Paragraph 10: Structural adjustment provided through resource retirement programs.** To be eligible for green box status, payments must be part of a well-defined government program that removes land or other resources from marketable agricultural production for a minimum of three years (permanently for livestock). Payments shall not require or specify an alternative use for the retired resources that involves the production of marketable agricultural products. The main program notified as green box by the United States in this category has been the Conservation Reserve Program.

- **Paragraph 12: Payments under environmental programs.** To be eligible for green box status under this paragraph, payments must be part of a clearly-defined government environmental or conservation program and must fulfill specific conditions under the program, including those related to production or inputs. In addition, payments must be limited to the extra costs or loss of income involved in complying with the program. In 2001, the latest year in which the United States notified its programs to the WTO, several conservation programs under this paragraph were notified as green box, including the Agricultural Conservation Program, the Emergency Conservation Program, the Great Plains Conservation Program, the Colorado River Basin Salinity Program, the Wetlands Reserve Program, the Wildlife Habitat Incentives Program, the Farm and Ranch Lands Protection Program, and the Environmental Quality Incentives Program.

**Key issues for future programs.** Current and future programs should strive for consistency between conservation and environmental programs and WTO green box criteria. Issues in achieving this consistency can be illustrated by examining several USDA programs, including one, CSP, which has not yet been notified to the WTO.

For example, cost-share payments under current conservation programs fit the criteria under Paragraph 12 and are considered to be green box because payments are limited to less than the full cost of implementing conservation practices. Paragraph 12 does not apply if conservation program payments plus any additional payments provided to producers as an incentive to participate in conservation programs exceed the full cost or loss of income in implementing conservation practices. EQIP's incentive payments relate to increased costs or potential loss of income as a producer adopts a new practice and are consistent with paragraph 12.

The CSP has four separate payments. The stewardship payment, which is the product of the number of acres in each land use category times the payment rate, could also qualify as a decoupled payment under Paragraph 6, recalling that payments cannot be linked to a factor of production after a fixed and defined base period. For the stewardship payment, acres are fixed at an historical level. But if payment rates are adjusted upward over the life of a contract, this feature could be seen as inconsistent with Paragraph 6 criteria. Some CSP enhancement payments may be consistent with paragraph 12 if they reflect costs. However, performance-based enhancement payments may exceed the cost incurred to implement conservation practices. In this instance, such payments would not meet the criteria under Paragraph 12 for a green box program. However, performance-based enhancement payments could meet the paragraph 6 criteria as decoupled income support, provided they are independent of production, price, and factor use.

For programs like CRP in which land is devoted to conserving uses, Paragraph 10 requires that enrolled land must be removed from marketable agricultural production for a minimum of three years to be considered a green box program. Some have advocated allowing the production and harvesting of energy crops on land enrolled in the CRP. Such use would have to be reconciled with the criteria contained in Paragraph 10 for a green box program. However, the CRP rental payment could also be viewed as an environmental program payment that compensates for loss of income under paragraph 12.

## **VI. Generalized Alternative Approaches to Current Programs**

This section considers four broad alternatives to the existing USDA Farm Bill conservation programs that would address some of the concerns raised in the previous section under “Key issues for future programs.” These approaches are not specific farm bill proposals that are being advocated. Neither are they mutually exclusive. Instead, they are presented to help focus further public discussion regarding the 2007 Farm Bill. Each alternative is discussed using the four criteria from Section V.

Conservation programs seek to maintain productive agriculture in harmony with clean air and water, healthy soils, healthy wildlife and fish populations, and sustainable rural communities. Conservation programs arose because tillage increases erosion and reduces soil organic matter; fertilizing crops can increase nutrient runoff and leaching; irrigation limits water available for other uses; and agricultural practices can affect wildlife habitat. Providing landowners with technical assistance and economic incentives to adopt conservation measures can increase environmental benefits.

Although there are many alternative ways to structure programs to increase environmental benefits, implementing conservation-based performance goals could increase program effectiveness. USDA has been developing tools to estimate the effects of conservation practices on nutrient runoff and leaching, greenhouse gas emissions, irrigation water savings, and certain targeted wildlife habitat. These measures could be adapted to provide performance-based conservation program compensation. The CSP has developed performance-based enhancement payments that set payment levels based on a farmer’s level of environmental performance as measured by environmental indices.

A performance-based approach to conservation could provide incentives for undertaking greater conservation efforts and a means to measure USDA progress towards meeting broad national conservation priorities. Where possible, addressing these priorities could be measured quantitatively, such as the amount of erosion reduction per year, the decline in nitrogen and phosphorous leaving farms and adversely affecting water quality per year; the increase in the number of acres of wetlands and buffers per year; the reduction in water use per year; and the increase named species habitat per year.

### **Alternative 1: Improve Existing Conservation Programs**

Statements made by farmers, ranchers, and the public during the Secretary’s Farm Bill Forums indicated stakeholders are generally satisfied with current USDA conservation programs. One of the underlying features of conservation programs—especially the working lands programs—that engenders broad support is the widespread distribution of program participants across the United States. This alternative examines four significant changes that could help improve the effectiveness and efficiency of current USDA conservation programs. The more substantial modifications include: (1) making programs more targeted and increasing the use of market mechanisms; (2) consolidating programs that share common purposes and incentives; (3) rebalancing conservation investments among programs and purposes; and (4) enhancing the support of farm and ranch energy management and development of alternative energy sources.

- **Increase Environmental Returns on Conservation Investments.** Increasing environmental returns on Federal conservation program investments requires focusing conservation funding on those locations, such as watersheds or basins, or natural resource problems, such as wetland or habitat losses, that maximize the environmental benefit of Federal investments. A strategy for maximizing the environmental benefit of the Federal investment would need to consider both (1) the way USDA identifies the potential for environmental gain from addressing various resource problems in various locations and (2) the balance between environmental gain and the cost of achieving those gains. A number of strategies could be employed:

  - Adopt a watershed or landscape approach to program delivery, focusing effort on watersheds or landscapes where environmental gains are most likely;
  - Improve program applicant ranking criteria, including replacement of the current regional equity provision with natural resource based strategies for allocation of program funds;
  - Make greater use of competitive bidding to lower the cost of conservation program contracts;
  - Use information or indices underlying applicant ranking criteria to vary payments in a way that is commensurate with the potential for environmental benefits, i.e., expand the use of performance-based payments; and
  - Reconsider paying for already implemented practices (stewardship payments) in the overall mix of conservation program tools.
  
- **Consolidate Programs and Delivery Mechanisms.** Consolidation of current cost-share, rental payment, easement purchase, and incentive programs would likely achieve administrative efficiencies as well as improve the effectiveness of program delivery. The current suite of programs could be replaced with a single, streamlined, comprehensive system of financial incentives, supported by technical assistance. Changes to be considered include incorporating the policy tools of conservation-use programs (CRP) and cost-share programs (EQIP, WHIP, and AMA) into a single conservation program and creating a single, multipurpose easement program that would combine WRP, FRPP, and GRP.
  
- **Rebalance the Conservation Program Portfolio.** The 2002 Farm Bill began the process of balancing conservation program funding by increasing the portion of funding allocated for working lands programs, primarily EQIP. Increasingly, CRP has moved away from putting entire fields into conservation uses toward funding the installation of high-priority “buffer” practices (e.g., filter strips, grassed waterways) that support working lands by reducing the environmental implications of on-going agricultural production. At the beginning of 2006, about 20 percent of CRP funding was devoted to these practices, up from about 10 percent at the beginning of 2002. Even with the 2002 Farm Bill’s expanded funding for working lands conservation programs, and changes in CRP funding, over half of USDA conservation payments are devoted to retiring land from commodity production. This modification would continue the trend of increasing the proportion of funding for working lands programs and reducing the proportion for putting land into conservation uses. With the large number of CRP contracts expiring in



2007 and 2008, there may be a unique opportunity to extend benefits on working lands, making additional funding available to a greater number of producers and applicable to a broader array of agricultural lands. In addition, the 39-million-acre cap for CRP may not be appropriate for the longer term given tools available under other conservation programs and concerns about capacity constraints in feedstock production for bioenergy.

- **Encourage Energy Conservation and Production.** Many conservation practices not only conserve natural resources, they also save energy. Recent increases in energy prices have significantly affected farm and ranch production costs. This option could add specific energy conserving practices to financial and technical assistance programs, including authorities and funding for: on-farm energy audits, activities which improve on-farm energy efficiency, and assistance in developing on-farm energy production and bio-energy feedstocks, including allowing, where appropriate, the use CRP and WRP land intermittently for bioenergy purposes with an accompanying reduction in rental payments.

**Conservation and Environmental Benefits.** The current allocation of conservation resources to rural areas and across landscapes where there are substantial natural resource problems may not be optimal. More direct consideration of environmental performance and comparison of benefits and costs could possibly improve the effectiveness of current conservation programs.

The way program payment and eligibility criteria are structured also affects the efficiency with which these programs deliver environmental gains. Current programs, such as EQIP and CRP, use prospective program costs and environmental benefits to select enrollees. Producer incentives to apply for cost-based payments are roughly the same for everyone and do not depend on the level of environmental benefit a given producer may offer. Thus, cost-based payments are typically used with environmental benefit-cost indices or other targeting devices to ensure that the producers selected for participation can deliver relatively large environmental benefits per dollar of program expenditure. A key question is whether existing environmental benefit-cost indices, such as the Environmental Benefits Index (EBI) used to rank proposed CRP contracts for acceptance in a general sign up, can be improved to more accurately reflect the potential benefits and costs of withdrawing land from commodity production.

Unlike EQIP or CRP, CSP bases a large portion of program payments on environmental performance, as measured by environmental indices. The key advantage of this approach is that producers who can deliver environmental benefits, especially those who can do so at a low cost, have a larger participation incentive. Some producers, who can deliver substantial environmental benefits but would not sign up for an environmental program that only reimburses the cost (or a portion of the cost) may be induced to sign up for a performance-based payment. On the downside, these incentives could increase the cost of achieving environmental gains, to the extent that payments exceed cost. Thus, programs with cost-based or bid-based payments (e.g., EQIP and CRP) may deliver more environmental gain per dollar of Federal investment, even without enrolling some producers who could deliver significant benefits. Performance-based payments must also be carefully designed to limit distortions of production incentives. If payments are too large, they may encourage the expansion of crop production onto marginal land.

With EQIP, the 2002 Farm Bill prohibited “bidding down” of the cost share out of concern that economies of size would result in most funds going to large farms that could agree to undertake conservation practices at lower costs. On the other hand, the use of auctions and bidding for at least a portion of the programs could stretch program dollars by encouraging producers to reveal the minimum payment they would be willing to accept for retiring land or installing conservation practices.

Finally, payments for prior implementation of conservation measures, such as so-called “good actor” payments, may help maintain conservation measures but can be costly with limited additional environmental benefit. Current programs focusing on land in agricultural production provide such payments as only a small portion of total program payments, such as the CSP stewardship payment. Analysis indicates more conservation benefits per dollar spent may be obtained by basing payments on performance targets rather than past actions or specific practices. Rebalancing the CSP funding between stewardship payments and enhancement payments could increase environmental benefits by encouraging additional new conservation actions on the part of producers.

Creating a single financial assistance conservation program would allow the program implementation process, which is sensitive to local conservation needs, to allocate funding to those conservation purposes and mechanisms that can create the greatest environmental benefit. A single program with expanded authorities for conservation performance payments has the potential to enhance the level of conservation and create new, innovative approaches to conservation. If the balance between rental programs and working lands programs changed toward working lands, some land now in conserving uses could be brought into commodity production. More land in working lands programs may bring fragile land into production that would not otherwise be there. While working lands conservation program tools could preserve many environmental benefits, some benefits on these lands, such as wildlife habitat, would be reduced, lost, or changed with respect to the species benefiting.

**Program Costs and Distribution of Program Assistance.** With competition for Federal funding, implementing the modifications in this alternative would likely enable the programs to operate with greater efficiency and thus stretch program dollars to achieve conservation objectives.

Taken as a whole, conservation participation and payments—on a per-farm basis—are relatively evenly distributed across the county and across farm size, farm type, and farm income level. The EQIP and CSP programs are somewhat uniform in their geographic distribution, and to the extent that the above modifications shift funding from rental and easement programs toward working lands programs, conservation program distribution would likely be made more geographically uniform. However, environmental concerns are not necessarily spread evenly geographically. Thus, program distribution under performance-based conservation programs tied to environmental goals would reflect areas of greatest resource concern.

**Economic and Market Impacts.** The financial assistance and easement programs are widely dispersed across the Nation and tend to have nominal impacts on local economies. The above modifications would not likely have significantly different commodity market effects from

current programs, unless the balance between rental programs and working lands programs changed sharply. Land brought back into production would increase the demand for farm-related goods and services leading to job growth in farm support service industries and marginally increase agricultural production. However, if recreational opportunities are reduced, then there could be an off-setting reduction in recreation-oriented enterprises. Expanding the GRP could be one option for providing incentives to keep expiring CRP land in grass and thereby mitigate any potential losses in recreational opportunities. This land could also shift directly to the CSP with cost share available to add fencing and livestock water.

Many of the conservation practices supported by USDA conservation programs conserve the use of fossil fuel-based inputs like diesel fuel, nitrogen, and electricity. In addition, there are programs that support bio-energy production like EQIP, CSP, and CRP. Expansion of these program initiatives could contribute to farm profitability and rural economies while providing environmental benefits.

**WTO Implications.** The changes under this alternative would employ the current suite of conservation program tools but in different ways. Thus, the programs are expected to be consistent with WTO obligations for green box programs. Two concerns are expanded energy production and greater use of enhancement payments. Care must be taken to ensure energy incentives are not coupled payments that are tied to production, price, or input use of energy crops. Enhancement payments must compensate only for costs incurred or income foregone or qualify as decoupled income support, an issue discussed in more detail in the next alternative.

**Alternative 2: Provide “green payments” to enhance environmental benefits and provide income support.**

Many Farm Bill Forum participants were interested in programs that would reward producers for environmental performance. These so-called “green payment” programs have been touted by some as an alternative way to provide income support to producers in a manner that is consistent with WTO domestic support constraints, while providing substantial environmental benefits.

There are numerous approaches to providing green payments for income support. One approach would be incentive payments to producers to undertake a broad range of conservation practices. Another approach would be performance-based payments, which would be commensurate with the environmental benefit of adopting and maintaining appropriate conservation practices, not the cost of installing or adopting the practices. In effect, the government would create a market for environmental gain, and producers would decide whether to produce those gains in much the same way as they decide to produce commodities: if the payment they receive exceeds the costs of their conservation activities, the producer would make a profit, or have their income supported, by “producing” environmental gain. To support incomes of most producers, including those currently receiving price and income support payments, most cropland and grazing land could be made eligible to participate.

**Conservation and Environmental Benefits.** The environmental impact of “green payments” would depend largely the program structure, and in particular, the degree to which a payment is tied to environmental performance. Enhancement payments, with their focus on the potential for

environmental gain, could increase environmental benefits by encouraging additional new conservation actions by producers. However, if payments are structured largely for income support (albeit with the condition that recipients must meet some environmental standards), a given level of conservation program funding is likely to produce less environmental gain.

**Program Costs and Distribution of Program Assistance.** If stewardship payments were focused on current recipients of farm income support, as for example, through expanded conservation compliance or other criteria, the payments would likely not address the same environmental issues or direct funds to the same producers as current conservation payments. For example, in 2003, only 43 percent of conservation payments went to farms that also received commodity payments. If commodity payments were to serve as the basis of a new green payment program, environmental benefits would focus more heavily on resource concerns related to crop production and less on resource concerns related to livestock producers.

By contrast, current conservation payments tend to be more broadly available to non-program crop and livestock producers. If green payments were focused on current recipients of conservation payments, producers of non-program crops and livestock producers would likely gain, perhaps at the expense of current program crop producers. Green payments funded from reductions in spending from current commodity programs could also have negative implications for asset values of current commodity program beneficiaries and may jeopardize the accomplishments of conservation compliance.

**Economic and Market Impacts.** While this alternative is an appealing approach on many levels, caution is in order. When environmental gain is equated with the application of certain practices through the use of an environmental benefit index or other means of estimation, producers may be encouraged to bring additional marginal land into production, possibly offsetting environmental gains. Unfortunately, it is not yet possible to monitor the conservation performance of a specific farm at a reasonable cost. Safeguards against expanding production would be needed.

Nearly every farm faces some type of environmental concern. However, unless payments are targeted to increased environmental performance, the marginal costs of increasing environmental benefits through green payments may be high. Performance-based payments could be more cost-efficient at providing environmental benefits than payments tied to practices or prior actions. For example, a practice-based program that pays out regardless of location or other field characteristics could be funding many practices of marginal environmental benefit.

**WTO Implications.** Another caution with this alternative is the inherent tension between the objectives of using green payments as income support and using them to produce environmental benefits as evidenced by examining the consistency of green payments with WTO criteria. If conservation payments only compensate producers for cost or income foregone, and are consistent with Annex 2, paragraph 12, then there is no income support. If the payments are for environmental benefits but exceed the producer's costs or income foregone, then to be green box, the payments must be decoupled income support and consistent with Annex 2 paragraph 6. However, to be decoupled income support, the payments must not be related to input use, and it is often by changing input use that conservation payments achieve environmental gains. Thus, if

the conservation practices undertaken by the producer are restricted to ensure WTO consistency, the environmental gains may be limited. A conservation program that enhances net farm income, is environmentally effective, and is green box for WTO purposes would be a challenge to design and require careful development.

A green payment program is not necessarily green box and thus exempt from reduction commitments in the context of the WTO. For example, to the extent conservation payments exceed the cost of implementing environmental practices, such payments are ineligible for inclusion under paragraph 12, environmental payments. However, such payments may still be consistent with paragraph 6 criteria as decoupled direct support, provided the payments are not linked to current prices, production, or input use.

### **Alternative 3: Encourage Private Sector Markets for Environmental Services**

There is increasing interest in the role agriculture and forestry practices can play in providing environmental goods and services to private sector markets. New private sector environmental markets could complement or in some cases potentially replace existing federally supported conservation efforts. Environmental markets offer an alternative way to achieve the goals of traditional environmental regulations. For example, industrial firms could meet regulatory obligations by purchasing pollution abatement services (offsets) from lower-cost providers and achieve pollution reductions at lower cost to society. Environmental markets offer financial opportunities for agricultural producers and landowners. Agricultural operations that are subject to environmental regulations could benefit from the improved efficiency provided by environmental markets, and earn income by providing offsets in cases where they are either not subject to regulatory requirements or can exceed the required environmental performance.

Agriculture and forestry can be low-cost providers of a number of environmental goods and services. Environmental markets with relevance to agriculture and forestry include: water quality, air quality, wetlands, endangered species, greenhouse gases, and development rights. Private environmental markets could supplement federal efforts for conservation and environmental protection, allowing federal funds to reach more farms. To accomplish this, federal conservation programs would need to contain provisions that allow private and federal funds to complement each other. First, programs need to allow the private sale of environmental credits produced as a result of federal support (this is currently permissible under EQIP and CRP and under WRP in some instances). Second, the programs would need to be structured to foster competition so that farmers receiving revenue from private environmental markets would have an incentive to reduce requests for federal aid.

The ability of agriculture and forestry to provide environmental credits has been hampered by several barriers, including: high transaction costs, the small quantity of benefits that can be provided by individual farmers or landowners, performance risks and liability, a lack of information, and uncertainties in quantifying benefits. New authorities could possibly enable USDA to overcome these barriers and promote the establishment of environmental markets for agricultural and forestry conservation activities. It is likely that development of these markets would take time.

- **Establish Market Confidence and Validity:** Generating substantial demand for environmental goods and services hinges on the ability to use environmental credits to offset regulatory requirements. Congress could authorize USDA and Federal regulatory agencies to cooperate to ensure that environmental goods produced by agriculture can be used to offset their regulatory requirements in other sectors.
- **Develop Uniform Standards:** Environmental markets require standard units of environmental benefits. USDA could be authorized to develop consistent standards for estimating environmental goods and services provided by agriculture and forestry. Uniform rules, including standards for data quality, verification, reporting, and estimation methods could help ensure credible and fair ecosystem service markets.
- **Foster Emerging Markets:** USDA could be authorized to provide investment capital, such as loans and grants to stimulate markets. Funds could be used for projects and to support States, cooperatives, and others that could work to address barriers such as risk, liability, lack of information, and scale of benefits.

**Conservation and Environmental Benefits.** Traditional environmental regulations require firms to reduce pollution to a set level or to install specific technologies and practices. While fairly straightforward, this approach can be costly both to the firms and to society because firms with high costs of pollution reduction and those with low costs are required to meet the same requirements, which may waste resources. Private sector environmental markets can offer efficiency improvements over traditional regulations and could result in overall increases in environmental and conservation benefits. For example, a firm that is a point source of water pollution could pay a farmer to establish buffer strips to reduce nutrient runoff. These buffer strips would also sequester carbon and provide wildlife habitat.

**Program Costs and Distribution of Benefits.** The Federal costs of promoting private sector environmental markets may be less than the costs of direct payments and cost-sharing. Federal costs would be limited to the costs associated with rule-making, research and development of methods for quantifying benefits, and investments in activities to foster emerging markets. The private sector would bear the major costs of implementing actions. Moreover, the costs to firms of purchasing environmental benefits under market systems would be lower than their costs under traditional command-and-control approaches.

The distribution of benefits would be driven by market forces. The distribution of benefits would also vary by the type of environmental market—reflecting differences in the underlying environmental goals and objectives. For example, water quality goals are specific and localized within watersheds and in some cases, localized to particular points within watersheds. The value of the offsets would be tied to the location of the action.

The case of regional or global air pollutants provide greater flexibility. Effective markets can exist based on the average benefits provided by actions. The estimates may over- or underestimate the benefits of a specific action or at a specific location. However, if the estimates are unbiased in their structure and application, they should reflect the benefits when aggregated at a

larger scale. Benefits in regional and global air pollutant environmental markets would tend to accrue in regions that can provide low cost offsets.

**Economic and Market Effects.** The application of environmental markets to agriculture could provide economic and environmental benefits to the sector. The cost of providing environmental services, such as improved water quality, reduced air pollution, and carbon sequestration are often lower in agriculture than in other sectors. As a consequence, the implementation of environmental markets could result in increases in the actions to improve environmental quality and an influx of revenue from sectors with high environmental compliance costs.

The magnitude of these benefits would vary depending on the type of environmental good or service. For example, wetland mitigation banks have been set up in many States to allow private developers to purchase wetland conversion rights from farmers who have established or restored wetlands. The prices of wetlands banked depend on location, establishment costs, and/or expected environmental benefits. For example, in Minnesota, wetland credits to public transportation authorities ranged from \$4,000 to \$35,000 per acre, depending on proximity to the Twin Cities metro area.

In cases where controls are not costly or regulations are not binding, the value of offsets is often low. Private markets for greenhouse gas reductions have emerged in the absence of regulatory requirements in the United States. The value of greenhouse gas reductions in these voluntary markets is low, on the order of \$1 to \$2 per ton of carbon dioxide.

**WTO Implications.** Market mechanisms are largely private sector transfers and should have negligible implications for WTO compliance. Ultimately, whether a program that involves any payments to producers is consistent with Annex 2 criteria will depend on whether payments exceed costs incurred or income foregone from implementing a particular practice (as in Annex 2, paragraph 12) or whether payments are tied to current production, prices, or input use (as in Annex 2, paragraph 6).

#### **Alternative 4: Expand Conservation Compliance or Establish a Standard of Care**

A way to strengthen the linkage between price and income support and conservation is to expand conservation compliance requirements. The effectiveness and enforceability of compliance mechanisms in achieving environmental gains, compared with a conservation payment program, would depend on the size and distribution of other types of USDA payments. The experience with current conservation compliance provisions is that the estimated level of farm program payments per acre of HEL cropland varies widely across farms as do compliance costs.

With price and income support programs centered on major field crops, environmental problems associated with cropland are likely candidates for compliance. For example, the overlap between farm program payments and areas with a high potential for nitrogen runoff would yield significant benefits if compliance requirements included some aspect of nutrient management.

One option is to recast the current compliance provisions and incorporate a “standard of care” approach to managing natural resources. For example, the standard of care could be the same as

the conservation requirements associated with CSP Tier I eligibility, which require the producer to address soil and water quality to a minimum level of treatment on part of the farm. The advantage of this approach would be that there are existing tools available to determine compliance and these standards already have acceptance as eligibility criteria in the CSP program. USDA program participants would be required to meet the standard of care in order to continue to receive price and income support. Or, program participants could be required to reduce erosion on all land, not just HEL. Such approaches move farm program payments in the direction of “green payments” as discussed in Alternative 2.

Compliance could be expanded not only in terms of environmental requirements but also by linkage to other USDA programs and the extent of land covered by compliance provisions. Linkages to other USDA programs could be expanded several ways, such as linking disaster payment eligibility to implementation of a conservation system that meets some minimum level of treatment or standard of care, or creating a sliding scale of commodity payments based on the level of conservation treatment, or prohibiting producers who bring certain grasslands into crop production from obtaining subsidized crop insurance for some period.

**Conservation and Environmental Benefits.** The erosion reductions under conservation compliance suggest that extending HEL compliance provisions to non-HEL could produce additional on-site and off-site environmental benefits. Incorporating additional criteria for the receipt of farm program benefits, such as CSP Tier I, would add to conservation benefits. For example, there are indications that non-HEL grassland is being converted to cropland in the prairie pothole region and adversely affecting critical duck habitat. Expanding sodbusting compliance provisions to non-HEL land could help protect this habitat. Additional water quality benefits could be obtained by adding some aspect of nutrient management in crop production to the list of compliance requirements.

**Program Costs and Distribution of Program Assistance.** One of the advantages of compliance programs is that they do not require additional program funding other than technical assistance to help farmers comply with the requirements of the compliance provision. However, technical assistance costs could be high and farmers would likely incur costs that are not offset by cost-share programs like EQIP. Moreover, these costs are not likely to be evenly distributed across producers. Expanding compliance beyond highly erodible land and wetlands by incorporating a standard of care for soil quality and water quality may substantially alter the distribution of farm types and increase the number of farms and acres affected by conservation compliance. Also, if farm program benefits were reduced in the future, there would be less incentive for producers to expand or maintain existing conservation practices to comply with conservation compliance.

**Economic and Market Impacts.** Properly designed, the economic and market impacts of expanded conservation compliance could be limited. A key element in minimizing the effects is the availability of cost-effective technology that can not only help farmers comply with the compliance provisions, but also reduce their production costs, reduce weather related risks, or enhance yields. To minimize adverse economic impacts to farmers and ranchers, a significant phase-in period would be needed, much like the 1985 compliance provisions. This would allow



time for enterprise changes, timely equipment purchases, the development of technology, and would help stimulate innovation on the part of agri-businesses.

**WTO Implications.** Expanded conservation compliance requirements as a condition for receiving program payments does not raise any specific issue relating to WTO rules. To maintain a payment's green box status, linkage between a compliance requirement and a payment must not be tied to current price, production, or input use. But, compliance provisions, however useful for improving environmental benefits, cannot turn an amber box payment into a green box payment.

## VI. Suggestions for Further Reading

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**Appendix Table 1. Policy Tools for Addressing Environmental Effects of Agriculture**

<b>Policy Tool</b>	<b>Participation</b>	<b>Government Role</b>	<b>Representative Programs</b>	
			Program title	Acronym
<b>Education/ Technical Assistance</b>	Voluntary	Provide farmers with information and training to plan and implement practices	Conservation Technical Assistance	CTA
<b>Economic Incentives: Place Cropland in Conserving Use</b>	Voluntary	Annual payments for placing cropland in conserving uses for contract duration or long term easements; contracts generally long term (10 years – permanent)	Conservation Reserve Program – General Signup Wetland Reserve Program and	CRP WRP
<b>Economic Incentives: Working Lands</b>	Voluntary	Payments to offset the cost of adopting specified management structural practices; contracts are for 1-10 years	Environmental Quality Incentives Program Conservation Security Program Wildlife Habitat Incentives Program  Conservation Reserve Program – Continuous signup Conservation Reserve Enhancement Program	EQIP CSP WHIP  None CREP
<b>Economic Incentive: Agricultural land preservation</b>	Voluntary	Purchase of easement on developments rights	Farm and Ranchland Protection Program	FRPP
<b>Compliance Mechanisms</b>	Involuntary, after opt-in to Farm Program	Sets standards for environmental performance and determines whether requirements are met before releasing payments	Conservation Compliance Sodbuster Swampbuster	None None None
<b>Regulatory Requirements</b>	Involuntary	Large livestock subject to permit requirements  Use restrictions and bans on certain pesticides  Farmers may not “take” a member of a listed species; Agencies must protect and restore species and their habitats	Clean Water Act  Federal Insecticide, Fungicide and Rodenticide Act  Endangered Species Act	CWA  FIFRA ESA

**Appendix Table 2. Summary of USDA Conservation Programs**

Program	Purpose / Priorities	Eligibility	Policy Tools		
			Technical & Education Assistance	Economic Incentives	Compliance [opt-in to Farm Program]
<b>Agricultural Management Assistance Program (AMA)</b>	Water management, water quality, and erosion control and mitigate risk through production diversification or resource conservation practices, including transition to organic farming. Priorities include: 1) Reduce non-point source pollution in impaired watersheds consistent with Total Daily Maximum Loads (TMDLs), where available, as well as the reduction of groundwater contamination; 2) Promote conservation of ground and surface water resources; 3) Reduce emissions that contribute to air quality impairment violations of National Ambient Air Quality Standards; 4) Reduce soil erosion and sedimentation; 5) Promote at-risk species habitat conservation.		√	√ incentive, cost share	√
<b>Conservation Reserve Program – General Signup (CRP)</b>	Retires land from crop production to provide specific environmental benefits. Priorities include soil erosion control, water quality, air quality, and wildlife	Owners/ operators for at least 1 year and control during contract period	√	√ cost-share, rental	√
<b>Conservation Reserve Program – Continuous signup (CCRP)</b>	Installs certain conservation practices that provide large benefits (such as riparian buffers and grass filters, bottomland hardwood reforestation, and wetland restoration)	Owners/ operators for at least 1 year and control during contract period	√	√ incentive, cost-share, rental	√
<b>Conservation Reserve Enhancement Program (CREP)</b>	Specific conservation needs as defined by state and federal partnership (such as sediment, and nutrient containing runoff into the Chesapeake Bay, the Everglades, and the Illinois, Ohio, and Minnesota River watersheds)	Owners/ operators for at least 1 year and control during contract period	√	√ cost-share, easement, rental	√
<b>CRP Farmable Wetlands Program</b>	Retires small wetlands on cropland to provide wildlife benefits	Owners/ operators for at least 1 year and control during contract period	√	√ rental	√
<b>Conservation Security Program (CSP)</b>	Promote the conservation and improvement of soil, water, air, energy, plant and animal life, and other conservation purposes. Meeting minimum standards for water quality and soil quality as basic eligibility requirements	Privately owned & tribal land; agricultural producers	√	√ stewardship, enhancement	√

Program	Purpose / Priorities	Eligibility	Policy Tools		
			Technical & Education Assistance	Economic Incentives	Compliance [opt-in to Farm Program]
<b>Environmental Quality Incentives Program (EQIP)</b>	Foster adoption of specified management and structural measures to address specific resource quality problems. National priorities include erosion, at-risk species habitat, air quality, water quality and conservation, and state and local resource concerns.	Agricultural producers	√	√ incentive, cost-share	√
<b>Ground and Surface Water Conservation (GSWC)</b>	Conserve ground and surface water on agricultural operations	Agricultural producers	√	√ incentive, cost-share	√
<b>Klamath Basin (KB)</b>	Conservation planning and on-farm conservation implementation in California and Oregon	Agricultural producers in Klamath Basin	√	√ incentive, cost-share	√
<b>Conservation Innovation Grants (CIG)</b>	Stimulate development and adoption of innovative conservation approaches and technologies while leveraging Federal investment in environmental enhancement and protection	Non-Federal government or non-government organizations, Tribes, or individuals		√	
<b>Farm and Ranch Land Protection Program (FRPP)</b>	Protect important farm and rangeland from conversion and retain in agricultural uses. Resource concerns include: soils of prime, unique, locally important or statewide significance or land with significant archeological or historic resources.	Landowners who apply cooperating entities	√	√ easement	√
<b>Grassland Reserve Program (GRP)</b>	Conserve vulnerable grasslands from conversion to other uses and conserve valuable grasslands by helping maintain viable ranching operations. Resource concerns include: animal and plant populations of significant ecological value, grazing land health	Easements – privately owned & tribal grasslands; Contracts – owners with long-term control of land		√ easement, rental	
<b>Healthy Forest Reserve Program (HFRP)</b>	Restore and enhance forest ecosystems to: 1) promote the recovery of threatened and endangered species, 2) improve biodiversity; and 3) enhance carbon sequestration			√ easement	
<b>Wetland Reserve Program (WRP)</b>	Restore and protect wetlands and associated upland resources, and the plant and animal populations they support; contribute to improved water supply and quality; and mitigate flooding	Owners of restored or restorable wetlands and uplands for at least 1 year	√	√ cost-share, rental, easement	√

Program	Purpose / Priorities	Eligibility	Policy Tools		
			Technical & Education Assistance	Economic Incentives	Compliance [opt-in to Farm Program]
<b>Wildlife Habitat Incentives Program (WHIP)</b>	Establish and improve fish and wildlife habitat. Priorities include: Promote the restoration of declining or important native wildlife habitats; Protect, restore, develop or enhance wildlife habitat of at-risk species (candidate species, and State and Federally listed threatened and endangered species); Reduce the impacts of invasive species on wildlife habitats; and Protect, restore, develop or enhance declining or important aquatic wildlife species' habitats.	Individuals, groups, entities, non-government organizations, tribe, nonfederal government	√	√ cost-share	√
<b>Conservation Technical Assistance (CTA)</b>	Technical assistance for conservation planning, design, and implementation; technology development and transfer; resource inventory and assessment; conservation compliance activities. National priorities include: 1) CNMP planning to assist animal feeding operation owners and operators to address their conservation needs, and where appropriate to comply under the EPA's Concentrated Animal Feeding Operation rule; 2) Reduce nonpoint source pollution in impaired watersheds consistent with TMDLs where available and reduce groundwater contamination and point sources contamination from confined animal feeding operations; 3) Conserve ground and surface water resources; 4) Reduce emissions that contribute to air quality impairment violations of National Ambient Air Quality Standards; 5) Reduce soil erosion and sedimentation; and 6) Promote at-risk species habitat conservation.	All non-federal lands	√		√
<b>Cooperative Conservation Partnerships Initiative (CCPI)</b>	Conservation priorities in watersheds and airsheds of special significance	State and local governments and agencies; Indian tribes; and non-governmental organizations that have a history of working with agricultural producers		√ cost-share	
<b>National Resources Inventory (NRI)</b>	Statistically reliable data and information on natural resource status and trends on non-federal lands to support policy, planning, and program development and implementation		√		
<b>Emergency Watershed Protection (EWP)</b>	Emergency response to watershed impairments from fire, flood or other natural occurrence; prevent development in vulnerable flood plains		√	√ cost-share, easement	

Program	Purpose / Priorities	Eligibility	Policy Tools		
			Technical & Education Assistance	Economic Incentives	Compliance [opt-in to Farm Program]
<b>Emergency Conservation Program (ECP)</b>	Emergency response to rehabilitate farmland damaged by wind erosion, floods, hurricanes, or other natural disasters; emergency water conservation measures during severe drought		√	√ cost-share	
<b>Flood Prevention Operations (WF-03)</b>	Watershed improvement measures to reduce flood, sedimentation, and erosion damages; further the conservation, development, utilization, and disposal of water; and conservation and proper land use		√	√ cost share	
<b>Resource Conservation and Development (RC&amp;D)</b>	Conservation, development and utilization of natural resources to improve the general level of economic activity, and to enhance the environment and standard of living in designated RC&D areas		√	√ [cost share authority?]	
<b>Watershed Surveys and Planning (PL-566)</b>	Investigations and surveys of river basins with other Federal, State, and local agencies as a basis for the development of coordinated water resource programs, floodplain management studies, and flood insurance studies; assists public sponsors to develop watershed plans to mitigate flood damages; conservation, development, utilization and disposal of water; and conservation and proper land use		√		
<b>Watershed Rehabilitation Program (REHAB)</b>	Rehabilitate dams critical to ensure community public health and safety		√	√ cost share	
<b>Watershed Operations (PL-534)</b>	Implement authorized watershed project plans through local sponsoring entities for the purpose of watershed protection; flood mitigation; water quality improvements; soil erosion reduction; rural, municipal and industrial water supply; irrigation water management; sediment control; fish and wildlife enhancement; and wetlands and wetland function creation and restoration		√	√ cost share	
<b>Forest Inventory and Analysis (FIA)</b>	Statistically reliable data and information on forest resource status and trends on federal and non-federal lands		√		
<b>Plant Materials</b>	Native plants to address specific natural resource problems		√		

Program	Purpose / Priorities	Eligibility	Policy Tools		
			Technical & Education Assistance	Economic Incentives	Compliance [opt-in to Farm Program]
<b>Snow Survey and Water Forecasting</b>	Information on western states and Alaska water supplies to support decisions on agricultural production, fish and wildlife management, municipal and industrial water supply, urban development, flood control, recreation power generation, and water quality		√		
<b>Soil Survey</b>	Soil information necessary for understanding, managing, conserving and sustaining the nation's soil resources		√		



**Appendix Table 3. Conservation Payments by Program, Estimated Calendar Year 2005 (1,000\$)**

State	CRP	WRP	EQIP	CSP	Emergency Conservation	Farmland Protection	Other	Total Payments
Alabama	22,474	22	7,143	941	7,764	338	300	38,982
Alaska	991	23	1,178	12	0	0	245	2,448
Arizona	0	3	8,803	243	419	135	78	9,680
Arkansas	12,811	14,149	10,065	15,620	499	0	366	53,509
California	4,513	10,367	27,285	7,348	1,837	2,341	715	54,406
Colorado	72,906	2,068	17,135	2,634	615	3,239	520	99,118
Connecticut	27	30	1,530	3	11	1,945	252	3,798
Delaware	810	0	3,727	501	0	2,293	418	7,750
Florida	2,661	1,256	5,395	551	15,527	850	322	26,563
Georgia	12,127	624	7,227	3,893	7,784	0	340	31,996
Hawaii	4	61	789	91	621	0	512	2,078
Idaho	31,506	263	8,882	5,204	80	403	260	46,598
Illinois	120,265	9,523	6,107	9,420	68	0	197	145,579
Indiana	42,816	11,242	5,343	7,328	185	999	267	68,180
Iowa	217,543	13,320	13,064	18,651	1,093	0	390	264,061
Kansas	116,004	776	14,763	10,108	15	468	542	142,676
Kentucky	30,396	3,631	7,624	532	171	2,846	210	45,410
Louisiana	15,145	5,877	7,802	488	1,609	0	511	31,432
Maine	1,205	28	3,967	37	25	674	729	6,665
Maryland	10,784	211	2,152	5,132	3	4,290	538	23,110
Massachusetts	14	180	1,506	35	16	3,556	515	5,823
Michigan	20,759	5,748	6,450	6,859	56	1,829	202	41,904
Minnesota	110,631	15,440	14,764	5,688	225	0	367	147,115
Mississippi	42,561	7,435	12,876	538	1,201	0	775	65,385
Missouri	105,354	10,519	9,184	19,092	1,655	0	605	146,409
Montana	113,501	455	15,681	11,249	681	800	257	142,624
Nebraska	71,264	4,437	20,254	7,071	477	211	483	104,196
Nevada	3	3	2,147	813	1,047	0	424	4,437
New Hampshire	11	111	1,340	67	0	3,819	161	5,508
New Jersey	139	4,456	1,768	75	809	4,707	284	12,237
New Mexico	19,209	420	12,168	1,789	192	1,516	175	35,469
New York	4,777	1,761	3,991	1,278	1,308	1,771	1,032	15,918
North Carolina	8,600	3,249	10,450	1,857	5,730	1,320	141	31,347
North Dakota	110,029	2,141	10,088	5,685	3	438	336	128,720
Ohio	36,095	3,123	6,828	8,694	1,492	1,954	361	58,548
Oklahoma	33,622	3,803	10,936	1,802	49	288	544	51,045
Oregon	30,340	6,649	13,023	23,152	250	0	548	73,963
Pennsylvania	23,369	53	6,274	1,442	719	2,051	704	34,610
Rhode Island	2	52	1,002	13	0	2,862	410	4,340
South Carolina	8,054	5,207	4,152	2,121	645	2,396	325	22,901
South Dakota	67,235	516	10,484	785	3,796	0	884	83,700
Tennessee	16,880	1,592	5,972	132	237	870	351	26,034
Texas	140,449	614	47,810	2,350	238	1,529	424	193,414
Utah	6,170	108	11,661	1,624	590	0	542	20,694
Vermont	460	15	2,648	122	21	1,304	732	5,304
Virginia	6,350	190	5,849	1,358	2,607	879	288	17,521
Washington	78,574	2,998	9,751	6,420	1,889	1,159	357	101,148
West Virginia	693	12	2,788	21	632	784	447	5,377
Wisconsin	44,452	5,865	11,677	4,214	0	0	334	66,540
Wyoming	8,092	62	10,426	972	586	55,580	992	76,710
United States	1,822,680	160,682	443,929	206,053	65,478	112,442	21,711	2,832,975