

## 1.1 Land Use

The three predominant uses of land in the contiguous 48 States are grassland pasture and range, forest-use land, and cropland, in that order. Total cropland (used for crops, used for pasture, and idled) has trended down slightly since the late 1960s. Greater variation has occurred in cropland used for crops. Changes in 1996 farm policy reduced the impact of farm programs on cropland used for crops. Weather, such as drought or heavy rains, can strongly influence the acreage of cropland used for crops from year to year. Programs aimed at farmland preservation have received increasing attention in recent years.

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The total land area of the contiguous 48 States is approximately 1.9 billion acres, with an additional 365 million acres in Alaska and a little over 4 million acres in Hawaii (table 1.1.1). Because Alaska has very little crop area and Hawaii primarily grows crops that are not grown elsewhere in the United States, the discussion in this chapter focuses on the contiguous 48 States.

Land is the first factor of production. Land's potential uses and its location determine its economic value. Land use can affect the environment and the sustainability of production; land used in one way often prevents or reduces other uses (see box on [Land Use Choice: Theory and Practice](#)).

### Major Land Uses in the Contiguous States

Grassland pasture and range, the largest use of land, accounted for 578 million acres (31 percent of major land uses in the 48 States) in 1997 (table 1.1.1, fig. 1.1.1). However, grassland pasture and range acreage has declined since the mid-1960s, when it was 636 million acres. Several reasons account for this decline. Farmers, with assistance from USDA agencies, the Cooperative State Research, Education, and Extension Service and the Natural Resources Conservation Service, and other agencies have improved the forage quality and productivity of grazing lands. Thus less pasture and range is needed to sustain grazing herds. Also, the number of domestic animals, particularly sheep and draft animals, has been declining in recent years, further reducing the need for pasture and range.

**Table 1.1.1—Major uses of land, United States, 1997**

Land use <sup>1</sup>	Acreage of land		Proportion	
	48 States	United States	48 States	United States
	<i>Million acres</i>		<i>Percent</i>	
Cropland	455	455	24.0	20.1
Grassland pasture and range	578	580	30.5	25.6
Forest-use land	553	642	29.2	28.4
Special uses	207	352	10.9	15.5
Miscellaneous other land	102	235	5.4	10.4
<b>Total land area<sup>2</sup></b>	<b>1,894</b>	<b>2,263</b>	<b>100.0</b>	<b>100.0</b>

<sup>1</sup>See the Glossary at the end of this section for definitions of land-use categories.

<sup>2</sup>Distributions by major use may not add to totals due to rounding.

Sources: USDA, ERS, based on AAR, 1997; BLM, 1998; BOC, 1999; FHWA, 1997; FS, 1998, 1999a; FWS, 1997; GSA, 1998; NASS, 1998, 1999a, 1999b; NPS, 1997; and unpublished data sources.

### **Land-Use Choice: Theory and Practice**

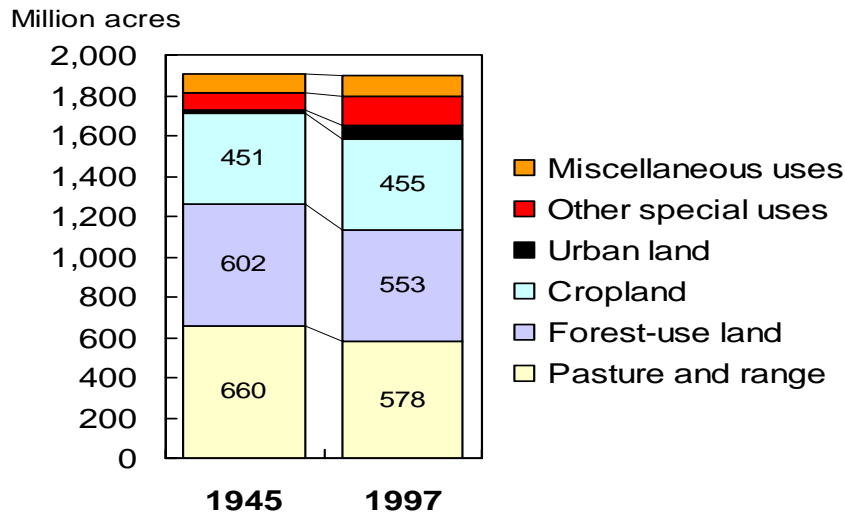
In theory, land-use choice is straightforward: Land is devoted to the use that provides the greatest value to its owner, as measured by the present value of the stream of returns expected in future years. In reality, land-use choice often involves a complex interaction of factors, including the characteristics of the land, the landowner, and the economic and policy contexts in which the choice is made.

Complexity arises in part because land is a highly differentiated economic resource. The location of land, as measured by proximity to the city center, transportation links, or recreational and aesthetic amenities is a key determinant of its value for residential or commercial development. Productivity, erodibility, and topography largely determine future returns to crop production, pasture, and forestry. Moreover, land may simultaneously pose characteristics that are favorable to and detract from its value for a particular use, creating tradeoffs in land-use decisions. For example, highly productive land may also be highly erodible. Using such land for crops will result in high yields, but may also mean high erosion control costs or, if erosion is unchecked, loss of future productivity. Finally, technological change may ameliorate land-related limitations to specific uses. One example is the development of rolling land for irrigated crop production following the introduction of center-pivot irrigation technology.

Exactly how these factors are assessed depends on the inclinations, circumstances, and economic expectations of individual landowners. For example, landowners who are optimistic about future returns to crop production will use more land for crops than those who are pessimistic. Other factors that affect land-use choices include management skills; discount of future income (where initial land conversion costs are high or for land uses where returns are delayed, e.g. forestry); risk aversion; and the age, occupation, or residence of the landowners.

Government policies and programs affect landowner expectations and actions. Federal farm commodity programs have long been suspected of encouraging crop production on marginally productive or environmentally sensitive land. Under the Sodbuster and Swampbuster provisions of the 1985 Farm Act, payments are now withheld from farmers who crop highly erodible land without an approved conservation plan or who drain wetlands. Zoning rules and land taxation may be important in urban fringe areas where rural land is being rapidly developed for residential or commercial purposes. For example, a jurisdiction seeking to retain open space may zone land for agricultural purposes or provide "use value" taxation to landowners who use land for agriculture.

**Figure 1.1.1--Major uses of land in the contiguous 48 States**



Sources: USDA,ERS,based on Krupa and Daugherty, 1990; Daugherty, 1995; and sources for [table 1.1.1](#).

*Forest-use land*, the second largest area among major uses, declined from about 32 percent of total land in 1945 to 29 percent in 1997. All land with a forest cover comprises an even larger area--nearly 618 million acres (33 percent) in 1997. However, much forested land is in special uses (parks, wilderness areas, and wildlife areas) that prohibits forestry uses such as timber production. These areas increased from 23 million acres in 1945 to 96 million acres in 1997. In addition, some of the decline in forest-use land was converted to other uses, such as urban uses, and miscellaneous uses. As a result, land defined as forest-use declined consistently from the 1960s to 1997. Special uses have trended upward since 1945 ([table 1.1.2](#)).

*Cropland* comprises the third largest use of land (24 percent in 1997) ([table 1.1.1](#)). Total cropland in the contiguous States varied about 8 percent between 1945 and 1997--ranging from 478 million acres in 1949 to 444 million acres in 1964 ([table 1.1.2](#)). The 1997 cropland base of 455 million acres was the lowest since 1964.

The cropland base includes cropland used for crops, cropland idled (including CRP), and cropland used for pasture. These components vary more than total cropland. The amount of cropland used for crops has ranged from 383 million acres in 1949 and 1982 to 331 million acres in 1987 ([table 1.1.2](#)). There has been no trend, but instead seemingly two major cycles, with cropland moving from idle into crop use and back again.

Between 1945 and the 1949 peak, cropland used for crops expanded rapidly to meet increased foreign demand for U.S. grain. After the postwar agricultural recovery in Europe and Asia, cropland used for crops gradually declined until the early 1970s, when a second round of strong foreign demand occurred for U.S. grains, peaking in 1982. Beginning in 1982, a severe recession in the United States and in other major markets weakened the demand for U.S. agricultural products and grain surpluses piled up. Annual Federal crop programs and the long-term Conservation Reserve Program (starting in 1986) idled additional cropland, again reducing the acreage used for crops.

**Table 1.1.2C Major uses of land in the contiguous United States, 1945-97**

Land use <sup>1</sup>	1945	1949	1954	1959	1964	1969	1974	1978	1982	1987	1992	1997
	<i>Million acres</i>											
Cropland <sup>2</sup>	451	478	465	458	444	472	465	471	470	464	460	455
Cropland used for crops	363	383	381	358	335	333	361	368	383	331	337	349
Cropland idled	40	26	19	34	52	51	21	26	21	68	56	39
Cropland used for pasture	47	69	66	65	57	88	83	76	65	65	67	68
Grassland pasture and range	660	631	632	630	636	601	595	584	594	589	589	578
Forest-use land <sup>2</sup>	602	606	615	611	612	603	599	583	567	558	559	553
Forestland grazed	345	320	301	244	224	198	179	171	158	155	145	140
Forestland not grazed	257	286	314	367	388	405	420	412	410	404	414	412
Special uses <sup>2</sup>	100	105	110	124	145	143	148	167	177	191	194	207
Urban land	15	18	19	27	29	31	35	44	50	56	58	64
Transportation	23	23	25	25	26	26	26	26	26	25	25	25
Recreation and wildlife areas	23	28	28	32	50	53	57	66	71	84	87	96
National defense areas	25	22	27	29	29	23	22	22	22	19	19	15
Misc. farmland uses	15	15	12	11	11	10	8	8	8	7	6	7
Miscellaneous other land	93	84	81	79	63	78	91	92	89	94	92	102
<b>Total land, 48 States<sup>2,3</sup></b>	<b>1905</b>	<b>1904</b>	<b>1904</b>	<b>1902</b>	<b>1900</b>	<b>1897</b>	<b>1897</b>	<b>1897</b>	<b>1896</b>	<b>1896</b>	<b>1894</b>	<b>1894</b>

<sup>1</sup> See the Glossary at the end of this section for definitions of land-use categories. Land use inventories were conducted prior to 1945 by an ERS predecessor agency, the Bureau of Agricultural Economics. However, different definitions were used prior to 1945. It was in 1945 that definitions were developed that marked the beginning of a relatively consistent series.

<sup>2</sup> Distribution may not add to totals due to rounding.

<sup>3</sup> Totals differ over time due to remeasurement of the U.S. land area.

Source: Daugherty, 1995; Krupa and Daugherty, 1990; and sources for [table 1.1.1](#).

Cropland is idled every year for reasons other than government programs, including weather or soil conditions at planting time, low crop prices, or holding for eventual conversion to nonagricultural uses.

Between 1945 and 1997, cropland used for pasture ranged from 47 million acres in 1945 (10 percent of total cropland) to 88 million acres (19 percent) in 1969 ([table 1.1.2](#)). Cropland pasture has averaged about 14 percent of total cropland.

*Special uses* include urban; rural transportation; rural parks and wildlife; defense and industrial uses; and farmstead, farm roads and lanes, and other miscellaneous on-farm uses ([table 1.1.2](#)). These uses increased from 100 million acres (5 percent of the land area of the contiguous United States) in 1945 to 207 million acres (11 percent) in 1997.

In response to expanding U.S. population, land in urban uses--for homes, schools, office buildings, shopping sites, and other commercial and industrial uses--increased 328 percent from 15 million acres in 1945 to an estimated 64 million acres in 1997. While the U.S. population nearly doubled, the amount of land urbanized quadrupled. However, urban uses still comprise less than 3.5 percent of the total land area of the contiguous United States ([table 1.1.2](#)). (See "Urbanization of Agricultural and other Rural Land," later in this chapter, for a more detailed discussion of urban land in the United States).

Land in transportation uses (highways and roads, railroads, and airports in rural areas) increased by 4 million acres (17 percent) between 1945 and 1982. Transportation uses declined by 2 million acres from 1982 to 1992 (table 1.1.2) due to the abandonment of railroad facilities and rural roads, and the inclusion of some transportation uses into urban areas. A small increase occurred from 1992 to 1997 due to airport expansions reported in 39 States.

Land used for recreation and wildlife areas (Federal and State parks, wilderness areas, and wildlife refuges) expanded 324 percent from 1945 to 1997 (an increase of 73 million acres). The increase was mostly from conversion of Federal lands, previously in forest and grassland pasture and range uses. Land in defense and industrial uses declined 41 percent from 1945 to 1997 (a decrease of 10.1 million acres), primarily in Arizona and Nevada. Most of the decrease in defense areas in Arizona and Nevada reverted to miscellaneous other land. Miscellaneous farmland uses declined 8 million acres between 1945 and 1997. Behind this decline was fewer farms; a trend toward larger, consolidated farms; and an increasing tendency for farm families to live off the farm.

*Miscellaneous other land uses* decreased from 1945 to 1964, and other uses have since trended upward, showing a 10-percent increase from 1945 to 1997. These uses include marshes and open swamps not included in other major land uses, bare rock areas, deserts, and other uses not inventoried. Because wetland is a condition of the soil or land, it may occur on land in many uses. (See Wetlands.)

## **Regional Changes in Land Use**

While land in every use occurs in all 10 regions of the contiguous States, some uses are more concentrated in some regions than others (table 1.1.3). Regions with the largest cropland acreage are the Northern Plains, Corn Belt, and Southern Plains. Grassland pasture and range is concentrated in the Mountain and Southern Plains regions. Acreage in forest-use and special and miscellaneous uses are highest in the Mountain region.

Regional shifts in total cropland and cropland used for crops have occurred since 1945. The largest increases occurred in the Northern Plains, Mountain, and Corn Belt regions, with smaller increases in the Southern Plains, and Pacific regions.

The Northeast, Appalachian, Southeast, Delta States, and Lake States regions lost cropland between 1945 and 1997 (table 1.1.4). Eastern regions lost cropland because of climatic and geographic constraints; failure to capture economies of scale (that is, prevalence of small farms); and increased urbanization which drives up land prices and increases property taxes, which reduces agricultural profit margins. Western increases resulted in part from federally subsidized irrigation water.

Eight of the 10 regions lost grassland pasture and range between 1945 and 1997. These losses ranged from 1.7 million acres in the Delta States region to 36.6 million acres in the Mountain region (table 1.1.4). The Northeast region lost more than 72 percent of its grassland pasture and range, and the Appalachian, Corn Belt, and Lake States regions more than 50 percent. The Northeast and Appalachian regions saw the natural reforestation of grassland on abandoned small farms, loss of some grassland to urbanization, and concentration of the dairy industry. Decreases in the Corn Belt, Northern Plains, and Mountain regions were likely associated with the conversion of some grassland pasture or range to cropland as demand for grain intensified.

**Table 1.1.3--Major uses of land in the contiguous United States, by region, 1997**

Land use <sup>1</sup>	North-east	Lake States	Corn Belt	Northern Plains	Appalachian	South-east	Delta States	Southern Plains	Mountain	Pacific	United States
<i>Million acres</i>											
Cropland <sup>2</sup>	13.4	40.7	98.6	107.8	28.0	18.0	22.0	56.4	45.4	24.4	454.7
Cropland used for crops	10.7	35.0	83.4	89.0	16.9	11.6	16.3	32.4	33.7	19.4	348.6
Cropland idled	0.8	3.2	5.2	9.0	2.1	1.9	1.7	6.3	6.1	2.3	38.7
Cropland used for pasture	1.8	2.5	9.9	9.8	8.9	4.5	4.1	17.7	5.6	2.7	67.5
Grassland pasture and range	2.8	5.0	11.6	68.3	5.4	9.1	5.5	115.4	302.7	52.1	578.0
Forest-use land <sup>2</sup>	66.2	49.2	31.3	4.3	71.5	71.9	50.8	18.0	112.6	76.7	552.5
Forestland grazed	1.3	2.8	6.6	2.0	4.8	6.1	14.4	9.3	66.4	26.8	140.4
Forestland not grazed	64.9	46.4	24.8	2.3	66.7	65.8	36.4	8.7	46.2	49.9	412.1
Special uses <sup>2</sup>	21.8	13.5	15.7	7.4	13.8	18.1	6.8	14.0	56.4	39.1	206.6
Urban land	11.4	4.4	8.3	1.3	6.2	9.1	3.1	7.2	5.4	7.9	64.3
Transportation	1.9	3.0	3.6	3.5	2.1	2.3	1.3	2.4	3.3	2.0	25.2
Recreation and wildlife areas	7.8	5.3	2.1	1.6	4.1	5.1	1.8	2.8	39.1	26.2	95.9
National defense areas	0.4	0.1	0.4	0.2	0.9	1.2	0.2	0.6	8.0	2.6	14.7
Misc. farm land uses	0.3	0.7	1.3	0.8	0.6	0.4	0.4	1.0	0.6	0.5	6.5
Miscellaneous other land	7.2	13.7	7.4	6.5	5.0	6.2	6.1	7.8	30.8	11.6	102.3
Total land, 48 States <sup>2</sup>	111.4	122.1	164.6	194.3	123.7	123.4	91.2	211.6	547.9	203.9	1,894.1

<sup>1</sup> See the Glossary at the end of this section for definitions of land-use categories.

<sup>2</sup> Distribution may not add to totals due to rounding.

Sources: Same as [table 1.1.1](#).

**Table 1.1.4CNet change in major uses of land in the contiguous United States, by region, 1945-97**

Land use <sup>1</sup>	North-east	Lake States	Corn Belt	Northern Plains	Appalachian	South-east	Delta States	Southern Plains	Mountain	Pacific	United States <sup>2</sup>
<i>Million acres</i>											
Cropland <sup>2</sup>	-11.6	-5.5	+6.3	+12.4	-7.0	-9.0	-2	+4.6	+13.1	+1.0	+4.0
Cropland used for crops	-10.2	-4.2	+5.5	+5.4	-6.0	-8.5	.0	-10.2	+9.5	+4.1	-14.6
Cropland idled	-1.0	+1.1	+2.3	+4	-1.6	-2.5	-7	+3.4	-.1	-2.6	-1.4
Cropland used for pasture	-.4	-2.4	-1.5	+6.6	+6	+2.0	+6	+11.3	+3.7	-.5	+20.0
Grassland pasture and range	-7.3	-5.1	-14.7	-14.0	-8.2	+4	-1.7	+10.3	-36.6	-4.7	-81.5
Forest-use land <sup>2</sup>	+4.5	-5.3	+2.4	+2	+7.8	-1.1	-6	-28.3	-8.9	-19.9	-49.2
Forestland grazed	-7.7	-12.5	-11.0	-1.4	-34.8	-47.5	-28.7	-33.1	-18.3	-9.7	-204.6
Forestland not grazed	+12.1	+7.3	+13.4	+1.6	+42.6	+46.4	+28.1	+4.8	+9.4	-10.2	+155.4
Special uses <sup>2</sup>	+11.4	+6.4	+5.7	-.2	+7.0	+11.6	+3.0	+8.1	+28.4	+25.2	+106.6
Urban land	+7.4	+2.9	+5.6	+8	+5.1	+7.9	+2.4	+6.2	+4.8	+6.0	+49.3
Transportation	.0	+2	+2	-.6	+3	+7	+5	+7	+4	+3	+2.6
Recreation and wildlife areas	+5.0	+4.6	+1.9	+9	+2.9	+4.4	+1.3	+1.9	+30.4	+19.9	+73.3
National defense areas	-.1	-.3	-.5	-.4	-.1	-.6	-.7	-.4	-6.4	-.6	-10.1
Misc. farm land uses	-.8	-1.0	-1.5	-.9	-1.2	-.7	-.5	-.4	-.9	-.5	-8.5
Miscellaneous other land	+2.	+8.7	-.5	+4	-.7	-3.1	-2.3	+3.9	+3.0	-2.6	+8.9
Total change, 48 States <sup>2</sup>	-1.0	-.6	-.9	-1.1	-1.2	-1.1	-1.8	-1.5	-1.1	-1.0	-11.3

<sup>1</sup> See the Glossary at the end of this section for definitions of land-use categories.

<sup>2</sup> Distribution may not add to totals due to rounding. Totals of net change do not add to 0 due to periodic remeasurement of the U.S. land area (see [table 1.1.2](#)).

Source: Daugherty, 1995; Krupa and Daugherty, 1990; and sources for [table 1.1.1](#).

In most regions, the changes in forest-use land were relatively small. The Northeast and Appalachian regions gained 4 million and 8 million acres of forest land, mainly from farm fields reverting to forest. The Pacific and Mountain regions lost forest-use land to recreation and wildlife areas. One-quarter of forest-use lands were grazed in 1997, down from over half in 1945. The proportional decline was greatest in the more heavily forested Southeast, Appalachian, Southern Plains, and Delta States regions. The decline in grazing derives from an increased emphasis on improving and managing farm woodlands. In the 1940s and 1950s, the Cooperative Extension Service encouraged farmers to fence livestock out of farm woodlands and to manage these areas for increased productivity of timber and other wood products. In some areas, such as the Appalachian region, many small farms ceased crop and livestock production and became forested. These reforested areas were generally not grazed.

The reduced grazing of forest-use land also reflects major changes in livestock production, including increased emphasis on improved grassland pastures; greater use of controlled, rotation grazing; and increased concentration and specialization in the dairy and beef cattle industry (as opposed to earlier general farming practices). By-products of other industries--such as beet and citrus pulp now substitute for forage. Also, some of the larger, more concentrated dairy farms have moved to confined animal operations, where the cows are not pastured during their production cycle.

The location of special-use lands shifted considerably during 1945-97. Urban-use lands expanded most rapidly in the warmer Sunbelt States of the Southeast and Southwest. Land in rural transportation facilities increased in 8 of the 10 regions, while land in recreation and wildlife areas increased in all regions. In contrast, land in national defense areas and miscellaneous farm uses declined in all regions.

## **Cropland Use and Programs**

Total cropland consists of cropland used for crops, cropland idled, and cropland used for pasture (tables 1.1.2-1.1.4). While total cropland has varied up and down and generally declined since 1969, greater shifts have occurred between cropland used for crops and cropland idled, mostly because of Federal programs. Cropland used for pasture has shown less variation than cropland idled.

### ***Cropland Used for Crops***

Most cropland used for crops is harvested, but typically 2-3 percent experiences crop failure and 5-10 percent is cultivated summer fallow (table 1.1.5, fig. 1.1.2). In 1999, farmers harvested one or more crops on an estimated 317 million acres of cropland, up 2 million acres from 1998, largely the result of increased soybean, cotton, and sorghum acres. About 10 million acres of the total harvested were double-cropped. When double-cropped land is counted twice, acres harvested come to 327 million acres.

The 344 million acres estimated to have been cropland used for crops (cropland harvested, crop failure, and summer fallow) in 1999 were down about 1 million acres (0.2 percent) from 1998 (table 1.1.5). While down, this is still the fifth largest area used for crops since 1986, the year in which the Conservation Reserve Program (CRP) began. The 2 million-acre increase in harvested acres is coincident with a corresponding decrease in failed acres. Cropland idled in Federal programs has decreased about 25 million acres since 1995 with the elimination of annual commodity programs and changes to the CRP.

Four crops--corn for grain, soybeans, wheat, and hay--accounted for 80 percent of all crop acres harvested in 1999 (table 1.1.6 and figs. 1.1.3, 1.1.4). The additional 17 "principal" crops accounted for another 16 percent of

**Table 1.1.5--Major uses of cropland, United States, 1987-99<sup>1</sup>**

Cropland	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999 <sup>2</sup>
<i>Million acres</i>										
Cropland used for crops <sup>3</sup>	341	337	337	330	339	332	346	349	345	344
Cropland harvested <sup>4</sup>	310	306	305	297	310	302	314	321	315	317
Crop failure	6	7	8	11	7	8	10	7	10	8
Cultivated summer fallow	25	24	24	22	22	22	22	21	20	20
Cropland idled by all										
Federal programs <sup>3</sup>	62	65	55	60	49	55	34	33	30	30
Annual programs	28	30	20	23	13	18	0	0	0	0
Conservation Reserve Program	34	35	35	36	36	36	34	33	30	30
Total, specified uses <sup>3,5</sup>	403	402	392	389	388	388	380	382	375	374

<sup>1</sup> Includes the 48 contiguous States. Fewer than 200,000 acres were used for crops in Alaska and Hawaii.

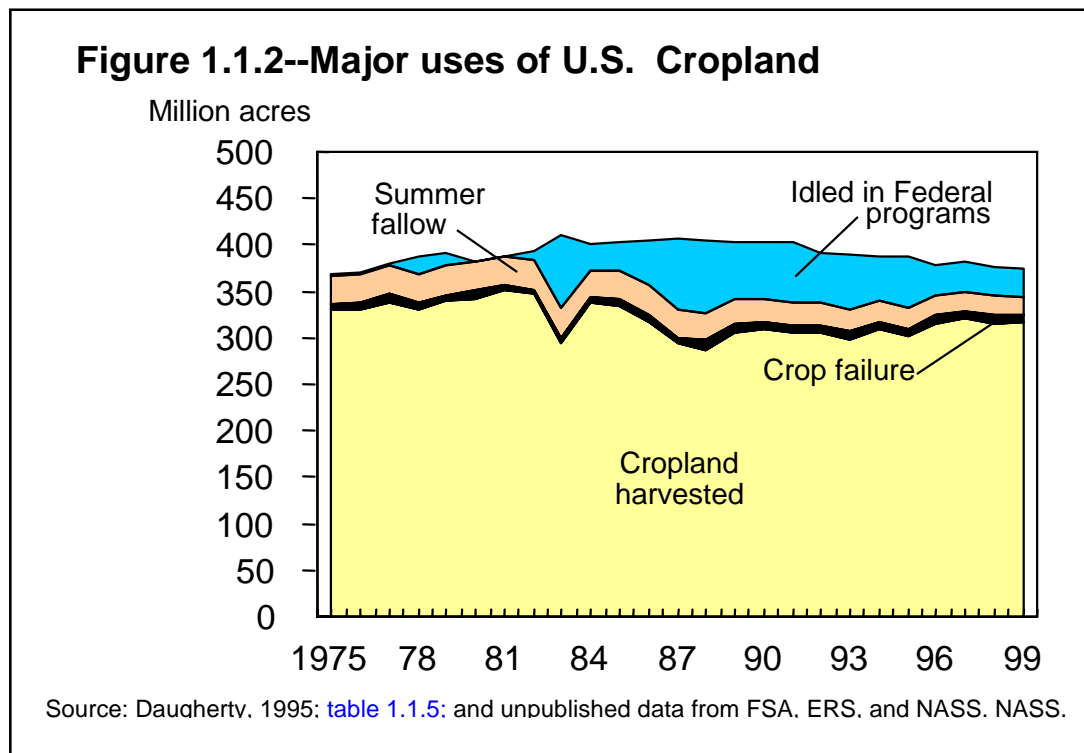
<sup>2</sup> Preliminary, subject to revision.

<sup>3</sup> Breakdown may not add to totals due to rounding.

<sup>4</sup> A double-cropped acre is counted as 1 acre.

<sup>5</sup> Does not include cropland pasture or idle land not in Federal programs that is normally included in the total cropland base.

Sources: USDA, ERS, based on ERS, 1997a; NASS, 1998, 1999a, 2000a; and unpublished data from FSA, ERS, and NASS.





**Table 1.1.6--Area of selected crops harvested, 1999**

Selected crops harvested <sup>1</sup>	Area	Proportion
	<i>1,000 acres</i>	<i>Percent</i>
Principal crops harvested:		
Soybeans	72,476	22.2
Corn for grain	70,537	21.6
All hay	63,160	19.3
All wheat	<u>53,909</u>	<u>16.5</u>
Subtotal, top 4	260,082	79.5
Cotton	13,381	4.1
Sorghum for grain	8,544	2.6
Corn silage	6,062	1.9
Barley	4,758	1.5
Rice	3,562	1.1
Sunflower	3,441	1.1
Oats	2,453	0.8
Dry edible beans	1,877	0.6
Sugarbeets	1,527	0.5
Peanuts for nuts	1,428	0.4
Potatoes	1,333	0.4
Canola	1,044	0.3
Sugarcane	956	0.3
Tobacco	644	0.2
Millet	540	0.2
Rye	383	0.1
Sorghum silage	<u>320</u>	<u>0.1</u>
Total, principal crops <sup>2</sup>	312,335	95.5
Noncitrus fruits <sup>3</sup>	2,122	0.6
Fresh market vegetables <sup>4</sup>	1,899	0.6
Processing vegetables <sup>5</sup>	1,509	0.5
Citrus fruits <sup>6</sup>	1,112	0.3
Tree nuts <sup>7</sup>	770	0.2
Other crops <sup>8</sup>	7,210	2.2
Estimated total crops harvested <sup>2,9</sup>	325,435	100.0

<sup>1</sup> Sum of indicated crops for contiguous 48 States.

<sup>2</sup> Percentage distributions may not add to totals due to rounding.

<sup>3</sup> Bearing acreage of apples, apricots, avocados (1998), berries, cherries, cranberries, dates, figs, grapes, kiwi fruit, nectarines, olives, peaches, pears, plums, prunes, and strawberries.

<sup>4</sup> Area harvested of artichokes, asparagus, lima beans, snap beans, broccoli, Brussels sprouts, cabbage, cantaloupes, carrots, cauliflower, celery, sweet corn, cucumbers, eggplant, escarole/endive, garlic, honeydews, lettuce, onions, bell peppers, spinach, tomatoes, and watermelons.

<sup>5</sup> Area harvested of lima beans, snap beans, beets, cabbage, carrots, sweet corn, cucumbers, green peas, spinach, and tomatoes.

<sup>6</sup> Bearing acreage of oranges, grapefruit, K-early citrus, lemons, limes, tangelos, tangerines, and temples.

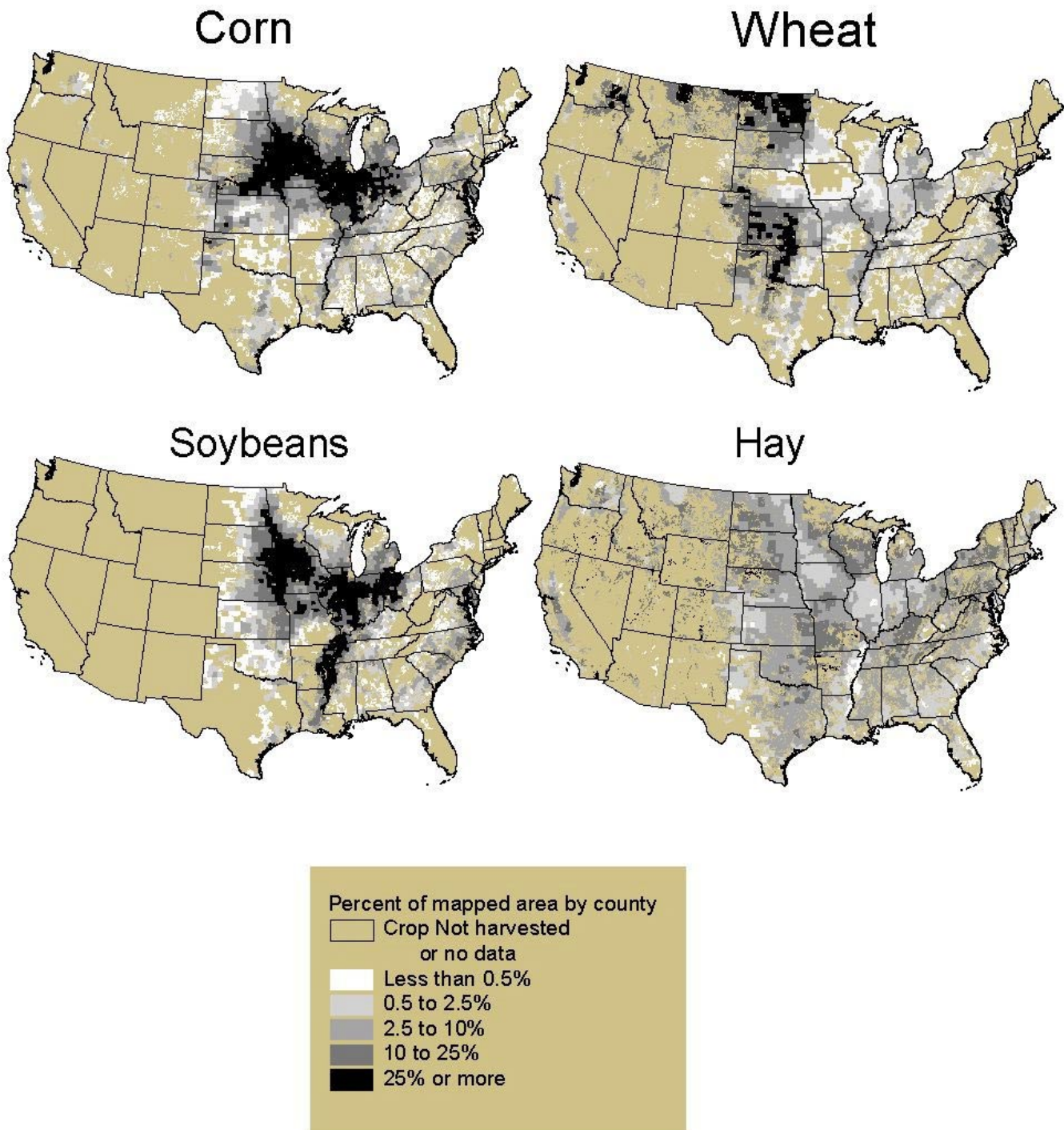
<sup>7</sup> Bearing acreage of almonds, hazelnuts, pistachios, and walnuts.

<sup>8</sup> Determined as a residual.

<sup>9</sup> Includes double cropping.

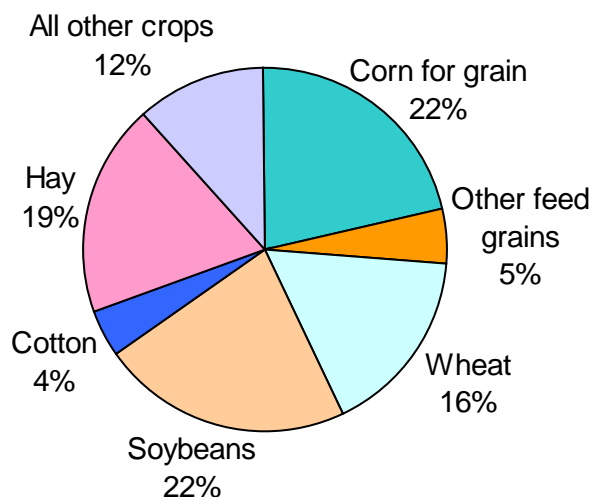
Source: USDA, ERS, based on NASS, 1999c, 2000a, 2000b, 2000c.

Figure 1.1.4 -- Geographic location of major crops, 1997



Source: USDA, ERS based on 1997 Census of Agriculture, USDA, NASS

**Figure 1.1.3--Harvested crops, 1999**



Source: USDA, ERS, based on NASS, 1999a, 1999b, 1999c, 1998.

harvested area. Vegetables, fruits, nuts, melons, and all other crops accounted for 4.5 percent of crop area harvested in 1999.

The 2 million-acre increase in harvested cropland in 1999 occurred despite a 5.1 million-acre decrease in wheat acreage and a 2.1 million-acre decrease in corn acreage (table 1.1.7). Smaller decreases also occurred for barley, oats and 5 other crops (not shown in table 1.1.7). However, there were increases in soybeans (2.1 million acres), cotton (2.7 million acres), hay (3.1 million acres), and other crops. These changes, together with a decrease in double-cropped acreage, contributed to the 2 million-acre net increase in harvested cropland from 1998 to 1999.

The decrease in harvested wheat acreage is the third straight year of reductions. Wheat reductions occurred in most regions with the largest share in the Northern and Southern Plains regions. Increases of soybean acreage in the Corn Belt and Northern Plains and of cotton and hay, mostly in the Southern Plains, accounted for most of the 2 million-acre increase of harvested cropland.

Food crop acres have tended to increase over the past 30 years, while feed and other crops have declined (Daugherty, 1995). Among crops used mostly for food, wheat acreage is higher now than in the 1960s, but down from the early 1980s. Rice production followed a similar pattern. Soybean acres harvested in 1999 were the largest on record, after experiencing declines during the late 1980s and early 1990s. Peanuts increased from the 1960s through the 1980s and have since decreased. Rye has decreased from a high of 1.7 million acres in 1971 to 383,000 acres in 1999. Sunflower production increased until the early 1980s, declined for a few

**Table 1.1.7 Harvested area of major crops, by region, 1993-99**

Crop and period	North-east	Lake States	Corn Belt	Northern Plains	Appalachian	South-east	Delta States	Southern Plains	Mountain	Pacific	United States <sup>1</sup>
<i>Million acres</i>											
Corn: <sup>2</sup>											
1993-97 avg.	2.3	11.2	33.5	13.9	3.0	1.1	0.8	2.0	1.1	0.3	69.3
1998	2.3	11.8	34.0	15.8	2.9	0.8	1.3	2.1	1.3	0.4	72.6
1999 <sup>3</sup>	2.0	11.4	33.9	15.2	2.7	0.8	0.7	2.1	1.4	0.3	70.5
Sorghum: <sup>2</sup>											
1993-97 avg.	-	-	0.7	4.6	0.1	0.1	0.4	3.3	0.4	-	9.4
1998	-	-	0.4	4.0	<sup>4</sup>	<sup>4</sup>	0.3	2.6	0.3	-	7.7
1999 <sup>3</sup>	-	-	0.4	4.0	<sup>4</sup>	<sup>4</sup>	0.4	3.4	0.3	-	8.5
Barley:											
1993-97 avg.	0.2	0.7	-	2.6	0.1	0.2	-	<sup>4</sup>	2.1	0.7	6.5
1998	0.2	0.5	-	2.0	0.1	-	-	<sup>4</sup>	2.3	0.8	5.9
1999 <sup>3</sup>	0.2	0.3	-	1.3	0.1	-	-	<sup>4</sup>	2.2	0.8	4.8
Oats:											
1993-97 avg.	0.3	0.9	0.5	1.1	<sup>4</sup>	0.1	<sup>4</sup>	0.2	0.2	0.1	3.3
1998	0.3	0.7	0.4	0.9	<sup>4</sup>	0.1	<sup>4</sup>	0.2	0.1	0.1	2.8
1999 <sup>3</sup>	0.2	0.7	0.4	0.7	<sup>4</sup>	0.1	<sup>4</sup>	0.1	0.2	0.1	2.5
Wheat:											
1993-97 avg.	0.6	3.1	4.3	27.4	1.7	0.7	1.3	8.5	10.4	4.1	62.2
1998	0.7	2.7	4.3	24.8	1.9	0.6	1.1	9.0	10.0	4.0	59.0
1999 <sup>3</sup>	0.6	2.7	3.5	22.7	1.6	0.5	1.2	7.7	9.9	3.5	53.9
Soybeans:											
1993-97 avg.	1.2	8.2	32.3	8.4	4.0	1.3	6.6	0.6	-	-	62.5
1998	1.3	9.8	35.8	11.1	4.3	1.1	6.5	0.7	-	-	70.4
1999 <sup>3</sup>	1.3	10.1	36.7	12.5	4.1	0.9	6.2	0.7	-	-	72.5
Cotton:											
1993-97 avg.	-	-	0.4	<sup>4</sup>	1.3	2.0	3.1	5.3	0.4	1.2	13.7
1998	-	-	0.4	<sup>4</sup>	1.2	2.1	2.4	3.5	0.3	0.8	10.7
1999 <sup>3</sup>	-	-	0.4	<sup>4</sup>	1.5	2.3	2.8	5.3	0.3	0.8	13.4
Rice:											
1993-97 avg.	-	-	0.1	-	-	-	2.1	0.3	-	0.5	3.0
1998	-	-	0.1	-	-	-	2.4	0.3	-	0.5	3.3
1999 <sup>3</sup>	-	-	0.2	-	-	-	2.6	0.3	-	0.5	3.6

- = None reported.

<sup>1</sup> Includes the 48 contiguous States. Because of rounding, regional acres may not sum to U.S. totals.

<sup>2</sup> Corn and sorghum for grain.

<sup>3</sup> Preliminary, subject to revision.

<sup>4</sup> Less than 50,000 acres.

Sources: USDA, ERS, based on ERS, 1997a; NASS, 2000a.

years, and has been generally increasing since the 1990s. Several other principal crops--dry edible beans and peas, potatoes, and sugarbeets--occupy a comparatively small acreage and have exhibited no major trends (USDA, ERS, 1997a).

Among crops used primarily for feed grains, corn acreage reached a high of 110 million acres in 1932, decreased to a little over 80 million acres in the late 1950s, and has since ranged from the low 60- to the low 80-million acre range. Corn was at 77 million acres in 1999. Sorghum and barley fluctuated year to year until the mid-1980s, when barley increased to a 30-year high and sorghum to a 14-year high. Both crops have declined since the mid-1980s. Oats have trended down over the last 55 years, while acreage of all hay has changed very little.

Harvested acreage of cotton hit a low of less than 8 million acres in 1983 and has since trended upward toward the levels of the late 1970s. Tobacco, at a 15-year high in 1997, decreased to 644,000 acres in 1999.

The demand for vegetable oils has led to increased production of special oilseed crops. Special oilseeds currently reported by NASS include canola, rapeseed, safflower, and mustard seed (USDA, NASS, 1999b). Since 1994, special oilseed crops increased 133 percent, from 588,100 acres to 1,369,200 acres in 1999, almost all due to increased acreage of canola.

### ***Cropland Idled Under Federal Programs***

The Federal Agriculture Improvement and Reform Act of 1996 (the 1996 Farm Act) eliminated the authority of USDA to implement an annual Acreage Reduction Program (ARP) and other annual acreage diversions. As a result, no land was idled under annual commodity programs after 1995. Prior to 1996, producers of corn, rice, sorghum, oats, barley, wheat, and cotton who decided to participate in USDA commodity programs were required to idle a proportion of the crop acreage base and place it in the ARP in order to receive program benefits. These requirements varied by crop and year from 0 to 35 percent. Since 1996 no land has been idled under annual commodity programs, compared with 18 million acres in 1995 and a range of 13 to 60 million acres idled since 1986. As of 1999, land idled under the long-term Conservation Reserve Program (CRP) is at 30 million acres (table 1.1.5). This is down from a combined annual and long-term peak of 78 million acres idled in 1983 (fig. 1.1.5). The extent of idled acres from participation in the CRP varies greatly by farm production region, with the most participation occurring in the Northern Plains and Mountain States (fig. 1.1.6). (See chapter 6.2, "Land Retirement," for more detail.)

## **Agricultural Land Use Issues**

### ***Federal Restrictions on the Use of Public and Private Land***

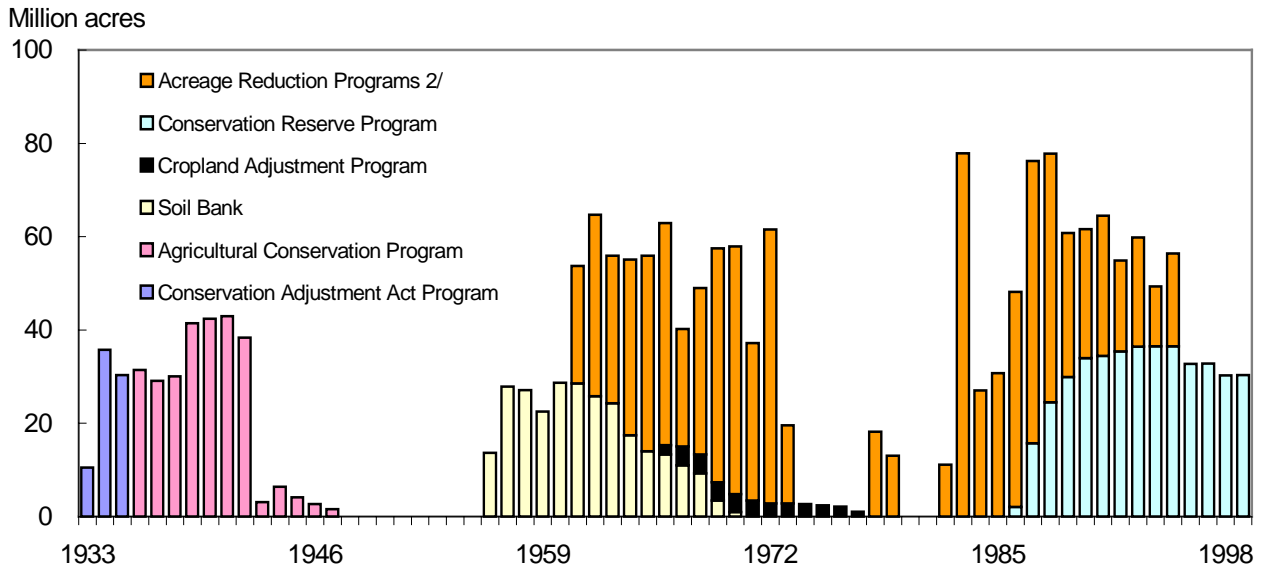
The Federal Government restricts the use of land in several ways. Government regulations, conservation easements, contracts, or other instruments that arise out of law, custom, and the operation of private markets serve to regulate and restrict both landowners' and society's rights to use land (see box, [The Private Property Rights Issue](#)).

For example, as of 1999, 104.6 million acres of Forest Service, BLM, FWS, and NPS land had been designated as wilderness by Congress (National Wilderness Preservation System, NWPS, web site, September 1999), restricting the use of motorized equipment, construction of buildings and roads, development of commercial enterprises, and other activities. Another 17.3 million acres of BLM land had been designated as wilderness study areas, providing interim protection until Congress makes a final decision on their status. All of the land managed by FWS and NPS (169.1 million acres in 1998) is generally considered to be restricted for conservation purposes.

Federal programs also seek to encourage conservation on privately owned land through various means. Through Conservation Reserve program (CRP) contracts and Wetlands Reserve program (WRP) easements, the Federal Government acquires cultivation rights from willing farmers and farmland owners in an effort to reduce soil erosion, protect wildlife habitat, and improve water quality. The Endangered Species Act and the Clean Water Act control the ways in which landowners may use their land. These instruments, as well as other policy tools, are discussed further in chapters in section 6. In addition, the Federal tax code provides income and estate tax benefits for landowners that donate interests in environmentally valuable land to qualified conservation organizations.

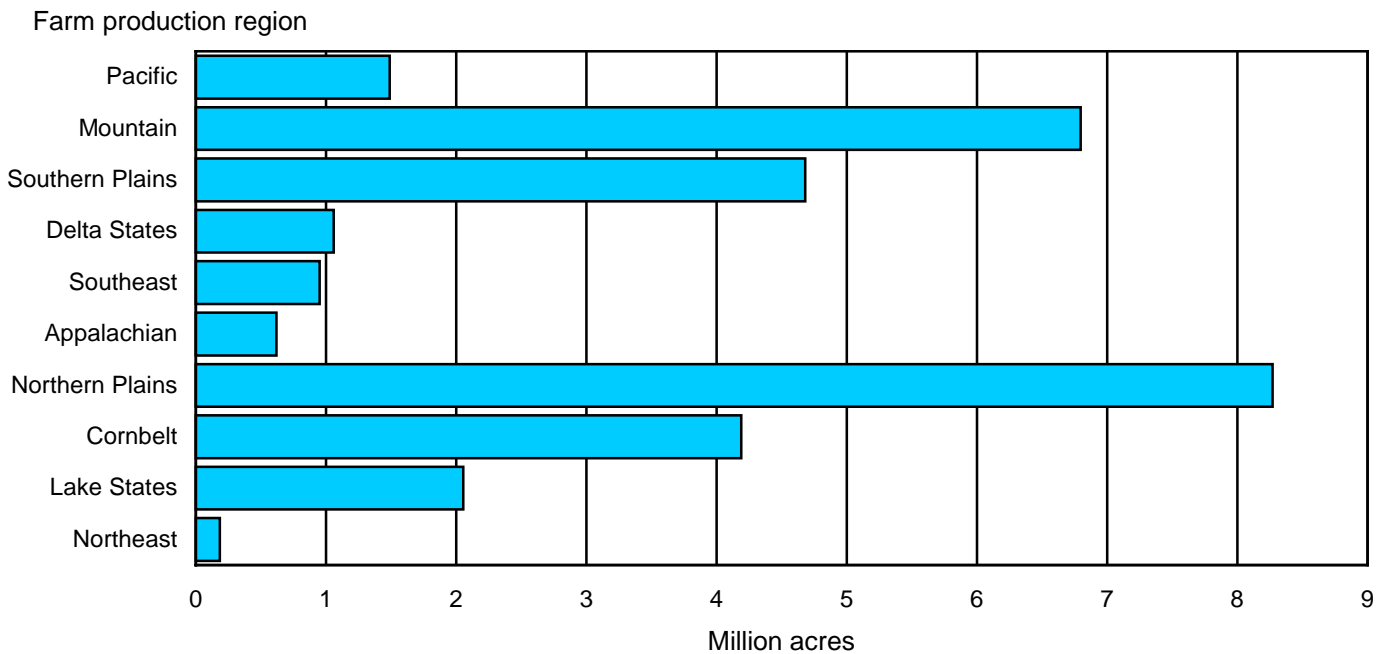
Apart from its treatment of conservation easements in the tax code, the Federal Government's role in farmland preservation consists of three pieces of legislation. The Farmland Protection Policy Act, part of the 1980 Farm

**Figure 1.1.5--Cropland acreage reduction by type of program, 1933-99** <sup>1/</sup>



1/ For yearly detail of programs since 1974, see ERS, 1997a, table 1.1.14.  
 2/ Acreage Reduction Programs include: Acreage Conservation Reserve, 0, 50/85-92 programs; Paid Land Diversion; and Payment-in-Kind programs.  
 Source: Crosswhite and Sandretto, 1991; updated by USDA, ERS, based on unpublished data from FSA.

**Figure 1.1.6--Cropland idled under the Conservation Reserve Program, by region, 1999**



Source: USDA, ERS, based on unpublished data from FSA.

### **The Private Property Rights Issue**

Property rights are the building blocks of land tenure. Property rights may be held publicly, as in federally owned national forests; held privately, as in most U.S. farmland; or held in combination, as when a government agency acquires a conservation easement on private land. A particular landowner may hold the rights to use his or her property for various purposes and to receive benefits or profits from those uses. Those rights generate value. Because a landowner's actions on his or her land may also generate adverse effects beyond the parcel's boundaries, however, the rights of each landowner are generally limited by the rights of other landowners and the rights of other members of society. These limitations take the form of local, State, and Federal restrictions on land use.

Private property is protected by the Constitution's Fifth Amendment, which states that private property shall not be taken for public use without just compensation. Only physical appropriations of property were viewed as "takings" until 1922, when the Supreme Court ruled that regulation could also be considered a taking if it went "too far" (*Pennsylvania Coal Company v. Mahon*). Even so, the courts have considered a regulation's impact on a property's value as only one among several criteria—such as the nature of the public purpose accomplished by the regulation—in determining whether a taking has occurred.

Congress has considered but so far rejected legislation that would require the Federal Government to compensate landowners whenever Federal restrictions on land use cause property values to fall by more than a threshold percentage. Such legislation would have established diminution in value as a sufficient criterion by which takings could be determined, regardless of other economic and legal criteria. Most States have also considered takings legislation in recent years, and about half have now enacted takings bills. Most of the bills passed by State legislatures require "takings impact assessments" rather than compensation for diminished property values.

Act, requires Federal agencies to identify and minimize adverse effects of their programs on farmland preservation and to ensure compatibility with State, local, and private farmland preservation programs. The Farms for the Future Act, part of the 1990 Farm Act, authorized the establishment of an Agricultural Resource Conservation Demonstration Project, which provides Federal loan guarantees and interest rate assistance for State trust funds through the Farmers Home Administration. In 1996, the Federal Agriculture Improvement and Reform Act increased direct Federal participation in farmland protection by establishing a Farmland Protection Program at the Federal level. This program was intended to protect 170,000-340,000 acres of prime, unique, or other farmland through USDA acquisition of easements or other interests in farmland. The initial funding of \$33.5 million was spent by November 1998 (NRCS, 1998). In January 2000, the Secretary of Agriculture made available another \$30 million through provisions in the Agricultural Risk Protection Act of 2000 (USDA, OC, 2001).

#### ***Non-Federal Programs to Preserve Land***

State and local government agencies and non-governmental organizations also acquire partial interests in private land for conservation purposes, including the preservation of farmland, wetlands, and wildlife habitat. Farmland preservation programs, which seek to retain land in agricultural use when land values rise due to urban pressure, operate primarily at the State and local levels.

One method used by State governments is to tax agricultural, forest, and open lands based on their current-use value rather than on their market value (which might reflect development pressure). Beginning with Maryland in 1956, all 50 States have now established programs that provide preferential property tax treatment for agricultural land (Malme, 1993; Aiken, 1989). Twenty States have "pure preferential programs," which provide special treatment while land remains in agricultural use but extract no penalty when land use changes. Other States impose deferred or "roll-back" taxes plus penalties when land is converted in order to recover at least a portion of the difference between the taxes paid and the taxes that would have been due without preferential

treatment. Preferential property tax treatment programs have generally had a limited effect in preventing conversion of farmland to more intensive uses because the tax benefits offered have not matched the profits available from conversion in areas experiencing development pressure (Malme, 1993).

In addition to property, income, and estate tax incentives for farmland preservation, public and private agencies also prevent farmland conversion through acquisition of agricultural conservation easements. Conservation easements are restrictions on land use voluntarily negotiated between landowners and conservation organizations (both public and private) that are binding on current and future landowners over a specified period of time. State and county programs generally acquire farmland preservation easements at fair market value, defined as the difference between the fair market value of the land unencumbered by an easement and the value of the land in agricultural use (Wiebe, Tegene, and Kuhn, 1996). Farmland preservation programs using easement acquisition have been established in 19 States to date, beginning with Maryland in 1977 (table 1.1.8). Maryland's is the largest program, protecting over 160,000 acres on over 1,000 easements so far. The State programs together have protected over 660,000 acres with over 4,000 easements, at average cost \$1,412 per acre. County farmland preservation programs are also active in many States. The Nation's 10 largest county programs are concentrated in California, Pennsylvania, Maryland, Washington, Colorado, New York, and Virginia (table 1.1.9). Together, State and local programs have protected over 819,000 acres with 5,252 easements at a cost of \$1.2 million. The average cost per acre is \$1,465.

Farmland preservation is also a goal of many land trusts, nonprofit conservation organizations that protect land from more intensive uses through direct involvement in voluntary land transaction activities. Over 1,200 land trusts operate at the local, State, or regional level, protecting 3.2 million acres through land ownership, conservation easements, and land transfers to government agencies (LTA, 1998). A few land trusts operate

**Table 1.1.8--State farmland preservation programs, 2000**

State	Year established	Area preserved	Easements	Average cost per acre <sup>1</sup>
		Acres	Number	Dollars
Maryland	1977	166,529	1,156	1,203
Massachusetts	1977	44,336	491	2,455
Connecticut	1978	26,000	185	2,923
New Hampshire	1979	9,096	67	1,138
Rhode Island	1981	3,311	43	4,581
New Jersey	1983	58,887	400	2,867
Pennsylvania	1988	147,643	1,193	1,626
Vermont	1987	83,411	263	501
Maine	1987	2,213	4	948
Delaware	1991	36,959	154	1,071
Kentucky	1994	1,337	8	799
Colorado	1994	71,942	34	139
Michigan	1994	4,081	23	3,083
California	1995	3,946	16	882
New York	1996	1,695	16	3,785
North Carolina	1999	1,981	12	379
Ohio	1999	254	1	2
Montana	1999	0	0	0
Utah	1999	0	0	0
Total for 19 States <sup>2</sup>		663,621	4,066	1,412

<sup>1</sup>Current dollars.

<sup>2</sup>See AFT web site for comments, footnotes and caveats. <http://farmlandinfo.org/fic/tas/tafs-pacestate.html>

Source: USDA, ERS, based on AFT fact sheet, web site, rev. March 2000.



**Table 1.1.9--Selected local farmland preservation programs, 2000<sup>1</sup>**

Local jurisdictions	Year established	Area preserved	Easements	Average cost	
				per acre <sup>2</sup>	
		Acres	Number	Dollars	
Marin	CA	1980	26,604	40	653
Sonoma	CA	1990	24,756	43	1,346
Lancaster	PA	1980	13,712	168	913
Harford	MD	1993	13,200	75	848
King	WA	1979	12,846	208	4,258
Howard	MD	1984	12,805	118	4,295
Douglas	CO	1994	10,944	6	621
Suffolk	NY	1974	6,743	113	5,330
Montgomery	MD	1998	5,130	51	3,559
Virginia Beach <sup>3</sup>	VA	1995	4,193	29	519
Other local jurisdictions			24,936	335	2,422
Total			155,869	1,186	1,974

<sup>1</sup> See AFT Web site for comments, footnotes and caveats.

<sup>2</sup> Current dollars. Based on payments to-date. Some jurisdictions pay on the installment plan, making their costs per acre appear lower.

<sup>3</sup> Virginia independent city.

Source: USDA, ERS, based on AFT fact sheet, web site, February 2000. <http://farmlandinfo.org/fic/tas/tafs-paceloc.pdf>

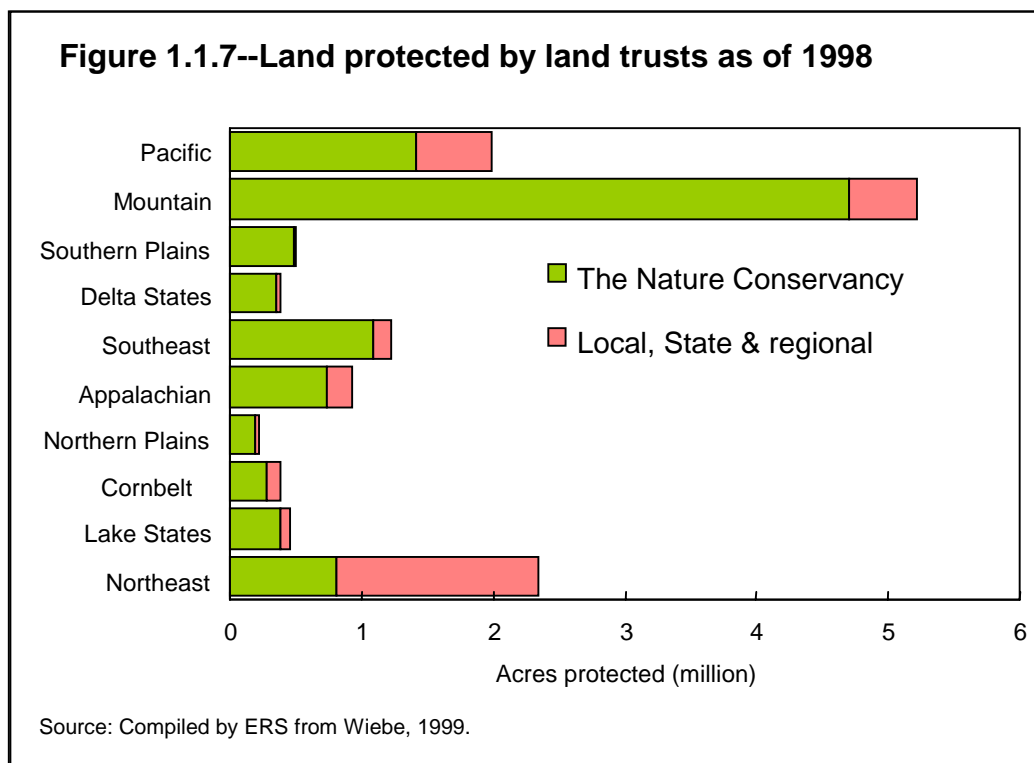
nationwide. The largest of these, The Nature Conservancy, specializes in the preservation of bio-diversity, protecting 10.5 million acres in the United States (TNC, 1998). Acreage protected by The Nature Conservancy was highest in the Mountain States, at 4.2 million acres (fig. 1.1.7). Acreage protected by local, State, and regional land trusts was highest in the Northeast, at 1.5 million acres.

The number of local, State, and regional land trusts grew by 38 percent between 1990 and 1998, to 1,213. Acreage protected more than doubled over the same period. About 0.8 million acres were owned by such land trusts, 1.0 million acres were transferred to government conservation agencies, 1.4 million acres were protected by conservation easements, and 1.5 million acres were protected by other means. Acreage protected by The Nature Conservancy increased by 103 percent between 1990 and 1998. About 0.9 million acres were owned, 2.8 million acres had been transferred to other conservation agencies, 1.1 million acres were protected by conservation easements, 3.4 million acres were protected under lease or management agreements, and 2.3 million acres were protected by other means.

The ultimate success of public agencies and private organizations in using easements and other partial interests in land to protect environmentally sensitive areas depends on the specific land-use restrictions that individual agreements contain. These restrictions may vary widely from one agreement to the next. Program success also depends on the strictness with which these restrictions are monitored and enforced.

### Urbanization of Agricultural and Other Rural Land

Preservation of agricultural land is a concern because cropland converted to urban uses is largely irreversible. Once converted to an urban use, land seldom shifts back to an agricultural use. It is important to know how much cropland is being lost to urban uses and how much of the loss is replaced from other major land uses.



Cropland lost to urban uses may potentially have an effect on the production of food and fiber, especially some specialty crops, and on the supply of rural amenities.

Urban land in the United States in 1990 constituted less than 3.5 percent of total land area. Seventy-five percent of the U.S. population lives in urban areas (table 1.1.10). (See box, [Urban Area](#), for a discussion of data and procedures used to estimate urban area.) Even with large increases in urban area, percentage decreases in rural area are small because rural area is much larger than urban area. The rate of expansion in urban area has decreased from 39 percent during the 1950s, to about 36 percent during the 1960s and the 1970s, to 18 in the 1980s, and an estimated 15 percent from 1990 to 1997. As urban area becomes larger, percentage increases have gotten smaller. In comparison, the 1992 National Resources Inventory shows a 26-percent increase from 1982-92 for the NRI categories of large and small urban and built-up areas (USDA, SCS, 1994). The small built-up portion by itself increased by 42 percent, from 4.5 to 6.4 million acres. However, the small built-up category was less than 10 percent of the total. Developed land, which includes urban and built-up, increased 13 percent from 1992 to 1997 (USDA, NRCS, 2000).

Land converted to urban uses comes from several different major land uses. From 1982 to 1992, 28 percent of new urban development came from cropland (fig. 1.1.8). The average annual expansion in urban area was about 1.3 million acres (table 1.1.11). Losing farmland to urban uses at this rate does not threaten total cropland or the level of agricultural production, which should be sufficient to meet food and fiber demands (Vesterby, Heimlich, and Krupa, 1994). However, urbanization has impacts on many other factors in addition to food and fiber production. These include open space, rural lifestyles, watershed protection, local rural economies, unique farmlands, sprawl, infrastructure costs, and others, and occur by region, State, county, and local levels.

Land use change is dynamic. With the exception of urban land, changes occur to and from major land uses (table 1.1.11). For example, 26.4 million acres (of prime and nonprime land) left the cropland and pasture

**Table 1.1.10—U.S. population and urban area, 1950-97**

Year	U.S. population			Urban	Urban
	Total	Urban	Portion urban	area <sup>1</sup>	area increase <sup>2</sup>
	--- Million ---	Percent	Percent	Million acres	Percent
1950	151	97	64	18	
1960	179	125	70	25	39
1970	203	150	74	35	36
1980	227	167	74	47	37
1990	249	187	75	56	18
1997 <sup>3</sup>	268	201	75	66	15

<sup>1</sup> Data differs somewhat from [table 1.1.1](#) due to different data sources and different time periods.

<sup>2</sup> Percent increase over that of 10 years past.

<sup>3</sup> Preliminary.

Sources: USDA, ERS, based on [table 1.1.2](#); BOC, 1999; Frey, 1983; and USDC, 1991.

category from 1982 to 1992 but 16.3 million acres came into the category, resulting in a net loss of 10.1 million acres. Forestland lost 14.2 million acres, but gained 15.2 million acres for a net gain of 1 million acres.

There is a concern that prime agricultural land is being converted to urban uses at a disproportionately high rate. "The land most likely to be converted to non-agricultural uses is prime farmland... Most U.S. cities and larger rural towns, therefore, are surrounded by productive agricultural land and any expansion must occur on such land (USDA, SCS, 1990)." Data from [table 1.1.11](#) indicate that the rate of prime land conversion is not disproportionately high, but converts at a rate only slightly higher than it occurs nationally. About 24 percent of rural non-Federal land is prime. Of land converted to urban, 28 percent is prime, so that urban conversion takes prime land in a slightly greater proportion than its occurrence. Of total cropland and pasture, 48 percent is prime and prime cropland is converted to urban uses at about the same rate as nonprime cropland. Prime agricultural land has the growing season, moisture supply, and soil quality needed to produce sustained high yields when treated and managed according to modern farming methods (Heimlich, 1989). Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses (USDA, NRCS, 2000).

Rural land is defined as all land that is not urban. Within the broad rural category is rural residential, consisting of houses and associated lots in rural areas. Data on this category are available from several periodic American Housing Surveys published by the U.S. Department of Housing and Urban Development and the U.S. Department of Commerce. While rural residential land use may be associated by some with sprawl, sprawl is usually considered to be more encompassing, consisting of a wide variety of land uses, scattered and interspersed with idle lands. Non-farm rural residential area was estimated to be about 73 million acres in 1997, up from an estimated 56 million acres in 1980 ([table 1.1.12](#)). The average annual rate of increase of rural residential land has been a little more than 1 million acres per year since 1980. The rate of increase could be higher for different or shorter periods of time. For example, a recent report states that land used for all single-family housing, urban and rural, has increased by 2.3 million acres per year from 1994 to 1997 (HUD, 2000).

## Urban Area

Nationally, there are two sources of data on urban area. First, the Bureau of the Census, U.S. Department of Commerce, compiles urban area every 10 years, coincident with the Census of Population. Second, the Natural Resources Conservation Service, U.S. Department of Agriculture, publishes developed land, including urban components, at five-year intervals as part of the National Resources Inventory (NRI).

**Urban area (Census)** is technically defined by the Bureau of the Census and consists of cities, towns, and Census designated places of 2,500 or more persons, including urbanized areas with populations of 50,000 or more—central cities and their "urban fringe" (BOC, 1992). Included in this definition are residential areas and concentrations of nonresidential urban area such as commercial, industrial, and institutional land; office areas; urban streets and roads; major airports; urban parks and recreational areas; and other land within urban defined areas. The definition allows for exceptions and special cases, and has changed slightly from decade to decade. Portions of extended cities that are essentially rural in character are excluded.

**Developed land (NRI)** in the National Resources Inventory consists of urban and built-up areas, as well as land devoted to rural transportation.

**Urban and built-up areas** consist of residential, industrial, commercial, and institutional land; construction and public administrative sites; railroad yards, cemeteries, airports, golf courses, sanitary landfills, sewage plants, water control structures, small parks, and transportation facilities within urban areas.

**Large urban and built-up areas** include developed tracts of 10 acres and more.

**Small built-up areas** include developed tracts of 0.25 to 10 acres, which do not meet the definition of urban area, but are completely surrounded by urban and built-up land.

**Rural transportation land** includes highways, roads, railroads and rights-of-way outside of urban and built-up areas.

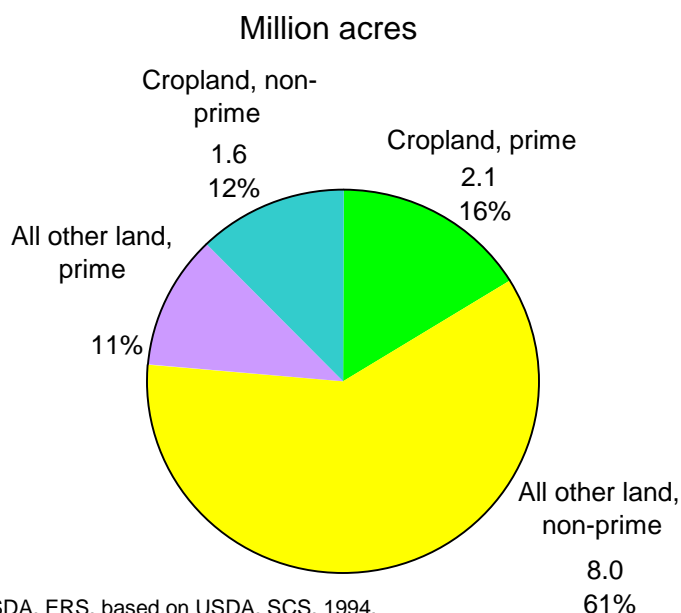
**Comparison.** While the U.S. Geological Service, NASA, HUD, and several local, State, and Federal agencies collect data or conduct special purpose studies on urban area, the Census and the NRI provide the only nationally consistent historical series. Due to differences in data collection techniques and definitions, the NRI estimates of "large urban and built-up areas" are usually higher than the Census "urban area" estimates for nearly all States. The Census urban area series runs from 1950, while the NRI started providing a consistent series in 1982. Historically, the ERS major land use series (see [table 1.1.2](#), Major uses of land in the contiguous United States, 1945-97) has used Census urban area numbers. Prior to 1982 Census urban area was the only reliable national source of urban area data available. Since 1945, Census urban area has been used in Major Land Uses to maintain a consistent series. For comparison purposes, Census urban area is checked against the NRI to help project and interpolate Census trends between decennial Census years.

**Residential area.** Residential area is the sum of acres in lots used for housing units. Estimates of residential area, urban and rural, are based on data from the American Housing Surveys (see [table 1.1.12](#) and references).

The increase in rural residential land use occurs in greater frequency on larger lot sizes compared to increases in urban residential land use ([fig. 1.1.9](#)). In the lot size, 10 acres and more, rural residential land use took up 44 million acres, versus 12 million by urban residential land use. However, in the lower lot sizes, urban land uses occurred in greater frequency. Urban land use occupied 2.8 million acres in the less than 1/8-acre lot size, while rural land use took up only 300,000 acres. Land in rural areas is less expensive than in urban areas, which, in part, accounts for the larger lot sizes.

Rural residential land conversion comes from rangeland and forest land, in addition to cropland. All categories of rural major land uses have shifted in use over time ([table 1.1.11](#)). While the net acreage of rangeland, forest land, and cropland have decreased, only a portion of this acreage has gone to urban and rural residential uses ([table 1.1.2](#)). Much has converted to miscellaneous and special uses.

**Figure 1.1.8--Land urbanized by prior use, 1982-92**



**Table 1.1.11--Land use changes from 1982 to 1992, contiguous United States**

Land use <sup>1</sup>	1982 land use totals <sup>2</sup>	Transition from 1982 to 1992					
		Cropland & pasture <sup>3</sup>	Range-land	Forest land	Other <sup>4</sup>	Urban and built-up	Federal land
<i>Million acres</i>							
Prime land in 1982 <sup>5</sup> --							
Cropland and pasture	267.8	<b>259.2</b>	0.7	2.7	1.7	2.9	.6
Rangeland	20.0	1.4	<b>18.2</b>	.1	.1	.1	--
Forest land	45.6	1.1	--	<b>43.3</b>	.2	.7	.2
Other <sup>4</sup>	6.2	.7	--	.2	<b>5.3</b>	--	--
Nonprime land in 1982--							
Cropland and pasture	284.3	<b>266.4</b>	2.8	8.7	2.4	3.2	.7
Rangeland	388.6	7.4	<b>373.5</b>	1.4	1.3	1.8	3.3
Forest land	348.3	3.3	1.1	<b>336.3</b>	1.4	4.4	1.8
Other <sup>4</sup>	73.0	1.7	.3	1.4	<b>69.0</b>	.2	.3
Urban and built-up	51.9	--	--	--	--	<b>51.9</b>	--
Federal land	404.7	.7	2.0	.7	.2	--	<b>401.1</b>
<b>1992 land use totals<sup>2</sup></b>	<b>1,891.1</b>	<b>542.3</b>	<b>398.9</b>	<b>395.0</b>	<b>81.6</b>	<b>65.4</b>	<b>408.0</b>

-- = Less than 50,000 acres.

<sup>1</sup> Numbers in bold, indicate the acres that remained in the same use during the decade. Non-bolded numbers across rows represent land moving out of 1982 land uses. Non-bolded numbers down columns represent land moving into 1992 land uses.

<sup>2</sup> Distribution by use may not add to totals due to rounding.

<sup>3</sup> Includes land in the CRP.

<sup>4</sup> Includes rural transportation, marshland, and barren land.

<sup>5</sup> Prime land is land that has the growing season, moisture supply, and soil quality needed to sustain high yields when treated and managed according to modern farming methods.

Source: USDA, SCS, 1994.

**Table 1.1.12—Change in urban and rural area, United States, 1980-97<sup>1</sup>**

Area	1980			1997			Annual change	
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
	Million acres							
Residential <sup>3</sup>	29	56	85	36	73	109	.42	1.03
Non-residential	18	2,260	2,178	30	2,124	2,154	.66	-2.10
Total	47	2,216	2,263	66	2,197	2,263	1.07	-1.07

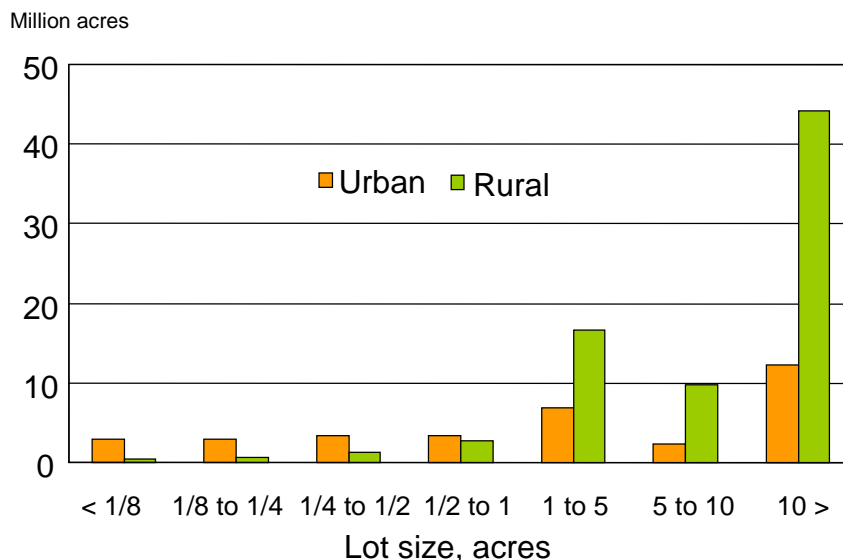
<sup>1</sup> Farm housing units were subtracted.

<sup>2</sup> Adjusted to 1997 estimated urban and rural areas.

<sup>3</sup> Residential area must be used with caution. Residential area is derived from American Housing Survey data and is subject to three types of error, 1) sampling error, 2) error due to incomplete data, and 3) error due to wrong or inconsistent answers (HUD/BOC, 1999a). The first two types of error together have a plus and minus 3 percent band at the 90-percent confidence level around the 92 million housing units associated with the 1997 urban residential area. A plus and minus 11 percent band is required for the 19 million acres associated with the 1997 rural residential area. Smaller sample units produce less accurate results. While AHS information is not available on the effect of "wrong answers" on lot size data, lots over 5 acres are a "special item" requiring a statistical formula that calculates larger sampling errors. In 1997 the AHS listed a number of survey question items that were answered with "highly unreliable answers" producing "wrong answer" error.

Sources: USDA, ERS, based on housing unit and lot size data from BOC, 1992; HUD/BOC, 1999a; HUD/BOC, 1999b; HUD/BOC, 1996; NASS, 1999a; Vesterby, Heimlich, and Krupa, 1994; [table 1.1.2](#) (plus Alaska and Hawaii).

**Figure 1.1.9--Urban and rural residential area by lot size, United States, 1997<sup>1/</sup>**



<sup>1</sup> 1997 AHS data is based on 1980 urban area. Farm housing lots were subtracted.  
Source: See table 1.1.9.

Two cautions pertain to the use of rural residential estimates. Rural residential land is not the same as urban land. Urban land is defined by the Census as a distinct land use (See box-[Urban Area](#)). Much urban land is paved and will never revert back to rangeland, forest land, or cropland. Rural residential land is outside of urban areas. Large rural lots tend to be mostly lawn, garden, or planted to trees. It would be relatively easy to convert many 22-acre rural residential lots back to agricultural or forest uses. A sharp rise in commodity prices

could entice owners to crop some rural residential land, which is a response that would not be economically feasible in most urban areas. Some rural residential land was originally converted from cropland and could be converted back to cropland.

The second caution pertains to statistical errors. Estimates of rural residential land are subject to three types of error (footnote to [table 1.1.12](#)). The third type of error pertains to wrong or inconsistent answers. The AHS has not measured this type of error so that the potential effect on the estimate of rural residential land is not known. Furthermore, AHS rural residential area is subject to more sampling error than urban residential area. This is because rural residential area is based on less than half as many sample observations as urban residential estimates.

### **Conflicts Among Uses of Federal Lands**

The land area of the United States encompasses about 2.3 billion acres. Of this, the Federal Government owns about 24.7 percent – or 563 million acres (USDI, BLM, 1999a, pg. 1). Most of this land is administered by the Department of the Interior's (USDI) Bureau of Land Management (BLM) and USDA's Forest Service (FS), with lesser amounts by USDI's Fish and Wildlife Service (FWS), and National Park Service (NPS).

National Forest System (NFS) lands total 191.8 million acres ([table 1.1.12](#)) (USDA, FS, 1999b). By law, the NFS is managed to promote multiple uses. Logging and grazing are the principle commercial activities. The NFS includes about 96.5 million acres of timberland and 96 million acres of rangeland. FY 1998 production from these resources included 3.3 billion board feet of timber (about 13 percent of national harvest) and over 8.9 million animal unit months (AUMs -- one AUM is forage for a 1,000 lb. cow, or the equivalent, for 1 month) of livestock grazing (USDA, FS, 1999b). Other commercial activities include oil, gas, and mineral production.

Recreation and conservation are also major uses. The Forest Service manages over 23,000 recreational facilities within the NFS, along with over 133,000 miles of trails and 4,348 miles of the Wild and Scenic Rivers System. FY 1998 recreational visits to NFS lands exceeded 859 million (USDA, FS, 1999b). The NFS also includes 34.7 million acres of designated wilderness. Within the continental United States, NFS lands provide habitat for 113 animal species and 87 plant species listed by the Federal Government as threatened or endangered (BioData, Inc., 1995). The NFS also accounts for about 6 percent of water runoff in the Eastern U.S. and 33 percent of water runoff in the West (USDA, FS, 2000).

Bureau of Land Management (BLM) lands total 263.6 million acres of Federal land, most of which are in Alaska and 11 Western States (USDI, BLM, 1999a). BLM lands are managed for multiple uses, but primary emphasis is on commercial production. The main commercial activity is grazing, with 18,698 grazing permits or leases authorizing 13.015 million AUM's in FY 1998 (USDI, BLM, 1999b). About 6.1 million acres of BLM land are classified as timberland. FY 1998 timber sales from these lands totaled about 260.6 million board feet. BLM also administers oil, gas, and mineral extraction activities on all Federal lands. Of BLM-managed lands, about 10.79 million acres are considered in oil and gas production. In FY 98, oil and gas activity on these lands included 49,633 producing wells and 2,363 new holes started (USDI, BLM, 1999b). FY 98 production of coal and sellable mineral were 347.7 million tons and 12.9 million cubic yards, respectively (USDI, BLM, 1999b).

Recreation is an increasingly important use of BLM lands. BLM lands contain 427 miles of National Recreation Trails, 3,518 miles of 64 National Back Country Byways, 11,000 miles of multiple-use trails, 2,000

miles of the Wild and Scenic River System, 205,498 miles of fishable streams, 5,409 miles of floatable rivers, 300 Watchable Wildlife viewing sites, 897 recorded caves and cave systems, and 412 campgrounds with 16,698 camp sites. FY 1998 recreational use of BLM lands included over 71.9 million visitor days (USDI, BLM, 1999a and 1999b). The most popular recreational activities on BLM lands were camping (28.1 million visitor days), trail activities (13.4 million visitor days), and fishing and hunting (11.7 million visitor days). Other activities included adventure sports, driving for pleasure, eco/cultural tourism, picnicking, water sports, winter sports, and other activities. Collectively these activities accounted for 18.7 million visitor days in FY 98.

As with the Forest Service, BLM has given increasing importance to conservation uses in recent years. Emphasis has focused on protecting wetlands and riparian areas, endangered species, and important wildlife habitat. BLM lands are known to include 180,000 miles of riparian-lined streams, 16 million acres of wetlands, 5.24 million acres in 136 designated National Wilderness Areas, 17.3 million acres under study for possible future Wilderness designation, and 3,000 species of mammals, birds, fish, and reptiles (USDI, BLM, 1999a and 1999b). Within the contiguous 48 States, BLM lands provide habitat for at least 61 federally listed threatened or endangered animal species and 77 listed plant species (BioData, Inc., 1995).

Conflicts and trends in the use of Federal lands. Debate over the use of public lands, particularly those under FS and BLM jurisdiction (i.e., those explicitly managed under multiple-use objectives), has become increasingly contentious over the last 20 to 30 years. Critics of existing policies argue that FS and BLM give grazing, logging, and mining priority over other land uses (primarily environmental uses but, to a lesser extent, recreation uses). Federal grazing fees, for example, are generally well below fees charged by private landowners in nearby areas. In 1998, the Federal grazing fee was \$1.35 per AUM. For the 11 Western States where non-Alaska BLM and FS lands are concentrated, private land grazing fees (for cattle) averaged \$11.50 per AUM in 1998 (USDA, NASS, 1999d) (see later chapter for more detail on grazing fees and recent proposals to raise fees on public lands). Similarly, the FS often pays for construction of access roads, which is a major cost component in bringing NFS lands into timber production. With respect to mining, Federal law allows prospectors to take title to public lands, and the minerals they contain, for as little as \$2.50 an acre (Land Letter, 1998).

Commercial users of Federal lands defend existing policies on a number of grounds. Ranchers argue that Federal rangelands are, on average, of lower quality than private rangeland and thus not worth as much. Ranchers also fear that raising Federal grazing fees would reduce ranch land values because the value of access to Federal lands is capitalized into land values. Loggers argue that roads into previously inaccessible areas of the NFS provide a stream of future recreation and logging benefits and these benefits justify their construction by the Federal Government. It is also frequently pointed out that the economies of many rural communities, particularly in the West, are heavily dependent on access to resources on Federal lands and reducing this access would increase unemployment in these areas.

In recent years, the Administration, Congress, and private interest groups (primarily groups interested in promoting timber production, grazing, mining, conservation issues, and recreation opportunities) have engaged in various efforts to affect changes in the management of federally owned lands. The Clinton Administration, for example, proposed and opened for public comment two sets of restrictions designed to limit road construction in roadless areas of the National Forest System. One proposal would protect about 50 million acres of inventoried roadless area from future road construction (of this area, about 27.2 million acres currently have some level of protection). The other proposal would establish procedures and criteria by which each national forest would decide what human activities -- including road construction and reconstruction -- would be allowed in roadless areas of any size. Similarly, over the last decade, Congress has regularly considered bills



that would reform the General Mining Law of 1872 (in 1998, such bills included S. 325, 326, 327, 1102) (Land Letter, 1998). Most bills have included provisions that would raise the prices mining companies pay for federal land, increase the royalties they pay for what they mine, and/or increase environmental protections in areas affected by mining operations. Whether designed to encourage economic activity, promote conservation objectives, or expand recreation opportunities, efforts to change the way Federal lands are managed generally meet with stiff opposition and no major reforms affecting commercial, conservation, or recreation activities on Federal lands have become law in the last few years.

While the debate over the use of Federal lands is likely to continue for the foreseeable future, elements of the debate have been reflected in recent changes in land use patterns. Since the late 1980s, both FS and BLM have marginally reduced the quantity of grazing they authorize annually. In 1987, FS and BLM authorized 9.953 and 11.178 million AUM of grazing, respectively. In 1998, these figures were 9.258 and 10.353 million AUM, respectively. Both agencies also significantly reduced timber sales over this period – although much of this has been in response to court injunctions brought to address environmental issues. FS timber sales dropped from 11.3 billion board feet in 1987, to 3.0 billion in 1998, while BLM timber sales dropped from 1.264 billion board feet in 1987 to 0.26 billion board feet in 1998. Recreation and conservation uses of BLM and FS lands increased significantly since the late 1980s. Recreational visitor days increased 75 percent on BLM lands between 1987 and 1998 and 45 percent on FS lands between 1987 and 1995 (the last year FS reported this statistic). For the two agencies collectively during the period 1987 to 1998, there was an increase in river miles designated as Wild and Scenic of 157 percent and an increase in acres designated as wilderness of 22 percent. There were also significant increases in the number of trail miles on both FS and BLM lands.

**Wetlands.** In 1780, there were an estimated 221 million acres of wetlands in what is now the contiguous 48 States; a recent estimate is less than 124 million acres (see chapter 6.5, [Wetland Programs](#)). Bringing land into agricultural production accounts for more than 80 percent of all wetlands lost since colonial times (U.S. Congress, OTA, 1993). Nearly a third of all wetland losses have occurred in the farm-intensive States of Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin (Heimlich et. al, 1998).

In recent years, the full range of ecological functions and economic benefits associated with wetlands has become much better understood; these include critical wildlife habitat, temporary stormwater storage, groundwater recharging, pollution control, sport hunting and fishing opportunities, wildlife viewing, and breeding grounds and nurseries for many commercially important fish, fur, and game species. As a result, Federal wetlands policy has increasingly emphasized conservation, and much of this policy shift has been directed at agriculture. Swampbuster provisions of the 1996 and 1990 Farm Acts, for example, denied crop subsidy payments to farmers who converted wetlands to boost commodity program acreage—even if the converted wetlands were not directly used to produce program crops (Heimlich et. al, 1998). Violation of Swampbuster regulations can mean the loss of eligibility for all farm program benefits—including commodity program participation, and disaster payments—until the violation is remedied. The Wetlands Reserve Program pays farmers and offers cost shares to encourage wetlands restoration.

Agriculture's role in converting wetlands to other uses has been declining. Between 1954 and 1974, agriculture accounted for 81 percent of all gross wetlands losses: between 1982 and 1992, it accounted for only 20 percent (see [table 6.5.1](#) in chapter 6.5, [Wetlands Programs](#)). Furthermore, this percentage change reflects a decrease in conversions of land to agriculture rather than an increase in wetlands losses due to other activities.

About 90 percent of the 124 million acres of wetlands remaining in 1992 in the 48 States were on rural non-Federal lands. Given its ownership of these land resources, the farm sector will likely remain a primary target of wetland conservation efforts. (See [chapter 6.5, Wetlands Programs](#), for more detail.)

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**Table 1.1.13--Land-use changes on Bureau of Land Management (BLM) and Forest Service (FS) Lands, FY 1983-98**

Land use	1983	1985	1987	1989	1991	1993	1995	1997	1998
<b>BLM land (million acres)</b>	341	337	334	270	269	268	264	264	264
Grazing - all livestock									
number of operators	20,644	19,880	19,532	19,625	19,482	19,048	NR	NR	NR
AUMs authorized (1,000)	10,336	11,218	11,178	11,043	9,602	9,758	9,941	9,445	10,353
Timber sales:									
Number of sales	1,016	2,277	22,144	23,433	18,925	20,200	NR	29,229	31,691
Volume (MBF)	240,099	1,042,917	1,264,981	795,729	602,006	87,402	NR	247,521	260,600
Recreation:									
Number of developed sites	406	375	368	554	726	908	NR	NR	NR
Visitor days (1,000)	27,834	20,384	41,388	41,101	44,982	35,735	73,359	71,965	71,965
Trails (miles)	2,000	1,600	1,600	1,600	2,300	4,869	NR	4,521	4,527
Wildlife and Nature									
Wilderness areas (number)	6	23	23	25	66	67	136	136	136
Wilderness acres (1,000)	19	369	369	469	1,611	1,654	5,227	5,251	5,243
Wild and Scenic Rivers (number)	12	15	15	15	32	32	33	34	34
Wild and Scenic Rivers (miles)			78	78	2,000	2,000	2,022	2,022	2,038
<b>FS land (million acres)</b>	191	191	191	191	191	191	192	192	192
Grazing - all livestock									
number of paid permittees	14,211	15,029	13,996	11,983	10,491	9,113	8,962	8,468	8,342
AUMs authorized (1,000)	10,074	10,124	9,953	9,566	9,554	9,138	9,290	8,830	9,258
Timber sales:									
Number of sales	235,585	366,874	289,043	275,895	271,963	255,825	216,272	232,110	165,697
Volume sold (MMBF)	11,061	10,819	11,318	8,415	6,395	4,515	2,885	3,688	2,995
Volume harvested (MMBF)	9,244	10,941	12,712	11,951	8,475	5,917	3,866	3,285	3,298
Recreation:									
Visitor days (1,000)	227,708	225,407	238,458	252,495	278,849	295,473	345,083	NR	NR
Trails (miles)	101,847	99,468	102,507	108,381	116,585	121,059	125,422	NR	133,000
Wildlife and Nature									
Wilderness areas (number)	163	327	348	354	380	397	398	412	412
Wilderness acres (1,000)	25,228	32,102	32,457	32,534	33,586	34,584	34,577	34,739	34,740
Wild and Scenic Rivers (miles)	1,722	1,919	2,404	3,338	3,417	4,316	4,385	4,348	4,348

NR = Not reported.

Source: USDA, ERS, based on U.S. Department of the Interior, Bureau of Land Management, Public Land Statistics (various year) and USDA, Forest Service, Report of the Forest Service (various years)

## Glossary of Land-Use Categories

**Cropland** includes three components: cropland used for crops, cropland used for pasture, and idle cropland.

**Cropland pasture** generally is considered to be in long-term crop rotation. However, some cropland pasture is marginal for crop uses and may remain in pasture indefinitely. This category also includes land that was used for pasture before crops reach maturity and some land used for pasture that could have been cropped without additional improvement. Cropland pasture and permanent grassland pasture have not always been clearly distinguished in agricultural surveys.

**Cropland idled** includes cropland set aside under Federal crop programs. In 1997 the Federal component consisted of cropland in the CRP. In the past, it also included cropland idled by annual set-aside programs. Cropland idled includes land not cropped for other reasons. These may include soil-improvement cover crops to conserve soil, or cropland for which no economically viable crop could be found during the current growing season. Acreage diverted from crops to soil-conserving uses (provided it was not eligible for and used as cropland pasture) would be included in this component

**Cropland used for crops** is further divided into three parts--cropland harvested, crop failure, and cultivated summer fallow.

**Cropland harvested** includes row crops and closely sown crops; hay and silage crops; tree fruits, small fruits, berries, and tree nuts; vegetables and melons; and miscellaneous other minor crops. Farmers double-cropped nearly 4 percent of this acreage.

**Crop failure** consists mainly of the acreage on which crops failed because of weather, insects, and diseases, but includes some land not harvested due to lack of labor, low market prices, or other factors. The acreage planted to cover and soil-improvement crops not intended for harvest is excluded from crop failure and is considered idle. In recent years, crops have failed on about 2-3 percent of the acreage planted for harvest.

**Cultivated summer fallow** refers to cropland in sub-humid regions of the West cultivated for one or more seasons to control weeds and accumulate moisture before small grains are planted. This practice is optional in some areas, but it is considered essential for crop production in the drier cropland areas of the West. Other types of fallow, such as cropland planted to soil-improvement crops but not harvested and cropland left idle all year, are not included in cultivated summer fallow but are included as idle cropland.

**Forest-use land**--Forest-use land excludes special-use areas in forest cover, such as parks, wilderness, and wildlife areas, to avoid double counting. To eliminate all overlap with other uses that exist is not feasible, but this reduced area is a more realistic approximation of the land that may be expected to serve normal forest uses as opposed to having forest cover. Forest-use land includes forested grazing land in this report.

**Forest land grazed**--Forested pasture and range consist mainly of forest, brush pasture, arid woodlands, and other areas within forested areas that have grass or other forage growth. The total acreage of forested grazing land includes woodland pasture in farms plus estimates of forested grazing land not in farms. For many States, the estimates include significant areas grazed only lightly or sporadically.

[More glossary](#)

### Glossary of Land-Use Categories (continued)

**Forest land not grazed**--As defined by the Forest Service, forest land is "land at least 10% stocked by trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. Forest land includes transition zones, such as areas between heavily forested and nonforested lands that are at least 10% stocked with forest trees and forest areas adjacent to urban and built up lands. Also included are pinyon-juniper and chaparral areas in the West and afforested areas" (Powell and others, 1993, p. 117).

**Grassland pasture and range**--Grassland pasture and range comprise all open land used primarily for pasture and grazing, including shrub and brush land types of pasture, grazing land with sagebrush and scattered mesquite, and all tame and native grasses, legumes, and other forage used for pasture or grazing. Because of the diversity in vegetative composition, grassland pasture and range are not always clearly distinguishable from other types of pasture and range. At one extreme, permanent grassland may merge with cropland pasture, or grassland may often be found in transitional areas with forested grazing land.

**Special-use areas** include five broad subcategories--urban area, transportation, recreation and wildlife areas, national defense areas, and miscellaneous farm uses.

**Urban area**--See box, [Urban Area](#).

**Transportation** includes rural highways, roads, and railroads rights-of-ways and airports.

**Recreation and wildlife areas** include Federal and State parks, wilderness areas, and wildlife refuges.

**National defense areas** include military bases and installations and defense related industrial areas.

**Miscellaneous farm uses** include farmsteads and farm roads and lanes.

**Miscellaneous other land** Includes miscellaneous special uses such as industrial and commercial sites in rural areas, cemeteries, rural golf courses, mining areas, quarries, marshes, swamps, sand dunes, bare rocks, deserts, tundra, rural residential, and other unclassified land.

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