

State of South Dakota

**COORDINATED PLAN  
for NATURAL RESOURCES CONSERVATION**

South Dakota Department of Agriculture  
Division of Resource Conservation & Forestry

January 2007



Horses graze a healthy rangeland

PHOTO BY TIM McCABE,  
1985 USDA NATURAL RESOURCES CONSERVATION SERVICE

Cover: A family of ranchiers check the grass on a  
ranch in South Dakota

1997 PHOTO COURTESY OF THE USDA NATURAL RESOURCES  
CONSERVATION SERVICE

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Aerial photo showing wetlands & farming in  
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PHOTO BY DON POGGENSEE,  
2001 USDA NATURAL RESOURCES CONSERVATION SERVICE

## Executive Summary

*Great achievements are not born from a single vision,  
but from the combination of many distinctive viewpoints.*

South Dakota has a history rich in agriculture, ranching, and land preservation. With great pride in their land, their work and their resources, South Dakotans have embraced conservation with energy and enthusiasm.

The South Dakota Legislature was one of the first to respond to President Franklin Roosevelt's call for the establishment of soil conservation districts. With similar foresight, South Dakota has created a wide array of conservation programs on state and local levels to protect, manage, and develop resources including water, soils, air, wildlife, and recreation areas. Still other programs increase public awareness of the benefits of conservation and develop funding sources for conservation implementation.

With the partnership of state, federal, and local programs, South Dakota has experienced the rewards of proactive conservation. By maintaining clean water, productive soil, abundant wildlife and a healthy environment South Dakotans have added value to the agricultural-based economy, developed resources for local industries, and created more opportunities for recreation and leisure. Since the implementation of the COORDINATED SOIL AND WATER CONSERVATION PLAN in 1991, South Dakota has achieved some remarkable gains, including:

- Reduction of cropland erosion on over 3.8 million acres to tolerable levels, with topsoil erosion cut by 28 million tons resulting in:
  - 5.5% increase in crop industry output
  - 1,769 new full and part time jobs
  - \$213 million increase in state industrial output
- Improvement of rangeland in poor to fair condition by one condition class on 1.7 million acres, resulting in:
  - 0.72% increase in cattle production
  - 478 new full and part time jobs
  - \$53 million increase in state industrial output
- Improvement of water quality in 35 water bodies in the State.

Since the 1991 plan was adopted, changes in agricultural methods, new uses for agricultural products, and improved understanding of conservation benefits and methods impel us to revise and expand the old plan. Through solicitation of public input via surveys and public meetings around the State, the South Dakota Department of Agriculture and its partners developed their goals for this COORDINATED PLAN FOR NATURAL RESOURCES CONSERVATION. By working towards these goals, South Dakotans will continue to enhance their natural resources and their quality of life.

The new Goals are supported by objectives stated in Chapter 5 of this Plan.

### Water:

Nothing is more essential to life on earth than water. Its uses include drinking, fishing, swimming, irrigation, wildlife habitat, and livestock watering. Not only must the water be of high enough quality to meet these purposes, there must also be enough of it. As everyone lives in a watershed, everyone has a stake in water quality and a role to play in its protection and improvement.

Goal #1: All Missouri River watersheds in South Dakota will achieve their environmental, social, and economic values.

Goal #2: All South Dakota waters will provide sufficient quantities of quality water to meet their beneficial uses.

### Soil:

Soils are the base to our agricultural economy and rural lifestyle. The health of a soil affects its ability to support plant and animal life, maintain or enhance water and air quality, and support human health and survival.

Goal #3: All lands in South Dakota will have quality soils appropriate for their capability.

### Air:

South Dakota is blessed with very good air quality, except when occasional dust, smoke or odor intrudes into our lives. Air quality affects both our health and our economy.

Goal #4: All of South Dakota will meet air quality standards.

### Recreation and Wildlife:

South Dakotans treasure their wildlife and recreation. Opportunities to protect and enhance these resources contribute to tourism and industry in our State.

Goal #5: Enhance recreation opportunities and wildlife habitats.

### Public Awareness:

Change requires motivation. Investment requires some assurance of a return. And education is key to continued progress in conservation.

Goal #6: Every South Dakota citizen will have an awareness and understanding of the benefits of natural resource management.

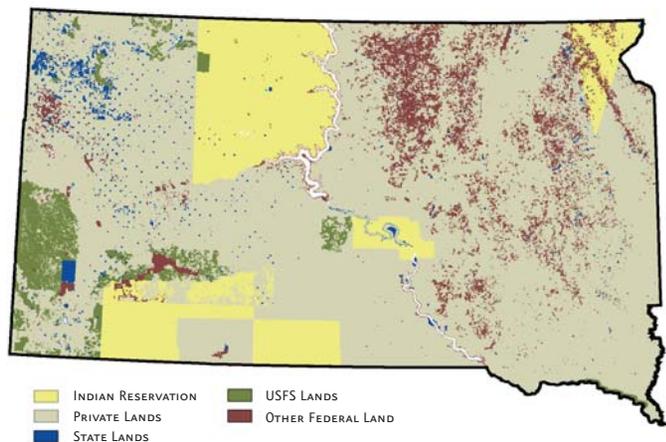
### Funding:

At public meetings around the State the number one concern was that funding for conservation programs would not keep up with the demand. Development of new funding sources is crucial to continued success in conservation in South Dakota.

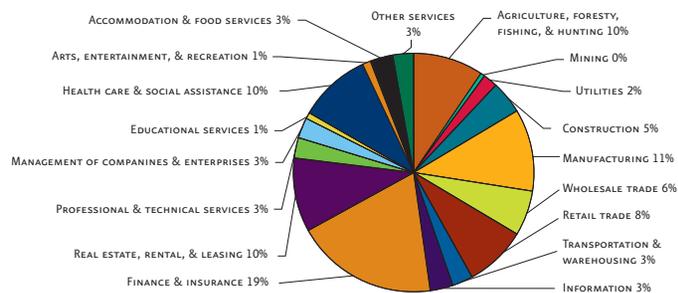
Goal #7: Secure stable funding and financial opportunities for natural resource management.

**Figure 1-1 Land ownership in South Dakota**

Data Source: USGS-SD Gap Data, SD Dept. of Ag Projection: UTM Zone 14N NAD 1983



**Figure 1-2 South Dakota gross economic production by industry for 2002** Source: USDC, 2006



## 1. Introduction

The people of South Dakota have an admirable history of natural resource conservation. On the following pages we have documented that history with respect to vegetation, soils, land use, wildlife, recreation, water, and air over the last decade or two.

The South Dakota Department of Agriculture (SDDA), State Conservation Commission, Conservation Districts, and their federal, state, tribal, and local conservation partners held public meetings around the State to assess, through public comment, the current condition of natural resources and the areas of concern that the people of the State would like to see addressed over the life of this revision of the 1991 conservation plan. Progress in soil erosion, water quality, and productivity were all praised. Many issues were raised and concerns discussed, but the people's number one issue, and the limiting factor for achievement of conservation goals, is the under-funding of conservation programs.

Changing the way we do business can be an expensive proposition for farmers, ranchers, forest managers, and other natural resources related enterprises. As technology and agricultural practices change, conservation programs, and funding to implement them, need to evolve at an equal pace, so the gains we have made in water quality, soil stability, wildlife habitat, and other resource areas are not lost.

As reflected in the Governor's 2010 initiative, South Dakotans need to work together to promote agricultural and natural resource development, stabilize our rural populations, and capitalize on existing outdoor opportunities. Maintaining clean water, productive soil, abundant wildlife and a healthy environment is the basis for adding value to any agricultural based economy. Our natural resources should be considered value-added opportunities for on-going as well as developing industries.

The U.S. Department of Commerce statistics for 2004 show the gross economic product for private industry in South Dakota as \$25.8 billion, with crop and animal production generating \$2.5 billion, and forestry, fishing and related activities generating \$108 million; these numbers do not include some value-added categories, such as food product manufacturing (\$370 million) and paper manufacturing (\$58 million). In the coming years, ethanol production will have a positive impact on the state's gross product for Agriculture. Figure 1-2 shows the USDC data in pie chart form. The U.S. Department of Agriculture Economic Research Service shows farm income and value added income for 2005 as \$2.2 billion for final crop output, \$2.7 billion for final animal output, and \$709 million for services and forestry.

Chapter Two of this Conservation Plan provides a brief history of conservation in South Dakota, including the 1991 SOUTH DAKOTA COORDINATED SOIL AND WATER CONSERVATION PLAN. It is noteworthy that this revision of that Plan expands our vision to include air, wildlife, and recreation in addition to soil and water. Chapter Three presents land use and land cover, as well as current conditions of our natural resources. Chapter Four describes conservation programs and natural resources management in South Dakota. The goals and objectives to protect and enhance South Dakota's natural resources over the next five years are found in Chapter Five.



Early use of contour plowing on a farm near Interior, South Dakota

PHOTO BY B.C. McLEAN,  
1977 USDA NATURAL RESOURCES CONSERVATION SERVICE



Dust Bowl in South Dakota  
1936 PHOTO COURTESY OF USDA

## 2. History

### History of Conservation

Natural resource conservation became an issue of national concern following the disastrous wind storms of 1935, commonly known as the Dust Bowl. A period of drought prior to the storms, aggravated by inappropriate farming practices for an arid climate, left cropland in the Midwest highly susceptible to severe wind and water erosion. In response to the devastation, Congress created the Soil Conservation Service, now the Natural Resources Conservation Service (NRCS), under the U.S. Department of Agriculture to help landowners employ soil conservation practices on agricultural land. The formation of this new agency drew attention to the immense need for soil conservation, and for local government and citizen involvement.

### History of Federal Conservation Efforts in South Dakota

In response to heightened concern over eroded cropland, erosion control projects were established in each state to demonstrate erosion control through conservation practices. The first of these Demonstration Projects in South Dakota was located near Wolsey. The Civilian Conservation Corps (CCC) established camps across the state to assist farmers and ranchers in conservation efforts.

In 1937, South Dakota became one of 21 states to respond to President Franklin Roosevelt's call for states to legislate the organization of soil conservation districts. The result was the creation of the South Dakota Soil Conservation District Law of 1937 which established the Soil Conservation Committee and allowed landowners to organize conservation districts to assist them in natural resource conservation.

### History of State Conservation Commission

When first established, the basic duties of the committee were to oversee the formation of the conservation districts and to provide for the conservation of the state's soil

resources. A revolving loan fund was established in 1949. In 1968 the name of the committee was changed to the State Conservation Commission and all funds appropriated to the commission were placed under the administration of the Secretary of Agriculture.

Today, the State Conservation Commission is a nine-member citizen board appointed by the Governor. They are responsible for overseeing the development and implementation of the State Conservation Plan and for establishing state natural resource conservation policies. The commission is the official entity that provides administrative oversight of the 69 conservation districts within our state, awards grants from the Coordinated Soil and Water Conservation Grant Fund, and approves loans to conservation districts from the Conservation District Revolving Loan Fund.

### History of State Conservation Agencies and Their Current Conservation Efforts

Today there are three state agencies responsible for overseeing and implementing conservation in South Dakota: the Department of Environment and Natural Resources (SDDENR), the SDDA Division of Resource Conservation and Forestry (SDRCF), and the Department of Game, Fish and Parks (SDGFP).

SDGFP was created in 1909 "to perpetuate, conserve, manage, protect, and enhance South Dakota's wildlife resources, parks, and outdoor recreational opportunities for the use, benefit, and enjoyment of the people of this state and its visitors, and to give the highest priority to the welfare of this state's wildlife and parks, and their environment, in planning and decisions."

SDRCF was initially established as two separate divisions within the SDDA. In 1995, the Division of Forestry and the Division of Conservation were combined to form the SDRCF by order of the Governor.

The mission of the SDRCF is to conserve, protect, improve, and develop the natural resources of South Dakota for its citizens. Currently, the division manages the Coordinated Soil and Water Conservation Plan and Grant Program on behalf of the state and the Conservation Commission. The Plan targets reducing soil erosion, improvement of rangelands, enhanced water quality and other natural resource conservation efforts by providing grants to conservation districts.

SDDENR's mission is to protect public health and the environment by providing natural resources assessment, financial assistance, and regulation in a manner that promotes a good business climate and exceeds their customers' expectations.

### History of Conservation Districts in South Dakota

South Dakota's district law became effective in 1937. By 1968, the majority of the State had organized into conservation districts, and in 1982 the legislature included all towns within a conservation district, thereby covering the whole State. Originally, conservation districts were called "Soil Conservation Districts," but later the title was expanded to "Soil and Water Conservation Districts." The name was again changed in 1968 to "Conservation Districts" to better represent the expanding responsibilities of the districts. Organized to assist landowners, each of South Dakota's 69 conservation districts is guided by five publicly elected supervisors who serve to:

- Provide local conservation leadership, teach the value of natural resources, and encourage conservation efforts
- Implement conservation practices that keep air, land, and water healthy and productive
- Conserve and restore wetlands that purify water and provide habitat for birds, fish, and numerous other animals
- Protect groundwater resources that provide much of South Dakota's drinking water, plant trees and other land covers to hold soil in place, clean the air, provide cover for wildlife and beautify neighborhoods.

### History of South Dakota Association of Conservation Districts

The South Dakota Association of Conservation Districts (SDACD) was established in 1941. The purpose of the SDACD is to promote conservation between districts across the entire state, and to assist in the exchange of information concerning the administration and operation of districts,

promote the interests and activities of other organizations in natural resource conservation, and to develop and carry out programs for controlling soil erosion and conserving natural resources.

### History of First Soil and Water Conservation Plan

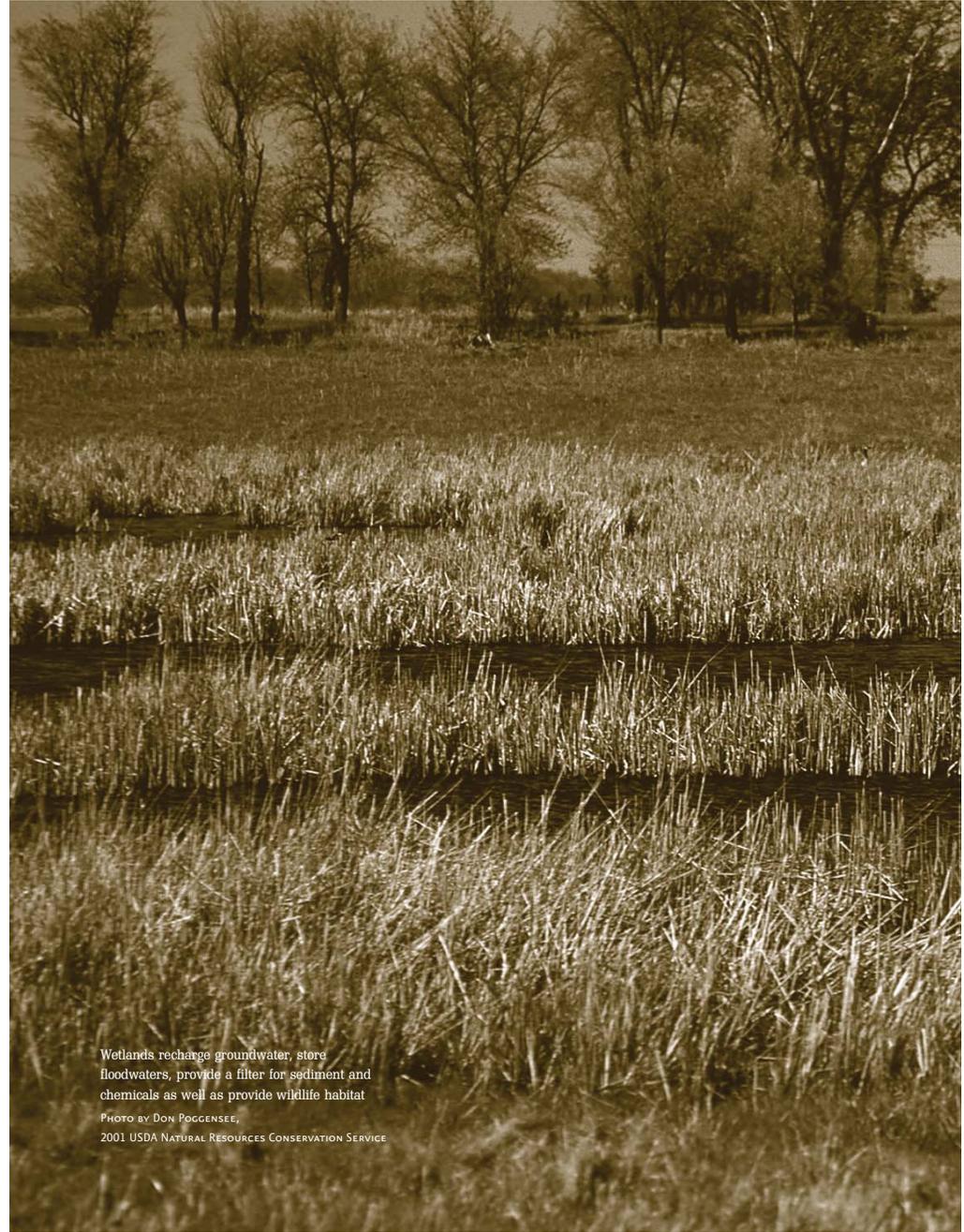
In 1991, the state developed a COORDINATED SOIL AND WATER CONSERVATION PLAN establishing specific goals and implementation strategies to address soil and water conservation. This plan was designed to guide local, state, and federal agencies in assisting South Dakotans with soil and water conservation efforts and to maximize resource conservation within the state's limited funding. The plan established four major goals:

1. Reduce cropland erosion on six million acres to tolerable levels by the year 2005
2. Improve three million acres of poor and fair condition rangeland and pastureland to good condition by the year 2005
3. Improve water quality in 42 lakes and river segments by the year 2005
4. Protect ground water consistent with the Centennial Environmental Protection Act.

### Accomplishments of First Plan

According to reports from conservation districts, federal, state, and local entities, by 2005 a number of improvements had been made to the state's resources as a result of the plan.

- Cropland erosion on over 3.8 million acres has been improved to tolerable levels, with topsoil erosion cut by 28 million tons resulting in:
  - 5.5% increase in crop industry output
  - 1,769 new full and part time jobs
  - \$213 million increase in state industrial output
- Rangeland in poor to fair condition has been improved one condition class on 1.7 million acres, resulting in:
  - 0.72% increase in cattle production
  - 478 new full and part time jobs
  - \$53 million increase in state industrial output
- Water quality has been improved in 35 water bodies in the state.

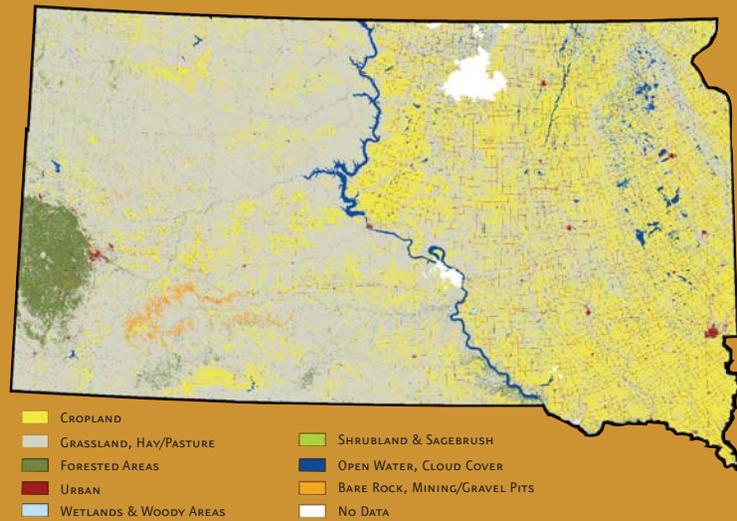


Wetlands recharge groundwater, store floodwaters, provide a filter for sediment and chemicals as well as provide wildlife habitat

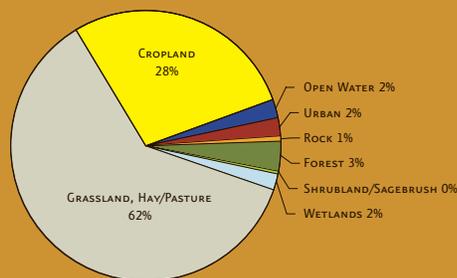
PHOTO BY DON POGENSEE,  
2001 USDA NATURAL RESOURCES CONSERVATION SERVICE

**Figure 3-1 Land cover/Land use map**

Data Source: SD Dept. of Ag. Projection: UTM Zone 14N NAD 1983



**Figure 3-2 South Dakota land cover** Source: NRCS, 2000



### 3. Land Use, Land Cover & Other Resources

Soils and geology are major factors in determining land use and land cover. Soil texture and composition affect hydrology, fertility, and stability. Sandy soils, for example, drain quickly and erode easily, while clay soils may absorb and bind water. Natural land cover is an indicator of the capability of the soil to grow and sustain certain types of vegetation. Figure 3-1 shows land cover in SD, from the forests of the Black Hills, to the grasslands of central and eastern SD, and the wetlands of the northeastern prairie pothole region.

In this chapter we show current land use, land cover and other natural resources, integrated as they are in the landscape, and as assessed by South Dakota and federal agencies. In addition to geology, soils, and vegetation, land

use is determined by the quality and availability of water, as well as by political and ownership boundaries.

Figure 3-2 shows the relative percentage of land uses and land covers in South Dakota, based on the National Land Cover Data Set. Over 60% of South Dakota's 77,047 square miles are grasslands, including pasture, hay, and range lands. The second most dominant land use is cropland, at 28%. All other land uses and land covers combined make up less than 11% of the state's area.

Table 3-1 shows land use data, as well as trends in cropland, woodland and conservation reserve program (CRP) lands between 1992 and 2002 based on USDA census data.

**Table 3-1 USDA Census land use by acres, 1992–2002**

Year	Total Cropland	Harvested Cropland	Cropland only for Pasture & Grazing	Other Cropland <sup>1</sup>	Total Woodland	Pasture & Range <sup>3</sup> (Grassland)	CRP or WRP
1992	19,582,565	13,624,006	2,485,119	3,473,440	255,193	23,946,525	1,300,085
1997	19,355,256	14,284,741	2,302,552	2,767,963	235,435	23,588,662	1,454,341
ADJUSTED TO 2002 METHODOLOGY							
1997	19,706,193	14,770,445	2,236,627	2,699,121	236,025	23,044,159	1,441,600
2002	20,318,036	13,492,286	2,351,951	4,473,799	226,981	22,025,971	1,342,598
Change, 1992 to 2002 <sup>2</sup>	384,534	(617,424)	(67,243)	1,069,201	(28,802)	(1,376,051)	55,254
	2.0%	-4.5%	-2.7%	30.8%	-11.3%	-5.7%	4.3%

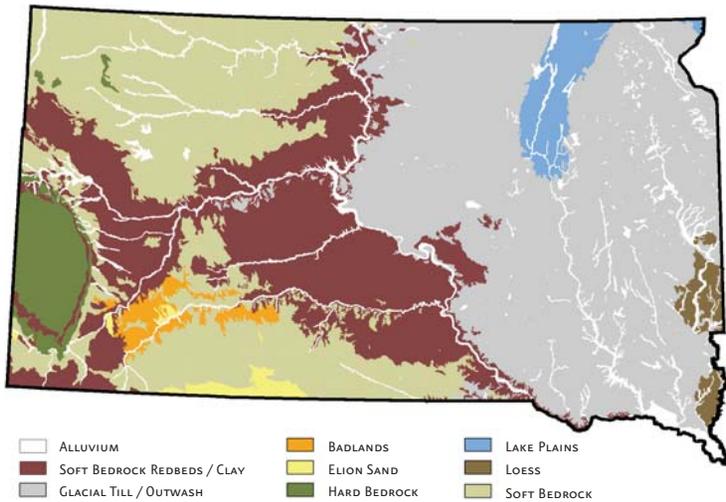
<sup>1</sup> "Other Cropland" includes "Cropland idle or used for cover crops or soil improvement, but not harvested or grazed" and "Cropland on which all crops failed."

<sup>2</sup> To correct for the two methodologies change was calculated in two steps, from 1992 to 1997 and 1997 to 2002 Source: USDA, 2004a; USDA, 1999.

<sup>3</sup> Excludes cropland and woodland.

**Figure 3-3 Geology map of South Dakota**

Data Source: USDA Geospatial Data Gateway Projection: UTM Zone 14N NAD 1983



**Geology**

Geological deposits are the parent materials from which most soils are formed, with decayed organic matter being the second major source. Some soils are carried to their current locations by wind (loess), water (alluvium, lake bed silts & clays) or glaciers (glacial drift), all of which are found in eastern South Dakota. In western South Dakota, many of the formations now at the surface have been exposed through erosion of older geological deposits. This is particularly true in the Black Hills of southwestern SD, where deposits form a concentric pattern with the oldest, Precambrian metamorphic

and igneous rocks in the center (e.g., granite, quartzite, schist, and rhyolite); surrounded by Paleozoic sedimentary rocks (e.g., limestones, sandstones, and shales); surrounded by Jurassic and Triassic shales, sandstones and rebeds; surrounded in turn by Cretaceous formations of limestone, shale, sandstone, chalk, and clay.

Figure 3-3 is a geologic map of South Dakota which, compared with Figure 3-1 (land cover/land use), shows how closely land use and geology are aligned.

**Table 3-2 Estimated average sheet, rill, and wind erosion on non-federal land in tons/acre/year**

Source: NRCS, 2000

Year	Cropland			CRP	Pasture
	CULTIVATED	NON-CULTIVATED	TOTAL		
1987	6.2	0.7	6.9	5.8	0.5
1992	4.8	0.5	5.3	0.7	0.4
1997	4.0	0.3	4.3	0.1	0.3
Change, 1987 to 1997	(2.2)	(0.4)	(2.6)	(5.7)	(0.2)
	-35%	-57%	-38%	-98%	-40%

**Soil**

Combined with slope, climate, hydrology, and other factors, soils are the primary determinant of agricultural suitability and land use. Threats to soil stability and fertility include erosion (wind and water), salinity and salts, and organic matter content.

South Dakota has done an admirable job of reducing erosion from water (sheet and rill) and wind through the use of conservation measures. Combined data from the 1997 NRCS Natural Resources Inventory (NRI) are shown in Table 3-2, and demonstrate that success.

**Grassland**

In 1997, the NRCS NRI estimated that there were 1,245,700 acres of tall-grass prairie and 20,630,700 acres of mixed-grass prairie in South Dakota. Over 60% of the land area of the state is grassland. Since 1991 1.7 million acres of rangeland has been improved by one condition class, as shown in Table 3-3, primarily from fair to good.

**Croplands**

The USDA NASS CENSUS OF AGRICULTURE (Census) for 2002 showed an increase in Total Cropland for the ten-year period of 1992 to 2002, but the data is skewed by the high acreage of cropland on which all crops failed in 2002, shown as "Other Cropland." A summary of agricultural land use from the Census is in Table 3-1. Over the period of 1991–2002 the total economic impact of agriculture in South Dakota, adjusted for inflation, has risen from \$13.5 billion in 1991, to \$15.5 billion in 1997, to \$16.9 billion in 2002, which is an overall increase of 25%.

Table 3-4 provides additional information from the NRCS NRI showing a shift from cultivated to non-cultivated or no-till cropping, as well as an overall increase of 10,200 irrigated acres (2.1%) between 1987 and 1997. The trend to non-cultivated cropping reduces erosion and has other conservation benefits.

**Table 3-3 Rangeland condition class improvement**

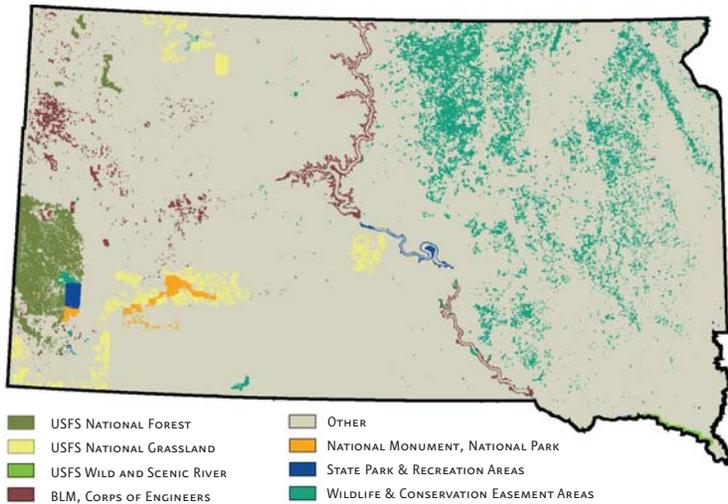
Year	Condition Class (acres)			
	POOR	FAIR	GOOD	EXCELLENT
1987	200,000	6,000,000	14,600,000	1,400,000
2005	180,000	4,340,000	16,280,000	1,400,000

**Table 3-4 NRCS NRI cropland trends in South Dakota, 1987–1997** Source: NRCS, 2000

Year	Cultivated			Non-cultivated			Total Cropland
	IRRIGATED	NON-IRRIGATED	TOTAL	IRRIGATED	NON-IRRIGATED	TOTAL	
	IN 1,000'S OF ACRES						
1987	450.4	15,040.6	15,491.0	38.3	1,983.4	2,021.7	17,512.7
1992	420.9	13,983.7	14,404.6	61.4	1,970.7	2,032.1	16,436.7
1997	391.6	13,948.4	14,340.0	107.3	2,291.1	2,398.4	16,738.4
Change, 1987 to 1997	(58.8)	(1,092.2)	(1,151.0)	69.0	307.7	376.7	(774.3)
	-13.1%	-7.3%	-7.4%	180.1%	15.5%	18.6%	-4.4%

**Figure 3-4 Dedicated park lands**

Data Source: SD Dept. of Ag. Projection: UTM Zone 14N NAD 1983



**Forest Land**

South Dakota has 1.6 million acres of traditional forest land, representing only 3.2% of its land area of 49.3 million acres (Figure 3-2). The state's forests are dominated by western ponderosa pine timberland that occupies 1.1 million acres, or 69% of the forested area, primarily in the Black Hills (Figure 3-1). The remaining forest lands are found in the plains portion of the state and are principally associated with lakes and waterways along the Missouri River and its major tributaries. Forest lands in the eastern river basins comprise only about 1% of the total land area, and about 9% of the total forest area in the state. They consist primarily of tree species associated with eastern hardwoods such as ash, basswood (linden), bur oak, hackberry, honeylocust, elm, cottonwood, and willow.

South Dakota's native woodlands and forests are predominately publicly owned, with approximately 82% in the Black Hills National Forest. Only 35% (566,000 acres) of the state's forest land is privately owned.

South Dakota has an additional 1.3 million acres of non-forest land with trees, which includes narrow wooded strips and windbreaks, wooded pasture, and urban forests. Of this, there

are about 95,000 acres of narrow wooded strips and 105,000 acres of windbreaks.

Urban and community forests are gaining attention as important forest resources in need of proper care and management. According to the 2000 CENSUS OF POPULATION AND HOUSING, there are 308,800 acres of urban and developing lands in South Dakota.

**Parks and Recreation Areas**

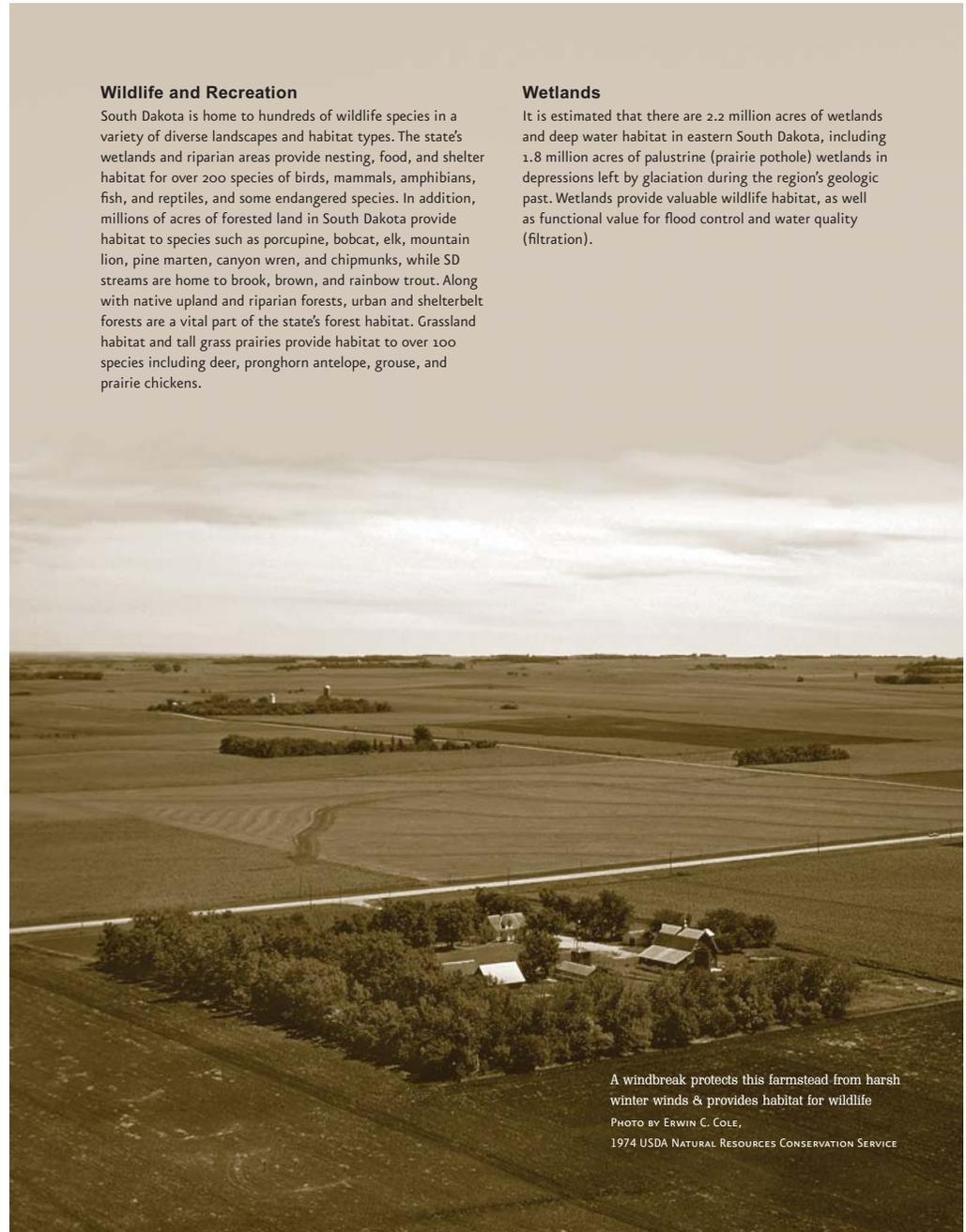
Public and designated recreation lands in South Dakota are managed at many different levels: federal, state, tribal, municipal, county, institutional, and private. State and federal park and recreation lands are shown in Figure 3-4, but there are also many recreation areas managed by tribal governments, local governments, and private providers. The South Dakota State Park system encompasses 103,750 acres in 12 state parks, 42 recreation areas, 5 nature areas, 1 historic prairie, 69 lakeside use areas, and 10 marina/resorts. In addition, the SDGFD Division of Parks and Recreation manages the 11.4-mile Mickelson Trail, South Dakota's Snowmobile Trail Program, 220 public water access areas and 291 boat ramps with a total of 389 launching lanes.

**Wildlife and Recreation**

South Dakota is home to hundreds of wildlife species in a variety of diverse landscapes and habitat types. The state's wetlands and riparian areas provide nesting, food, and shelter habitat for over 200 species of birds, mammals, amphibians, fish, and reptiles, and some endangered species. In addition, millions of acres of forested land in South Dakota provide habitat to species such as porcupine, bobcat, elk, mountain lion, pine marten, canyon wren, and chipmunks, while SD streams are home to brook, brown, and rainbow trout. Along with native upland and riparian forests, urban and shelterbelt forests are a vital part of the state's forest habitat. Grassland habitat and tall grass prairies provide habitat to over 100 species including deer, pronghorn antelope, grouse, and prairie chickens.

**Wetlands**

It is estimated that there are 2.2 million acres of wetlands and deep water habitat in eastern South Dakota, including 1.8 million acres of palustrine (prairie pothole) wetlands in depressions left by glaciation during the region's geologic past. Wetlands provide valuable wildlife habitat, as well as functional value for flood control and water quality (filtration).



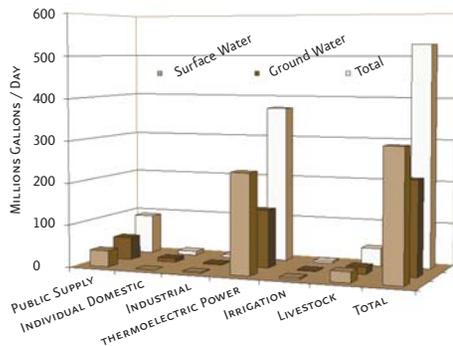
A windbreak protects this farmstead from harsh winter winds & provides habitat for wildlife  
 PHOTO BY ERWIN C. COLE,  
 1974 USDA NATURAL RESOURCES CONSERVATION SERVICE

## Water

By far, the majority of South Dakota's 77,047 square miles of land area is in the Missouri River basin. Outside the Missouri River basin there are 600 square miles in the Red River basin (which drains into Hudson's Bay) and 1,572 square miles in the Minnesota River basin (which drains into the Mississippi River). Statewide, there are 9,289 perennial stream miles, 85,841 intermittent stream miles, 360 miles of border river (one bank in South Dakota), and 424 miles of man-made ditches and canals; there are 573 lakes, reservoirs or ponds with 204,987 surface acres and 1,780,859 acres of freshwater wetlands.

Figure 3-5 shows estimated water use in South Dakota in millions of gallons per day (MGD) by use category and source (i.e., surface water, groundwater). Non-consumptive uses, such as hydroelectric power generation and fisheries, are not shown.

**Figure 3-5 Water use in year 2000** Source: USGS, 2002



Surface water quality in South Dakota is continually being assessed and improved. The state is currently using an assessment process that classifies streams and lakes (waterbodies) by their potential uses, then assesses them as fully, partially, or not supporting those uses, based on water quality and related factors. Assessments include the causes of impairment (e.g., pH, sediment, metals, fecal coliform bacteria, temperature, pesticides, etc.) and the sources of impairment (e.g., erosion from roads, mines, municipal sewage treatment plants, agricultural practices, etc.).

Table 3-5 shows sources of impairments on streams, lakes, and reservoirs. Over 80% of South Dakota's perennial stream

miles have been assessed in the past five years (October 2000 to September 2005). During this period, 50% of assessed stream miles were found to support all assigned beneficial uses. A total of 86 different streams or stream segments are listed as impaired.

In addition to rivers and streams, South Dakota has 573 lakes and reservoirs with specific aquatic life and recreational beneficial use classifications. The four Missouri River mainstem reservoirs were not included in the total lake acres but were included in the monitored river mileage.

Excluding the four mainstem reservoirs, an estimated 140 of the 573 classified lakes have been assessed. The assessed lakes account for 70% of the total classified lake acreage. An estimated 41% of the assessed lake acreage was considered to support all assessed beneficial uses and 59% did not support assessed beneficial uses. A total of 61 lakes are listed as impaired. Runoff, carrying sediment and nutrients, is the major nonpoint pollution source. Sediment from several tributaries is also shortening the useful lives of the four large mainstem reservoirs.

Groundwater is extracted from several aquifers underlying South Dakota. It is pumped from a wide range of depths and has variable quality, although the quality is usually high enough for drinking water supply, irrigation, and some other uses. Generally, shallower aquifers have fresher water while deeper aquifers have higher concentrations of dissolved solids and salinity. At the same time, shallower aquifers have the disadvantage of being more vulnerable to pollution from surface sources and activities.

## Air

Concerns about air quality have grown out of new directives from the U.S. Environmental Protection Agency (EPA) related to regional haze reduction. Currently there are no areas in the state that do not meet air quality standards. Wind Cave and Badlands National Parks are Class I air quality areas, due to their pristine condition.

**Table 3-5 Sources of impairment in South Dakota waterbodies** Source: SDDENR, 2006b

Rivers/Streams			
SOURCE CATEGORY	MILES	SOURCE CATEGORY	MILES
Acid Mine Drainage	6	Municipal Point Source Discharge	72
Animal Feeding Operations (NPS)	444	Natural Sources (including drought-related impacts)	2,470
Combined Sewer Overflow	1	On-Site Treatment Systems	81
Crop Production (including irrigated and non-irrigated crop production)	2,805	Other Recreation Pollution Sources	50
Grazing in Riparian or Shoreline Zones	715	Rangeland (Unmanaged Pasture) Grazing	551
Flow Modification	236	Residential Districts	10
Industrial Point Source Discharge	22	Source Unknown	1,170
Livestock (Grazing or Feeding Operations)	2,284	Streambank Modifications/Destabilization	109
Managed Pasture Grazing	24	Wet Weather Discharges	20
Mine Tailings	6	Wildlife	23
Municipal (Urbanized High Density Area)	5		
Lakes and Reservoirs			
SOURCE CATEGORY	SURFACE ACRES	SOURCE CATEGORY	SURFACE ACRES
Natural Sources	5,267	Unknown Sources	3,846
Non-Point Sources	95,167		

A rancher & the NRCS conservationist discuss grazing management techniques as the rancher's son looks on  
1997 PHOTO COURTESY OF USDA NATURAL RESOURCES CONSERVATION SERVICE



## 4. Current Management & Programs

This chapter provides brief descriptions of conservation programs and their administration.

### Management Responsibilities

#### Water

In South Dakota, numerous state and federal agencies have responsibility for maintaining and improving water quality, and regulating water quantity. State agencies include SDDA, SDDENR, and SDGFP. Federal agencies include the NRCS, EPA, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, tribes, and other agencies.

Surface waters in the State are monitored through an ambient water quality sampling program, water quality surveys, fish surveys, TMDL assessments, and other monitoring programs.

#### Soils

There are a number of agencies and organizations that have programs aimed at soil and land use conservation. Some of the primary soils conservation practices include no till and minimum till cropping methods, field buffers (including shelter belts), crop rotation, residue management, grassed waterways, and nutrient management. Other practices for reducing erosion and sediment run-off, such as contouring, strip-cropping, crosswind and filter strips, are encouraged as more conservative resource management. Conservation Reserve Programs are designed to preserve land use and land cover, such as wetland, forest, grassland, and other cover types.

#### Air

SDDENR is the agency responsible for air quality regulation and compliance in SD. Air quality is regulated through permitting, and new programs are being developed to address smoke from large fires and controlled burns in the Black Hills National Forest; evolving agricultural practices; and regional haze from all sources. Open burning is permitted through local regulation in some areas.

Odors and dust emissions can be nuisances in some instances, such as when they are located close to residences. In these cases local ordinances are used to limit odor nuisances, often by establishing set-back distances. Shelterbelts have also been shown to effectively improve air and water quality around animal feeding operations.

#### Wildlife & Recreation

Numerous programs and management efforts are in place to protect and enhance wildlife habitat. Although SDGFP has primary responsibility for wildlife management in South Dakota, there are a number of other agencies and organizations involved. The 2002 Farm Bill is responsible for fostering the development of a number of conservation programs that address wildlife and recreation.

The SDGFP created the Wildlife Diversity Program designed to "inventory, protect, and manage the species and habitats that comprise the biological diversity of South Dakota in a manner that meets the needs and desires of the people of the state." Under the Wildlife Diversity Program, the South Dakota Natural Heritage Program promotes public awareness of wildlife diversity issues, and works to conserve all native plants and animals, and their associated habitats.

## Public Awareness

Conservation agencies at all levels participate in demonstrating to the public that conservation practices are effective and that they allow us to make the best use of our resources, even improve our resources, without adversely affecting the “bottom line.”

Public awareness programs include person-to-person programs supplemented with well-written, thoughtful books, brochures, videos, and other aids.

## Funding Sources

The majority of funding for conservation programs in South Dakota has traditionally been provided through programs administered by USDA agencies such as the NRCS, Farm Service Agency, and Rural Development. Other federal agencies that provide grants and cost share programs for conservation projects include EPA and USFWS. State agencies such as SDDA, SDDENR, Conservation Commission, and SDGFP, provide funds through partnerships and revolving loans for conservation practices.

Funding of conservation was identified as the number one priority at public meetings across the State. As federal and state budgets become smaller there is great need to be creative and pro-active in funding conservation projects to protect and enhance the natural resources of South Dakota. The challenge for the future of conservation funding is developing long-term partnerships with federal and state agencies, as well as with Non-Governmental Organizations. These partnerships, in conjunction with an aggressive political campaign to increase funding for conservation, can provide long-term stable funding.

## Conservation Programs

### Federal Programs

#### Cooperative Conservation Partnership Initiative Grants

The Cooperative Conservation Partnership Initiative (CCPI) is a voluntary program established to foster conservation partnerships that focus technical and financial resources on conservation priorities in watersheds and airsheds of special significance. Under CCPI, funds are awarded to state and local governments and agencies; Indian tribes; and non-governmental organizations that have a history of working with agricultural producers. The CCPI grants are awarded for work performed under two components: Conservation Priorities and Rapid Watershed Assessment.

## Conservation Innovation Grants

Conservation Innovation Grants (CIG) is a voluntary program, administered by NRCS, intended to stimulate the development and adoption of innovative conservation approaches and technologies in conjunction with agricultural production. CIG enables NRCS to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches to address natural resource concerns.

## Environmental Quality Incentives Program

Environmental Quality Incentives Program (EQIP) addresses locally identified needs with natural resources. High priority is given to assistance where agricultural improvements will help meet water quality objectives. EQIP offers contracts that provide incentive payments and cost sharing for conservation practices, such as manure management systems, pest management, erosion control, and other practices to improve and maintain the health of natural resources.

## Farm and Ranch Lands Protection Program

Farm and Ranch Lands Protection Program (FRLPP) provides funds to help purchase development rights and keep productive farmland in use. Working through existing programs, the USDA joins with state, tribal, or local government to acquire conservation easements or other interests from landowners. The USDA provides up to 50% of the costs of purchasing the easements.

## Grassland Reserve Program

The Grassland Reserve Program (GRP) helps landowners restore and protect grassland, rangeland, pastureland, shrubland, and other lands, and provides assistance for rehabilitating grasslands.

## Wetlands Reserve Program

Wetlands Reserve Program (WRP) is a voluntary program to restore wetlands. Participating landowners can establish conservation easements of either permanent or 30-year duration or can enter restoration cost-share agreements where no easement is involved.

## Wildlife Habitat Incentives Program

Wildlife Habitat Incentives Program (WHIP) provides financial incentives to develop habitat for fish and wildlife on private lands. Participants agree to implement a wildlife habitat development plan and USDA agrees to provide cost-share assistance for the initial implementation of wildlife habitat development practices.

## Conservation Reserve Program

Conservation Reserve Program (CRP) is a voluntary program for agricultural landowners. Through CRP, property owners can receive annual rental payments and cost-share assistance to establish long-term, resource conserving covers on eligible farmland.

An offspring of CRP, Conservation Reserve Enhancement Program (CREP) is a voluntary program for agricultural landowners. Unique state and federal partnerships allow agricultural landowners to receive incentive payments for installing specific conservation practices.

## Forest Legacy Program

The Forest Legacy Program (FLP) is a federal program implemented in partnership with states. It supports state efforts to protect environmentally sensitive forest lands, and encourages the protection of privately owned forest lands. FLP encourages and supports acquisition of conservation easements.

## Stewardship End Results Contracting

This tool includes natural resource management practices seeking to promote a closer working relationship with local communities in a broad range of activities that improve land conditions. Stewardship contracting is a means for federal agencies to contribute to the development of sustainable rural communities, restore and maintain healthy forest ecosystems, and provide a continuing source of local income and employment.

## Private Stewardship Grants Program

The Private Stewardship Program provides grants and other assistance on a competitive basis to individuals and groups engaged in local, private, and voluntary conservation efforts that benefit federally listed, proposed, or candidate species, or other at-risk species.

## Landowner Incentive Program

The Landowner Incentive Program (LIP) establishes or supplements existing landowner incentive programs that provide technical or financial assistance, including habitat protection and restoration, for the protection and management of habitat to benefit federally listed, proposed, or candidate species, or other at-risk species on private lands.

## Partners for Fish and Wildlife

This program provides technical and financial assistance to private landowners and tribes to help meet the habitat needs of Federal Trust Species. The five primary restoration



Planting in no-till cropland in Eastern South Dakota

PHOTO BY DON POGGENSEE,

2001 USDA NATURAL RESOURCES CONSERVATION SERVICE

and enhancement activities include wetland establishment, wetland restoration, managed grazing systems, grassland seeding, and riparian enhancement.

#### **Clean Water Act Section 319**

Under Section 319, state, territories, and Indian Tribes receive grant money which supports a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring to assess the success of specific nonpoint source implementation projects.

#### **State Programs**

##### **Coordinated Soil & Water Conservation Grant Fund**

Grants from the Coordinated Soil & Water Conservation Grant Fund are available for projects that show a natural resource conservation benefit to the state. Any organized conservation district within the state may apply to the State Conservation Commission.

##### **Forest Land Enhancement Program**

Forest Land Enhancement Program (FLEP) replaces the Stewardship Incentives Program (SIP) and the Forestry Incentives Program (FIP). FLEP is optional in each state and is a voluntary program for non-industrial private forest (NIPF) landowners. It provides for technical, educational, and cost-share assistance to promote sustainability of NIPF forests.

##### **Forest Stewardship Program**

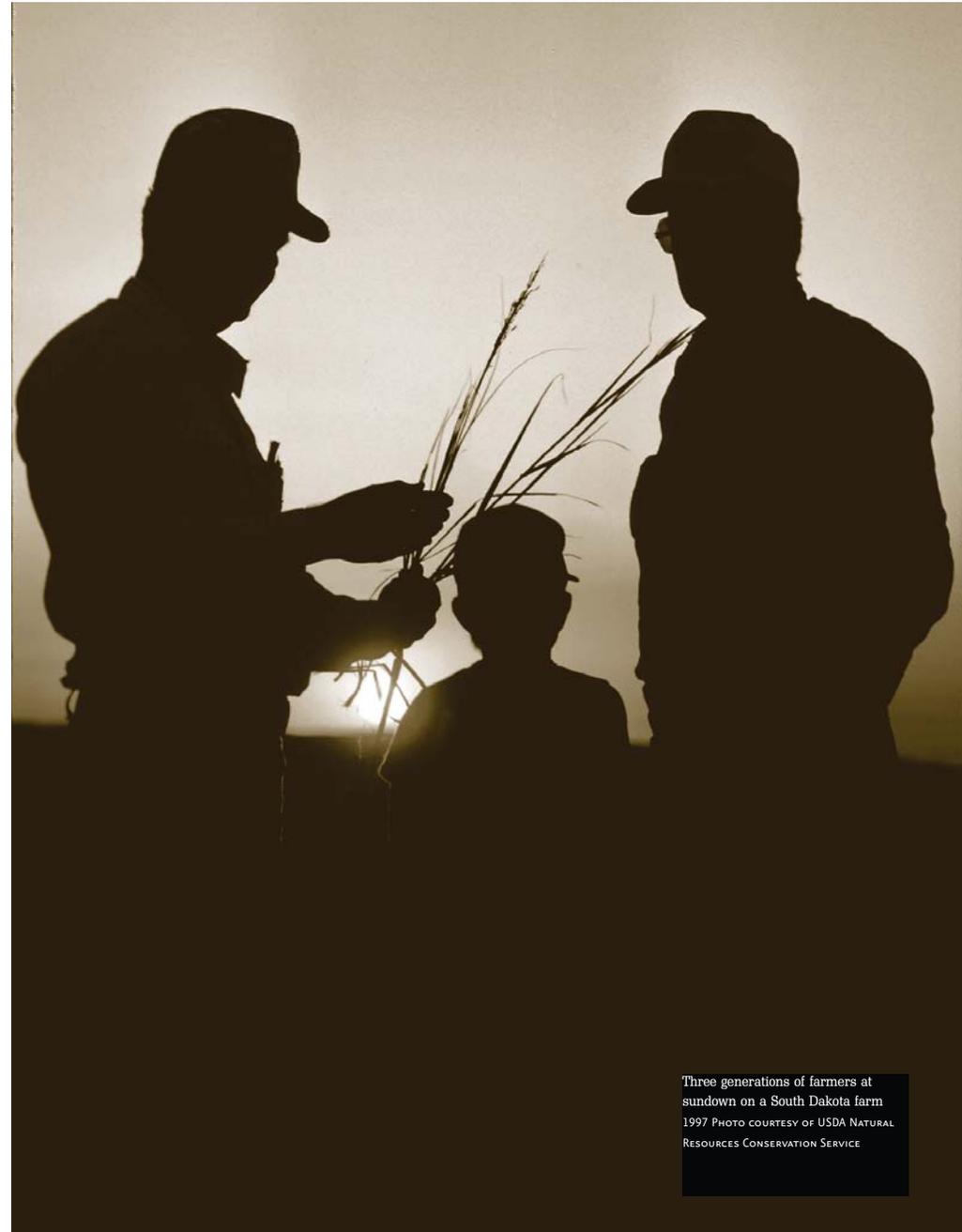
The Forest Stewardship Program (FSP) provides technical assistance, through state forestry agency partners, to NIPF owners to encourage and enable active long-term forest management.

##### **SDGFP Private Lands Programs**

SDGFP has limited funding to manage habitat and hunting on private lands and is financed through hunters and anglers. To stretch the funding, SDGFP has developed programs that take advantage of, or improve, programs already available to landowners. In addition, the department maintains partnerships with a number of government and private organizations.

#### **Local Programs**

Some conservation districts in South Dakota offer cost-share programs which assist in funding local conservation projects.



Three generations of farmers at  
sundown on a South Dakota farm  
1997 PHOTO COURTESY OF USDA NATURAL  
RESOURCES CONSERVATION SERVICE



Canoeing the Missouri River  
PHOTO COURTESY OF USDA NATURAL RESOURCES CONSERVATION SERVICE

## 5. Goals and Objectives

In preparation for development of this Coordinated Plan for Natural Resources Conservation, the SDDA, State Conservation Commission, and its partners solicited public input through meetings around the state and survey forms. Comments were ranked by the importance assigned to them by respondents and the number of responses, which resulted in the following goals and objectives. As with any long-term plan, issues change over time as practices, conditions, economics, and technical innovations develop. So this plan will not preclude additional directions, approaches, or remedies that may be found in the future.

### Water

Everyone lives in a watershed and is influenced by watershed conditions to some degree. For example, the availability and quality of water in the watershed determines where our drinking water comes from, what level of processing it must receive, and perhaps what economic enterprises can be supported. Most of South Dakota drains into the Missouri River watershed. The Missouri River is the lifeblood for South Dakota. But trying to address its issues all at once is more than we can handle. We can solve the puzzle, though, one piece at a time. A comprehensive planning process would address the needs of the many smaller watersheds that comprise the Missouri River watershed in South Dakota. We can build our knowledge base while addressing those needs. Everyone has a stake in water quality and a role to play in its improvement, whether their land is measured in square feet, acres or sections.

**GOAL #1:** All Missouri River watersheds in South Dakota will achieve their environmental, social, and economic values.

Objective #1A: Complete strategic plans for the Missouri River and its watersheds that meet the approval of the cooperating agencies by 2012.

Objective #1B: Complete 20 TMDL assessments for critical waters that meet the approval of the cooperating agencies by 2012.

Water has many uses ranging from drinking to fishing to swimming to irrigation to wildlife habitat to livestock watering. Not only must the water be of high enough quality to meet these purposes, there must also be enough of it. Our choices affect our water quality. We must choose to use best management practices that enhance our water. These practices could include, but are not limited to, grazing systems, conservation tillage, stream bank stabilization, grassed waterways, tree plantings, terraces, strip cropping, nutrient management systems, and practices yet to be developed. As agricultural practices change with economics and technology, conservation practices must be developed and implemented to match.

**GOAL #2:** All South Dakota waters will provide sufficient quantities of quality water to meet their beneficial uses.

Objective #2A: Install 20 million linear feet of additional livestock water pipelines by 2012 based on yearly program accomplishment reports.

Objective #2B: Install 60 animal nutrient management systems and nutrient management plans by 2012 based on yearly program accomplishment reports.

Objective #2C: Install 200 miles of buffer strips by 2012 based on the yearly program accomplishment reports.

Objective #2D: Seal 400 abandoned wells by 2012 based on the yearly program accomplishment reports.

Objective #2E: Reduce sediment delivery to water bodies by 8 million tons by 2012 based on 2003 NRCS data.

Objective #2F: Reduce nitrogen delivery to water bodies by 7,500 tons by 2012 based on 2003 NRCS data.

Objective #2G: Reduce phosphorous levels in water bodies by 1,400 tons by 2012 based on 2003 NRCS data.

## Soil

Soil provides a foundation for not only our agriculture economy, but also road and homebuilding, tourism, and industry. It is a dynamic natural resource that is biologically active because it contains millions of living organisms. Soils, like people, are most productive when they are healthy and fit. The health of a soil affects its ability to support plant and animal life, maintain or enhance water and air quality, and support human health and survival.

**GOAL #3:** All lands in South Dakota will have quality soils appropriate for their capability.

Objective #3A: Reduce the total number of acres eroding at greater than "T" by 10% by 2012 based on 2002 NRI data.

Objective #3B: Convert 250,000 acres of marginal cropland to permanent vegetative cover by 2012 based on 2002 NRI data.

Objective #3C: Improve 400,000 acres of poor and fair condition grassland one condition class by 2012 based on 2002 NRI data.

Objective #3D: Develop forest management plans on 20,000 acres by 2012 based on 2006 RCGF data.

## Air

The air quality in South Dakota is very good but there is room for improvement. Air quality, on any given day, could be affected by blowing dust, road dust, unpleasant odors, industrial output or natural events occurring halfway around the world. Airborne pollutants are measurable solids, liquids, or gases that can negatively impact our environment. Odor is a subjective consideration; what is offensive to one can be of no consequence to another. Our dependence on carbon-based fuels affects our economy and our environment. Our increased use of alternative energy sources could not only improve our local economies, but also our global air quality.

**GOAL #4:** All of South Dakota will meet air quality standards.

Objective #4A: Promote and increase practices that improve air quality by conducting seven training sessions for conservation districts on air quality issues and technology by 2012.

Objective #4B: Increase the sequestration of carbon by developing a website that allows access to research and resources by 2012.

## Recreation and Wildlife

South Dakotans treasure their wildlife and recreation. We invest a lot of time and energy discussing how to achieve the optimal balances. When all interests "come to the table," we have a chance to listen to each other and learn to appreciate all viewpoints. Then we can potentially come to a consensus. The key to success is participation, whether it is as a private individual, a business or governmental agency.

Great achievements are not born from a single vision, but from the combination of many distinctive viewpoints. Diversity challenges assumptions, opens minds, and unlocks our potential to solve any problem we may face.

**GOAL #5:** Enhance recreation opportunities and wildlife habitats.

Objective #5A: Improve wildlife habitat by installing 16,000 acres of herbaceous cover by 2012 based on yearly program accomplishments.

Objective #5B: Create or restore 12,000 acres of wetlands by 2012 based on 2002 NRCS/NRI data.

Objective #5C: Restore 4,000 acres of riparian areas by 2012 based on 2002 NRCS/NRI data.

Objective #5D: Renovate 50 shelterbelts by 2012 based on yearly program accomplishments.

## Public Awareness

It is hard to support that which you don't understand. Before we can ask the public to support natural resource issues, the public needs more than a vague assurance of the benefits of natural resource management. The public needs to know specific benefits. Then we can talk about issues and how to best address them. We also need to integrate the economics of ecology. Conservation pays—we need to show how.

**GOAL #6:** Every South Dakota citizen will have an awareness and understanding of the benefits of natural resource management.

Objective #6A: Increase public awareness of conservation by implementing a media campaign by 2012.

Objective #6B: Increase public awareness of conservation districts by developing 40 district websites by 2012 based on the number of district websites in 2006.

Objective #6C: Establish a conservation project in 2005th grade classes by 2012 based on the number of programs in 2006.

Objective #6D: Establish an Envirothon program in 20 high schools by 2012 based on the number of 2006 programs.

Objective #6E: Develop a web-based resource that addresses natural resource management issues by 2012.

## Funding

Given current funding levels, we cannot meet the record demand for assistance with natural resources. The National Governors' Association estimates that at least \$5 billion is needed annually in government assistance to significantly improve the natural resources management system in the U.S. Increased investment in this system will make the world better for our children and grandchildren. Is our state and local investment adequate? Consider this: the three state agencies responsible for natural resources management in South Dakota (SDDA, SDDENR, and SDGFP) comprise 1.5% of the state's annual budget. The South Dakota Association of Conservation Districts estimates an additional 112 technical staff and \$7 million annually are needed to help put adequate conservation "on-the-ground." Increased state and federal funds are not the only answer and may not provide long-term solutions. Local initiatives to address local issues as

part of a regional cooperative effort will provide the most effective long-term opportunities for natural resource management. Some call this the "Age of Philanthropy." Not only have private individuals and organizations opened their pocketbooks at record levels, but they have also volunteered their time and expertise, thereby leveraging further dollars. Creating more opportunities for giving toward natural resource issues is critical.

**GOAL #7:** Secure stable funding and financial opportunities for natural resource management.

Objective #7A: Each conservation district will increase their supplemental funding by one additional source by 2012 based on the districts' 2006 annual reports.

Objective #7B: Obtain funding for 14 conservation technicians by 2012 based on the districts' 2006 staffing levels.

Objective #7C: Identify or create one additional funding source for shelterbelt renovation by 2012 based on the development of a new cost/share program.



Ring-necked pheasant

PHOTO COURTESY OF USDA NATURAL RESOURCES CONSERVATION SERVICE

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Wetlands in the Prairie Pothole region of Northeastern  
South Dakota

PHOTO BY DON POGGENSEE,  
2001 USDA NATURAL RESOURCES CONSERVATION SERVICE



South Dakota Department of Agriculture

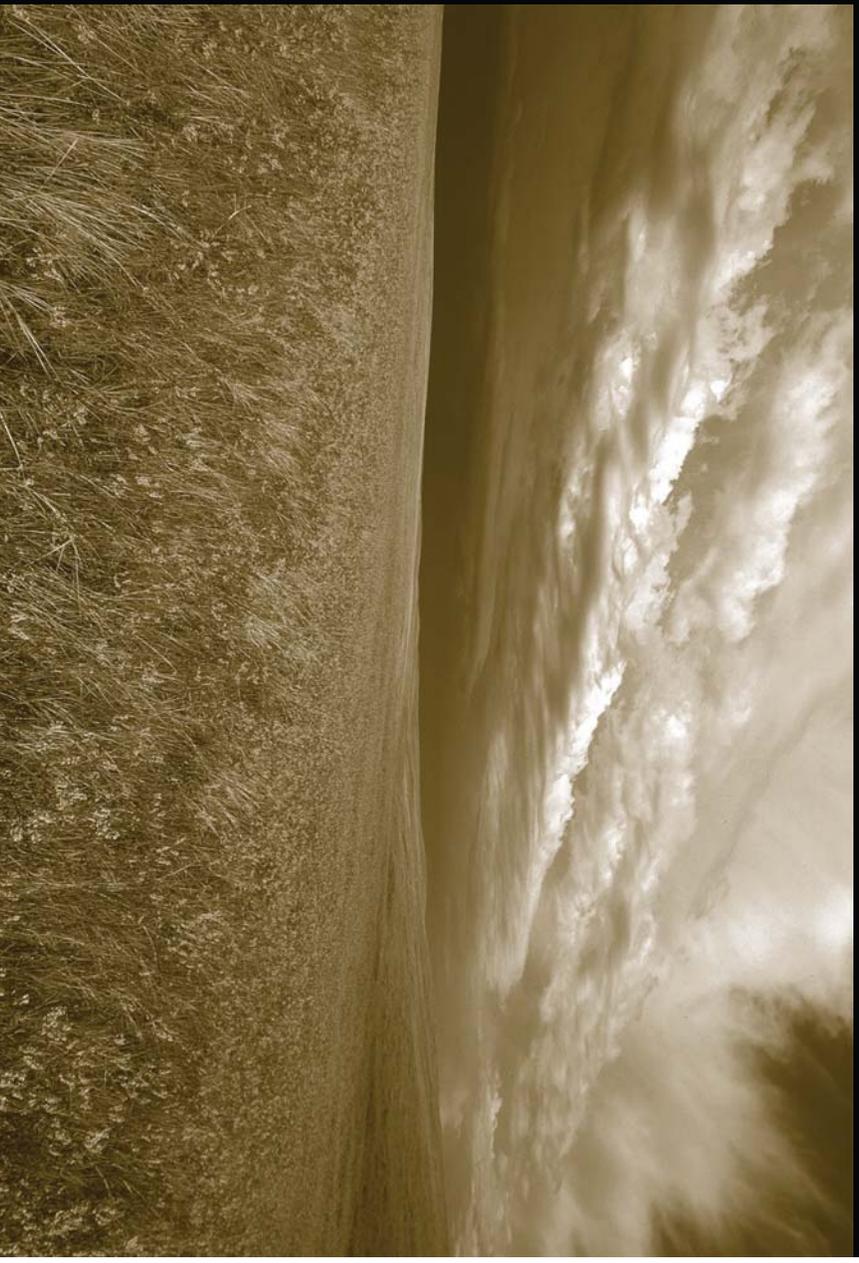
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South Dakota prairie and sky

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