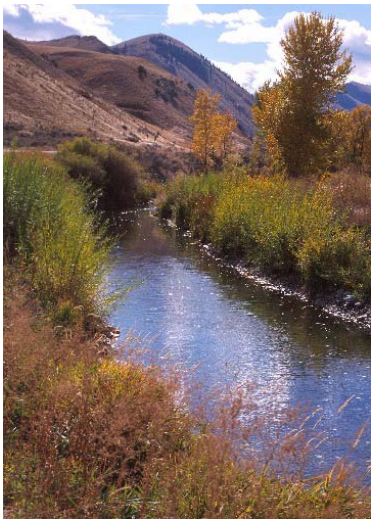
United States Department of Agriculture

NRCS Natural Resources Conservation Service



CONSERVATION SECURITY PROGRAM (CSP)

Draft
Environmental Assessment
July 24, 2003

Table of Contents

BACKGROUND

Introduction

The Natural Resources Conservation Service (NRCS) is promulgating a proposed regulation to implement the Conservation Security Program (CSP), which is authorized by Title XII, Chapter 2, Subchapter A, of the Food Security Act of 1985, as amended by the Farm Security and Rural Investment Act of 2002 ("the 2002 Act").

The National Environmental Policy Act of 1969 (NEPA) requires that Federal agencies prepare Environmental Impact Statements (EIS's) for major federal actions significantly affecting the quality of the human environment. In addition, the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Parts 1500-1508) require Federal agencies to prepare Environmental Assessments (EA's) to assist them in determining whether they need to prepare an EIS for actions that have not been categorically excluded from NEPA. The CEQ has defined "major federal action" to include activities over which Federal agencies have control, including promulgation of regulations in which they exercise discretion.

NRCS regulations implementing the provisions of NEPA state that an EIS is normally required for "broad Federal assistance programs administered by NRCS when the environmental evaluation indicates there may be significant cumulative impacts on the human environment." (7 CFR 650.7 (a)(3).) The environmental evaluation for the CSP indicated that, when focusing on the significant adverse impacts that NEPA is intended to help decision makers avoid and mitigate, it is unlikely there will be significant cumulative impacts on the quality of the human environment because of implementing the CSP. However, NRCS nonetheless determined it would develop this EA to review the effects of the proposed program and to assist in determining whether implementing the CSP will significantly affect the quality of the human environment such that NRCS must prepare an EIS. The proposed action under consideration here involves rulemaking, and no site-specific or ground-disturbing actions will occur as an immediate result of implementing the proposal. NRCS will undertake additional environmental review at subsequent stages of program implementation consistent with NEPA requirements and NRCS regulations.

CSP Statutory Requirements

The CSP is a voluntary program providing both technical and financial assistance to producers of agricultural operations, for the conservation and improvement of the quality of soil, water, air, energy, plant and animal life on working lands. The intent of the program is to financially recognize producers for the significant environmental goods and services they provide to the public through their annual and ongoing conservation efforts, to motivate others to do the same, and to secure the Nation's ability to produce food and fiber. The program provides payments to producers who practice good stewardship on their agriculture operations and provides additional incentives to enhance their conservation achievements. Participation in CSP requires that an inventory be conducted of an agriculture operation to identify existing resource concerns and determine the extent of existing conservation treatment. Annual payments made under CSP contracts may include a base payment for existing conservation treatments, cost-share and

maintenance payments, and an enhanced payment for exceptional conservation effort. A three-tiered approach is used to determine base payments. The Chief of NRCS also has authority under CSP to assist producers who participate in CSP to develop a comprehensive, long-term strategy for improving and maintaining all natural resources of the producer's agricultural operation. All participants must meet the highly erodible land and wetland conservation provisions of the Food Security Act of 1985, as amended. (See Appendix A for a copy of the CSP authorizing legislation.)

Eligibility:

Producers may participate in the CSP if they:

- Own or control
    - private agricultural land, including cropland, grassland, prairie land, improved pastureland, and rangeland;
    - private forested land that is an incidental part of the agricultural operation; or
    - agriculture land that is federally recognized Tribal, BIA allotted, or Indian trust land; and
- Have not already enrolled the land in the Conservation Reserve Program, the Wetlands Reserve Program, or the Grassland Reserve Program, or converted the land to cropland subsequent to passage of the 2002 Farm Bill.

Producers must submit an application and a conservation security plan that:

- Identifies significant resource concerns;
- Identifies the lands to be included in the contract;
- Describes the base payment tier and the individual conservation practices to be implemented and maintained before the participants are eligible to receive a base payment, maintenance payment, and enhancement payment, as applicable;
- Contains a schedule for implementing, maintaining, or improving applicable conservation practices for the term of the conservation security contract.

Payments:

The CSP authorizes three types of payments for approved land management, vegetative and structural practices:

1. Base payments. These payments are derived from the average national per-acre rental rate for a specific land use during the 2001 crop year; or another appropriate rate for the 2001 crop year that ensures regional equity. The producer receives a higher percentage of the applicable rental rate when a higher level of conservation is applied to the agricultural operation. The statute includes eligibility requirements for each of the three levels, or tiers, of base payments and specifies the amounts that NRCS may pay under each Tier. (See Table 1 below for a comparison of the Tiers.)

Tier I:

- Applies when conservation practices address at least one significant resource of concern for the enrolled portion of the agricultural operation at a level that meets the appropriate non-degradation standard.
- Contracts are for five years.
- Producers may receive 5 percent of the rental rate of the land covered by the contract.
- The base payment is limited to $5,000 because there is a contract limit of $20,000 for Tier I contracts, and the base payment may not be more than 25 percent of the contract amount.

Tier II:

- Applies when conservation practices address at least one significant resource of concern for the entire agricultural operation at a level that meets the appropriate non-degradation standard.
- Contracts are for a period of not less than five years and no more than 10 years.
- Producers may receive 10 percent of the rental rate of the land covered by the contract.
- The base payment is limited to $10,500 because there is a contract limit of $35,000 for Tier II contracts, and the base payment may not be more than 30 percent of the contract amount.

Tier III:

- Applies when resource management systems are used that meet the appropriate non-degradation standard for all resources of concern of the entire agricultural operation.
- Contracts are for a period of not less than five years and no more than 10 years.
- Producers may receive 15 percent of the rental rate of the land covered by the contract.
- The base payment is limited to $13,500 because there is a contract limit of $45,000 for Tier III contracts, and the base payment may not be more than 30 percent of the contract amount.

2. Cost-share payments for installation and maintenance of conservation practices, except payments are not to be provided for:
   - Construction or maintenance of animal waste storage or treatment facilities or associated waste transport or transfer devices for animal feeding operations; or
   - Purchase or maintenance of equipment or a non-land based structure that is not integral to a land-based practice.

3. Enhancement payments to reward producers who go beyond the minimum requirements of the program to address additional resource considerations. Producers may be eligible to receive enhancement payments for the following:
    - Implementing or maintaining multiple conservation practices that exceed current Tier requirements
    - Addressing local conservation priorities in addition to resource considerations for the agricultural operation
    - Participating in an on-farm conservation research, demonstration, or pilot project
    - Participating in a watershed or regional resource conservation plan that involves at least 75 percent of the agricultural producers in the plan area
    - Assisting in assessment and evaluation of conservation practices included in the CSP plan

An agricultural producer may be eligible to receive cost-share payments for maintenance and installation, as well as enhancement payments, regardless of the tier under which the base payment falls; however, there are limitations on base payments and contract payments, as well as a per-person payment limitation of $45,000 per year.

Table 1: Comparison of Tier Requirements and Limits by Statute

	Extent	Required Treatment	Rental Rate Limit	Base Payment Limit	Contract Limit
Tier I	Part of Ag Operation	One Resource Concern	5%	$5,000	$20,000
Tier II	Entire Ag Operation	One Resource Concern	10%	$10,500	$35,000
Tier III	Entire Ag Operation	All Resource Concerns	15%	13,500	$45,000

Level of Treatment to Address Resource Concern

As indicated in Table 1, the level of conservation treatment required increases with each tier. Each resource concern that is treated must raise the condition of the resource at least to a non-degradation level. The CSP authorizing legislation defines this non-degradation standard as the "level of measures required to adequately protect, and prevent degradation of, one or more natural resources, as determined … in accordance with the quality criteria described in handbooks of the Natural Resources Conservation Service."

Quality criteria are qualitative or quantitative statements of a treatment level required to achieve the Resource Management System (RMS) level of conservation planning. The object of RMS planning is to achieve resource sustainability in order to secure the Nation's ability to produce food and fiber. While quality criteria are established at the national level, they are also modified at the State and local level to take into account state and local laws, regulations, and standards that may apply, as well as unique conditions that may exist. Local quality criteria are contained in each NRCS Field Office Technical Guide.

Quality criteria are established for soil erosion and soil condition; water quality and quantity; air quality; plant suitability and condition; fish and wildlife habitat; and domestic animal management. Appendix C identifies the National Quality Criteria, and Table 2 provides an example of quality criteria established for surface water quality, the type of resource problem to which the quality criteria might apply and the types of conservation practices that could be implemented so the resource is restored to a condition that meets the quality criteria.

Table 2: Application of Quality Criteria to Surface Water Quality Concern

DESCRIPTION OF RESOURCE CONCERN	QUALITY CRITERIA	SAMPLE CONSERVATION PRACTICES
Water Quality—Excessive Nutrients and Organics in Surface Water: Pollution from natural or human-induced nutrients such as nitrogen, phosphorous, and organics (including animal and other wastes) degrades surface water quality.	Nutrients and organics are stored, handled, disposed of and managed such that surface water uses are not adversely affected.	Nutrient Management (590) and Waste Utilization (633).
Water Quality—Harmful Levels of Pesticides in Surface Water: Pest control chemicals present in toxic amounts degrade surface water quality.	Pesticides are applied, stored, handled and managed such that surface water uses are not adversely affected.	Pest Management (595).
Water Quality—Excessive Suspended Sediment and Turbidity in Surface Water: Pollution from mineral or organic particles degrades surface water quality.	Movement of mineral and organic particles is managed such that surface water uses are not adversely affected.	Terrace (600), Residue Management, Seasonal (344), and Riparian Forest Buffer (391).

PURPOSE AND NEED FOR ACTION

The need to which NRCS is responding by proposing action is the need to implement the CSP as authorized by Congress. To meet this need, NRCS must implement the program in a manner that achieves the following purposes, identified in the authorizing legislation:

- Secure agricultural producers' ongoing stewardship of America's lands by providing incentive payments for producers to maintain and enhance conservation practices at a non-degradation level.

- Assist agricultural producers to increase their current level of conservation by providing financial and technical assistance to promote conservation and improvement of soil, water,

air, energy, plant and animal life, and to achieve other conservation purposes on working lands.

- Reward producers who support conservation in a manner that goes beyond the minimum requirements of the program.

The wide variety in the types of agricultural operations and related environmental and social concerns across the U.S., as well as the CSP statutory framework, requires that NRCS implement CSP with flexibility to address differences in State, Tribal and local situations. Thus, State Conservationists must have a great deal of authority and flexibility to determine how best to implement CSP within each State so the program effectively achieves its purposes. At the same time, there is also a need for NRCS to maintain program integrity by ensuring a level of consistency in the way States carry out the CSP.

ALTERNATIVES

NO ACTION

This alternative assumes CSP would not be implemented.

PROPOSED ACTION

This alternative assumes CSP would be implemented according to the proposed rule, including the following provisions:

- The Chief of NRCS will allocate CSP funds among the State Conservationists according to the purpose and projected cost of contracts in a fiscal year.

- NRCS will determine the payment amount on the level of conservation applied, the cost of adopting new management practices, the maintenance of new and existing management practices, and other factors determined by the Chief. However, participants will not receive payment for
    - maintaining practices required to meet highly erodible land or wetland compliance requirements;
    - maintenance costs being reimbursed under other agreements;
    - construction or maintenance of animal waste storage or treatment facilities or associated waste transport or transfer devices for animal feeding operations; or
    - purchase or maintenance of equipment or a non land-based structure that is not integral to a land-based practice.

- NRCS may provide cost-share payments to establish structural conservation practices or allow practices to be established through other conservation programs.

- Significant Resource Concerns:

    - Soil and water quality are designated as nationally significant resource concerns, as well as other additional significant natural resource concerns the Chief may identify to address the most pressing needs and emphasize off-site environmental benefits.
    - The State Conservationist, with advice from the State Technical Committee, may identify additional state-wide and local significant resource concerns.

- The Chief will encourage CSP participants to do comprehensive planning to
    - Thoroughly examine opportunities to conserve natural resources and improve the profitability and environmental health of their entire agricultural operation;
    - Develop a long-term strategy for implementing, monitoring and evaluating conservation practices and environmental results in the land enrolled in CSP;
    - Be eligible to participate in other conservation programs;
    - Maintain the agricultural integrity of the land; and
    - Adopt innovative conservation technologies and management practices.

- The Chief shall determine the minimum requirements for each tier of conservation practices to treat each resource concern for each land use and the minimum treatment necessary to be eligible for base, maintenance and enhancement payments.

- The Chief shall designate signup periods and may limit the focus of the program to address specific natural resource concerns, may limit the program to a geographic region or to a limited number of States, or may limit the program on another basis determined acceptable by the Chief.

- The Chief may impose limits on the base payments, maintenance and management, cost-share, and enhancement payments to focus funding to other components of the program.

- Applicants will develop a resource inventory to:
    - Describe and document the benchmark condition of the property to be enrolled including, among other things, the applicant's objectives, land uses, acres, resource concerns and conservation practices already applied; and
    - Determine initial tier placement and payment amounts.

- To advance from one tier to a higher tier, the participant must have established and maintained the necessary practices for 18 months before advancing to the higher tier.

- Enhancement payments may be authorized for:
    - Applying practices that exceed the minimum requirements of the tier;
    - Addressing local conservation priorities in addition to concerns of the participant;
    - Participation in research and demonstration projects;
    - Cooperating with other producers to implement watershed or regional resource conservation plans that cover at least 75 percent of the targeted area; and
    - Carrying out assessment and evaluation activities relating to practices included in the conservation security plan.

IMPACTS

NO ACTION[1]:

If the CSP were not implemented, the current resource trends would continue, including concerns about the security of the Nation's ability to produce food and fiber. A summary of these conditions follows.

SOIL

Soil Quality:

The potential for decline in the health or overall quality of the soil resource is an issue because it can reduce crop production and require more inputs, such as nutrients and labor, to produce an acceptable crop. Soil quality has a number of facets and is difficult to measure directly. Thus it is difficult to assess its impact at broad scales over extensive areas. A natural consequence of cultivating soil is decomposition of the soil organic matter. Depending on the use of the land and its management, cultivation may impact the soil's overall tilth (or workability); its fertility and biological activity and its ability to store adequate water for plant growth.

Over the years, the level of organic matter in agricultural soils has declined as a consequence of conventional tillage methods. Widespread soil cultivation began in about 1907 with the conversion of native grasslands and forest lands to cropland. By the 1950's, soil organic matter was approximately 53 percent of the 1907 level. Conservation tillage systems began being adopted in the 1970's and since that ime, soil organic matter has increased so it is now at about 61 percent of the 1907 level. (Lal 1998).

Data from the Conservation Technology Information Center show that in 2000, some form of conservation tillage was practiced on about 37 percent of cropland in the United States, meaning that those lands had more than 30 percent residue cover on the ground after planting (NACD 2001). This use of conservation tillage has mostly occurred since the early 1980s, when farmers began widely adopting the practice.

[1] The information in this section is based on or directly excerpted from "A Resources Conservation Act Report: Interim Appraisal and Analysis of Conservation Alternatives."

Adoption of no-till practices has risen significantly in recent years. No-till is a form of conservation tillage where a new crop is planted directly into the residue-covered soil from the previous crop; there is no additional tillage or seedbed preparation. In 1990, about 16.8 million acres were being managed with no-till systems. By 2000, that number had increased to 50.8 million acres (NACD 2001).

Despite these gains, NRCS estimates that about one-third of the approximately 269 million acres of U.S. cropland not experiencing excessive (greater than "T") erosion might benefit from management systems aimed at enhancing soil quality.[2]

Soil Erosion:

Soil erosion by water and wind is one aspect of soil quality and is one of the major processes that can lead to environmental degradation. Soil erosion and accelerated sedimentation, often brought about by cultivating or unwisely managing marginal soils or soils with high erosion potential, are degrading soil and water quality on a global scale. Sheet and rill erosion that occur when rainfall and water run off the land and remove soil from the surface of the land is often the most obvious form of soil erosion. However, wind erosion is also a concern and in extreme cases, wind erosion can create huge dust clouds that suspend unacceptable levels of particulate in the air, in addition to damaging the soil.

Erosion caused by water and wind will always occur as part of the natural cycle, but the natural process of soil development can renew and sustain the soil if demands on the soil resource do not exceed its regenerative capabilities. For most soils, an erosion rate less than four to five tons per acre per year is considered "acceptable" from a soil-quality standpoint. This level is termed the soil loss tolerance, or "T" value. Even at such rates, however, sediment from eroding lands may lead to decreased water quality in some areas.

Over the past several decades, U.S. agriculture has made significant strides in reducing erosion on cropland through conservation practices such as conservation tillage, crop rotations, grassed waterways and contour-strip cropping. Landowners also participate in USDA easement and reserve programs that target lands most susceptible to erosion, provide incentives for conservation and help offset costs associated with such measures. According to data from the National Resources Inventory (NRCS 2000), approximately 170 million acres, or 40 percent of all cropland, were eroding at greater than acceptable ("T") levels in 1982. By 1997, that amount had been reduced to about 108 million acres, 28 percent of total cropland acreage at that time. However, despite these gains, of the 377 million acres of working U.S. cropland, 28 percent is eroding at rates great enough to have adverse impacts on long-term soil productivity and overall soil quality. [3]

---

[2] *Interim Appraisal and Analysis of Conservation Alternatives,* p. 21.

[3] Estimates of sedimentation are from a broad-scale national analysis using National Resource Inventory-derived sheet and rill water erosion data coupled with NRCS-assigned sediment delivery ratios for areas in the conterminous U.S. approximating 2nd-code hydrologic units.

Soil erosion also results in more than just the removal of topsoil. About three-quarters of the soil eroded by water in a typical farm field is deposited as sediment in the same field from which it eroded. Upon deposition, the eroded soil material causes the soil surface to crust and seal in low areas of the field, resulting in ponding and irregular distribution of nutrients. Uneven crop productivity in the field leads to inefficient water and nutrient use, which causes excessive soil nutrient buildup, runoff or deep percolation, all of which can adversely impact water quality.

Of the approximately one-quarter of soil material eroded by water that actually leaves farm fields, most — about 60 million tons annually — is deposited in local streams and waterways of small watersheds. There, it disrupts streamflow, affects streambank stability and accelerates siltation of lakes, reservoirs, ponds and wetlands. The relatively small proportion of eroded soil that eventually leaves watershed outlets, estimated at about 14 million tons a year, carries excessive levels of nutrients and pesticides to larger water bodies such as the Gulf of Mexico and the Chesapeake Bay, contributing to regional water quality problems.

It is difficult to quantify the off-site fate of soil material lost through wind erosion. However, in severe cases blowing soil contributes to the level of particulate matter in the air, damages fences and other infrastructure through abrasion, and drifts over roads where it increases maintenance costs and poses a travel hazard.

WATER

Water Quality

There are no reports or studies that fully describe the health of all waters in the United States. The U.S. Environmental Protection Agency makes periodic reports to Congress based on assessment reports from states, territories, tribes and interstate commissions. Findings from EPA's 1998 report (USEPA 2000) indicate the following:

- Of the 23 percent of the nation's rivers and streams that were assessed, 35 percent were impaired for one or more of three primary uses (drinking, fishing and swimming).
- Of the 42 percent of lakes, reservoirs and ponds that were assessed, 45 percent were impaired.
- Of the 32 percent of the country's estuaries that were assessed, 44 percent were impaired.

According to EPA, more than 20,000 individual river segments; lakes and estuaries are impaired with one or more pollutants from all sources.

Sediment. EPA reports that sediment is the most common pollutant affecting assessed rivers and streams and that agriculture is the leading source. However, the impact of agriculture on water quality should be considered in the context of the amount of land supporting agricultural activities. About 900 million acres, or 41 percent of the continental United States, are on farms and ranches.

As documented in local soil surveys, soils have varying degrees of erosion potential and capacity to allow sediment movement in streams. Based on soil information, reducing soil erosion through on-farm conservation practices can improve the condition of surface and ground waters.

Nutrients: In agriculture, nutrients — mainly nitrogen, phosphorus and potassium — are applied to promote plant growth. If they are applied inappropriately or in excessive amounts, they can be transported to surface or ground waters.

Nitrogen is added to soils from commercial fertilizers, animal manure, legumes such as alfalfa and soybeans and from atmospheric deposition. Some soils with sufficient clay content slow down leaching of nitrates through the soil; enough to retain nitrogen near the surface and keep it available for plant uptake. Other soils, particularly sandy ones, allow for rapid leaching and in some cases provide a pathway for excess nitrogen movement into stream systems and groundwater.

Nitrogen compounds in excessive amounts accelerate eutrophication in surface waters, which depletes oxygen, kills fish and results in cloudy water with an unpleasant smell. Elevated concentrations of nitrate in drinking water poses a potential threat to human health, particularly among infants.

The phosphorus compound phosphate, while not as mobile as nitrate, tends to be carried on soil particles that move off the land. Recent studies show that phosphate can also leach to ground waters, especially where commercial fertilizers or manure have been applied to the land over many years. Phosphate can also contribute to eutrophication in fresh surface waters.

Pesticides**:** Pesticides are used to control harmful insects, rodents, molds and other fungi that may reduce production of agricultural commodities. Since 1979, according to NASS surveys (USDA 2000), the agricultural sector in this country has accounted for about 80 percent of all pesticide use each year.

Pesticides may contaminate water by leaching through the soil or as a result of being washed from the field surface into nearby water bodies. Only small proportions of pesticides migrate from farm fields, however. In general, monitoring results show that most agricultural pesticides occur in low concentrations in surface and ground waters, even in regions where agricultural use is high.

Farmers and ranchers are modifying their management practices by using more environmentally friendly pesticides, applying pesticides only when the pest is likely to cause economic damage to crop production and reducing their reliance on agricultural pesticides through integrated pest management techniques.

By practicing prevention, avoidance, monitoring and suppression of pests — either through cultural, physical or biological means — dependence on chemicals has decreased. Insecticide use per acre on corn dropped 52 percent from 1991 to 1999. Also by 1999, more than half of the corn and 80 percent of all cotton grown in the United States were produced using integrated pest management techniques.

Irrigation**:** Irrigation-induced erosion creates a sedimentation problem in some areas. There is also concern that deep-water aquifers will become contaminated with agricultural chemicals as the water used for irrigation percolates down and carries chemical residuals to aquifers.

Irrigation accounts for 37 percent of the elevated salinity concentrations in the lower Colorado River. Irrigation water's natural base load of dissolved mineral salts become concentrated as the water is consumed by plants or evaporated. Deep percolating irrigation water may also become contaminated through contact with shale or highly saline aquifers and the return flows convey the salts to the receiving streams or ground water. As the same water is used over and over again and more water evaporates, the salinity level increases, and that can impair water quality.

Water Quantity:

Drought: Every year some parts of the country experience water shortages. When drought occurs, water shortages may become critical. The more severe consequences of drought include huge economic losses in agriculture, shipping and other water-dependent businesses; drinking water shortages, particularly in small rural communities; and environmental stresses, including loss of or damage to wildlife habitat and downshifts in wildlife populations. Prolonged drought may also mean we have to make tough decisions in regard to water allocations among competing interests such as fisheries, agriculture and communities.

In years when drought has occurred, USDA programs have helped farmers who irrigate their crops to achieve a savings of 4.7 million acre-feet of water each year (enough to cover the nearly 700,000 acres of Rhode Island with seven feet of water), primarily through adoption of management practices that conserve water and reduce the potential for soil salinity.

Such conservation practices reduce the risk associated with drought, especially if improvement in soil quality has been a primary objective. Healthy soils absorb and store more water than do degraded soils.

Irrigation**:** According NASS (USDA 1998), irrigated crops, while raised on only 16 percent of all harvested cropland in the country, account for 49 percent of total U.S. crop sales. In the West (including the 17 western contiguous states, Hawaii and Alaska), irrigated crops make up 72 percent of all crop sales.

For the past 20 years, approximately 43 million acres of cropland land have been irrigated in the western states. While that figure has remained fairly constant, there has been a shift of about three million irrigated acres from the more arid Southwest and southern plains primarily to the less arid and more abundant groundwater areas of central and eastern Nebraska. Irrigation withdrawals as a share of total freshwater withdrawals in this country declined from 46 percent in 1960 to 40 percent in 1995, where they remain today.

Throughout the United States, irrigation for crops may have significant environmental impacts, including:

- Diversions from some streams impair aquatic communities and migration of anadromous fish.
- Return flows from irrigated areas may contain biocide residues, nutrients (phosphates and nitrates), total dissolved solids (salinity) and sediment and may reduce the quality of ground and surface waters.
- Seepage from irrigation systems creates fish and wildlife habitat and recharges aquifers.

Irrigators continue to adopt and apply water management practices based on on-site soil information that allow for more efficient use of water and a reduction in the magnitude of adverse environmental impacts. Since 1979, use of gravity systems decreased by 20 percent, while use of sprinkler and drip/trickle systems increased by 25 percent and more than 500 percent, respectively.

These and other practices, along with shifts in irrigation to less arid climates, are having an impact. Since 1969, the national average irrigation rate declined by 4.5 inches, or 20 percent. That is enough to offset the increase in irrigated acreage and maintain the total water applied near the level of 25 years ago. Farmers are simultaneously increasing yields of irrigated crops (for example, rice yields increased 1.2 percent per year over the last 30 years), making the conservation results in relation to water use per unit of agricultural product even more dramatic. However, water shortages, subsidence, saltwater intrusion and other effects continue to occur in some areas, making further water conservation efforts necessary.

Wetlands

Wetland functions improve surface and ground water quality, ease flood effects, and provide habitat to many aquatic and terrestrial species. The National Resources Inventory estimates there were 111,156,000 acres of wetlands on U.S. nonfederal lands in 1997 (Table 3, NRCS 2000). Approximately 16.5 percent of the national wetland acreage existed on agricultural land, including cropland, pastureland and land enrolled in USDA's Conservation Reserve Program (Table 4).

The extent of wetlands in the six NRCS administrative regions varied widely. The Southeast Region (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Virginia and the Caribbean Islands) had close to 31 percent of the total 1997 wetland acreage and the West Region (California, Hawaii, Idaho, Nevada, New Mexico, Oregon, Utah and Washington) had about six percent (Table 5).

Analysis of changes in the status of wetlands between 1992 and 1997 in the six NRCS administrative regions shows that the West Region came closest to a no net loss goal with a net gain of 20,000 acres, followed by the Northern Plains Region with a net loss of 2,700 acres. Overall wetland gains were greatest in the Southeast Region, but that region also had the highest net loss (Table 3, NRCS 2000). Acreage gains resulted from restoration and creation activities, natural causes and as unintentional byproducts of various activities (NRCS 2000). The average

annual loss rate of 26,800 acres from1992 to 1997 was the smallest average annual loss rate attributed to agricultural activities reported to date (NRCS 2000). The nation has yet to achieve no net loss of wetland acreage, but progress is evident.

Table 3: Wetland Status and Trends
1997 National Resources Inventory
(NRCS 2000; numbers = thousands of acres)

	East	Southeast	South Central	Midwest	Northern Plains	West	Total
1997 Extent	14,262.8	34,377.9	18,884.9	27,032.1	10,183.3	6,415.0	111,156.0
Gross losses	-57.6	-216.9	-84.1	-74.2	-37.0	-36.2	-506.0
Gross gains	15.4	110.5	78.4	48.4	34.3	56.2	343.2
Net change	-42.2	-106.4	-5.7	-25.8	-2.7	20.0	-162.8
Loss due to agriculture	-5.2	-42.0	-18.3	-38.5	-18.0	-11.8	-133.8
Loss due to silviculture	-9.4	-27.1	-3.8	-14.3	-1.7	-3.8	-60.1
Loss due to development	-38.7	-125.8	-49.9	-21.3	-1.4	-10.4	-247.5
Loss due to miscellaneous Activities	-4.3	-22.0	-12.1	-0.1	-15.9	-10.9	-64.6

Table 4: Extent and Percent of Wetlands by Selected Land-Use Type
(NRCS 2000; numbers = thousands of acres)

Land use	Wetlands extent	Wetlands percent
Cropland, pastureland and land enrolled in CRP	18,359.3	16.5
Forestland	65,128.5	58.6
Rangeland	7,862.7	7.1
Urban and developed land	1,407.5	1.3

Table 5: Wetland Extent by Broad Land Cover Type Within NRCS Administrative Regions

(NRCS 2000; regional wetlands extent = thousands of acres; numbers in parentheses = percent of total wetland extent in the region for each land cover type)

Region	Cropland, pastureland and Land enrolled in CRP	Rangeland	Forestland	Urban and developed land	Regional wetlands extent
East	1,666.0	458.3	10,952.0	228.8	14,262.8
	(11.7)	(3.2)	(76.8)	(1.6)	
Southeast	3,335.9	2,484.4	21,524.5	450.7	34,377.9
	(9.7)	(7.2)	(62.6)	(1.3)	
South Central	2,614.1	307.7	8,196.8	103.0	18,884.9
	(13.8)	(1.6)	(43.4)	(0.5)	
Midwest	3,931.6	0.0	13,694.8	210.8	27,032.1
	(14.5)	(0)	(50.7)	(0.8)	
Northern Plains	3,914.7	2,862.4	6,878.6	119.5	10,183.3
	(38.4)	(28.1)	(67.5)	(1.2)	
West	2,897.0	1,749.9	3,881.8	294.7	6,415.0
	(45.2)	(27.3)	(60.5)	(4.6)	

AIR

Particulate matter in the air has been linked with respiratory illness and is viewed as a growing public health concern. EPA estimates that fugitive dust from crop production totals 3.3 million tons annually and that, under current controls, these emissions will increase to about 3.8 million tons by 2005. EPA also projects that fugitive dust from livestock operations, now contributing an estimated 181,400 tons every year to the atmosphere, will rise to 193,400 tons a year by 2005.

In 1998, EPA identified fewer than 10 air quality non-attainment areas[4] that included rural lands. In 2000, after additional surveys, there were more than 100 such rural areas, and EPA projects the number to rise significantly by 2002.

GRAZING LANDS

Rangelands are managed as natural ecosystems while pastures are managed more intensely — fertilization and irrigation to attain maximum forage production are common, for example. USDA technical assistance programs have helped to improve nearly 20 million acres of grazing land (Grazing Lands Conservation Initiative data). However, a number of critical resource concerns must still be addressed so that grazing lands can continue to provide diverse benefits.

Maintenance of appropriate plant cover (including natural plant communities) is a primary resource concern on grazing land in this country (Grazing Lands Conservation Initiative data). Over-use of grazing lands and concentrated livestock numbers place stress on vegetation on grazing lands, particularly in riparian areas or during times of drought. Without proper grazing management — in addition to proper nutrient management on pastures — the quality and

[4] In non-attainment areas, air quality is below the limits set by Clean Air Act regulations.

quantity of plant cover declines. This causes productivity losses, exposes the soil to damaging wind and water erosion and impairs water quality.

Because grazing land occupies such a large portion of the landscape, degradation of the vegetative cover on grazing lands can have a potentially significant impact on U.S. soil and water resources. It is estimated that about 280 million acres — more than 50 percent — of U.S. grazing lands may be susceptible to such degradation and in need of some form of conservation management (SRM 2000 and Smith and Koala 1999). Approximately 50 percent of U.S. pastureland, or 60 million acres, is on land that is subject to erosion and other soil limitations if adequate ground cover is not maintained (National Resources Inventory 1997).

Establishment of invasive plant species on grazing lands is another resource concern, and it is gaining increased attention. Productivity of grazing lands declines and management becomes more difficult upon the invasion of non-native woody shrubs and trees, noxious weeds and plant species of low forage value. As invasive species take over a site and displace native or introduced forage species, the landscape hydrology is altered. This can adversely affect water quality and quantity, which increases the potential for soil erosion and the risk of damaging floods.

Other impacts include loss of critical wildlife habitat and a reduction in the natural diversity of the landscape. Natural diversity is crucial to an ecosystem's ability to recover from stresses such as fire, drought or flooding.

PROPOSED ACTION:

CSP will have impacts on the quality of the human environment only by affecting the application of conservation measures. Thus, to determine CSP effects from a programmatic perspective, it is necessary to examine the program's payment structure and to determine what types of practices are most likely to be implemented and where they are likely to be located.

PAYMENT STRUCTURE

CSP base payments are made to recognize conservation investments that agricultural producers have already made and have maintained for 18 months or more. Because of previous commitments to conservation these producers have made, it is reasonable to believe that many agricultural producers who receive base payments will use the funds to invest in additional conservation measures and that they will become "model conservationists." The example of the commitment to conservation set by these producers is expected to influence others producers to follow suit.

Cost-share payments will result in the application of new conservation practices, including vegetative, structural, and land management types of practices. The types of practices likely to be implemented, and the locations of those practices are discussed below. The maintenance payments will encourage agricultural producers to continue ensuring their land-based structures will perform their functions at least through the period of the CSP contract.

The enhancement payments will provide incentives to agricultural producers who are already committed to conservation to encourage others in their watershed or special emphasis area to participate in conservation efforts. At times, these payments will also provide the opportunity for NRCS to collect information on the effects of conservation practices. This will allow NRCS, as well as landowners, to apply adaptive management techniques and maximize natural resource benefits. The payments will enable landowners to try new conservation technologies that may be promising but are not yet proven in the field and may require more of an economic investment than producers would otherwise be willing to make.

WHERE CSP EFFECTS ARE LIKELY TO OCCUR

While CSP will support conservation nationwide because of the nature of the base payments, it is reasonable to expect that the location of new conservation practices implemented under CSP, and the types of practices implemented, will be determined to a great extent by the agricultural land use and the conservation needs associated with those agricultural land uses. Based on its 1992 National Resources Inventory (NRI)5, NRCS conducted an analysis to determine the needs for conservation treatment for cropland and pastureland.

The dot density map in Figure 1 shows where conservation treatment is needed on cropland[6]. Each dot represents 20,000 acres of cropland that has been identified as needing conservation treatment. Cropland includes both cultivated and non-cultivated cropland. Dots were aggregated by and placed randomly within each 8- digit hydrologic unit[7]. Based on the conservation needs related to cropland, it is likely that the areas identified in Figure 1 as most needing conservation treatment will be those with the most significant resource concerns related to cropland and the key locations in which cropland conservation practices will be implemented under CSP. (See Appendix D for the most frequently used cropland practices and their effects.)

[5] The NRI is a statistically based sample of land use and natural resource conditions and trends on U.S. nonfederal lands. The Natural Resources Conservation Service's program for NRI serves as the Federal Government's principal source of information on the status, condition, and trends of soil, water, and related resources in the United States.
[6] Needs are based on the judgment of a qualified specialist as guided by the local NRCS Technical Guide, the prevailing agricultural operations, and the guides used in the development of conservation plans [NRI-92].

[7] **http://www.nrcs.usda.gov/technical/land/meta/m2716.html.**

Figure 1: Acres of Cropland Needing Conservation Treatment, 1992

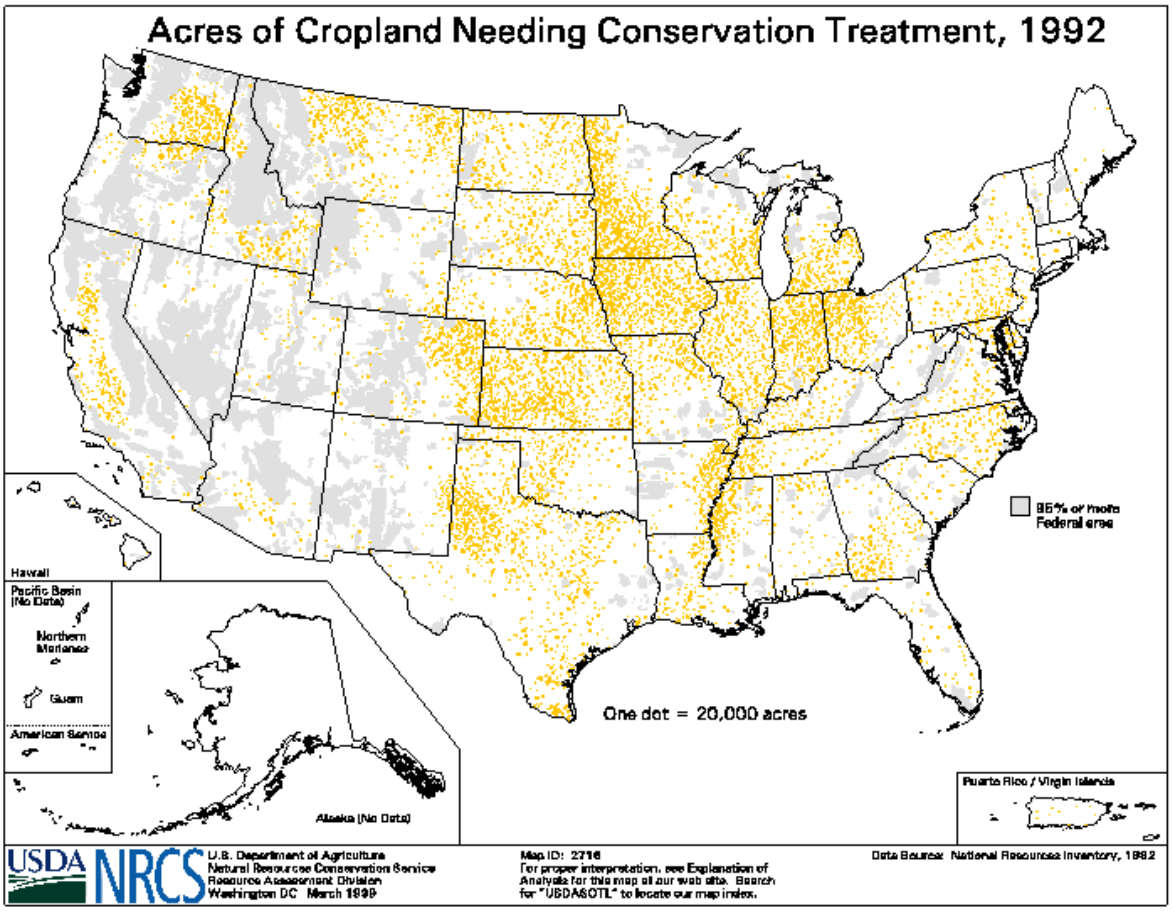
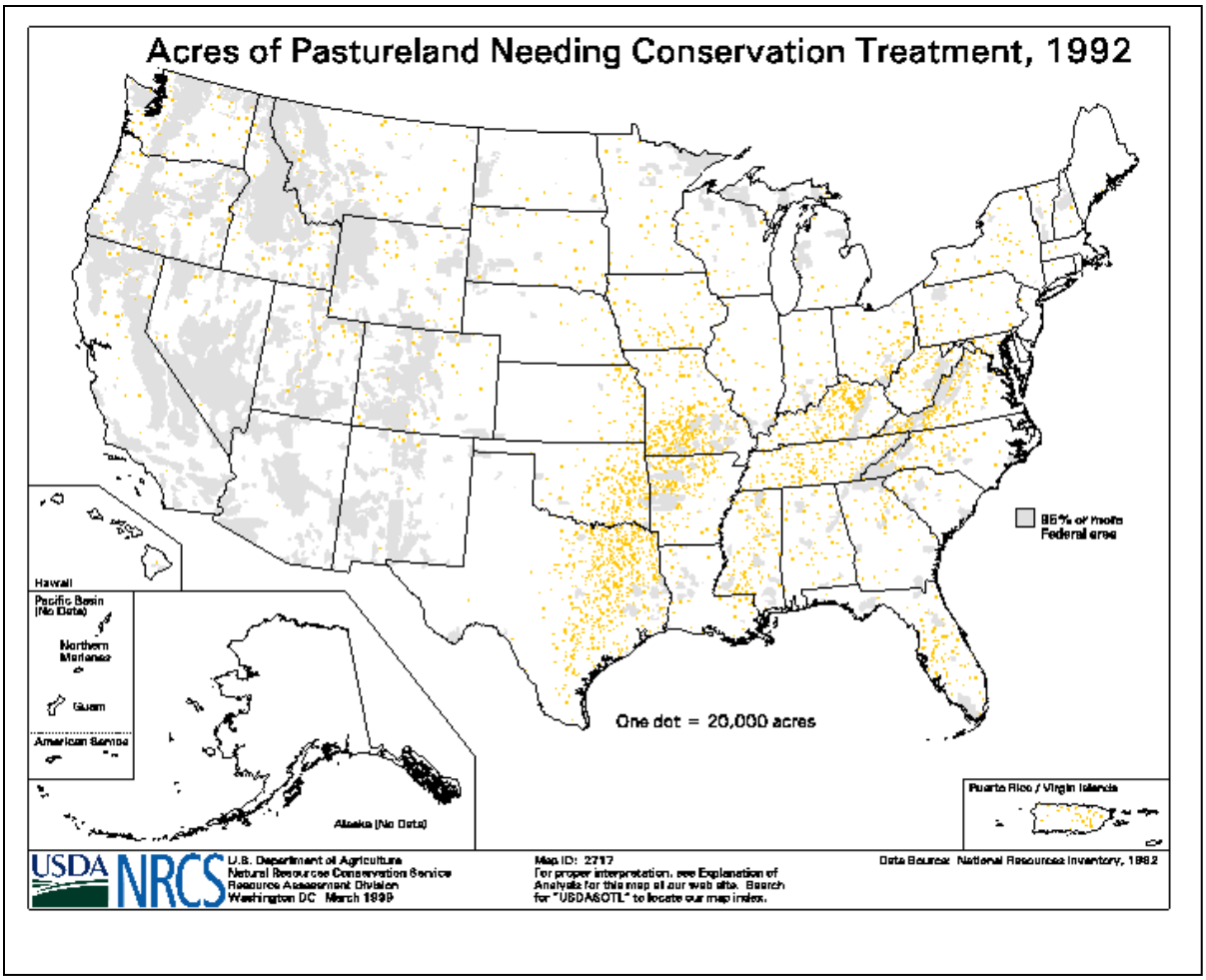


Figure 2 is a dot density map that shows where conservation treatment is needed on pastureland[8], which is a land cover/use that is managed primarily for the production of introduced or native forage plants for livestock grazing. Pastureland may consist of a single species in a pure stand, a grass mixture or a grass-legume mixture, and includes grasslands and prairie lands. Each dot in Figure 2 represents 20,000 acres of pastureland that has been identified as needing conservation treatment. Dots were aggregated by and placed randomly within each 8-digit hydrologic unit. Based on the conservation needs related to pastureland, it is likely that the areas identified in Figure 2 as most needing conservation treatment will be those with the most significant resource concerns related to pastureland and the key locations in which grazing land conservation practices will be implemented under CSP. (See Appendix D for the most frequently used grazing land practices and their effects.)

[8] As with cropland, the conservation needs are based on the judgment of a qualified specialist as guided by the local NRCS Technical Guide, the prevailing agricultural operations, and the guides used in the development of conservation plans [NRI-92].

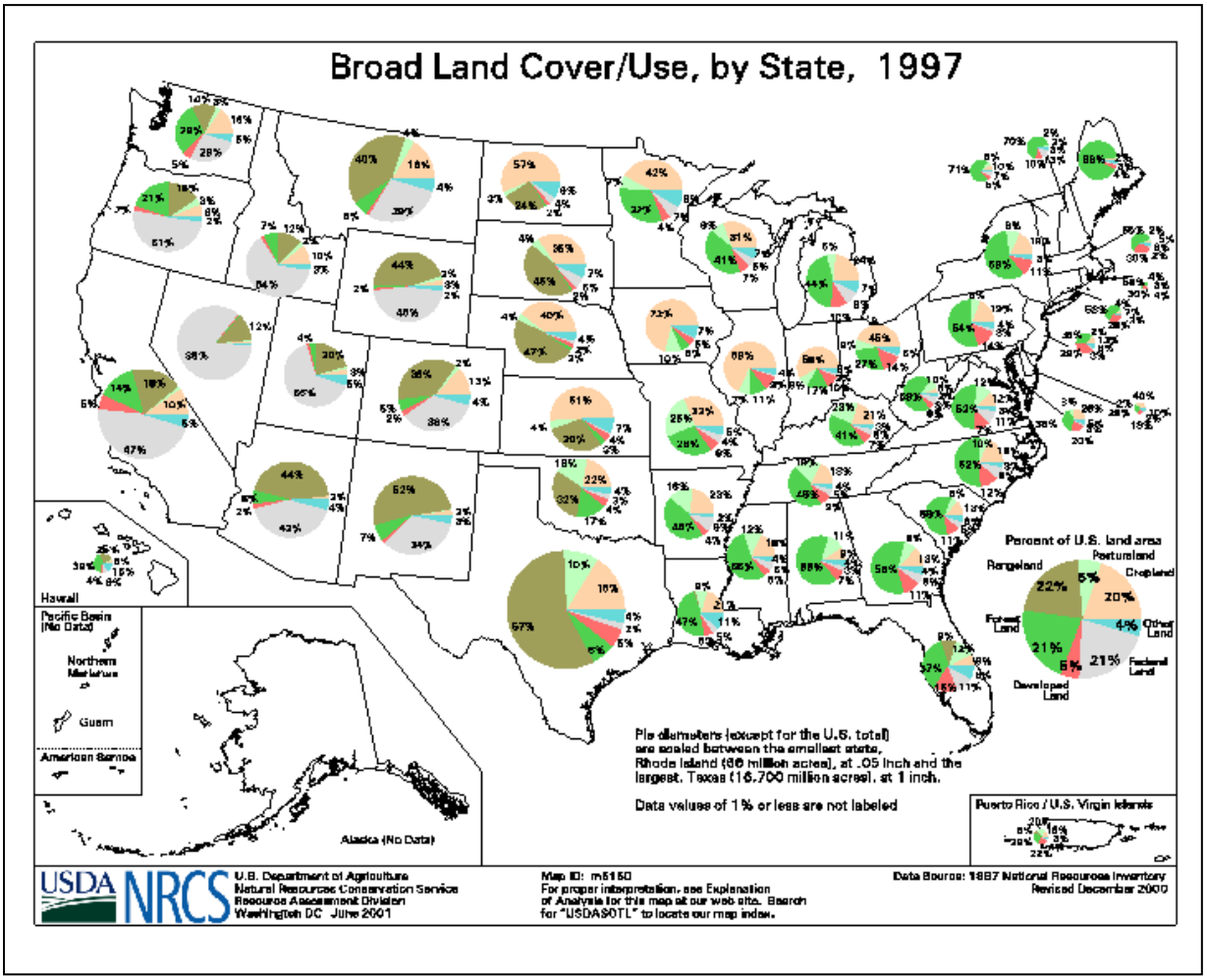
FIGURE 2: Acres of Pastureland Needing Conservation Treatment[9]



In addition to cropland and pastureland, rangeland is also eligible to be enrolled in CSP. Rangeland is land on which the climax or potential plant cover is composed principally of native grasses, grasslike plants, forbs or shrubs suitable for grazing and browsing, and are managed as natural ecosystems. Grasslands, savannas, many wetlands, some deserts, and tundra are considered to be rangeland. Certain communities of low forbs and shrubs, such as mesquite, chaparral, mountain shrub, and pinyon-juniper, are also included as rangeland. [NRI-97] "It is estimated that about 280 million acres – more than 50 percent – of U.S. grazing lands may be susceptible to degradation and in need of some form of conservation management (SRM 2000, Smith and Koala 1999)."[10] The location of rangelands and other land uses is shown in Figure 3, which is a pie map containing a pie chart for each state and the nation. The pie slices reflect acres of land in various land cover/use categories as a percent of the total area. The "Other" category includes Conservation Reserve Program (CRP) land, rural transportation land, other rural land, urban areas, and water areas. The size of the pies is proportional to the amount of land in the state.

[9] http://www.nrcs.usda.gov/technical/land/meta/m2717.html.
[10] *Interim Appraisal and Analysis of Conservation Alternatives,* p. 45.

FIGURE 3[11]: Broad Land Cover/Use, by State, 1997



CSP CONSERVATION PRACTICES AND EFFECTS

CSP participation requires agricultural producers to treat one or more significant resource concerns to a non-degradation level. NRCS helps landowners treat resource concerns through the application of conservation practices, which are structural or vegetative measures or management techniques for which NRCS has developed conservation practice standards. These conservation practices are contained in Section 4 of the Field Office Technical Guides (FOTG), and are based on the National Handbook of Conservation Practices. Conservation practices are particularly effective when used in combinations as conservation management systems, and when they are tailored to fit the site-specific conditions in which they are being used. Each practice is designed specifically to address a particular resource concern, though in addition to achieving its primary purpose, many practices also benefit other natural resources. The following is an example of a particular resource setting in Iowa and the types of conservation management systems that might be formulated to address the identified resource concerns at

[11] http://www.nrcs.usda.gov/technical/land/meta/m5150.html.

different CSP tiers based on the provisions of the proposed rule to implement CSP. Appendix D includes a description of the referenced conservation practices, as well as the practice purposes and effects.

Example of Applying Conservation Management Systems To Treat Resource Concerns To Meet Or Exceed Quality Criteria

Location: Iowa – Midwest

Land Use: Dryland (non-irrigated) cropland on which corn and soybeans are planted in rotation on 0-5 percent slopes. With adequate drainage systems installed, average production for corn and soybeans is 160-170 bushels and 50-60 bushels, respectively.

Typical farming operations are 800-1000 acres. About 25 percent are farmed by the owners and the remaining units are rented on a year to year cash rent basis. Almost all producers participate in commodity programs.

Resource Setting:

Soil. Soil is deep and ranges from poorly drained to very poorly drained silty clay loams to clay with inherently high organic matter. Soils are hydric, but are typically classified as having been converted to cropland use before the Food Security Act of 1985, as amended, (referred to as "prior converted" or "PC") or as farmed wetlands (FW).

Soils are not classified as highly erodible (HEL), but have a significant potential for both wind and water erosion (sheet and rill and ephemeral). Soils are subject to compaction and crusting. In normal years, the erosive force and intensity of rain is moderate. Ponding, flooding and inadequate outlets for subsurface drains are common problems.

Water. Water quality is impacted by sediments, as well as misapplication of pesticides and nutrients. The area organized drainage districts in the early 1900's that led to the application of underground tiles that subsequently brought the area into crop production.

Inadequate outlets for subsurface drains and sloughing from ditch banks and streams used for outlets. Flooding, ponding and saturation can result. Aging drainage systems (early 1900's) that have may fail causing subsidence in the area. Misapplication of pesticides and nutrients causes water quality problems. Fall application of fertilizer (anhydrous ammonia) is a typical problem.

Air. Air quality from dust is a secondary concern due to wind erosion.

Plants. Noxious and invasive plant species, such as thistles, velvetleaf, cocklebur, smartweed are present. Plant health from wind erosion.

Animals. The area is on the southern boundary of the prairie pothole region and the central flyway, but very little natural wildlife habitat remains for waterfowl.

CSP Significant Resource Concerns:

- National concerns: Soil Quality, Water Quality
- Statewide concerns: Wildlife Habitat

Possible Treatments[12]:

	Tier 1	Tier 2	Tier 3
Base Payment	**Participant addresses soil erosion ("at least one significant resource of concern") on the enrolled portion of the agricultural operation to a level that meets the appropriate non-degradation standard:** The base component is: .05 x # of acres in each land use category x rate applicable to that land use.	**Participant addresses soil erosion ("at least one significant resource of concern") on the entire agricultural operation to a level that meets the appropriate non-degradation standard:** The base component is: .10 x # of acres in each land use category x rate applicable to that land use.	**Participant applies resource management systems that meet the appropriate non-degradation standard for soil erosion, water quality and wildlife ("all resources of concern") on the entire agricultural operation:** The base component is: .15 x # of acres in each land use category x rate applicable to that land use.
Practice Installation Cost-Share & Maintenance Payment	**An amount not to exceed 75 percent (or 90 percent for beginning farmers or ranchers) of the average 2001 county cost of adopting or maintaining:** Conservation Crop Rotation, Seasonal Residue Management, Grassed Waterway, and Contouring on the portion of the operation under contract, so long as the practices or their maintenance are not funded by another program and the practices were not installed before Tier 1 enrollment.	**An amount not to exceed 75 percent (or 90 percent for beginning farmers or ranchers) of the average 2001 county cost of adopting or maintaining:** All practices listed under Tier 1 on all appropriate areas of the entire agricultural operation, so long as the practices or their maintenance are not funded or required by another program and the practices were not installed before Tier 2 enrollment.	**An amount not to exceed 75 percent (or 90 percent for beginning farmers or ranchers) of the average 2001 county cost of adopting or maintaining:** Soil erosion treatment: Same as required under Tier 2. Water quality treatment: Pest Management[13], Nutrient Management[14], Riparian Buffer, Filter Strips, Field Borders on all appropriate areas of the entire agricultural operation. Wildlife Habitat: Wetland Wildlife Habitat Management,[15] ensure Buffers, Filter Strips and Field Borders are planted to wildlife-friendly plant species on all appropriate areas of the entire agricultural operation. Cost-share and maintenance payments are only available for practices that are not funded or

[12] The same conservation practice may be applied with different levels of management intensity. The higher the tier, the more intense application of the practice is expected.

[13] In Tier 3, integrated pest management principles are likely to be applied. Chemicals with lower potential environmental hazards are used.

[14] In Tier 3, this is likely to include use of soil tests every 2.5 acres (hectare) every year, with nutrient applications adjusted across the field according to GPS references. There would be no fall application or nutrients.

[15] In Tier 3, this is likely to require providing annual food plots, as well as leaving areas of unharvested crops to provide food for waterfowl.

	Tier 1	Tier 2	Tier 3
			required by another program and were not installed before Tier 3 enrollment.
Enhancement Payment	**On part of operation, treats wildlife habitat concerns (local conservation priority) treated beyond non-degradation level:** Wetland Wildlife Habitat Management [16]	**On part of operation, treats wildlife habitat concerns (local conservation priority) beyond non-degradation level and carries out assessment and evaluation activities related to practices included in the conservation security plan:** Wetland Wildlife Habitat Management[17] and agreeing to monitor and report use of crop residues by migrating waterfowl.	**Participating in a watershed plan that involves at least 75 percent of producers in the watershed.**

CSP Conservation Practices

The following section describes potential impacts of practices likely to be implemented in the CSP. Many of the same conservation practices will be implemented though they may appear in different "packages" in different settings. This Section provides an overview of the physical effects of conservation practices likely to be used under the CSP.

NRCS developed network diagrams depicting the chain of natural resource effects resulting from the application of a representative sample of conservation practices likely to be implemented under CSP. (See Appendix D.) Each of the diagrams first identifies the typical setting to which the practice is applied. This includes identification of the predominating land use and the resource concerns that trigger use of the practice. The diagrams then identify the practice used to address the resource concerns. Following identification of the practice, there is a description of the physical activities that are carried out to implement the practice. From there, the diagrams depict the occurrence of the direct, indirect and cumulative effects of the practice. Effects are qualified with a "+" or a "-" which denotes an increase ("+") or decrease ("-") in the effect. Pluses and minuses do not equate to good and bad or positive and negative. Only the general effects that are considered the most important ones from a national perspective are illustrated. In addition to the network diagrams, Appendix B includes a photo and summary description about how each of these practices is intended to be used and the general effects of using the practice.

[16] In Tier 1, this is likely to include leaving crop residues available for waterfowl throughout the fall migration period.

[17] In this case, the Wildlife Wetland Habitat Management could be at the same intensity level of performance as under Tier 1 because of the additional monitoring requirement.

The effects of the practices may vary somewhat depending on the local ecosystem(s), methods of practice installation, and presence of special resource concerns in a particular State, such as the presence of a coastal zone, endangered or threatened species, historic or cultural resources, and the like. While effects on these resources may be described in general terms at the national level, they must be addressed at the State and local level. This is particularly true for endangered and threatened species, historic preservation, historic and cultural resources, essential fish habitat and other resources that are protected by special authorities that require consultation. NRCS will consult on a State or site-specific level as needed and appropriate, to ensure CSP actions do not adversely affect special resources of concern. NRCS will also implement practices in a manner that is consistent with the NRCS policy to avoid, minimize or mitigate adverse effects to the extent feasible.

For example, to ensure compliance with the Endangered Species Act, State Conservationists will invite representatives of the U.S. Fish and Wildlife Service (FWS) and the National Oceanographic and Air Administration's Office of Fisheries (NOAA Fisheries, previously known as the National Marine Fisheries Service or NMFS), as applicable, to all State Technical Committee meetings and encourage their involvement in the development of program criteria within the State. NRCS will also conduct additional programmatic consultations with FWS and NOAA Fisheries at the State level as needed to ensure CSP implementation is not likely to adversely affect species listed as endangered or threatened or species proposed for listing as endangered or threatened or designated or proposed critical habitat. Such consultation will also be used to identify ways the CSP might further the conservation of protected species and identify situations in which no site-specific consultation would be needed.[18] Site-specific consultation will also be conducted as needed to avoid adversely affecting any protected species or habitat.

To ensure compliance with the National Historic Preservation Act and associated authorities, NRCS State Offices will follow the procedures outlined in the Advisory Council on Historic Preservation's (ACHP) regulations (36 CFR Part 800) or, in accordance with NRCS' alternate procedures (nationwide Programmatic Agreement), invite State Historic Preservation Officers (SHPO's) and federally recognized Tribes (or their designated Tribal Historic Preservation Officers) to enter into consultation agreements that highlight and focus review and consultation on those resources and locations that are of special concern to these parties. In addition, if no State-level agreements are developed with the SHPO's or Tribes, and/or if other consulting parties are identified, they will be afforded, as appropriate, an opportunity to advise the NRCS State Office during project-specific planning about their historic and cultural resource concerns so that they may be taken into account in accordance with the ACHP regulations. Similar processes will be followed, as needed and appropriate, to address other special requirements for the protection of the environment.

The conservation practices expected to be used most commonly in CSP address significant resource concerns related to either cropland or grazing land, which includes grassland, prairie

[18] In addition to situations in which NRCS determines there is no effect on protected species or habitat, site-specific consultation should not be needed when NRCS and FWS or NOAA Fisheries agree a category of proposed actions is not likely to adversely affect a protected species or habitat and NRCS obtains written concurrence based on that agreement.

land, improved pasture land and rangeland, as well as forested land that is an incidental part of an agricultural operation.

Cropland

While there is a broad range of conservation practices that may be used under CSP to address resource concerns on cropland, those expected to be used most frequently are identified in Table 6.

Table 6: Cropland Practices

Practice Name	Practice Number[19]
Conservation Crop Rotation	328
Contour Buffer Strips (Herbaceous)	332
Contour Farming	330
Cover Crop	340
Critical Area Planting	342
Diversion	362
Filter Strip	393
Grade Stabilization Structure	410
Grassed Waterway	412
Irrigation Water Conveyance (AA-EE)	430
Irrigation Water Management	449
Nutrient Management	590
Pest Management	595
Residue Management, Mulch Till	329B
Residue Management, No Till/Strip Till	329A
Residue Management, Ridge Till	329C
Residue Management, Seasonal	344
Riparian Forest Buffers	391
Terrace	600
Upland Wildlife Habitat Management	645
Wetland Restoration	657
Wetland Wildlife Habitat Management	644
Windbreak/Shelterbelt Establishment	380

These practices are generally designed to reduce erosion, redirect water flow, enhance crop production, produce bio-fuels and other bio-products, enhance wildlife food and cover and/or reduce surface runoff that may carry contaminants to receiving water. They perform these functions by creating channels, covering the soil with live vegetation or crop residues, creating barriers, planting crops or other vegetation with specialized characteristics, or adjusting the timing and techniques used to apply fertilizers or pesticides.

[19] Practice numbers are assigned by NRCS for eases of reference and are found in the NRCS National Handbook of Conservation Practices.

In addition to the primary effects mentioned above, other effects, both positive and negative, may occur. Livestock feed production, soil organic matter, and biodiversity may increase. Carbon sequestration may increase, while particulate matter generation and transport may decrease. Nutrient cycling may be improved, and the corresponding need for purchased nutrients may decrease. Aesthetics may also be improved. Snow trapping may occur, saline seeps may be reduced, and water use efficiency by crops may be improved. Many of the practices will also result in an initial up-front cost and increase in fuel use when they are installed. However, the total costs and fuel used on the cropland may eventually be decreased because of increased efficiencies resulting from the installation. Many of the practices will also decrease runoff while correspondingly increasing infiltration, which may result in both positive and negative effects.

The direct effects lead to indirect effects. Improved wildlife habitat should lead to increased wildlife, reduced runoff and erosion should lead to reduced loss of soluble and sediment-bound contaminants to receiving water bodies, and snow trapping should lead to increased water storage, leading to healthier crops in many cases, as well as a reduced need for irrigation water. Reduced need for nutrient and pesticide applications will reduce farmer costs, leading to increased net income.

Direct and indirect effects lead to cumulative effects such as income stability for farmers and communities, improved air quality, water quality, habitat suitability and environmental health. These effects occur when the practice is applied within the same watershed or region on many farms or fields, as might be expected when CSP is implemented.

Grazing Lands

Grazing lands include a myriad of land uses: rangelands, pasturelands, haylands, grazed forestlands, grazed croplands, and naturalized pastures. While there are many conservation practices that may be used under CSP to address resource concerns found on grazing lands, those expected to be used most frequently to improve the quality of grazing land are identified in Table 7.

Table 7: Grazing Land Practices

Practice Name	Practice Number[20]
Animal Trails and Walkways	575
Brush Management	314
Critical Area Planting	342
Fence	382
Forage Harvest Management	511
Pasture/Hayland Planting	512
Pipeline	516
Pond	378
Prescribed Burning	338
Prescribed Grazing	528A
Range Planting	550
Spring Development	574
Use Exclusion	472
Watering Facility	614

These practices are generally designed to provide feed and water for livestock production; enhance wildlife food and habitat; enhance plant biodiversity; protect air, soil, and water resources; and provide a basis for diversifying farm income.

Practices frequently used to carry out these functions are manipulation of livestock numbers, grazing intensity, duration, and distribution. Other practices used to augment these are clipping, crop rotation, drainage, fertilization, and addition of soil amendments, irrigation, land clearing, mechanical harvest, pest control, vegetative plantings, rock picking, selection and/or protection of plant species, tillage, brush management, watering facility development, and livestock use exclusion.

In addition to the primary effects mentioned above, other effects, both positive and negative, may occur. Improved plant growth and condition can result from controlling erosion on steep slopes and around feed areas. The increase in plant cover protects streams, ponds, and other water supplies from sediment and other possible contaminants, as well as providing food for livestock and wildlife and decreased potential for wind erosion and particulate matter generation. Soil condition may be improved, resulting in increased nutrient cycling, organic matter, and carbon sequestration. Equipment, labor, materials, and maintenance may result in added costs to the producer in order to provide water, erosion control, and other associated conservation measures and controls.

The direct effects can lead to indirect effects. Controlled access to sensitive areas should lead to a reduction in contaminants, pathogens, and sediments in receiving waters, as well as protection and productivity of desired plant species. Development of water facilities and mechanisms for providing source water for livestock leads to an increase in animal health and production and

[20] Practice numbers are assigned by NRCS for eases of reference and are found in the NRCS National Handbook of Conservation Practices.

sometimes benefits wildlife. These same practices may interfere with natural water flow and/or enhance saltwater intrusion and possibly allow potential contaminants into water bodies. Some wildlife species may also be negatively affected.

Direct and indirect effects lead to cumulative effects such as income stability for producers and communities, improved water quality, habitat suitability, and human and animal health.

Forestry Management

Owners of private forest lands, including farmers and ranchers with grazed or ungrazed forest land on all or part of their operating units, are referred to as Non-industrial Private Forest Land (NIPF) owners, an ownership group of 10 million people that comprises 350 million acres in the United States. However, only forest land that is incidental to the producers operation can be included in CSP. The tracts of forest land that may be eligible might include forest management practices listed in Table 8, which include: Forest Stand Improvement, Forest Harvest Trails and Landings, Forest Site Preparation, Firebreaks, Prescribed Burning, Tree Establishment, Pruning, and Use Exclusion.

Agroforestry Practices

Agroforestry is the intentional blending of agricultural and forestry production in conservation systems and practices. Practices used in agroforestry listed in Table 8 include: Alley Cropping, Riparian Forest Buffer, Windbreak/Shelterbelt Establishment, and Windbreak/Shelterbelt Renovation. There is growing interest in the use of these practices to increase carbon sequestration, production of biomass for fuel, and mitigation of odor and particulate matter transport from livestock operations. The use of practices in systems has high potential to increase forage and wood fiber yields and diversify incomes. Agroforestry practices provide many of the buffers that improve water quality and reduce soil erosion. A new practice of silvopasture has great potential to reduce fuel loads around communities.

Table 8: Agroforestry Practices

Practice Name	Practice Number[21]
Alley Cropping	311
Firebreak	394
Forest Harvest Trails and Landings	655
Forest Site Preparation	490
Forest Stand Improvement	666
Prescribed Burning	338
Riparian Forest Buffer	391
Tree/Shrub Establishment	612
Tree/Shrub Pruning	660
Use Exclusion	472
Windbreak/Shelterbelt Establishment	380
Windbreak/Shelterbelt Renovation	650

CONCLUSION

CSP is used not only to fund new conservation practices, but to recognize agricultural producers for the stewardship efforts they have already made. Even when this financial recognition does not directly result in new conservation, it will provide an impetus for these producers, who have already demonstrated their conservation ethic, to become "model conservationists" and to encourage others to do the same. To the extent new conservation practices are installed, soil and water will be saved, and water quality, air quality, fish and wildlife habitat and livestock health will be improved. The combination will secure the ability of U.S. agricultural producers to provide a safe and abundant food supply into the future.

[21] Practice numbers are assigned by NRCS for eases of reference and are found in the NRCS National Handbook of Conservation Practices.

LIST OF PERSONS AND AGENCIES CONSULTED

Natural Resources Conservation Service

Andrée DuVarney, National Environmental Coordinator, NRCS, Washington, D.C.

Carl Hutcherson, Regional Programs Coordinator, NRCS South Central Region, NRCS, Fort Worth, Texas

Craig Derickson, Acting CSP National Program Manager, NRCS, Washington, D.C.

David McKay, Planning Team Leader, NRCS, Washington, D.C.

Howard Hankin, National Aquatic Specialist, NRCS, Washington, D.C.

Network Diagramming and Practice Effects Assistance

Carolyn Adams, Director, Watershed Science Institute, NRCS, Raleigh, North Carolina

CSP-Cropland:

*Steffanie Aschmann, Agroecologist, WSSI-Lincoln
Ken Pfeiffer, Pest Management Specialist, NWCC-Portland
Joe Bagdon, Pest Management Specialist, NWCC-Amherst
David Anderson, Agricultural Engineer, WSSI-Lincoln
Dennis Carman, Agricultural Engineer, NWMC-Little Rock
Doug Seibel, Engineer, Quality Assurance Staff, NHQ
Charlie Rewa, Wildlife Biologist, WHMI-Patuxent
Bill Kuenstler, Agronomist, National Cartography and Geospatial Center, Ft. Worth
Arnold King, National Technical Coordinator, Cooperating Scientist, Ft. Worth
Jerry Lemunyon, Conservation Agronomist, RAD-Ft. Worth
Ron Harris, Natural Resource Specialist, AHCWPD, Beltsville
Kerry Robinson, Hydraulic Engineer, WSSI-Raleigh

CSP-Grazing Lands:

*Betty McQuaid, Ph.D., WSSI-Raleigh
Jim Cropper, Ph.D., Forage Management Specialist, GLTI, University Park, PA
Arnold Norman, Ecosystem Management Specialist, GLTI, Ft. Worth, Texas
George Peacock, Range Management Specialist, GLTI, Ft. Worth, Texas
Ken Spaeth, Ph.D., Range Hydrology Specialist, GLTI, Boise, Idaho

Air Quality Review Team:

Elvis Graves, liaison to EPA, EPA, North Carolina
Jeff Schmidt, Community Assistance Coordinator, BLM/NRCS, AZ
John Beyer, State Air Quality Specialist/NRI Coordinator, Fresno, CA
Roel Vining, Cooperating Scientist, Purdue University, IN
John Brenner, Cooperating Scientist, Fort Collins, CO
Beth Sauerhaft, National Ecological Climatologist, NRCS, Washington, DC

*Diagram Facilitator

REFERENCES

Natural Resources Conservation Service. (2001). *A Resources Conservation Act Report: Interim Appraisal and Analysis of Conservation Alternatives.* (Available on the internet at: http://www.nrcs.usda.gov/technical/land/pubs/rca/downloads.html).

Smith, O.B., and S. Koala. 1999. *Desertification: Myths and Realities.* International Development Research Centre, Ottawa, Canada.

SRM (Society for Range Management). 2000. *Assessment of USDA Conservation Programs on Private Rangelands.* Report prepared for USDA's Natural Resources Conservation Service. Denver, CO.

APPENDICES

Appendix A –CSP Legislation, as Established by the Farm Security and Rural Investment Act of 2002

Appendix B - Conservation Security Program: Advance Notice of Proposed Rulemaking and Request for Comments

Appendix C – National Quality Criteria

Appendix D – CSP Practice Photos, Descriptions and Network Diagrams