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# Who Owns the Land?

## Agricultural Land Ownership by Race/Ethnicity

Jess Gilbert  
Spencer D. Wood  
Gwen Sharp

*Of all private U.S. agricultural land, Whites account for 96 percent of the owners, 97 percent of the value, and 98 percent of the acres. Nonetheless, four minority groups (Blacks, American Indians, Asians, and Hispanics) own over 25 million acres of agricultural land, valued at over \$44 billion, which has wide-ranging consequences for the social, economic, cultural, and political life of minority communities in rural America. This article presents the most recent national data available on the racial and ethnic dimensions of agricultural land ownership in the United States, based largely on USDA's Agricultural Economics and Land Ownership Survey of 1999.*

Ownership and control of land strongly affects many aspects of rural life, especially in the poorest regions of the country. Land ownership in minority communities is particularly important since it is often one of the few (and largest) forms of wealth. Beyond economics, land ownership contributes substantially to civic activities and political participation. Land is also culturally significant to minority groups like American Indians, Hispanics, and Blacks. Yet some argue that they are losing ownership and control of land at much faster rates than Whites. In recent years, USDA has been sued for racial discrimination in Federal farm programs. For these reasons among others, good

landownership data are essential for better rural development practice as well as improved agricultural policymaking.

In this article, we present the most recent and thorough national data on the racial/ethnic dimensions of agricultural land ownership in the United States, based largely on USDA's Agricultural Economics and Land Ownership Survey of 1999 (AELOS). Of all private U.S. agricultural land, Whites account for 96 percent of the owners, 97 percent of the value, and 98 percent of the acres. Nonetheless, four minority groups (Blacks, American Indians, Asians, and Hispanics) own over 25 million acres of agricultural land, with a value of over \$44 billion: Blacks possess 7.8 million acres (\$14.4 billion), American Indians 3.4 million private acres (\$5.3 billion), and Hispanics nearly 13 million acres (\$18 billion). The large acreage and high value have significant social, economic, cultural, and political consequences for minority communities in rural America.

### Blacks

For a century after the end of slavery, Black farmers tended to be tenants rather than owners. Since the early 1970s, activists and scholars have warned that the rural Black community was in danger of losing its entire land base. Land ownership by Black farmers peaked in 1910 at 16-19 million acres, according to the Census of Agriculture. However, the 1997 census reports that Black farmers owned only 1.5 million acres. This drastic decline contrasts sharply with an increase in acres owned by White farmers. Thus, the most surprising finding in the 1999 AELOS is that—despite many decades of land loss—Blacks own 7.8 million acres (table 1).

This estimate has not been available to other researchers because these data appeared only last year, and previous national studies have not counted minority land owners as thoroughly as AELOS. Analysts instead have used the much smaller Census of Agriculture figure (1.5 million

Jess Gilbert is professor in the Department of Rural Sociology at the University of Wisconsin-Madison and Co-Director of the Center for Minority Land and Community Security; Spencer D. Wood and Gwen Sharp are graduate students in sociology at the University of Wisconsin-Madison. For assistance and suggestions, we thank Calvin Beale, Charles Bernard, David Buland, Jim Burt, Theresa Carmody, Anne Effland, Bob Hoppe, Lukata Mjumbe, Jerry Pennick, Ross Racine, Gene ummers, Frank Tolson, Raymond Winbush, and John Zippert. The Center for Minority Land and Community Security, based at Tuskegee University, supported some of this work.

Table 1

**All private agricultural land owners, acres owned, and value of land and buildings, by race and ethnicity, 1999**  
*Minorities own only a small part of the U.S. agricultural land base*

Group	Land owners		Acres		Average acres <sup>1</sup>	Value (\$1,000)	
	Number	Percent <sup>1</sup>	(1,000)	Percent <sup>1</sup>		Percent <sup>1</sup>	Percent <sup>1</sup>
United States	3,412,080	--	932,495	--	273	1,283,853,124	--
White	3,218,751	96.2	856,051	98.1	266	1,156,977,076	96.8
Black	68,056	2.0	7,754	0.9	114	14,366,319	1.2
American Indian	23,266	0.7	3,398	0.4	146	5,271,769	0.4
Asian	8,158	0.2	964	0.1	118	6,860,824	0.6
Other	27,290	0.8	4,640	0.5	170	11,753,114	1.0
Hispanic <sup>2</sup>	47,223	1.4	12,888	1.4	273	18,209,871	1.4

<sup>1</sup>Racial percentages are calculated based on the racial totals for all owners and all owner acres (3,345,521 and 872,807,000). The U.S. total is greater than the sum of the races because it includes corporate and other non-individual owners that do not have racial characteristics, plus some individuals who did not answer or did not receive a racial identifier. This also applies to average acres per owner.

<sup>2</sup>Hispanic percentages are calculated based on the U.S. totals for all owners and all owner acres (3,412,080 and 932,495,000).  
 Source: Table 68, 1999 Agricultural Economics and Land Ownership Survey.

acres). In another major discrepancy, the Census shows fewer than 19,000 Black farmers while AELOS counts 68,000 Black agricultural land owners. These seeming contradictions, however, are due largely to intentional differences between

the two sources: The Census of Agriculture studies farmers whereas the AELOS studies agricultural land owners (see box, "Many Agricultural Land Owners Are Not Farmers," pp. 58-59).

According to the AELOS, only one-third of Black-owned acres are operated by the owner (table 2), with most Blacks renting their land to others (mainly Whites). In fact, 61 percent of Black owners in 1999

Table 2

**Owner-operators, non-operator owners, and acres owned, by race and ethnicity, 1999**  
*Most agricultural land owners, other than Blacks, are owner-operators*

Group	Owner-operators <sup>1</sup>					Non-operator owners <sup>1</sup>				
	Number	Percent <sup>2</sup>	Acres (1,000)	Percent <sup>2</sup>	Average acres <sup>2</sup>	Number	Percent <sup>2</sup>	Acres (1,000)	Percent <sup>2</sup>	Average acres <sup>2</sup>
United States	1,966,715	58	542,890	58	276	1,445,365	42	389,605	42	270
White	1,892,676	59	533,642	62	282	1,326,075	41	322,410	38	243
Black	29,241	43	2,502	32	86	38,815	57	5,252	68	135
American Indian	17,479	75	2,615	77	150	5,787	25	783	23	135
Asian	6,116	75	655	68	107	2,042	25	309	32	151
Other	21,203	78	3,475	75	164	6,087	22	1,165	25	191
Hispanic <sup>3</sup>	33,834	72	10,160	79	300	13,389	28	2,728	21	204

<sup>1</sup>Percentages for owner-operators and non-operator owners are calculated row-wise based on the total number of owners and acres in each racial/ethnic category.

<sup>2</sup>Racial percentages are calculated based on the racial totals for all owners and all owner acres (3,345,521 and 872,807,000). The U.S. total is greater than the sum of the races because it includes corporate and other non-individual owners that do not have racial characteristics, plus some individuals who did not answer or did not receive a racial identifier. This also applies to average acres per owner.

<sup>3</sup>Hispanic percentages are calculated based on the U.S. totals for all owners and all owner acres (3,412,080 and 932,495,000).  
 Source: Table 68, 1999 Agricultural Economics and Land Ownership Survey.

were landlords, leasing 4.7 million acres for over \$216 million in rent (table 3). Of all the racial groups, Blacks own the smallest average acreage (114 acres per owner).

Black agricultural land owners are highly concentrated in the South, from east Texas through the Black Belt up into Virginia. Their land use patterns are similar to those for the region as a whole: crops and woodland, with relatively little land in pasture (table 4). Blacks' representation in the Conservation Reserve Program is higher than that of other minorities but lower than Whites' (table 5).



Photo courtesy USDA/ERS.

### American Indians

Historically, of course, American Indians had access to practically all the land in the present-day United States. White settlers and the Federal Government subsequently dispossessed them of most of the land. Between the Allotment Act of 1887 and the Indian Reorganization Act of 1934, American Indians lost an additional 90 million acres. Before discussing

current American Indian ownership, it is important to note that AELOS contains data only on *private* Indian land, excluding reservation land that is held by the tribe or otherwise administered communally. Thus, AELOS captures only a small amount of the total agricultural land of American Indians. For instance, the 1997

Census of Agriculture reports that only 2 million acres are held privately by American Indians, while 46 million additional acres are on reservations.

AELOS reports over 3 million acres of private agricultural land held by 23,266 Indian owners, with an average of 146 acres per owner (table 1). Unlike Blacks, these

Table 3

### Private agricultural landlords and acres leased to others, by race and ethnicity, 1999

*Nearly half of all land owners are landlords (less for most minorities)*

Group	Landlords		Acres leased		Average acres per landlord <sup>3</sup>	Total rent received (\$1,000)
	Number	Percent <sup>1</sup>	(1,000)	Percent <sup>2</sup>		
United States	1,638,033	48	394,336	42	241	17,379,889
White	1,505,648	47	321,711	38	214	14,492,197
Black	41,377	61	4,668	60	113	216,262
American Indian	6,487	28	726	21	112	27,384
Asian	2,634	32	378	39	144	42,648
Other	6,584	24	1,476	32	224	91,267
Hispanic	14,616	31	2,997	23	205	156,100

<sup>1</sup>Landlords as percent of all owners.

<sup>2</sup>Leased acres as percent of all owned acres.

<sup>3</sup>U.S. average is higher than race-specific averages because U.S. figures include corporate and other non-individual owners that do not have racial characteristics, plus some individuals who did not answer or did not receive a racial identifier.

Source: Table 98, 1999 *Agricultural Economics and Land Ownership Survey*.

## Many Agricultural Land Owners Are Not Farmers

### Comparing the AELOS and the Census of Agriculture

The 1999 Agricultural Economics and Land Ownership Survey (AELOS) was a follow-on survey to the 1997 Census of Agriculture. The sample size included 37,182 farmers and 67,178 private landlords. The response rate was 71 percent for farmers and 51 percent for landlords. Data for nonresponding landlords was taken from the reports of farmers who rent from them. It is important to note that the AELOS focuses on agricultural (farm and ranch) land only. For more information on research methods, see Appendix A of AELOS (USDA, 2001).

There are no ideal data sources on land ownership in the United States—other than in the 3,000-plus county courthouses throughout the Nation. Every 5 years, the census of agriculture reports on “land in farms,” which accounts for roughly half of all private land in the U.S. The Census offers the most comprehensive data on farms and farmers, including the land they operate. Yet it is a poor source of information on agricultural land ownership; it covers land owners only when they are also “farm operators” (farmers). Other landlords and nonoperator owners are intentionally excluded from the census of agriculture.

The crucial distinction is between farmers and agricultural land owners. A farmer may rent rather than own land, and an agricultural land owner may not operate a farm. The census of agriculture studies farmers, not land owners. Land owners, though, are exactly the focus of the 1999 AELOS. It reveals much more than the Census about the ownership of agricultural land. For example, the 1997 Census of Agriculture says that 16,560 Black farmers own 1.5 million acres, whereas the 1999 AELOS shows 68,000 Black agricultural land owners with over 7.7 million acres. This discrepancy has broad implications.

Researchers who work on these issues know that census of agriculture data are problematic. For one thing, small farmers are more likely to be missed by the census, and minority farmers tend to be small-scale. The 1997 Census of Agriculture (the first conducted by the U.S. Department of Agriculture instead of the Department of Commerce) made special efforts to include more minority farmers, and seems to have produced results.

Another problem is the census handling of American Indians. The 1997 Census of Agriculture (tables 17, 19, and appendix B) reports that 18,495 Indian farmers operate 52 million acres, for an average Indian farm size of 2,812 acres—almost seven times the average size for all U.S. farms. (See footnote to box table.) This measure is highly unlikely; it results from the Census’s counting each reservation as a single farm. The 46 million acres on Indian reservations is included (and constitutes the vast majority) in the total for Indian agricultural land. Thus, it is difficult to

Indian land owners tend to be farm operators and rent their land to others less often (table 2). Private Indian agricultural land is worth over \$5 billion, and leased land earned over \$27 million in rent in 1999 (table 3). American Indian land owners are generally concentrated in the West and Southwest. They tend to specialize in pasture (49 percent of all acres), with some land in crops (39 percent) and less in woodland (8 percent) (table 4). Pastureland’s prevalence is probably due to the concentration of

Indian farmers and ranchers in arid and semi-arid regions, which are generally more suitable for livestock grazing than for growing crops. Very few Indian owners, and even fewer of their acres, are enrolled in the Conservation Reserve Program, which again may reflect their concentration in regions dominated by rangeland (table 5).

To supplement the AELOS data on private Indian ownership, we used an Intertribal Agricultural Council report based on Bureau

of Indian Affairs data from 1990 (McKean et al.). The BIA counted over 18 million acres of agricultural land on reservations, owned by 29,500 individual Indian farmers or ranchers. Most of these farmers (63 percent) raised livestock, mainly cattle. A more recent report from USDA says that the BIA “manages 55 million acres in trust for Indian tribes and individuals”: 2 million acres of cropland, 36 million in pasture and range, 11 million in forest land, and 6 million other acres (Vesterby and Krupa, p. 24). As with

compare census of agriculture data on Indians with data on other groups, for whom individually held land is the dominant type of ownership.

Finally, the AELOS shows many more owner-operators for all racial/ethnic groups (except Asians) than does the 1997 Census of Agriculture. AELOS estimates of acres owned by owner-operators are closer to the census figures, but still considerably higher for Blacks (see table).

### Comparison of 1997 Census of Agriculture and 1999 AELOS on owner-operators, by race and ethnicity

Major data sources disagree

Group	Census of Agriculture				AELOS			
	Owner-operators		Acres owned		Owner-operators		Acres owned	
	Number	Percent	(1,000)	Percent	Number	Percent	(1,000)	Percent
United States	1,720,730		553,705		1,966,715		542,890	
White	1,679,861	97.6	501,683	90.6	1,892,676	96.2	533,642	98.3
Black	16,560	1.0	1,499	0.3	29,241	1.5	2,502	0.5
American Indian	9,406 <sup>1</sup>	0.5	48,043	8.7	17,479	0.9	2,615	0.5
Asian	6,502	0.4	786	0.1	6,116	0.3	655	0.1
Other	8,401	0.5	1,694	0.3	21,203	1.1	3,475	0.6
Hispanic	24,365	1.4	10,462	1.9	33,834	1.7	10,160	1.9

<sup>1</sup>The number of American Indian owner-operators is not reported in the 1997 Census of Agriculture. It is between the 9,406 owner-operators reported in Table 17 and the 18,495 Indian farmers reported in Appendix B, Table A. The total number of Indian owner-operators is certainly closer to 18,495. Furthermore, the Census of Agriculture count of the acres operated by Indian owner-operators includes reservation land, which is excluded from the AELOS.

Sources: Tables 16, 17, 46, and Appendix B, 1997 Census of Agriculture—United States Data, and Table 68, 1999 Agricultural Economics and Land Ownership Survey.

Blacks, different data sources report different amounts of land ownership for American Indians (see box, "Many Agricultural Land Owners Are Not Farmers").

#### Asians

Asians (and Pacific Islanders) make up the smallest of the racial groups in the AELOS. Some 8,158 Asians own slightly less than a million acres, with an average of 118 acres per owner (table 1). Owner-operators control over two-thirds of this land, with the remainder held

by landlords who do not farm (table 2). However, 39 percent of all Asian-owned acres are rented out, indicating that some owner-operators are also landlords (table 3). The total value of agricultural rent collected by Asian landlords is almost \$43 million. Asian-owned land is highly concentrated in crops (76 percent of all acres), and 90 percent of Asian owners have some cropland (table 4). Only a small percentage of Asian acreage is in pasture, woodland, or the Conservation Reserve Program

(table 5). Asian owners are concentrated in California and Hawaii, areas that specialize in high-value crop production such as orchards and specialty crops.

#### Hispanics

The AELOS also gathers data on Hispanic-owned agricultural land. Individuals in this ethnic category are included in the AELOS racial categories, but are also reported separately as being "of Spanish origin." Thus, because Hispanics are already counted in the racial cate-

gories, data on these owners are not strictly comparable to the data by race.

The AELOS reports 47,000 Hispanic owners of agricultural land, with almost 13 million acres (table 1). Over 70 percent of these owners operate the land themselves (table 2). They have larger average holdings (273 acres per owner) than any racial group, including Whites. Hispanics leased out almost 3 million acres, for \$156 million in rent (table 3). Over 60 percent of Hispanic-owned agricultural land is in pasture, and 28 percent in crops

(table 4). As with American Indians, this is likely due to their concentration in the Southwest, where livestock operations predominate. Only about 5 percent of Hispanic owners participate in the Conservation Reserve Program (about half the rate for Whites), and less than 3 percent of Hispanic-owned land is in the CRP (table 5).

### Racial/Ethnic Comparisons

Among agricultural land owners, the most striking finding is that minorities are truly in the minority. Less than 4 percent of all owners

are non-White. They hold only 2 percent of all private agricultural land and control just 3 percent of its value. Still, the absolute numbers for minority land owners (25 million acres worth \$44 billion) indicate agricultural land as a tremendous resource for these groups, who tend to reside in particularly poor regions of rural America.

Individual minority groups vary significantly—in tenure status (operator or landlord), value of land, rents received, and land uses. Compared with other races

Table 4

### Land use by agricultural land owners and acres, by race and ethnicity, 1999<sup>1</sup>

*Agricultural land use varies across groups*

Group	Cropland					Pastureland				
	Owners		Acres		Average acres	Owners		Acres		Average acres
	Number	Percent	1,000	Percent		Number	Percent	1,000	Percent	
United States	2,710,174	79	434,162	47	160	1,870,355	55	379,579	41	203
White	2,567,497	80	394,792	46	154	1,785,108	55	351,783	41	197
Black	48,916	72	3,772	49	77	28,421	42	2,169	28	76
American Indian	14,437	62	1,309	39	91	16,980	73	1,671	49	98
Asian	7,367	90	733	76	99	1,221	15	76	8	62
Other	14,921	55	1,689	36	113	17,390	64	2,400	52	138
Hispanic	29,619	63	3,632	28	123	27,992	59	8,055	63	288
Group	Woodland					Other				
	Owners		Acres		Average acres	Owners		Acres		Average acres
	Number	Percent	1,000	Percent		Number	Percent	1,000	Percent	
United States	1,210,005	35	73,016	8	60	2,215,992	65	45,738	5	21
White	1,149,038	36	68,396	8	60	2,101,328	65	41,080	5	20
Black	28,938	43	1,244	16	43	41,923	62	569	7	14
American Indian	7,525	32	267	8	35	17,366	75	151	4	9
Asian	1,739	21	105	11	60	3,726	46	50	5	13
Other	4,740	17	250	5	53	19,650	72	300	6	15
Hispanic	8,978	19	678	5	76	29,967	63	524	4	17

<sup>1</sup> Owners usually own land in multiple land-use categories, but any given acre is devoted to only one land use. Therefore, if one sums all owners in the land-use categories, they will be higher than the total number of owners, whereas the summed land-use acres equal the total number of acres.

Source: Table 74, 1999 *Agricultural Economics and Land Ownership Survey*.

Table 5

**Conservation Reserve Program (CRP) participation of agricultural land owners and acres by race and ethnicity, 1999**  
*Minority land owners use CRP less than Whites*

Group	All owners	Acres (1,000)	CRP land				
			Owners		Acres		Average acres <sup>1</sup>
			Number	Percent	(1,000)	Percent	
United States	3,412,080	932,495	320,323	9.4	39,759	4.3	124
White	3,218,751	856,051	308,052	9.6	37,936	4.4	123
Black	68,056	7,754	4,789	7.0	363	4.7	76
American Indian	23,266	3,398	537	2.3	52	1.5	97
Asian	8,158	964	252	3.1	39	4.0	155
Other	27,290	4,640	578	2.1	38	0.8	66
Hispanic	47,223	12,888	2,295	4.9	349	2.7	152

<sup>1</sup>Average acres in CRP for those participating in the program. U.S. average is higher than race-specific averages because U.S. figures include corporate and other non-individual owners that do not have racial characteristics, plus some individuals who did not answer or did not receive a racial identifier. Source: Table 74, 1999 *Agricultural Economics and Land Ownership Survey*.

(including Whites), a large proportion of Blacks are nonoperator owners, who own two-thirds of all Black-held agricultural land. The other racial minorities are above the national averages (58 percent) for both owner-operators and the acres they own.

Moreover, agricultural land use patterns differ among racial/ethnic groups. Blacks have above-average percentages of woodland and below-average pastureland, with the largest proportion of their land in crops. American Indian and Hispanic owners use most of their agricultural land as pasture, whereas Asians have hardly any pastureland and a large majority of their land in crops, especially high-value ones. These land use patterns reflect the regionalization of U.S. agriculture and the concentration of racial/ethnic populations.

### Conclusion

This article only begins to document minority land ownership. Largely due to data sources, it has several serious limitations. First, it

covers privately held land, thus excluding the major resource base of American Indians: reservations. Second, it presents only national data; State-level information (much less county-level) is not available from the AELOS by racial groups. Third, it is cross-sectional, dealing with ownership at only one point in time (1999).

Trend data—ownership changes over time—are essential for both agricultural policymakers and practitioners of land-based community development. Activists and analysts need more accurate information on land ownership. In minority communities, this can be an especially pressing concern since some are not reaping the full value of their property, and others are in danger of losing their land base altogether. Several improvements would strengthen our knowledge of land ownership:

- The AELOS could be conducted every 5 (rather than 10) years as a regular follow-on survey to the Census of Agriculture.

- Racial characteristics could be reported at the State level, not just the national level.
- The Census of Agriculture could break down the tenure category of “part owner” by owned and rented land by race (cf. tables 17 and 46 in the 1997 Census).
- USDA could support a voluntary registry of minority land owners (following recommendation 28 of USDA’s 1997 Civil Rights Action Team Report).
- American Indian farmers and land could be better counted. Reservations, for instance, are not single farms, as the Census of Agriculture now classifies them.

Many believe, and research has shown, that land ownership is of tremendous economic, cultural, and political value to rural communities (e.g., Salamon, Couto, LaDuke, Mitchell). Major private

foundations, as well as the Federal Government, are also convinced. They have invested millions of dollars in research and community development activities that bolster land ownership. The 25 million acres that the 1999 AELOS reports for minority owners, worth over \$44 billion, are only a small fraction of the amount and value of all U.S. private agricultural land. However, it is a major form of wealth in minority rural America, much as homeownership—a top policy priority—is throughout the Nation.

This currently existing asset base, in some of the poorest areas of the country, could be further utilized in community development efforts. Access to land means that rural communities have more options in addressing rural housing needs. Minority land ownership is being used to develop youth training programs in many rural areas. Small producers and land owners have created opportunities for value-added agriculture (e.g., truck crop operations and farmers' markets). Additionally, of course, land owners have greater financial possibilities. Land often serves as collateral for college educations and entrepreneurial ventures. These are just some of the ways that land ownership is crucially important to rural minority communities. This social asset base is too often overlooked by race/ethnic scholars, agricultural policymakers, and sometimes even rural development practitioners in the communities themselves.<sup>RA</sup>

#### For Further Reading . . .

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**African American Land Loss:  
An Historical Overview and Analysis of Prevention Strategies**  
*by Jerry Pennick and Heather Gray*  
*Federation of Southern Cooperatives/Land Assistance Fund*

## **OVERVIEW**

The statistics on Black land loss in the United States are alarming yet virtually ignored by those who are in a position to reverse the trend. It is rarely considered that there is a finite amount of land, that the ownership of land lends itself to economic empowerment along with the control of resources, and that Blacks should be players in that scenario. In fact, the statistics reveal conditions are not in the least favorable toward assisting Blacks in controlling their economic destiny through land ownership. Yet, the constant decline in Black land ownership is a tragedy that, if left unsolved, will spell the end to any real hope of economic independence for Black America. Also, Black-owned land is rarely considered in its totality as a cultural component and as an economic resource - rather, it is more often referred to as productive "farmland". This conceptual error impacts the solutions necessary to assist Blacks to maintain land ownership and develop productive communities. In this paper we will offer an expanded definition of Black "land" ownership, discuss Black land loss and offer solutions to the problem.

### **Land Acquisition And Loss From Civil War To The Present**

The acquisition of land by Blacks following the Civil War was an impressive accomplishment. In fact, by the beginning of the 20th century, the development of a land base was considered a high priority by emancipated slaves. In 1910, less than 50 years after the Civil War, Blacks had acquired 15 million acres of land. Surprisingly, these 15 million acres were primarily small tracts of land. The bulk of land owned by Blacks was and still remains in the cotton belts of Alabama, Mississippi, Georgia, South Carolina and North Carolina. The cotton belt is also known as the 'black belt' because of its rich, dark soil which also 'coincidentally' corresponds with a sizable concentration Blacks living in the region (1980).

Black land acquisition in the United States cannot proceed, however, without mention of the now infamous "forty acres and a mule". Land reform was hoped for throughout the Black community in the South when the 1865 Freedmen's Bureau Bill "provided for the 'allocation of 'unoccupied lands' (not to exceed forty acres) among the freedmen." (1980) This 'forty acres' was a promise of extensive land reform that never came to fruition, as Congress, in the mid-19th century, was not in the mood for sweeping reforms. The Freedmen's Bureau could only sell small five-to-ten acres tracts of land to Blacks which set the pattern of what has been comparatively very small acreage for Black owned family farms.

The dream of forty acres and a mule, for the majority of the freedmen and their descendants, never materialized. The overwhelming majority of them remained landless and circumscribed by the plantation. In the meantime, poor white farmers benefited from the shaken plantation and land economy and were able to purchase land abandoned by farm or plantation owners. Although poor whites and blacks shared common economic problems, the black landowners and the landless farmer were the targets of tremendous racial bias and strife which effected their ability to acquire and use land productively. (1980)

Further, the Freedmen's Bureau - which "stood between the freedmen and the wrath of their ex-masters" (ELF)- lasted but a short seven years (1865-1872). Blacks, then, forged ahead without government intervention in the midst of a turbulent and racist post-war South. And they did it with all deliberate speed. Not only did Blacks acquire 15 million acres of land by 1910, but the census that year indicated that there were 920,833 Blacks farming 46,632,742 acres of both owned and leased land.

Another rarely discussed tragic legacy of the unfulfilled Reconstruction was a legal system that never tried to protect the interests of Black land owners. Historically, laws relevant to land issues in the United States have **never** been favorable to Black land owners. Specifically tax sales, foreclosures and laws surrounding heir property have wreaked havoc on the Black community and require extensive reform. (Some of these legal issues will be covered more extensively later in this paper.)

Historically, it is important to note the racial climate in the South and how it has impacted Black land loss. The publication "Only Six Million Acres: The Decline of Black Owned Land in the Rural South" published by the Black Economic Research Center in 1975 revealed stark examples of manipulative tactics in the South that led to loss of land.

### **Blacks Are Losing Land At A Tragic Rate**

The 15 million acres of Black owned land acquired by 1910 has rapidly declined this century. In fact, census data reveals that Blacks are **now** losing land at a rate two and one half times that of other Americans. Over a fifteen year period from 1978 to 1992, Blacks lost 55% of their rural land base - down from 57,000 farms and 4.2 million acres of land in 1978 to 18,816 farms and 2.3 million acres in 1992. The two million acres lost in this period have a conservative value of one billion dollars and tens of billions in lost economic development activity.

The above statistics on land ownership, however, represent only those farms and acreage listed by the U.S. Census of Agriculture. The Federation of Southern Cooperatives/Land Assistance Fund estimates that there could be an additional four to five million acres of land owned by Blacks. This "excluded land" does not meet the agriculture census criteria, which includes a minimum gross farm income of \$1,000, set forth by the USDA to be considered a farm. Often idle, this land, is more likely to be

occupied by elderly individuals, is heir property or subject to absentee ownership, is prey to land speculators, and more often is lost through tax and partition sales.

### **Why Blacks Lose Land**

The loss of Black owned farm land has been the subject of several commissions...several reports have been written on the subject...countless remedies have been sought. A few of the major reasons frequently mentioned for the decline in Black owned land are the following.

#### **Lack of Credit**

Blacks who are still farming today can thank the 1987 Credit Act. Farmers, who had struggled since the seventies due to a series of droughts, rising interest rates and embargoes were finally given an opportunity to restructure their debt and develop a plan to save their farms and operate profitably. Many Black farmers took advantage of the opportunity and were, once again, farming and paying their debts.

Tragically, the 1995-96 Farm Bill has had the opposite impact. Under the current Bill any farmer who took advantage of the 1987 Credit Act and had either a debt write-off or filed bankruptcy to save his/her farm and restructure the debt can no longer borrow money from the Farm Service Agency (FSA). It does not matter that many of these farmers had been borrowing and paying loans since 1987. Also, no consideration was given to the fact that Black farmers have traditionally not had the same access to credit as other farmers and for them the Farm Service Agency is truly the lender of last resort.

Another mandate in the Bill which adversely effects Black farmers is the seven year transitional payments provision. The government will provide subsidies for the next six years, and after that, farmers are on their own. Without the subsidies, farmers will be at the mercy of a market controlled by large corporate farms and the consequences will be staggering.

If credit is not available through FSA - the lending institution of last resort - more family farms will be forced out of business and land will be lost. How can Black farmers compete with large corporate farms? What will happen to thousands of other Black farmland owners, such as Black women who own land and rent to Black farmers? By making farm land available to Blacks, these women and others are receiving much needed income. If Blacks are not able to make productive use of their land through farming, it, too, will fall prey to land speculators because it is likely to become a burden to the owner.

#### **Lack of Access to Appropriate Technical Assistance**

Black farmers lack access to appropriate technical assistance available through the USDA extension and other programs is now legendary. This is coupled with a lack of

funding for community based organizations and 1890 land grant institutions that would enable them to research and develop materials on production and marketing trends relevant to Black family farmers in the South and to provide them with much needed technical assistance.

Further, assistance to Black farmers and the encouragement of Black youth into agriculture was impacted by the desegregation efforts of the 1960's. As stated in the USDA's May 1998 "Agriculture Outlook"

"(In the 1960's, many Black schools were closed) ending separate extension services for Blacks, (and) brought an end to farm clubs and vocational agriculture programs directed specifically toward Black youths. These events reduced the assessability of training for a career in agriculture, and in part led to reduced demand for agricultural education by young Blacks. Combined with competition for students from newly integrated state universities, this reduced demand also contributed to reduced support for the agriculture programs at the historical Black land-grant universities." (1998: p 17)

### **Legal Problems**

**Tax sales:** Tax sales result from a failure to pay assessed taxes when due. Property lost through tax sales can be redeemed within a specified time. If the land is heir property, the redemption usually inures to the benefit of all heirs. Tax sales generally involve the taking of property that is tax delinquent and auctioning it off to the highest bidder. Many black landowners are not informed by the proper officials that taxes are due or that the land will be sold.

**Partition Sales:** According to the 1980 Emergency Land Fund study on heir property, estate planning through testacy was not incorporated into Black thought because Blacks felt that they could not trust or rely on a legal system which had traditionally failed to protect their interests. Passing land through testacy, therefore, became a tradition. Over sixty three (63.2%) percent of the respondents in the landowners' survey (conducted by the Emergency Land Fund) indicated a preference that the family land remain heir property. The practice, either passive or active, of failing to write wills has remained a predominant characteristic of Black rural land tenure in the southeastern region of the United States

The courts often rule that heir property cannot be equitably divided thus a partition sale is ordered and the proceeds are divided among the heirs in proportion to their interest in the land. Moreover, partition sales are often instigated by some individual outside the family, who has purchased an heir(s) interest(s).

**Foreclosure sales:** Foreclosure sales are another contributing factor to black land loss, and legally it can be most difficult to overcome. This is because blacks often mortgage their land as security for a debt without understanding the full legal consequences, and the mortgage may be subsequently foreclosed if the debt is not repaid. Older landowners are particularly vulnerable to mortgages that carry exorbitant interest rates and other adverse conditions.

**Voluntary Sales:** Although it receives less attention, voluntary sales are the number one cause of Black land loss in America. Rarely does a voluntary sale take place between Blacks, thus, when a Black landowner sells, the land invariably leaves the control of the Black community.

Although more extensive research is needed to ascertain why voluntary sale is so prevalent, it is important to note that according to a survey conducted by ELF in 1980, the following reasons were given: "...economic stress; to prevent foreclosures; family pressure; and pressure from a white controlled system. Therefore, whether a sale is truly voluntary must be evaluated in part by the ability of the landowner to negotiate free from pressure and intimidation."

**Shortage of lawyers:** The lack of attorneys in the rural South, particularly Black attorneys, with knowledge of real estate practices, agricultural and land retention issues and policies is another major legal problem that contributes to black land loss. This scarcity is of primary importance because black landowners tend to feel suspicion and distrust towards the legal system, which is justified given their bitter experiences with that system. As a result, many black landowners face complex legal problems alone, because they do not have capable legal representation to protect their rights. Consequently, there is an overwhelming need for dedicated and scrupulous black lawyers with real estate experience who can adequately assist black landowners and dispel their mistrusts of the legal system.

## **ASSESSING BLACK-OWNED LAND**

### **Land Ownership Is Not Limited To Farmland**

As alluded to above, a discussion about Black owned land and its loss is often clouded by the lack of clarity in defining "black owned land". This is compounded by the difficulties in finding an accurate accounting of Black owned land whether it be farmland or otherwise. And while still the best, the U.S. Census of Agriculture is not the most reliable source of information about land ownership. In the 1980 report on heir property by the Emergency Land Fund (ELF), reference is made to this issue. The ELF report notes that:

- The US Census of Agriculture (in existence since 1920) records only farmland.

- The enumerations inevitably miss many units of land, particularly smaller ones. Black-owned parcels, which are relatively small, are more likely to be under counted than white-owned parcels. The under-counting became acute in the 1969 census, when the data were gathered through the use of mail questionnaires instead of home visits by enumerators. Consequently, the typical Black farm operator -- i.e. part-time, part-retired, low-income, and of little education -- was less likely than the white farm operator to be included in the administrative records used to assemble the basic mailing list.

### **Exclusion Factor**

In 1980 the ELF conducted extensive research in selected counties in 5 southern states. Through courthouse records, each black owned parcel was identified and counted. To attempt to acquire as accurate an assessment as possible regarding the race and location of land owners, the assistance of community leaders was necessary and extremely helpful. These parcels of Black owned land were, then, verified by one-on-one interviews with the land owners. Comparisons were then made with the US Agriculture Census data per county. A formula was developed by using the total acreage identified in 8 counties studied. The findings were striking. Blacks owned slightly more than 3 times the amount of land revealed in the 1974 census. From this data an extrapolation was made to 10 Southern states resulting in the calculation that Black owned land in 1974 was 9,257,311 acres rather than the 5.5 million acres counted by the Census of Agriculture.

Although the excluded acres do not meet the criteria established by the USDA to be considered a farm, in many areas they represent a tremendous asset for the owners and the community. Still, much of the excluded land is for the most part idle and heir property which continues to make it a prime target for unscrupulous land speculators.

Using the formula established by ELF, we estimated that in the 1990's Black America likely owns over 5 million acres of land instead of the 2.3 million counted by the 1992 Agriculture Census. The excluded acres could be a major factor in creating self-help rural economic development opportunities for Black America.

As of 1997 the U.S. Census of Agriculture is under the auspices of the U.S. Department of Agriculture rather than the U.S. Census Bureau. Nevertheless, the census questionnaires are still being mailed and home visit are not being made. One change is that the USDA Extension offices are involved in the process and efforts are being made to provide services for those in need of assistance in filling out the census questionnaire. Given the history of the Extension Service and its relationship to Black farmers, however, this might or might not make a difference in a more accurate accounting.

### **SOLUTIONS**

The following are some suggested strategies to both prevent Black land loss and expand the current Black owned land base.

### **Productive use of Black owned land**

It is important to note here that the US Department of Agriculture's Civil Rights Action Team (CRAT) held historic listening forums with minority farmers in 1997. From these forums recommendations were developed by CRAT to address the numerous complaints revealed at those forums. A National Small Farm Commission also developed strategies to assist small farmers. We are of the opinion that all the recommendations of CRAT and the Small Farm Commission should be implemented. The following, however, are two of the recommended solutions that we think are of major significance regarding assisting Black farmers in making productive use of their land.

#### **Credit Issues**

Efforts to amend the credit provisions of the 1996 Farm Bill should be passed by Congress. While the amendment of this provision will help all family farmers, Black farmers are particularly vulnerable and need relief. As indicated and now admitted by the USDA, Blacks have been harshly discriminated against by the US Department of Agriculture. One of the suggested amendments to the Credit Provision of the 1996 Farm Bill that would assist Black farmers is that a debt write down resulting from discriminatory practices by the USDA would be excluded from consideration in credit applications.

#### **Full and permanent funding of 2501**

In various forms, Section 2501 (known as the Minority Farmers Rights Bill) has been part of the last two farm bills. It was authorized by Congress to be funded at the level of \$10,000,000 annually. The purpose of 2501 is to provide technical assistance to disadvantaged farmers. This assistance includes, but is not limited to; developing farm plans, marketing, alternative crop production and record keeping. The program is administered under cooperative agreements between the USDA and 1890 Land Grant Institutions as well as those NGO's with a proven track record of work with disadvantaged farmers.

Over the years, 2501 has been very successful. For example, in Georgia over 500 Black farmers have participated in the 2501 program run by the Federation of Southern Cooperatives/Land Assistance Fund. Prior to entering the program, nearly 100 percent were delinquent on their loans and were trying to grow traditional crops on relatively small acreage. Today, less than one-third are delinquent and over 75% are growing alternative crops.

Although authorized, Congress never appropriated full funding of 2501 which is less than five percent of the agriculture budget. The USDA's Civil Rights Action Team (CRAT) recommended \$25,000,000 to be appropriated for this program. In addition, many NGO's believe that it should automatically be included and funded in all future farm bills until the trend of African-American farm and land loss is reversed.

## **Protect Land By Implementing Changing In Legal System**

Black landowners are particularly disadvantaged given the current laws on land and the lack of qualified and informed attorneys. The following are some suggested legal solutions.

### **Adequate and Affordable Legal Assistance**

Legal problems related to black land loss can be effectively dispelled through practical solutions. Legal assistance can be provided by sympathetic attorneys who will charge a reduced fee. Additionally, Legal Service offices should have a separate division that specifically focus on real estate issues so that they can better assist black land owners with legal problems. Foundations, churches and universities should fund programs that identify and place on retainer a small number of trusted and skilled attorneys to assist black land owners. Moreover, these programs could recruit and train volunteer paralegals to assist the retained attorneys. Legal advocates should advise black land owners to write wills and clear all titles to protect their land.

### **Heir Property**

In most states the following problems exist. The solutions have been adopted by some states but should be adopted nationwide.

**(1) Problem:** There are no laws to respond to the situation in which all heirs are known and locatable but cannot agree on the use and management of the property.

**Solution:** *If an heir or purchaser of an heir interest seeks a partition sale, the remaining heirs can purchase, at fair market value, his or her interest prior to the sale (as amended, State of Alabama, Code of Ala., 1975)*

**(2) Problem:** There are no laws which permit an heir or heirs to obtain a partial partition without disrupting the entire cotenancy.

**Solution:** *Laws should permit a cotenant to obtain a partial partition and, if the other heirs agree, the remaining land will still be held in cotenancy.*

**(3) Problem:** The allowance of attorney's fees from the proceeds of a partition sale encourages attorneys to recommend partition sales, rather than partitions in kind.

**Solution:** *In a contested action for partition sale, the award of attorney's fees only effects the share of the sale proceeds of the heir or heirs who partitioned for the sale.*

**(4) Problem:** The right to partition land in kind is statutorily provided; however the courts frequently order a sale even when the heirs do not want such and even when the land could be divided in unequal shares or where contribution can be effected to compensate for the difference.

**Solution:** *The statute authorizes the court to divide the land into unequal shares among the cotenants and compensation is given to those cotenants receiving shares with values less than their total interests in the land.*

**(5) Problem:** It is difficult to extinguish or limit the rights of an heir who has left the land and has not communicated with the other cotenants for several years.

**Solution:** *Any individual who absents himself from the limits of the state for five consecutive years, with no indication that he/she is alive, shall be presumed dead.*

### **Voluntary Sales**

Equal access to credit would enable potential Black landowners to secure financing. FSA should place priority on lending to Black farmers who seek to purchase land from other Blacks. Black landowners should also be given equal access to the various state and federal programs that would help make land an asset rather than a liability. Too often, Blacks are not privy to information on government funded land utilization opportunities.

### **Tax Sales**

Many of the following tax sale solutions are already in place in several states. However, in order to have maximum effect, they should be adopted by every state.

- notice of the tax sale should be posted on the premises;
- the officials conducting the sale should first try to sell personal property before selling the land;
- no official or his/her agent or representative should be allowed to bid at the sale;
- the tax payer should be allowed to remain in possession until the end of the redemption period;
- the taxpayer can redeem at anytime within the redemption period and before the right to redeem has been foreclosed by notice;
- if the state or taxing unit does not collect or sue for the collection of taxes for a period of six years, it shall be barred from doing so.

### **National Education Program**

Due to the lack of relevant information in the general population about Black owned land and how to protect this asset, a national educational program should be implemented. Also, given the solutions above, the program must incorporate local, state and regional efforts. Such an educational thrust could include churches throughout the country (particularly churches in the South), 1890 Land Grant Institutions, community based organizations and USDA extension offices.

Education is necessary on two levels. One, individuals need to be better informed about their rights and responsibilities as land owners and how to guard against tactics that might result in the loss of their land. For example, as heir property is invariably vulnerable, land owners need to be educated about the importance of having a will. Second, advocacy and education of legislative solutions is necessary, particularly at the state level on changes in the above mentioned "legal issues" and federal legislative initiatives to assist Black farmers in terms of credit and funding of section 2501 to provide technical assistance to minority farmers.

## SUMMARY

### Results Of Black Land Loss

Land is the most valuable resource owned by minorities and cannot be underestimated. The political and economic power of the minority community is weakened with the loss of every acre. If there is no land, the problems of remote claims and black heirship will be moot in the black community. A landless and economically powerless minority will have a devastating impact on the entire nation.

Land ownership by Blacks is highly correlated with certain other important characteristics which are generally regarded as worthy of encouragement within the Black community. Black landowners have proven to be more likely to register to vote, more likely to participate in civil rights actions, and more likely to run for political office than are those who do not own land. This suggests that land ownership confers on Blacks a measure of independence, of security and dignity, and perhaps even of power.

Rural land owned by Blacks represents tremendous economic development potential including forestry, recreation and mineral extraction. What's needed is proper attention and assistance.

There is also a direct relationship between Black land loss and the migration of Blacks to the cities. It is painfully obvious that most cities are not able to absorb the massive number of unskilled, resourceless people who continue to migrate from rural areas.

Urban America might be radically different today had resources been devoted to land based rural economic development projects encouraging and assisting Blacks to stay on the land. This economic development planning and implementation would have cost a fraction of the money that has and continues to be spent on welfare, crime prevention and other social services.

With the new Welfare Reform Bill, the issue of Black land loss becomes even more critical. Where will rural welfare recipients find the jobs required under this legislation? With a rural-urban migration no longer a viable option, the jobs - whatever they might be - have to be created where the people reside.

There are now Enterprise Communities and other government sponsored rural development initiatives that encourage economic growth including cooperatives, credit unions, non-farm business development programs and others. Blacks in rural America, with assistance from organizations like the Federation of Southern Cooperatives/Land Assistance Fund, want to be and should be an integral part of these initiatives. However, their participation and benefits will be severely limited if they are not land owners.

### **A Collaboration Is Called For**

These and other reasons point to why it is necessary to help save Black owned land. There needs to be a collaboration between government, non-governmental organizations and educational institutions that will effectively address all aspects of the Black land loss problem.

Such a collaboration could create a network of economically independent landowners which, in turn, would mean less welfare, more jobs and a future for young Blacks.

Finally, Black America must begin to hold its leadership, both political and non-political, liable for its general inattention to this serious problem. Only when there is a Black land related problem that gets media attention does the Black leadership get involved, once the cameras are gone, for the most part so is the leadership.

### **References**

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1998 "Status Report: Minority and Women Farmers In The United States" Agricultural Outlook (May), P. 16-21. Economic Research Service/USDA.

## Heir Property & Land Preservation Alternatives

*Heir property* is a major contributor to land loss in the African-American community. When a landowner dies without a will, or other estate plan, the distribution of the property is controlled by state law. Distribution of an estate that is controlled by state law is called an *intestate estate*. Land that is distributed according to a state law is commonly referred to as *heir property*.

### Estate Planning

*Estate Planning* is the process of arranging for the distribution and management of your estate after you die through the use of wills, trusts, insurance policies, and other devices. An *estate* is defined as all the assets and liabilities left by a person at death. Assets include real property (e.g. land, home) and personal property (e.g. car, furniture, jewelry, etc.). Liabilities are debts you owe.

Estate planning is a useful tool to prevent the creation of heir property and to prevent further fractionation of heir property. Heir property can potentially have numerous owners, especially where generations of heir property owners pass without an estate plan, or nothing has been done to centralize ownership in the land. Heir property that has so many owners that physical division of the property is not feasible is known as *highly fractionated heir property*. With each passing generation that does not have an estate plan, the number of interest holders in the property increases. This can make it increasingly difficult to properly manage the land.

If you are interested in having an estate plan completed for you, we strongly recommend that you seek the guidance of an attorney. Further, it is important that you keep track of all your personal and financial records that demonstrate what you own (your assets) and what you owe (e.g. mortgage).

### Administration of Intestate Estates

An *administrator* is someone who is appointed by a probate court to administer the estate. An administrator is typically appointed in one of the two following situations:

1. An individual's is being probated and his/her will does not does not name an executor; or,
2. An individual dies without an estate plan, and someone needs to be appointed to administer the intestate estate.

To administer an estate means for a court-appointed administrator, or an executor, to settle an estate. Settling an estate includes paying outstanding debts owed by the estate, making distributions of the estate according to a will, or according to state law, and, eventually closing an estate after those activities have been completed. An administrator has a duty to act in the best interest of all those who have an interest in the estate.

Most states allow interested individuals (e.g. relative or spouse of the deceased), to seek appointment as administrator. For example, in Georgia, an individual has five (5) years after the date of death to seek such an appointment. Opening an intestate estate for administration is one way to centralize a family's efforts to effectively manage and ultimately distribute the heir property in the estate.

With some heir property, the landowner(s) have died a long time ago, often beyond the time allowed to file for administration in many states. In this instance, having an administrator appointed may be a way to centralize the effort of resolving heir property concerns a family may have. It may also be a way to motivate heirs to be proactive in resolving heir property concerns, or revive once existing efforts to do the same.

Administration is an option that may be considered if distribution of the intestate estate is foreseeable. For example, if it is feasible and all the heirs agree to the physical division of the land, then administration may be an option to consider.

Some of the activities an administrator may consider to resolve heir property concerns in his/her family may include:

1. Division of the land according to each heirs' fractional interest in the land.
2. Oversee the "buy out" or donation of disinterested heirs' interests by those heirs who are interested in retaining land ownership, and other alternatives to preserving heir property (see below).

These are just two activities that may be considered. Resolving heir property concerns are highly individualized. Any activity, or activities, considered by the family.

### **"Buying Out" Disinterested Heirs**

One of the contributors to African-American land loss is the voluntary sale of property, or the sale of an interest in heir property to someone outside the family. Interest holders in heir property can sell their ownership interest to whomever they choose, and they do not have to seek the consent of the other interest holders in the land. This can lead to land loss due to *partition sale*. A *partition sale* is the court-ordered, public sale of land. The Federation has seen partition sales initiated in one of the following ways:

1. An heir files a petition with the court for the partition sale or physical division of the land. If the heir can prove that partition sale would be in the best interest of all interest holders in the property, or if the court determines that it would not be feasible to divide the land, a partition sale will be ordered.
2. An heir sells their interest to someone outside the family, typically a land speculator, and that individual then files a petition with the court for the partition sale of the land.

Those heirs who seek to have the land sold at partition sale erroneously believe that they will receive the actual value of the property, or, otherwise receive some substantial amount of money from the sale. This is not necessarily true. Often land is sold at a partition sale for far less than its actual value. Further, before the sale money is distributed to the heirs, the cost of conducting the sale and, often, attorney fees will be deducted from it first.

One way to prevent a partition sale is for disinterested heirs to either sell or convey their interest in the land to another family member. A *disinterested heir* is an interest holder in heir property does not wish to have anything to do with the land. He/She has no desire to visit the land and no desire to help manage the land (i.e. pay annual property taxes).

If there are heirs who no longer recognize a connection to family land, they should consider donating or selling their interest to those heirs who are interested in retaining ownership. In the event a disinterested heir wants to sell, not donate, their interest, typically the sale amount will be based upon the actual value of the property and the size of the heir's fractional interest in the land.

### **Division of Intestate Property**

A *partition-in-kind* is the physical division of property that is owned jointly. The acreage each heir property owner will receive is determined by the size of his/her fractional ownership interest. Until property is equitably divided through a partition-in-kind, the interest holders have an arbitrary interest in the land, but cannot link their interest to a physical portion of the property. Therefore, by equitably dividing heir property, the interest holders no longer share ownership, and each is given sole ownership of a part of the land.

A partition-in-kind should be considered if there are not many heirs to the land so that the division of the property will be reasonable, and if they are all known and locatable. There is no set definition of what "reasonable" is, but partition-in-kind should probably not be considered unless each heir can receive at least 1 to 2 acres.

If heirs are unknown or unlocatable, then the property cannot be equitably divided without court supervision, if at all. Further, if the heirs are known and locatable, but do not agree that the property should be equitably divided, voluntary division cannot be accomplished. Remember, for any decision for heir property, all interest holders must consent to them, except the sale of an individual's interest. Buying out disinterested heirs may be an option to consider to overcome these hurdles, thereby reducing the number of ownership interests attached to the intestate property.

## **Establishing Heirship**

Since ownership interests in heir property are distributed according to state intestacy law, the potential for numerous interest holders is possible. When heir property has been passed down through many generations, there is the possibility that there will be many interest holders in the land. The *unknown/unlocatable heir syndrome* occurs when numerous heir property owners are scattered across the country. When this happens, the interest holders often have never heard of each other and/or they do not know that they have an interest in land. Thus, determining who actually has an interest in land may be the first alternative to consider. Although this may be a lengthy and cumbersome task, it is one that may be necessary.

## **Setting Up a Family Business Entity**

## Another alternative for protecting heir property is to set up a family business entity that is owned and operated by all or a select group of the interest holders. The primary advantage of this option is that management of the land will be centralized in the business entity. The disadvantage of this option is that it will require the consent and participation of all interest holders in the land because each individual's interest will have to be transferred to the business. Although ownership of the land is transferred to the business, each interest holder will receive an interest in the business that reflects the size of their interest. Additional benefits of this alternative are as follows:

1. Centralizes management decisions for the land;
2. Control of the property rests in the heirs' hands;
3. Reduces the likelihood of land lost due to partition sale;

I. Corporation. A *corporation* is the most complex form of a business organization. It is a business entity that is separate, or independent, from those who create it. The owners of a corporation are called *shareholders*. In this case, shareholders would be the heir property owners. The greatest advantage of a corporation is that the shareholders generally are not liable for the debts of the corporation. In other words, if the corporation cannot pay its creditors (i.e. landlord, lender, supplier, etc.), the creditor cannot come after the shareholders. Another advantage of incorporation is that if a shareholder wants to leave the corporation, this will not trigger the automatic *dissolution*, or end, of it.

II. Limited Liability Company (LLC). Like a corporation, an LLC protects its owners from personal liability for the debts of the business. Owners of an LLC are known as *members*. With an LLC, this protection is limited.

An LLC has advantages similar to a corporation. The disadvantage of an LLC is that when one member wants to leave the LLC, the company will dissolve. When an LLC dissolves, the members must fulfill any remaining business obligations, pay off all debts, divide any remaining

assets and profits among themselves, and then decide whether they want to start a new LLC so the remaining members can continue the business. The operating agreement that creates the LLC can prevent the automatic dissolution, or end, of the business if "buy-sell" provisions in the agreement. "Buy-sell" provisions are used to set up guidelines for what will happen when one member retires, dies, becomes disabled or leaves the LLC to pursue other interests.

**III. Family Partnership.** A partnership is a business that has two (2) or more owners. It is the easiest of the three business entities to form because it does not require the filing of any papers with the state, as required to form a corporation (articles of incorporation) or LLC (articles of organization). Unlike a corporation or LLC, the individuals who have entered into a partnership are liable for all the debts and obligations of the business.

You should check with your local government to find out the requirements for registering the partnership as a business. For example, you may be required to register your business name. You may also want to have a partnership agreement written to formally outline how the business will operate, and the rights and responsibilities of each partner.

The disadvantage of a partnership is that it will automatically dissolve, or end, if one partner decides to withdraw from it. To avoid this, you may consider including a "buy-sell agreement in the partnership agreement that would lay out what would happen to the partnership when one partner retires, dies, becomes disabled or leaves the partnership to pursue other interests. For example, you could have language in your "buy-sell agreement" that allows the partners to buy out a departing partner's interest so business can continue as usual.

### Conclusion

These are some alternatives you may consider as possible tools to preserve heir property ownership in your family. Any decision or alternative considered must have the consent of all interest holders in the land. This information is Not Meant to Be a Substitute for Competent Legal Assistance. Please consult an attorney before you pursue any of the alternatives listed below. For further assistance and/or a lawyer referral, please call the Federation's headquarters at (404) 765-0991.

See also Special Topics notebook section  
*Farm/Forest Transfer and Estate Planning.*

## The Land Retention Project

### Heir Property & African-American Land Tenure

© The Federation of Southern Cooperatives/Land Assistance Fund

## What is the Federation of Southern Cooperatives/ Land Assistance Fund??

- Community Education
- Legal Assistance
  - Direct representation - GA
  - Attorney Referrals - AL, MS, SC, etc.
- Technical Assistance
  - Environmental farming techniques
  - Cooperative development.
- Community Organizing

## The Decline of African-American Land Ownership

- The importance of land ownership
- "Torn From the Land" - Associated Press articles
  - 107 land takings cases documented
  - over 1/2 (57) violent land takings
  - trickery and legal exploitations
  - <[www.federationsoutherncoop.com](http://www.federationsoutherncoop.com)>

## The Decline of African-American Land Ownership

- **Farm Land**
  - 1910 - 1997: 15 million acres to 2.4 million acres
  - Currently: < 1.9 million acres
- **Rural, unfarmed land**
  - Current Statistics - The 1999 AELOS study:
    - 68,000 African-American rural landowners, includes farmers and non-farmers
    - African-Americans own approx. 7.7 million acres (approx. 1% of all rural land in the U.S.)
    - 60% of the land owned by African-Americans is unfarmed
- Rate of land loss per day : 1000 acres/day

## African-American Land Loss: Contributors

- Heir Property
  - Tax Sales
  - Partition
  - Adverse Possession
- Lack of Estate Planning
- Voluntary Sale

## What is Intestacy???

Governs how an estate is distributed if there is no estate plan.

- **Surviving Spouse - when do they take?**
  - They always take 1/3 of deceased's personal estate and share 1/2 ownership of land with deceased's children
  - Take all the land if deceased has no children, surviving parents, nor siblings
- **Deceased's children - when do they take?**
  - When there is or is not a surviving spouse
- **Deceased's Parents - when do they take??**
  - When there are no surviving spouse and no children living to take
  - When there is a surviving spouse and children, they take 1/2 of deceased's land.

## Joint Property Ownership

- Property that is owned by at least 2 or more people
- Property subject to intestate succession is typically owned jointly
- Types of joint property
  - Tenancy in Common

## Heir Property

- Heir Property is owned jointly by at least 2 people - - tenancy in common
- Heirs share an "undivided, fractional interest in the land."
  - "fractional interest" = each interest holder has their own interest in the land; their "piece of the pie"
  - "undivided interest" = do not have actual ownership of a portion of the land

## Heir Property

### Definition:

Land that is subject to state laws of intestate distribution. Heir property is commonly held under a tenancy in common ownership arrangement.

### Characteristics of Heir Property:

1. Each interest holder has an undivided, fractional interest
2. No right of survivorship - each heirs' interest can be passed down to their successors
  - \* Potential for highly fractionated interests:
  - \* Difficult to track interest holders
  - \* Difficult to equitably distribute
3. No accountability structure
4. An interest can be easily conveyed; purchaser becomes a TIC

## Heir Property: Landowner Rights & Responsibilities

1. Any maintenance/upkeep of the property is voluntary.
  - "Freerider" Problem
  - Those who invest in the land do not have "superior title"
2. TICs may sell/gift their interest to anyone without consent of other TICs.
3. Any profit generated from activities on property must be equitably distributed to all TICs.

## The Impact of Tenancies in Common on African-American Rural Landowners

\* Heir property, or tenancies in common, are prevalent in African-American rural landowner population

\* "When I hear heir property, I immediately think of African-American landowners in the South."

\* High fractionation is common in tenancies in common owned by African-American families.

- \* Heirs scattered across the country
- \* Unlocatable heirs
- \* Different levels of attachment to the property

## Heir Property: The Consequences

### Tax Sale

No accountability structure in place to hold one or several heirs responsible for payment of property taxes.

### Partition

Partition-in-kind: Physical division of land

Partition Sale: Courts prefer partition sale over physical partition.

Friendly partition

## Partition Sale: The Good, the Bad, & the Ugly

### The Good

This is the one of the easiest ways to obtain, clear and marketable title

### The Bad

- \* Difficult, if not impossible for heirs to competitively bid at partition sale.
- \* Property is often sold for far less than its appraised value.

### The Ugly

- \* The decision to partition or sell an interest to someone outside the family does not require consensus
- \* Partition laws in many states do not take into consideration the efforts of heirs who want to preserve the land in the family.
- \* Land can be sold at FAR below its market value

## Adverse Possession

Adverse possession has been called 'legalized thievery.' It rewards diligent possessors, and punishes slumbering owners."

Olin L. Browder

Adverse possession is defined as a claim of ownership by one who is not the true or original owner of a piece of property.



## Adverse Possession

- Requirements to adversely possess another landowner's property
  - demonstrate acts of ownership for a period of time required by law
- Landowners are responsible for filing an ejection action to remove the adverse possessor and assure his/her title before the statutory period tolls
  - Do not personally eject another from your property
- If successful, an adverse possessor will acquire fee simple ownership of another's property

## Alternatives to Preserve Land: Estate Planning

### Estate Planning

Arranging for the distribution and management of your estate after you die.

### What is an estate?

All the assets and liabilities left by a person at death. Includes personal property (e.g. cars, furniture) and real property (e.g. land)

## Alternatives to Preserve Land: Estate Planning

### The Importance of Estate Planning

1. Prevent the creation of heir property
2. Prevent further fractionation of heir property
3. You have some control of how your estate will be passed down after you pass

### Types of Estate Plans Include:

1. Will
2. Trust - -( different from a land trust)

## Choosing An Estate Plan That Is Right for You

### Which estate plan is right for me?

- **Talk with an attorney -- will draft the estate plan, and assist you in planning for the unexpected future**
- **Factors to Consider**
- **Know what you have -- What are your assets?**
- **Know who you want to benefit from your estate plan?**



## Conclusion

- Know what organizations can assist you in acquiring land, preserving land, and making the most beneficial use of your land
- The importance of education on heir property and the legal consequences of having it.

Available online at  
[www.srs.fs.usda.gov/pubs/gtr/gtr\\_srs055.pdf](http://www.srs.fs.usda.gov/pubs/gtr/gtr_srs055.pdf)

# Human Influences on Forest Ecosystems

The Southern Wildland-Urban Interface Assessment



U.S. Department of Agriculture  
Southern Research Station  
General Technical Report SRS-55

Edited by  
Edward A. Macie  
L. Annie Hermansen

# Human Influences on Forest Ecosystems

The Southern Wildland-Urban Interface Assessment

Edited by

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**Edward A. Macie**, Regional Urban Forester, USDA Forest Service, Southern Region, 1720 Peachtree Road, NW, Atlanta, GA 30367-9102, [emacie@fs.fed.us](mailto:emacie@fs.fed.us)

**L. Annie Hermansen**, Technology Transfer Coordinator, USDA Forest Service, Southern Research Station, 408 W. University Ave., Suite 101, Gainesville, FL 32601, [ahermansen@fs.fed.us](mailto:ahermansen@fs.fed.us)

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## Foreword

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**I**n 1998, Florida wildfires demonstrated the complexities of natural resource management in the wildland-urban interface. Shortly after these fires, the Chief of the USDA Forest Service identified the wildland-urban interface as one of the main challenges for the Forest Service in the South.

While many studies have addressed various interface issues, few have been conducted with an interdisciplinary perspective in the South. As this Assessment demonstrates, the South is facing dramatic change. The future sustainability of southern forests and the ability to manage for forest benefits, goods, and services are challenged. This Assessment is a first step toward addressing these challenges and validates the need to establish a wildland-urban interface center that addresses the many research and information needs identified.

The Southern Wildland-Urban Interface Council, an interagency team with representatives from the Forest Service; Southern Group of State Foresters; universities; the Cooperative Extension Service, Southern Region; and nonprofit organizations provided direction for the Assessment. Council members were principal advisors and planners for this project and identified key interface issues, which were then refined and validated by a series of focus groups held in six Southern States.

This Assessment is closely linked to the Southern Forest Resource Assessment (SFRA), which has comprehensively examined challenges to forest sustainability in the South. We focus here specifically on urbanization, changing land use patterns, and issues related to the wildland-urban interface. Readers of this Assessment, however, will find valuable supporting information in the SFRA report.

A comprehensive wildland-urban interface literature database and other supporting resources can be found on the Web site, Interface South ([www.interfacesouth.usda.gov](http://www.interfacesouth.usda.gov)). This Web site was developed to meet the growing demands for wildland-urban interface information and resources.

As you read this Assessment, remember that issues in the wildland-urban interface are too complex to be bound to a single topic or perspective. Furthermore, this Assessment was not meant to cover every possible issue related to the wildland-urban interface; space and other limitations made this impossible. Rather, our goal has been to start a dialogue. We hope that dialogue will lead us toward a more complete understanding of interface issues, challenges, and needs for the Southern United States.

**Peter J. Roussopoulos**

Station Director  
Southern Research Station

## Contributors to this Report

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### Authors

**H. Ken Cordell** is a Project Leader and Senior Scientist with the USDA Forest Service, Southern Research Station, Athens, GA. He specializes in outdoor recreation, wildlands, and demographic trends.

**Terry A. DeMeo** is the Environmental Policy Program Coordinator with the Carl Vinson Institute of Government at the University of Georgia, Athens, GA. She conducts research on environmental management and policy issues and provides technical assistance to local, regional, and State governments.

**Mary L. Duryea** is a Professor at the School of Forest Resources and Conservation, University of Florida, Gainesville, FL. She teaches and conducts research in reforestation and urban forestry.

**John L. Greene** is a Forest Economist with the USDA Forest Service, Southern Research Station, New Orleans, LA. He specializes in the economics of nonindustrial private forestry and the effect of Federal and State taxes on the financial returns to forest management.

**L. Annie Hermansen** is the Technology Transfer Coordinator for the USDA Forest Service, Southern Research Station, Southern Center for Wildland-Urban Research and Information, Gainesville, FL. Her work focuses on expanding technology transfer capacity and delivery of wildland-urban interface information across the southern region.

**R. Bruce Hull** is a Professor of Forestry at Virginia Polytechnic Institute and State University, College of Natural Resources, Blacksburg, VA. He teaches and conducts research on the social dimensions of natural resource management, especially the public understanding of nature, sources of conflict in environmental management, and interface forestry.

**James E. Kundell** is Senior Associate and Director of the Environmental Policy Program at the Carl Vinson Institute of Government, and Professor of Environmental Policy at the Institute of Ecology at the University of Georgia, Athens, GA. He specializes in water resources, air quality, growth management and sustainable development, and hazardous and solid waste management.

**Edward A. Macie** is the Regional Urban Forester for the USDA Forest Service, Southern Region, Atlanta, GA, and Acting Project Leader for the Southern Research Station, Southern Center for Wildland-Urban Interface Research and Information, Gainesville, FL. His work focuses on the effects of urbanization and public policy on forest ecosystems.

**Steverson O. Moffat** is a Policy Analyst and Research Forester for the USDA Forest Service, Southern Research Station, New Orleans, LA. His research and publications are primarily focused on the policies and laws that affect forestry and forest management and on questions pertaining to the politics and policies of sustainable forest management.

**Martha C. Monroe** is an Assistant Professor at the School of Forest Resources and Conservation, University of Florida, Gainesville, FL. She teaches courses on natural resource communication and environmental education program development, and she develops extension programs that enable resource managers and citizens to work on resolving wildland-urban interface issues.

**Margaret Myszewski** is an Environmental Policy Specialist at the Carl Vinson Institute of Government, University of Georgia, Athens, GA. She conducts research and writes policy reports on a variety of environmental and legal topics including land use issues, growth management, and water resources.

**Susan I. Stewart** is a Research Social Scientist with the USDA Forest Service, North Central Research Station, Evanston, IL. Her research interests include amenity migration and other human settlement patterns and their implications for resource management.

**Wayne C. Zipperer** is a Research Forester with the USDA Forest Service, Northeastern Research Station, Syracuse, NY. His research focuses on how urbanization affects the structure and function of forest ecosystems in urban and urbanizing landscapes.

## Editorial Team

**Robert Biesterfeldt** is an editing consultant and a retiree of the USDA Forest Service, Southern Research Station, Asheville, NC, where he served as Group Leader for the Communications Office.

**L. Annie Hermansen** is the Technology Transfer Coordinator for the USDA Forest Service, Southern Research Station, Southern Center for Wildland-Urban Research and Information, Gainesville, FL. Her work focuses on expanding technology transfer capacity and delivery of wildland-urban interface information across the southern region.

**Edward A. Macie** is the Regional Urban Forester for the USDA Forest Service, Southern Region, Atlanta, GA, and Acting Project Leader for the Southern Research Station, Southern Center for Wildland-Urban Interface Research and Information, Gainesville, FL. His work focuses on the effects of urbanization and public policy on forest ecosystems.

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## Chapter 1

# INTRODUCTION

L. Annie Hermansen and Edward A. Macie

Technology Transfer Coordinator, USDA Forest Service, Southern Research Station, 408 W. University Ave., Suite 101, Gainesville, FL 32601, [ahermansen@fs.fed.us](mailto:ahermansen@fs.fed.us)

Regional Urban Forester, USDA Forest Service, Southern Region, 1720 Peachtree Road, NW, Atlanta, GA 30367-9102, [emacie@fs.fed.us](mailto:emacie@fs.fed.us)

## Introduction

Large areas of once primarily contiguous forest land in the South are increasingly influenced by humans and surrounded by or intermixed with urban development. These areas of increased human influence and land use conversion make up the wildland-urban interface. Severe wildfires in Florida in 1998 demonstrated the complex challenges that the wildland-urban interface presents for a diverse group of people that live and work there. These fires also brought the wildland-urban interface to the forefront for the U.S. Department of Agriculture Forest Service (USDA Forest Service) and other natural resource agencies across the South, spurring the development of this Assessment.



*“In a word, the interface is a façade—the illusion that you are in the forest.” Texas*

Due to these wildfires, over \$600 million were lost through reduced tourism, fire suppression efforts, and damaged timber, businesses, and homes. Public health and safety were threatened; in some cases entire counties had to be evacuated and many elderly people and those afflicted with asthma needed medical treatment. Forest ecosystems were endangered. Although fire is a common occurrence in most southern forest ecosystems, the intensity of these fires was enough to kill large, mature trees (fig. 1.1). Firefighting agencies fought first to prevent loss of life and structures and second to protect natural resources. They also struggled to combine responsibilities of structural and wildfire firefighting, a necessity in the wildland-urban interface.

Though fire is a critical issue in the wildland-urban interface, it is but one of the many issues affecting the condition, health, and management of forest resources. Demographics, economics and taxation, and land use planning and policy are major forces driving change in the wildland-urban interface. Urbanization is influencing forest ecosystems by changing their structure, function, and composition, as well as the benefits derived from them. Management of water resources, recreation, traditional forest products, wildlife, and other natural resources is changing to meet the challenges in the interface. There are also many social consequences produced by this changing landscape.

Resource professionals need new management practices, skills, and tools to address the new and changing environment of the wildland-urban interface. New research is needed to place the best scientific information into the hands of decisionmakers. This Assessment is a first step towards addressing wildland-urban interface challenges, opportunities, and needs in the South.

We begin this chapter by defining the wildland-urban interface. Then we present the Assessment’s purpose, objectives, scope, and information sources. We conclude by describing the organization of the Assessment and a brief overview of each chapter.

## Defining the Wildland-Urban Interface

For this Assessment, we defined the wildland-urban interface as an area where increased human influence and land use conversion are changing natural resource goods, services, and management. Our definition was written from a natural resource perspective. Other common definitions are based on geographical, sociopolitical, biophysical, and fire perspectives.

The term wildland-urban interface most often brings to mind a definition based on geography. There are many types of interface that vary by spatial configuration. Spatial differences among these interface types are significant because they result in different conditions and challenges for natural resource managers, policymakers, and landowners.

The classic wildland-urban interface is characterized by areas of urban sprawl where homes, especially new subdivisions, press against public and private wildlands, such as private nonindustrial or commercial forest land, or land under public ownership and management (Hughes 1987) (fig. 1.2).



**Figure 1.1**  
The intensity of the 1998 wildfires in Florida was enough to kill large, mature trees.

Photos courtesy of Florida Division of Forestry



Photo by Hans Riekerk, University of Florida

**Figure 1.2**  
The classic wildland-urban interface is characterized by areas of urban sprawl where homes and other human-made structures press against public and private wildlands.

The wildland-urban intermix refers to areas going through transition from agriculture and forest uses to urban land uses on the leading edge of development. Such areas are characterized by a mixing of urban, forest, and agricultural land uses in advance of where the urban fringe is moving into the rural countryside.

The isolated wildland-urban interface is made up of remote structures, typically second or summer and recreation homes, ranches, and farms, surrounded by large areas of vegetation (fig. 1.3).



Photo courtesy of Virginia Department of Forestry

**Figure 1.3**  
The isolated wildland-urban interface is made up of remote structures surrounded by large areas of vegetation.

**Figure 1.4**  
Islands of undeveloped lands, such as public parks, are left when cities grow together. This creates wildland-urban interface islands.



Photo courtesy of USDA Forest Service

Finally, wildland-urban interface islands are areas of wildland within predominantly urban areas. As cities grow together, islands of undeveloped land are left, creating remnant forests. Sometimes these remnants exist as public or publicly protected openspace, or as land that is not developable or too expensive to develop due to site limitations, such as topography, wetlands, or rocky outcrops (**fig. 1.4**).

The interface can also be thought of in a sociopolitical context as a place of interaction between different political forces and potentially competing interests (Vaux 1982). It is a place of interaction between people with different beliefs and perceptions about how natural resources should be managed or between institutions with competing visions. One example is the opposing views within a community over the value of a local watershed. Some may see managing forests in a watershed to protect water quality as an important value while others may see more value in large expanses of parking lots within the same watershed.

**Figure 1.5**  
The wildland-urban interface can also be defined as an area where physical changes to forest ecosystems, such as this spot created by a southern pine beetle outbreak, are occurring as a result of increased urbanization.



Photo courtesy of USDA Forest Service

From a biophysical perspective, the interface can be defined as an area where physical changes to forest ecosystems are occurring because of increased urbanization. Examples of these changes include habitat fragmentation, reductions in connectivity, changes in biodiversity, encroachment of invasive species, changes in stormwater runoff and quality, and increased soil erosion (fig. 1.5).

Fire managers in the wildland-urban interface are concerned with protecting people and built structures as well as natural areas. Their definition of the interface is an area where residential or commercial development is in or adjacent to areas prone to wildfire (Davis and Marker 1987, Tokle 1987).

## Purpose and Objectives of the Assessment

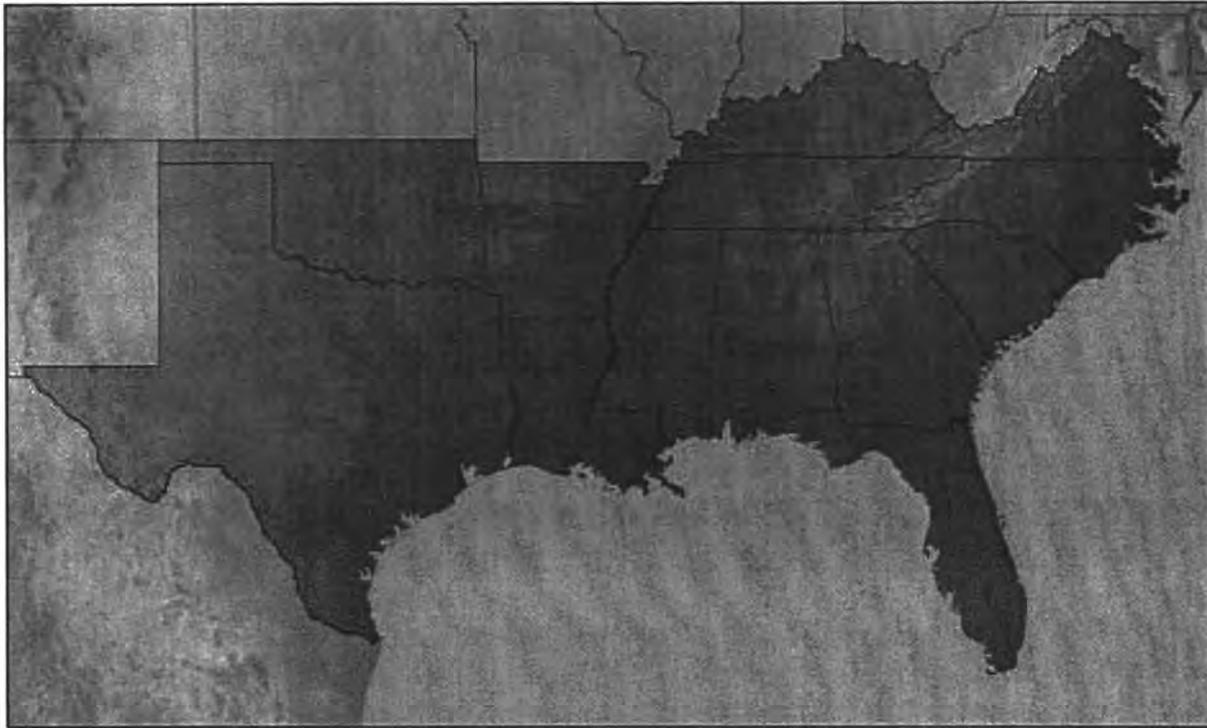
The main purpose of this Assessment is to provide a foundation for developing an integrated USDA Forest Service program of research, application, and development that addresses the issues, challenges, and opportunities of the wildland-urban interface. The five main objectives were to:

1. Explore the wildland-urban interface from an interdisciplinary perspective in order to understand the complexity and connectivity of interface issues.
2. Examine factors driving change in the interface, including population and demographic trends, economic and taxation issues, and land use planning and policy.
3. Explore consequences of this change on forest ecosystems, resource management, and social systems.
4. Identify gaps in our knowledge of interface issues to help us identify research and information needs.
5. Promote dialogue about and heighten awareness of interface issues among practitioners, researchers, and the public.

## Scope and Sources of Information

This Assessment covers the 13 Southern States shown in **figure 1.6**. Challenges in the wildland-urban interface in the South differ somewhat from those of other U.S. regions due to differences in the number of private landholdings, topography, climate, vegetation type, and culture. Although Assessment findings are for the South, many of the main themes and recommendations are applicable to other areas of the United States and abroad.

*“ . . . The interface is sometimes very abrupt. You’ll have agricultural fields right next to shopping centers. There’s no transition zone there.” Virginia*



**Figure 1.6**  
The scope of this Assessment covers the 13 Southern States.

Several sources of information were utilized for this Assessment. Scientific literature was searched to identify the current state of knowledge on interface issues. Also, a total of 12 Assessment focus groups were convened in 6 communities experiencing rapid growth across the Southern United States. The States in which these focus groups took place are Texas, Georgia, Florida, Alabama, Virginia, and Mississippi. Findings of focus groups are reported in the USDA Forest Service General Technical Report “The Moving Edge: Perspectives about the Southern Interface” (Monroe and others, in press). These focus groups helped to refine and validate interface issues that are presented in this Assessment and demonstrated that interface challenges are complex, compelling, and shared commonly among a diverse group of people who live and work in the interface. Quotations from these focus groups are presented in each chapter.

*“The interface is a mosaic of incompatible land uses, a zone of increased conflict.” Texas*

## Organization of the Assessment

This publication is divided into three major sections. Within each section are several chapters, each beginning by exploring major issues, changes, and challenges in the wildland-urban interface. Then current programs, tools, research, and information that help address interface challenges are examined. Chapters conclude with suggestions for research, education, and development of management options and tools.

Section I (chapters 2 through 4) provides a foundation for subsequent chapters by overviewing factors driving the rapid change and expansion of the wildland-urban interface in the South. Chapter 2 begins with a discussion about population and demographic trends and projections in the South and predicts where forest resources are likely to face the greatest pressures from human influences. Chapter 3 follows with a look at economic conditions and tax policies that influence land use decisions and the rate of change in the wildland-urban interface. Chapter 4 then examines the role of land-related public policy at the Federal, State, and local levels and explores how natural resource management and conservation in the interface is complicated by current land-related public policies.

While the authors in the first section explore factors driving change in the interface, contributors to section II (chapters 5 through 7) assess some of the consequences of this change. Chapter 5 focuses on urban influences on forest ecosystems in the South. The author explores how urbanization is changing forest health and modifying the goods and services provided by forest ecosystems. The changing condition of forest ecosystems has a direct effect on the management of forest resources in the wildland-urban interface. Chapter 6 considers important changes and challenges that forest resource managers face when managing water resources, traditional forest products, fire, recreation, and wildlife in interface forests and gives some examples of innovative management and conservation alternatives. Chapter 7 reviews social consequences of change in the interface. It includes effects on communities and landowners as a result of changes in economics, policies, community structure, and quality of life in the interface. The authors conclude with a discussion of what natural resource professionals need to be effective in the changing social climate of the interface.

Section III (chapters 8 and 9) summarizes the Assessment by presenting a case study and addressing major themes and research and information areas. Chapter 8 uses fire in the wildland-urban interface as a case study to emphasize many of the questions and issues raised in the previous sections of the Assessment. Wildland fire perhaps best demonstrates how demography, economics and taxation issues, land use planning and policy, ecosystem structure and function, forest resource management, and social dimensions all affect efforts to manage resources and protect human communities in the wildland-urban interface. Chapter 9 concludes the Assessment by highlighting major themes that cross all of the chapters and by listing research and information needed to promote better understanding and provide solutions for wildland-urban interface challenges.

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## ***Farm Bill 2002 Forum: Review and Discussion of Forestry Opportunities***

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The Pinchot Institute hosted "**Farm Bill 2002 Forum: Review and Discussion of Forestry Opportunities**" on August 8, 2002, at the Washington Terrace Hotel in Washington, DC.

The objectives of the forum were to highlight the forestry-related provisions of the 2002 Farm Bill and potential agency strategies for implementing them, and to provide opportunities for all participants to comment on these programs. The agenda featured presentations by congressional staffers, USDA representatives, state agency representatives, and private landowners. The afternoon was devoted to breakout groups, where participants provided input to agency personnel on the development of specific programs.

A report is now available that provides a summary of the morning presentations and a compilation of the comments provided by participants in the afternoon breakout sessions.

Appendices include the forum agenda, the participant list, and program fact sheets that were developed by the Pinchot Institute and distributed at the forum.

### **[Click here to download a pdf version of the report](#)**

If you would like to order a printed copy, please email [publications@pinchot.org](mailto:publications@pinchot.org) .

Fact sheets (pdf) on the following programs are included in the report but can also be downloaded separately:

- [Forest Land Enhancement Program \(FLEP\)](#)
- [Sustainable Forestry Outreach Initiative \(SFOI\)](#)
- [Community and Private Lands Fire Assistance \(CPLFA\)](#)
- [Environmental Quality Incentives Program \(EQIP\)](#)
- [Conservation Title Programs](#)

Questions about the forum or the report can be directed to Naureen Rana by phone at (202) 797-6584 or by email to [nrana@pinchot.org](mailto:nrana@pinchot.org) .

<a href="#">Return to Forestry in the Farm Bill Homepage</a>
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# FOREST LAND ENHANCEMENT PROGRAM (FLEP)

*A new program established by the 2002 Farm Bill*

## Program Purpose

FLEP has been established to replace the Forestry Incentives Program (FIP) and the Stewardship Incentives Program (SIP), which were repealed in the 2002 Farm Bill. FLEP is a new incentives program that encourages the long-term sustainability of non-industrial private forestlands by providing financial, technical, and educational assistance by State Forestry agencies to assist private landowners in actively managing their land.

## Administering Agency

USDA Forest Service, in partnership with State Foresters and State Forest Stewardship Coordinating Committees, and in consultation with other Federal, State, and local natural resource management agencies, institutions of higher education, and a broad range of private sector interests.

## Funding Level and Program Lifespan

\$100 million (in mandatory funding) from FY 2002 – FY 2007. Annual funding levels will be determined by the agencies involved in implementation. Acceptance of landowner cost-share applications will start 30 days after the interim rule is published and after a State has completed its priority plan.

## Forest Landowner Eligibility

To be eligible for cost-share assistance, an owner of non-industrial private forest (NIPF) must develop and implement a management plan (addressing certain criteria) that provides for the treatment of no more than 1,000 acres of non-industrial private forestlands. This acreage limit may be increased to no more than 5,000 acres if it is determined that the treatment of additional acres will result in significant public benefit. The management plan must be for no less than 10 years and must be approved by the State Forester. All NIPF lands are eligible for technical and educational assistance.

## Amount of Assistance Offered

Cost-share assistance of up to 75% is offered for the implementation of activities and practices approved in a *State Priority Plan* that designates priorities for action. Priority plans will be developed jointly by the State Forester and the State Forest Stewardship Coordinating Committee.

## Opportunities for Input on Program Development

A draft interim rule will be released on or about August 16, 2002 for limited distribution and comment. October 30, 2002 is the target date for publication of the interim rule in the Federal Register, which will be followed by a 60-day comment period. December 1, 2002 is the target date for starting the program.

## Additional Information

Hal Brockman  
USDA Forest Service, Cooperative Forestry  
(202) 205-1694  
[hbrockman@fs.fed.us](mailto:hbrockman@fs.fed.us)

<http://www.usda.gov/farmbill/>

# SUSTAINABLE FORESTRY OUTREACH INITIATIVE (SFOI)

*A new program established by the 2002 Farm Bill*

## Program Purpose

SFOI is a new program created as an amendment to the Renewable Resources Extension Act of 1978 (RREA). It aims to educate landowners on: the value and benefits of practicing sustainable forestry, the importance of professional forestry advice in achieving their objectives, and the variety of public and private resources available to assist them.

## Administering Agency

*USDA Cooperative State Research, Education, and Extension Service (CSREES)*

## Funding Level and Program Lifespan

Annual RREA funding is authorized at \$30 million/year for 5 years (FY 2002 – FY 2007), for a total of \$150 million.

## How SFOI Works

The recipients of funding for RREA funds are land grant universities. The land grants will receive program guidance from CSREES relative to including the objectives of SFOI within their state RREA funded programs. Funds are distributed to institutions based on demographics and forest resource characteristics of each state.

## Opportunities for Forest Landowners

Forest landowners may serve as stakeholder advisors especially at state and local levels. Some of these positions are elected. Also, in cooperation with resource professionals, landowners may organize and conduct classroom and field instructional events, and serve as volunteer, peer-to-peer ambassadors for forest and natural resources conservation at national, state, and local levels.

## Additional Information

Eric Norland  
USDA CSREES  
(202) 401-5971  
[enorland@reeusda.gov](mailto:enorland@reeusda.gov)

Larry Biles  
USDA CSREES  
(202) 401-4926  
[lbiles@reeusda.gov](mailto:lbiles@reeusda.gov)

<http://www.reeusda.gov/>



USDA Forest Service  
State & Private Forestry  
Cooperative Forestry

## Forest Land Enhancement Program Briefing Paper

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May 14, 2003

**Contact:** Hal Brockman, National Program Manager  
**Phone:** 202-205-1694  
**Fax:** 202-205-1271  
**Email:** [hbrockman@fs.fed.us](mailto:hbrockman@fs.fed.us)

**Website** [www.fs.fed.us/spf/coop/flep.htm](http://www.fs.fed.us/spf/coop/flep.htm)

### FLEP Overview

#### **New Multimillion Forest Service Program Gives NIPF Owners Boost**

The 2002 Farm Bill has authorized the Forest Service to launch a multimillion-dollar forestry program to assist nonindustrial private forest (NIPF) landowners in what will be known as the Forest Land Enhancement Program (FLEP). Authorized for \$100 million for program years 2002-2007, the program has been approved to allocate \$20 million in its inaugural year (FY2003) to be distributed through State forestry agencies.

Through FLEP, State forestry agencies can provide a wide array of educational, technical and financial services that are intended to ensure that the nation's NIPF and related resources continue to provide sustainable forest products and safeguard the health of our water, air, and wildlife.

FLEP is a voluntary program in each State and participation by landowners is voluntary. In each State participating in the program, the State Forester and State Forest Stewardship Coordinating Committee will jointly develop a State priority plan that is intended to promote forest management objectives and describe FLEP in their State. The State priority plan will determine the mix of educational, technical and financial assistance with States choosing one or more of these elements. As applicable, it will identify educational activities and their outcome, describe the technical assistance to be provided and its outcomes, and describe the cost-share components that will be available to NIPF landowners and the public values of these practices.

The Stewardship Incentive Program (SIP) and the Forestry Incentives Program (FIP) were repealed in the 2002 Farm Bill. FLEP will provide States with the opportunity to continue the efforts they had going with SIP and FIP. State forestry agencies can use FLEP funds to provide assistance to NIPF owners to achieve a broad array of natural resource objectives. The Forest Service and State forestry agencies are guided by the following principles:

- Establish, manage, maintain, protect, enhance, and restore NIPF lands.
- Enhance the productivity of timber, habitat for flora and fauna, soil, water, air quality, wetlands, and riparian buffers of these lands.
- Assist owners and managers to more actively manage NIPF lands to enhance and sustain the long-term productivity of timber and non-timber forest resources.
- Reduce the risk and help restore, recover and mitigate the damage to forests caused by fire, insects, invasive species, disease, and damaging weather.

- Increase and enhance carbon sequestration opportunities.
- Enhance implementation of agroforestry practices.
- Encourage and leverage State, Federal, and local resource management expertise, financial assistance and educational programs that support FLEP.

NIPF owners who wish to participate in the cost-share component of FLEP in those States offering it as an option, must complete one or more of the sustainable forestry practices available in their State as described in a forest management plan.

In each state, the State forester or their representative will evaluate the management plans submitted by NIPF owners and approve them for participation in FLEP. Eligibility criteria for FLEP are broader than for SIP and FIP to encourage greater participation.

FLEP allows treatment of up to 1,000 acres per year and variances of up to 5,000 acres if significant public benefits will accrue. The maximum FLEP cost-share payment for any practice may be up to 75 percent. The aggregate payment to any one landowner through 2007 may not exceed \$100,000.

States will be responsible for reporting program accomplishments for all the program components - educational, technical, financial, - that the State is implementing. States will also account for administrative dollars used to implement FLEP.

Program implementation will commence after the publication of an interim rule in the Federal Register, anticipated this month. There will be a formal 60-day comment period for the Interim Rule. A final rule is anticipated for May 2004. Comments on the Interim Rule can be made by going to: [www.regulations.gov](http://www.regulations.gov) and typing in the program name. There will be a comment block to send program comments to the Forest Service

FY 2002 appropriations in SIP and FIP are in the process of being obligated by the Forest Service and the Natural Resources Conservation Service.





## Forest Legacy Program Overview

February, 2003

**USDA FOREST SERVICE**

### BUDGET HISTORY: Appropriations

FY 1992	FY 1993	FY 1994	FY 1995*	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000**	FY 2001***	FY 2002	FY 2003	Presidents FY 2004
...Dollars in thousands...												
4,938	9,915	6,948	6,688	3,000	2,000	4,000	7,012	29,933	59,637	65,000	68,380	90,000

\* - \$7.8 million of unspent funds were rescinded in FY 1995 - all the FY1995 funds plus \$1.112 million of prior year funds. The above amounts were the original appropriations before the rescission.

\*\* - Reflects realignment and adjustments to achieve primary purpose objectives.

\*\*\* - Reflects 0.22% rescission.

### Key Points:

- The Forest Legacy Program (FLP) conserves resource values of forest land, emphasizing lands of regional and national significance that are threatened with conversion to non-forest uses. Conservation easements, or fee simple purchase, are the methods used by the Forest Service (FS) and its partners in working with willing landowners to accomplish program objectives.
- The FLP involves a partnership between State and Private Forestry, National Forest System branches of the FS, State Foresters, local governments, land trusts and interested landowners to conserve these environmentally important forests.
- The FLP assures that both traditional uses of private lands and the public values of America's forests are protected on thousands of acres for future generations. It provides a cost-effective mechanism to protect critical wildlife habitat, conserve watershed functions, and maintain recreation opportunities.
- Participating States, Territories or local governments in cooperation with States can use FLP grant funds to acquire land, or interests in land, and hold title in their name.
- Thirty-five States including Territories (AK, AL, CA, CO, CT, DE, GA, HI, IA, IL, IN, MA, MD, ME, MI, MN, MT, NC, NE, NH, NJ, NM, NY, OR, PA, PR, RI, SC, TN, UT, VA, VI, VT, WA, WI) are active in the FLP. Other States (AS, FL, KY, OK, NV, WV) are developing plans for approval.

- **Utah:** The largest land value donation in the Forest Legacy Program was made a short distance from rapidly developing areas of Salt Lake City. The land remains in family ownership and ranges from snow covered peaks and alpine lakes in the headwaters, to the rich pasture and meadows of a significant watershed. Less than \$1 million in federal funds leveraged \$8.5 million in non-federal contributions. Additional acres, with an estimated value of over \$13 million, have been identified as future projects.
- **The Northern Forest: Maine, New Hampshire, Vermont, New York:** A nationally significant 26 million acre region of mostly private forested land in the northern portions of these four states. Sixteen projects protecting over 83,000 acres have been completed with a value of over \$15 million. The focus in this region is on key parcels, including lake and river frontage. Well over 675,000 acres, with an estimated value of over \$50 million, have been identified as future projects.
- **Mountains to Sound Greenway, Washington:** Located along the I-90 corridor from Seattle eastward through the Cascade Mountains, a major collaborative effort has incorporated the Forest Legacy Program as a tool to protect and conserve this important greenspace. Four complex Forest Legacy acquisitions have been completed that protect over 2,200 acres linking critical habitat, providing public recreational access, and preserving the regions stunning views. The Forest Legacy investment of \$6.2 million has leveraged non-federal contributions of nearly \$5 million, as well as countless hours of work by partners. An additional 2,292 acres, with an estimated value of over \$17 million, have been identified as future projects.

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# FACT SHEET

Office of Communication – Washington, D.C.

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## The Forest Legacy Program

- The Forest Legacy Program (FLP) was established in the 1990 Farm Bill to protect environmentally important forest areas that are threatened by conversion to non-forest uses and to promote forestland protection through the use of conservation easements and fee-simple purchase.
- The FLP involves a partnership between State and Private Forestry and National Forest System mission areas of the Forest Service, State Foresters, local governments, land trusts and interested landowners to conserve environmentally important forests. Protection of forestlands of regional and national significance and those that can be effectively protected and managed are emphasized.
- The FLP assures that both traditional uses of private lands and the public benefits of America's forests are protected for future generations. It provides an incentive based mechanism to protect critical wildlife habitat, conserve watershed functions, and maintain recreation opportunities.

Participating States, Territories, or local governments, in cooperation with States, can use FLP grant funds to acquire land, or interests in land, and hold title. The program operates on the principle of "willing buyer, willing seller".

- States and Territories develop an Assessment of Need (AON) to participate in the FLP. The AON is an implementation plan that demonstrates important forest areas, indicates specific forest areas where the FLP will be focused and has program goals and eligibility criteria that guide the selection of forest tracts. The Forest Service and the Secretary of Agriculture must approve the AON.
- Thirty-three States and Territories (Alabama, Alaska, California, Colorado, Connecticut, Delaware, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Massachusetts, Maryland, Maine, Minnesota, Montana, North Carolina, New Hampshire, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Puerto Rico, Rhode Island, South Carolina, Tennessee, Utah, Virginia, Vermont, Washington, Wisconsin) are active in the FLP. Other States (Kentucky, Michigan, Nebraska, Nevada, Ohio, South Dakota, West Virginia, and The Virgin Islands) are either developing plans for approval to be considered for entry into the program.
  - Since its first appropriation in FY 2002, FLP has completed 137 projects protecting over 300,000 acres across 20 States.
  - FLP has provided excellent leverage of the forest conservation federal investment by protecting over \$174 million of land value with a federal investment of \$83 million.

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# FACT SHEET

Office of Communication – Washington, D.C.

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## The Forest Legacy Program Budget History: Appropriations

FY 1992	FY 1993	FY 1994	FY 1995*	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003**
...Dollars in thousands...											
4,938	9,915	6,948	6,688	3,000	2,000	4,000	7,012	29,933	59,868	65,000	69,873

\* - \$7.8 million of unspent funds were rescinded in FY 1995 - all the FY1995 funds plus \$1.112 million of prior year funds. The above amounts were the original appropriations before the rescission.

\*\* - President's Budget Proposal



# The Southern Forest Resource Assessment Summary Report

David N. Wear and John G. Greis

Southern Research Station, USDA Forest Service, and Southern Region, USDA Forest Service

## Preface

The Southern Forest Resource Assessment was initiated in 1999 as a result of concerns raised by natural resource managers, the science community, and the public regarding the status and likely future of forests in the South. These included changes to the region's forests brought about by rapid urbanization, increasing timber demand, increasing numbers of satellite chip mills, forest pests, and changing air quality. In response to these issues, leaders of four of the region's Federal natural resource agencies (USDA Forest Service, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service), and the Tennessee Valley Authority, agreed to work together to provide a careful evaluation of the overall condition and ongoing changes of southern forests. State forestry and fish and wildlife agencies were invited to take part and have actively contributed to the effort. The USDA Forest Service, through the Southern Region and Southern Research Station, has provided overall leadership.

The Technical Report (General Technical Report SRS-53) and this Summary Report are the culmination of more than 3 years of effort by more than 25 scientists and analysts from the above agencies as well as southern universities. More than 100 scientists from universities, State and Federal agencies, industry, and conservation organizations provided peer reviews to enhance the reports' accuracy and completeness. This Summary Report is intended to provide its reader with an overview of the many forces of change affecting southern forests and the changes they produce. It summarizes the detailed results reported by Assessment Team members in individual chapters of the full Technical Report. The information contained in the body of the Assessment should enhance public understanding of southern forests, inform public debate, and improve public policies that result.



## Broad Findings

Currently several forces of change are altering southern forests, raising questions about the sustainability of their functions and values. The first steps toward achieving their sustainability are to understand and anticipate the forces of change that shape forested ecosystems. Ultimately, sustainability requires that society manage change. Today's actions will influence whether and to what degree future generations will continue to benefit from the unique, inherent values of southern forests.

This Assessment has taken steps toward a fuller understanding of forest conditions and potential for their change by (1) identifying the forces of change that continue to reshape forests, (2) describing current resource conditions and their possible futures, and (3) highlighting where additional information is needed to fully identify and deal with concerns and opportunities. The findings of this Assessment have led us to some broad observations about the status and possible future of southern forests.

**Several forces are affecting the condition of southern forests**—The South is an economically, culturally, and ecologically complex region, and multiple forces of change are simultaneously affecting forest conditions. Timber harvesting and management and land use changes into and out of forest cover influence forest area, structure, biodiversity, and water quality. Other human influences, such as atmospheric pollution, exclusion of fire from fire-dependent communities, and the introduction of exotic plants, diseases, and insects continue to reshape the composition, productivity, and ecological function of forests. Such influences are pervasive and difficult to predict and manage. All of these forces interact in their effects and will play out differently in different parts of the region. As a result, the extent, structure, and health of forests of the South are changing and will continue to change in the future.

**Urbanization has a substantial impact on the extent, condition, and health of forests**—Among forces of change, urbanization will have the most direct, immediate, and permanent effects on the extent, condition, and health of forests. While urban uses currently represent a small share of land in the South, they are expanding rapidly. Forecast models predict that about 12 million acres of southern forests will be urbanized between 1992 and 2020. Nineteen million acres of forest are forecast to be developed between 2020 and 2040. In addition, population growth in rural areas means that more forests are increasingly influenced by human presence. In these areas remnant forests are becoming more fragmented. An important and pervasive direct result of urbanization of southern forests will be increasing limitations on forest management options, such as prescribed burning, that are necessary to maintain productive and healthy forests.

**Population is growing, and the social context is changing**—From 1980 to 2000, total population increased at a higher rate in the South than in the Nation. Through the 1980s,

population growth in the South was focused primarily in urban areas. Many rural areas experienced population losses. Since then, populations increased in nearly all of the South's counties, expanding the interface between people and forests. The demographic profile of the region has changed toward a more urban population. These demographic changes are reflected in attitudes and values held about the region's forests. Public values about forests vary among sectors of the population and include both commodity and biocentric views.

In urban areas and at their periphery, certain forest benefits are becoming increasingly scarce. Among these are opportunities for forest recreation. While the demand for recreation will increase as the population grows, recreational access to private land is expected to continue to decrease. As a result, congestion and competition between recreation user groups for access to and use of the region's public forests will increase.

**Total forest area within the South is forecast to remain stable, but subregional and compositional changes will continue**—The South has rebounded from widespread deforestation of the early 1900s to become a heavily forested region. While the total area of forest has remained relatively constant over the past 30 years, 1 to 2 percent of forest land moved into or out of forest cover each year. We forecast little change in the total area of forests between 1995 and 2040, as losses of forests to urban uses are expected to be offset by conversions of agricultural land to forest. Urban development is forecast to be concentrated in the eastern part of the region and conversion of agricultural land to forest cover in the west, resulting in an overall westward shift in forest area as well changes in shares of forest types. These shifts in forest area and composition will alter the region's forests in ways that could be significant in affected areas. For example, loss and fragmentation of forests in some areas and an increasing share of pine plantations in others could have important localized economic and ecological implications.

**Timber production is forecast to expand but not deplete forest inventories below present levels**—While the total area of forest land has remained relatively stable and harvests have expanded since the 1970s, the timber inventory on these forests has increased by more than 70 percent. Softwood inventories leveled off in the 1990s, but recent inventories and model forecasts indicate that they will expand as new and anticipated pine plantations grow to maturity. Hardwood inventories continued to increase through the 1990s, but at a decreasing rate. A region-wide trend of increasing removals relative to net hardwood growth is forecast to continue, resulting in the total inventory of hardwood forests peaking in 2025, then declining to about current inventory levels in 2040. While region-wide removals are forecast to exceed growth in 2025, this occurs at least 10 years earlier in four States. As with softwoods, additional investment in hardwood management could increase future growth and inventories of these forests, but this response has not yet been observed.

**Investment in pine plantations is forecast to continue to expand to meet increased softwood demand, resulting in some changes to the ecological characteristics of southern forests**—Historically, private landowners in the South have responded to rising softwood timber prices by investing in tree planting and more intensive management. The result has been an increase in the area of pine plantations in the South, from about 2 million acres in 1952 to 32 million acres in 1999. Forecasting models predict that pine plantation acreage will increase to 54 million acres in 2040.

These new pine plantations, which will be derived from the afforestation of agricultural lands and conversion of hardwood, natural pine, and mixed pine/hardwood forests, enhance softwood timber productivity and concentrate timber harvesting on fewer acres than would otherwise be necessary to meet demand. For example, plantation forests accounted for 15 percent of timberland and 12 percent of total growing stock volume in the 1990s, but 43 percent of softwood net annual growth and 35 percent of annual softwood removals ([chapter 16](#)). Increased pine plantation acreage could also result in varying ecological changes, depending on stand origin and management. For example, young planted pine stands provide early successional habitats within which many species thrive. Subsequent management activities, however, largely determine plant diversity and habitat structure. While these dynamics have been studied at the forest stand level, they are not well understood at a broader landscape scale.

**Changing land use and harvest patterns will have important impacts on people—**

Land use and forest management changes can influence people in a variety of ways. Historically, the southern economy has been inextricably tied to various uses of its land base. The wood products industry, for example, currently accounts for about 6 percent of regional employment and 8 percent of income. Forecasts of increasing timber harvests imply more jobs in the wood products sector, especially outside the traditional core timber production areas. Forests also contribute to the quality of life by providing recreation opportunities, visual backdrops, and a variety of environmental amenities. Because people derive value from the landscape condition in which they live, abrupt changes in its condition, such as when timber harvesting is increased in areas where it had not been common in recent years, or when urban expansion occurs, can lead to costs for some people as others benefit.

In such areas, the values of green space and large remnant forests will likely increase. Whatever the cause, the variety of effects of forest changes on local communities is likely to continue to result in controversy and an increase in local regulation of land uses and forest treatments.

**Southern forests have proven resilient, but some components are scarce and therefore vulnerable to change—**Through the 20<sup>th</sup> century, the South has recovered from a largely cutover, exhausted, eroded condition to become one of the most productive and biologically diverse forest regions in the world. However, the presence of numerous increasingly rare forest communities and imperiled aquatic and terrestrial animal species are reasons for concern. Such forest communities include certain wetlands types, longleaf pine ecosystems, old-growth forests, and spruce-fir forests. Added to the 132 terrestrial species of conservation concern are numerous species of amphibians, fish, and other aquatic species that are either critically imperiled or vulnerable to extinction.

All of these communities and species are likely to continue being adversely affected by multiple forces of change. Protection and restoration efforts, already underway in some areas, provide some means of addressing these changes. Ultimately, with a few exceptions, their future lies largely in the hands of private forest owners who own the vast majority of forest communities and habitat.

**Scarce forest types have high ecological value—**To borrow the adage from economics, scarcity defines value. The rare forest communities in the South (above)

have especially high ecological value. Thus, much consideration of biodiversity is focused on a relatively small share of the forest landscape. With the exception of old-growth and spruce-fir communities, these rare communities are largely on private land.

In the urbanizing areas of the South, unfragmented forest cover is becoming increasingly scarce, especially in the Piedmont. In these areas, the value of residual forest cover is increasing, especially as sources of outdoor recreation and as habitat for certain wildlife species. For area-sensitive wildlife species, large contiguous blocks of forest become especially valuable as refuges in areas fragmented by urbanization or other forest disturbances. In these areas, public forests provide stable blocks of contiguous forest cover, thus the conservation value of this public land, which is especially scarce in the rapidly urbanizing Piedmont and Coastal Plain ecological regions, is very high and will increase in the future.

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content: [David Wear](#) and [John Greis](#)  
webmaster: [John M. Pye](#)

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<a href="#">Chapter 5 (TERRA-5): Maintaining Species in the South</a>	 689k	<a href="#">N</a> <a href="#">O</a> <a href="#">F</a> <a href="#">R</a> <a href="#">A</a> <a href="#">M</a> <a href="#">E</a>	<a href="#">The</a> <a href="#">Q</a>
<a href="#">Chapter 6 (SOCIO-1): Land Use</a>	 13.6M	<a href="#">N</a> <a href="#">O</a> <a href="#">F</a> <a href="#">R</a> <a href="#">A</a> <a href="#">M</a> <a href="#">E</a>	<a href="#">The</a> <a href="#">Q</a>
<a href="#">Chapter 7 (SOCIO-2): Socio-Demographics, Values, and Attitudes</a>	 10.7M	<a href="#">N</a> <a href="#">O</a> <a href="#">F</a> <a href="#">R</a> <a href="#">A</a> <a href="#">M</a> <a href="#">E</a>	<a href="#">The</a> <a href="#">Q</a>
<a href="#">Chapter 8 (SOCIO-3): Policies, Regulations, and Laws</a>	 1008k	<a href="#">N</a> <a href="#">O</a> <a href="#">F</a> <a href="#">R</a> <a href="#">A</a> <a href="#">M</a> <a href="#">E</a>	<a href="#">The</a> <a href="#">Q</a>
<a href="#">Chapter 9 (SOCIO-4): Motivation for Private Forest Land Owners</a>	 107k	<a href="#">N</a> <a href="#">O</a> <a href="#">F</a> <a href="#">R</a> <a href="#">A</a> <a href="#">M</a> <a href="#">E</a>	<a href="#">The</a> <a href="#">Q</a>
<a href="#">Chapter 10 (SOCIO-5): Local Economic Impacts of Forests</a>	 238k	<a href="#">N</a> <a href="#">O</a> <a href="#">F</a> <a href="#">R</a> <a href="#">A</a> <a href="#">M</a> <a href="#">E</a>	<a href="#">The</a> <a href="#">Q</a>
<a href="#">Chapter 11 (SOCIO-6): Forest-Based Outdoor Recreation</a>	 319k	<a href="#">N</a> <a href="#">O</a> <a href="#">F</a> <a href="#">R</a> <a href="#">A</a> <a href="#">M</a> <a href="#">E</a>	<a href="#">The</a> <a href="#">Q</a>
<a href="#">Chapter 12 (SOCIO-7): Forests and the Quality of Life</a>	 109k	<a href="#">N</a> <a href="#">O</a> <a href="#">F</a> <a href="#">R</a> <a href="#">A</a> <a href="#">M</a> <a href="#">E</a>	<a href="#">The</a> <a href="#">Q</a>
<a href="#">Chapter 13 (TIMBR-1): Timber Products Supply and Demand</a>	 4.8M	<a href="#">N</a> <a href="#">O</a> <a href="#">F</a> <a href="#">R</a> <a href="#">A</a> <a href="#">M</a> <a href="#">E</a>	<a href="#">The</a> <a href="#">Q</a>

<u>Chapter 14 (TIMBR-2):</u> Intensive Timber Management Practices	 131k	N O	FR AME	The Q
<u>Chapter 15 (TIMBR-3):</u> Forest Operations Technology	 1.1M	N O	FR AME	The Q
<u>Chapter 16 (HLTH-1):</u> Forest Area and Conditions	 4.6M	N O	FR AME	The Q
<u>Chapter 17 (HLTH-2):</u> Impact of Pests on Forest Health	 12.5M	N O	FR AME	The Q
<u>Chapter 18 (HLTH-3):</u> Abiotic Factors	 6.2M	N O	FR AME	The Q
<u>Chapter 19 (AQUA-1):</u> Water Quality in the South	 1.3M	N O	FR AME	The Q
<u>Chapter 20 (AQUA-2) :</u> Forested Wetlands	 2.0M	N O	FR AME	The Q
<u>Chapter 21 (AQUA-3):</u> Forestry Impacts on Water Quality	 142k	N O	FR AME	The Q
<u>Chapter 22 (AQUA-4):</u> Best Management Practices in the South	 128k	N O	FR AME	The Q
<u>Chapter 23 (AQUA-5):</u> Aquatic Animals and their Habitats	 5.4M	N O	FR AME	The Q
<u>Chapter 24 (BACKGROUND HISTORY):</u> Historical Overview of the Southern Forest Landscape and Associated Resources	 719k	N O	FR AME	-
<u>Chapter 25 (BACKGROUND FIRE):</u> Fire in Southern Forest Landscapes	 184k	N O	FR AME	-
<u>APPENDIX: GLOSSARY</u> Definitions of Terms				
<u>APPENDIX: SPECIES NAMES</u> Scientific Names of Species				

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## Key Findings

- Except for a moderate decline in agricultural uses, most States in the South have experienced relatively stable land use distributions between 1945 and 1992. The most notable exception is Florida, where developed land uses have expanded substantially.
- Stability in overall land use distributions masks offsetting shifts into and out of forest cover in many States.
- Urbanization and relative returns to agriculture and timber uses will strongly influence changes in land use during the next 20 years. Urbanization will continue to consume forest land and agricultural land, while rising timber prices will push some agricultural land toward forest uses.
- The South is forecast to lose 12 million forest acres (8 percent) to developed uses between 1992 and 2020. An additional 19 million forest acres are forecast to be converted to developed uses between 2020 and 2040.
- Southern forest losses will likely be concentrated in a few places: (1) the Piedmont and Mountain areas of North Carolina, (2) adjacent Piedmont areas of South Carolina and Georgia, (3) Florida, and (4) the Atlantic and gulf coastal areas. Smaller areas with substantial projected losses include areas surrounding the cities of Nashville, TN, and Birmingham, AL, and the area of northern Virginia between Washington, DC, and Richmond, VA.
- Increased timber prices are forecasted to cause about 10 million acres of agricultural land to be forested between 1992 and 2020. As much as 25 million acres of agricultural land could be forested by the year 2040.
- Much agricultural land may be converted to forest in some parts of the South. In the eastern part of the South, gains are possible on the upper Coastal Plain of Georgia and on the Coastal Plain in an area centered on the boundary between North Carolina and Virginia. The largest area of potential forest gains is on the lower Gulf Coastal Plain and in large portions of Arkansas, Mississippi, and Louisiana.
- Taken together, these forecasts suggest a western shift in forest area—losses are concentrated in the eastern South, and gains are concentrated in the western South.
- Forecasts of a forest population density index indicate that the potential influence of southern urban areas extends far beyond their cores. This condition has important consequences. As the population increases in a forested area, the ability of the forest to moderate microclimate may be reduced. Availability of land for public recreation is normally reduced, and availability for timber management plummets.
- In some areas, the share of forest cover is relatively high, but forest tracts are highly fragmented. This condition is prevalent in some northern parts of the South, on the Southern Appalachian Piedmont, and in northern Florida. In these areas, marginal changes in the amount of forest cover may have disproportionate impacts on the connectivity of forested habitats.

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# State of the Forest:

## A Report on Georgia Forests 2003

**G**eorgia has more than 24 million acres of forestland covering two-thirds of the state. While urbanization and population growth are changing land use in Georgia, the state's healthy and dynamic forests continue to play a vital role in the state's economy and overall quality of life. Georgia forests provide wildlife habitat, clean water, clean air, recreation and greenspace, at the same time, providing jobs and forest products.

This report provides a look at Georgia forests using recent data provided by federal and state agencies and educational institutions. The report addresses the amount and condition of forests as well as forestry's impact on wildlife, water and the state's economy. It also assesses some of the challenges and opportunities that could impact the future of the state's forest landowners and forest industry.



## Georgia Forests Today: Diverse, Well-Managed and Healthy

Georgia forests are diverse, well managed and healthy and appear to be stable with no significant shifts in the amount and type of forests since 1998, according to new data from the USDA Forest Service<sup>1</sup> and Georgia Forestry Commission (GFC). To assess the condition of forests, the

Of approximately 15.8 billion trees growing on timberland in Georgia; 5.3 billion are softwoods (mostly pine) and 10.5 billion trees are hardwoods.

Forest Service and GFC conduct aerial and ground surveys, specialized timber inventories and forest health monitoring. Other data on water, air and wildlife provide a complete picture of Georgia forests.

In brief, Georgia has 23.9 million acres of timberland, approximately 44% pine forests and 55% hardwood forests. Despite ongoing forest loss to development and urbanization, the amount of timberland in Georgia

has remained fairly stable across the last 70 years (see chart). In fact, Georgia's forest acreage has actually increased by roughly 200,000 acres over the last five years. Additionally, Georgia forests represent a range of age classes from young seedlings to large sawtimber.

Georgia forests and Georgia residents benefit from the diverse ownership objectives of its 600,000 individual forest landowners that own 72% of the state's forests. They own and manage forests for many reasons including timber production, wildlife, recreation, investment and personal enjoyment.

<sup>1</sup> The U.S. Forest Service Southern Research Station's Forest Inventory and Analysis (FIA) Program and the Georgia Forestry Commission initiated a new annual forest inventory system in 1998. It measures a sample 20% of all inventory plots annually. The information in this report is based on data from the completion of 60% of all forest inventory plots in the state, a statistically sound measure. FIA data for Georgia is available at [www.srsfia2.fs.fed.us](http://www.srsfia2.fs.fed.us).

## Economic Benefits of Georgia Forests

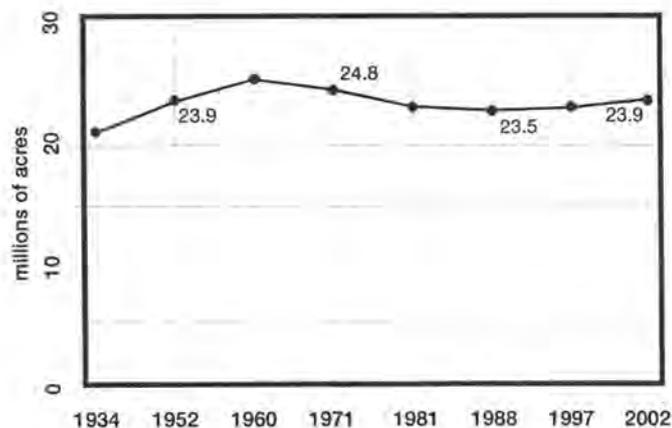
Georgia is one of the leading forest products producing areas in the world. According to a recent economic survey<sup>2</sup> conducted by Georgia Tech's Economic Development Institute, Georgia's modern forest products industry directly contributes \$19 billion to the state's economy. And, that number grows to \$30 billion when you consider indirect contributions from related industries.

Georgia forests are the root of high paying jobs for thousands of rural and urban citizens and of a manufacturing industry that provides timber markets and income for the 600,000 private landowners who own timberland in the state. Timber is also the highest valued crop in Georgia – followed by vegetables, cotton, and peanuts. Because the forestry community is so integrated, recent slowdowns in paper and wood products manufacturing due to increased global competition and a slow economy have a ripple effect across the state. In addition to the loss of direct industry and industry-related jobs, it reduces private landowner's ability to market their timber, and could ultimately result in land conversions due to landowners choosing not to invest in timberland.

The forest industry is an important part of the state's economy, making it critical to focus on programs and policies that will keep it a viable, healthy enterprise now and in the future.

<sup>2</sup> Economic Benefits of the Forestry Industry in Georgia: 2001, William Riall, Ph.D Economic Development Institute, Georgia Institute of Technology, October 2002

## Georgia Forest Area Trends, 1934-2002



Georgia forest area has remained stable across the last 30 years with tree planting on old agricultural lands helping to offset the loss of 1.9 million acres of forest to urbanization from 1961 to 1997.

## Economic Benefits of Georgia Forests

	Direct	Direct & Indirect
Economic Activity (Business Output)	\$19,522,025,569	\$30,472,391,639
Employee Compensation	\$3,625,679,508	\$7,673,247,082
Jobs	77,268	204,065

This economic data, based on 2001 data, does not provide a completely accurate picture of Georgia's forest industry. Since 2001, a slow economy and increasing global competition has resulted in mill closures and the loss of thousands of forest industry jobs.

# Wildlife, Recreation and Quality of Life

Georgia forests provide multiple benefits for the state of Georgia. Providing habitats for diverse animal and plant populations is a major role of the state's 24 million acres of forest. Along with that come many forms of recreation, from hunting and fishing to birdwatching and hiking. In 2001, more than 2 million people enjoyed wildlife-related activities in Georgia, directly contributing more than \$1 billion to the state's economy.

As urban areas expand and the state's population continues to grow, managed and non-managed forests also provide valuable greenspace and enhance the state's air and water quality. From an aesthetic standpoint, trees beautify Georgia communities.

Georgia's diverse forest types – from the upland hardwoods in the mountains and pine forests of the south to the live oak dominated maritime forests on the coast – contribute to the diversity and health of our state's natural communities,

especially wildlife populations. Game species such as deer, turkey and quail thrive in Georgia forests. From near elimination in the early 1900s, Georgia's deer population has grown to 1.2 million today. In the last 25 years, Georgia's turkey population has increased from 17,000 to more than 300,000 turkeys. Much of this was the result of turkey restoration projects on private industrial and non-industrial forestland.

The forestry community also focuses on non-game animals and unique plant communities working with the Georgia Department of Natural Resources Wildlife Resources Division and Natural Heritage Program. Recent efforts to reestablish the longleaf pine and wiregrass ecosystem are helping some of Georgia's most notable protected species such as the red-cockaded woodpecker, gopher tortoise, Bachman's sparrow and the indigo snake.

Although urbanization and resulting forest fragmentation have impacted habitat for neotropical migratory

songbirds, the recent Southern Forest Resource Assessment<sup>3</sup> documents that pine plantations of various ages provide food and habitat for many species of migratory birds.

Properly managed forests can enhance wildlife populations and produce valuable forest products at the same

As urban areas expand and the state's population continues to grow, managed and non-managed forests provide valuable greenspace and enhance the state's air and water quality.

time. Specific forest management practices such as thinning and prescribed burning are the most commonly used techniques that benefit both timber and wildlife.

<sup>3</sup> *The Southern Forest Resource Assessment Summary Report, USDA Forest Service*

## Forests & Water Quality

As Georgia's population has grown so have the demands on one of the state's most valuable resources – water.

Georgia's 24 million acres of forests play an important role in protecting the quality of the state's water. Forests act as natural filters and trap sedimentation while also providing shade for streams to keep water temperatures cool.

Best Management Practices (BMPs) for forestry that are designed to protect water quality during these types of activities and ensure compliance with the Federal Clean Water Act.

### **BMP Compliance Improves**

To help track BMP implementation and effectiveness, The Georgia Forestry Commission conducts regular BMP

compliance across all tracts which is an improvement when compared to 98% compliance in 1998. Significant improvement was made in the area of streamside management zones, stream crossings and road building.

Since the mid-90s, there has been a dedicated effort to improve BMP education within the forestry community. The Sustainable Forestry Initiative (SFI) program in Georgia has provided more than \$1 million in financial support since 1995, enabling BMP education for thousands of logger and foresters. A key component of the SFI-sponsored Master Timber Harvester program is BMP education.

GFC has piloted and plans to launch a new BMP Assurance program in 2003 that will provide additional monitoring of forestry BMPs in 63 watersheds that have been targeted for a reduction of sediment.

The 2002 BMP survey also showed a strong 85.9% implementation rate on specific BMP practices (streamside management zones, road building, etc.) that should have been implemented. This is a 7% increase from the 1998 survey; however, there is still room for improvement in critical areas such as stream crossings.

Although forestry is a relatively low-intensity land use, soil disturbance does occur during forestry activities such as harvesting, planting and related forest road building. The state has voluntary

compliance surveys across all forest ownerships – family owned, industrial and government. The latest survey, completed in December 2002, evaluated some 40,159 acres or 420 tracts. Results showed 99.1% of the acres evaluated in

# The Future of Forestry in Georgia: Challenges and Opportunities

**T**oday, Georgia's forest products industry is a "mature" industry and while still making significant contributions to the state, challenges that affect the future of the state's vital forest industry and related forestry community need to be addressed now. A report from the *Georgia State Forester's Task Force on Marketing* provides historical context and addresses many of the current challenges in greater detail.

Global competition, available markets for wood fiber, taxes and continued urbanization and the resulting impact on land values and taxation are just some of the factors that have already begun to influence the future of the industry. These issues affect forest landowner decisions about future investments in forests and industry decisions about investment in manufacturing facilities.

Along with the challenges, there are opportunities to act now to ensure that Georgia's forestry community remains a critical contributor to Georgia's economy and overall quality of life. Here are some examples of current challenges and opportunities.

## Challenges

- **Maintaining a healthy forest business climate** is critical to the ongoing success of forestry enterprises in Georgia. Creation of regulation and legislation that hinders the management, harvesting or transportation of forest products without sound science or justification reduces the competitiveness of Georgia's 600,000 forest landowners in the world market. This applies to the manufacturing sector as well.
- While taxes are crucial in providing essential services to Georgia citizens, the current forest **ad valorem tax structure** is in need of immediate overhaul. In 2002 alone, valuations in many Georgia counties have increased 100 to 200%. Forestland is being appraised at fair market values that don't acknowledge their current use status. The increasing threat of urban sprawl, which raises real land values, along with highest and best use tax appraisal is a disincentive for landowners to keep their land in forests.
- **Global competition** will continue to reduce available markets for Georgia's forest products. In the past two years, an estimated 15 sawmills, one pulp mill, and an unknown number of secondary manufacturers have ceased operations, resulting in job losses of over 5,000 (direct and indirect). A concerted public and private effort is required that will help maintain and expand current forest resource industry, develop new forest industry opportunities as well as promote the use of products from the forest.
- The lack of basic science education in our primary and secondary school system is affecting the critical thinking skills of students. A **strong science curriculum** is needed to develop students who can research, analyze and generate positions based on facts.

## Opportunities

- Establish state research and financial **support in developing "new" markets** for forest products. One possible "new" market is the use of wood and wood by-products for supplying some of Georgia's energy needs.
- Establish **tax incentives or credits** to offer strong encouragement for landowners to retain land in forests. These incentives would acknowledge that both urban and rural communities benefit from all aspects of Georgia forests, including clean air, clean water and green space.
- Support the use of "**impact fees**" for residential development. These revenues can be earmarked for reducing the tax base on forestland. Recent studies from the University of Georgia (Dorfman & Black) shows that tax revenue from residential development does not cover the government services required by that development, where as, taxes on forestlands are used for services that are of little benefit to the forest community.
- Adopt the **rural evaluation manual for taxes** that was revised and proposed three years ago. Adoption of the manual can offer some immediate relieve for forest landowners in the state.
- Create a pro-forestry and forest products climate in Georgia through the development of a **forest products marketing campaign**. Marketing messages promoting use of products made from Georgia and Southern trees would target consumers, manufacturers, retailers, and other industrial users.

Georgia Forestry Association  
(770) 416-7621  
www.gfagrow.org

Georgia Forestry Commission  
1-800-GATREES  
www.gfc.state.ga.us

Sustainable Forestry Initiative<sup>SM</sup>  
Georgia Implementation Committee  
(706) 542-7691  
www.sfi-georgia.org



## Quick Facts

Amount of Georgia in forests: 66%

Acres of forestland: 24.49 million

Acres of timberland\*: 23.9 million

Tree planting in 2001: 592,560 trees per  
day on average

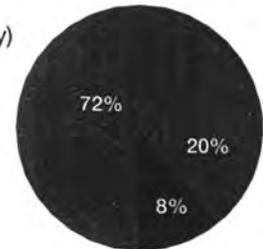
Economic impact of Georgia's  
forest industry: \$19 billion, direct  
\$30 billion, direct & indirect

*\* Land deemed suitable for growing  
a certain volume of wood fiber.*

## Who owns Georgia forests?

Ownership of Georgia's 23.9 million  
acres of commercial timberland is  
divided into three broad classes:

- non-industrial private landowners  
(farmers, individuals, investors)
- forest industry
- government  
(federal, state, county)



## Hardwood vs. Softwood

Approx. 6.7 million acres of Georgia's  
softwood forests are planted pines  
such as loblolly, slash and longleaf.  
Hardwoods are naturally regenerated.

- hardwood
- softwood



## In Brief: Challenges & Opportunities

Georgia faces key challenges that affect the future of the forestry community. Read more about these on the back page of this report.

### Challenges

- Maintaining a healthy forest business climate
- Overhaul of ad valorem tax structure
- Staying globally competitive
- Science curriculum that focuses on critical thinking

### Opportunities

- Support in developing new markets for forest products
- Tax incentives for forest landowners
- Use impact fees for development to offset tax burden on forestlands
- Adoption of the rural evaluation manual for taxes
- Develop a forest products marketing campaign

## Products from Trees

Wood and wood fiber are used in more than 5,000 products, including: lumber, furniture, milk cartons, bath tissue, eyeglass frames, paper, photographic film, vitamins, paint solvents – and thousands of other products.

## Industries Supported by Georgia Forests\*

- Forestry
- Logging
- Wood products (such as dimension lumber)
- Paper and paper products
- Packaging
- Manufactured housing
- Furniture
- Chemicals
- Miscellaneous wood products
- Woodworking and papermaking machinery

\*North American Industrial Classification System (NAICS)



# WHY SAVE FARMLAND?

**P**roductive agricultural land is a finite and irreplaceable natural resource. Fertile soils take thousands of years to develop. Creating them takes a combination of climate, geology, biology and good luck. So far, no one has found a way to manufacture them.

America's agricultural land provides the nation—and world—with an unparalleled abundance of food and fiber products. The dominant role of U.S. agriculture in the global economy has been likened to OPEC's in the field of energy. The food and farming system is important to the balance of trade and the employment of nearly 23 million people. Across the country, farmland supports the economic base of many rural and suburban communities.

Agricultural land also supplies products with little market value, but enormous cultural and ecological importance. Some are more immediate, such as social heritage, scenic views, open space and community character. Long-range environmental benefits include wildlife habitat, clean air and water, flood control, ground-water recharge and carbon sequestration.



## AMERICA'S AGRICULTURAL LAND IS AT RISK

Yet despite its importance to individual communities, the nation and the world, American farmland is at risk. It is imperiled by poorly planned development, especially in urban-influenced areas, and by the complex forces driving conversion. USDA's Economic Research Service (ERS) developed "urban influence" codes to classify each of the nation's 3,141 counties and county equivalents into groups that describe the degree of urban influence.<sup>1</sup> AFT found that in 1997, farms in the 1,210 most urban-influenced counties produced 63 percent of dairy products and 86 percent of fruits and vegetables.<sup>2</sup>

Agricultural land is desirable for building because it tends to be flat, well drained and generally is more affordable to developers than to farmers and ranchers. Far more farmland is being converted than is necessary to provide housing for a growing population. Over the past 20 years, the acreage per person for new housing almost doubled.<sup>3</sup> Most of this land is outside of existing urban areas. Since 1994, lots of 10 to 22 acres accounted for 55 percent of the growth in housing area.<sup>4</sup> The NRI shows that the best agricultural soils are being developed fastest.



*According to USDA's National Resources Inventory (NRI), from 1992 to 1997 more than 11 million acres of rural land were converted to developed use—and more than half of that conversion was agricultural land. In that period, an average of more than 1 million agricultural acres were developed each year. And the rate is increasing—up 51 percent from the rate reported in the previous decade.*



## THE FOOD AND FARMING SYSTEM

The U.S. food and farming system contributes nearly \$1 trillion to the national economy—or more than 13 percent of the gross domestic product—and employs 17 percent of the labor force.<sup>5</sup> With a rapidly increasing world population and expanding global markets, saving American farmland is a prudent investment in world food supply and economic opportunity.

Asian and Latin American countries are the most significant consumers of U.S. agricultural exports. Latin America, including Mexico, purchases an average of about \$10.6 billion of U.S. agricultural exports each year. Asian

countries purchase an average of \$23.6 billion/year, with Japan alone accounting for about \$10 billion/year.<sup>6</sup> Even as worldwide demand for a more diverse diet increases, many countries are paving their arable land to support rapidly expanding economies. Important customers today, they are expected to purchase more agricultural products in the future.

While domestic food shortages are unlikely in the short term, the U.S. Census predicts the population will grow by 42 percent in the next 50 years. Many developing nations already are concerned about food security. Of the 78 million people currently added to the world each year, 95 percent live in less developed regions.<sup>7</sup> The productivity and diversity of American agriculture can ensure food supplies and continuing preeminence in world markets. But this depends upon an investment strategy that preserves valuable assets, including agricultural land, to supply rapidly changing global demand.



## FISCAL AND ECONOMIC STABILITY

Saving farmland is an investment in community infrastructure and economic development. It supports local government budgets and the ability to create wealth locally. In addition, distinctive agricultural landscapes are often magnets for tourism.

People vacation in the state of Vermont or Steamboat Springs, Colo., because they enjoy the scenery created by rural meadows and grazing livestock. In Lancaster, Pa., agriculture is still the leading industry, but with the Amish and Mennonites working in the fields, tourism is not far behind. Napa Valley, Calif., is another place known as a destination for “agro tourism.” Tourists have become such a large part of most Napa Valley wineries that many vintners have hired hospitality staff. Both the valley and the wines have gained name recognition, and the economy is thriving.

Agriculture contributes to local economies directly through sales, job creation, support services and businesses, and also by supplying lucrative secondary markets such as food processing. Planning for agriculture and protecting farmland provide flexibility for growth and development, offering a hedge against fragmented suburban development while supporting a diversified economic base.

Development imposes direct costs to communities, as well as indirect costs associated with the loss of rural lands and open space.<sup>8</sup> Privately owned and managed agricultural land generates more in local tax revenues than it costs in services. Carefully examining local budgets in Cost of Community Services (COCS) studies shows that nationwide farm, forest and open lands more than pay for the municipal services they require, while taxes on residential uses consistently fail to cover costs.<sup>9</sup> (See COCS fact sheet.) Related studies measuring the effect of all types of development on municipal tax bills find that tax bills generally go up



as communities become more developed. Even those communities with the most taxable commercial and industrial properties have higher-than-average taxes.<sup>10</sup>

Local governments are discovering that they cannot afford to pay the price of unplanned development. Converting productive agricultural land to developed uses creates negative economic and environmental impacts. For example, from the mid-1980s to the mid-1990s, the population of Atlanta, Ga., grew at about the same rate as that of Portland, Ore. Due to its strong growth management law, Portland increased in size by only 2 percent while Atlanta doubled in size. To accommodate its sprawling growth, Atlanta raised property taxes 22 percent while Portland lowered property taxes by 29 percent. Vehicle miles traveled (and related impacts) increased 17 percent in Atlanta but only 2 percent in Portland.<sup>11</sup>



Photo courtesy U

## ENVIRONMENTAL QUALITY

Well-managed agricultural land supplies important non-market goods and services. Farm and ranch lands provide food and cover for wildlife, help control flooding, protect wetlands and watersheds, and maintain air quality. They can absorb and filter wastewater and provide groundwater recharge. New energy crops even have the potential to replace fossil fuels.

The federal government owns 402 million acres of forests, parks and wildlife refuges that provide substantial habitat for wildlife. Most of this land is located in 11 western states. States, municipalities and other non-federal units of government also own land. Yet public agencies alone cannot sustain wildlife populations. Well-managed, privately owned agricultural land is a critical resource for wildlife habitat.

With nearly 1 billion acres of land in farms, agriculture is America's dominant land use. So it is not surprising that farming has a significant ecological impact. Ever since the publication of Rachel Carson's *Silent Spring*, environmentalists have called attention to the negative impacts of industrial agricultural practices. However, converting farmland to development has detrimental long-term impacts on environmental quality.

Water pollution from urban development is well documented. Development increases pollution of rivers and streams, as well as the risk of flooding. Paved roads and roofs collect and pass storm water directly into drains instead of filtering it naturally through the soil.<sup>12</sup> Septic systems for low-density subdivisions can add untreated wastes to surface water and groundwater—potentially yielding higher nutrient loads than livestock operations.<sup>13</sup> Development often produces more sediment and heavy metal contamination than farming does and increases pollutants—such as road salt, oil leaks from automobiles and runoff from lawn chemicals—that lead to groundwater contamination.<sup>14</sup> It also decreases recharge of aquifers, lowers drinking-water quality and reduces biodiversity in streams.

Keeping land available for agriculture while improving farm management practices offers the greatest potential to produce or regain environmental and social benefits while minimizing negative impacts. From wetland management to on-farm composting for municipalities, farmers are finding ways to improve environmental quality.

*Urban development is a significant cause of wetland loss.<sup>15</sup> Between 1992 and 1997, NRI showed that development was responsible for 49 percent of the total loss. Increased use of automobiles leads to traffic congestion and air pollution. Development fragments and often destroys wildlife habitat, and fragmentation is considered a principal threat to biodiversity.<sup>16</sup>*





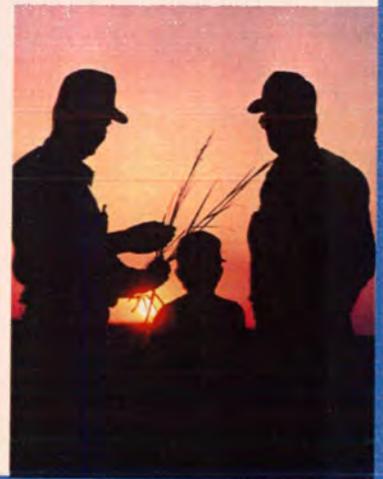
## HERITAGE AND COMMUNITY CHARACTER

To many people, the most compelling reasons for saving farmland are local and personal, and much of the political support for farmland protection is driven by grassroots community efforts. Sometimes the most important qualities are the hardest to quantify—such as local heritage and sense of place. Farm and ranch land maintain scenic, cultural and historic landscapes. Their managed open spaces provide beautiful views and opportunities for hunting and fishing, horseback riding, skiing, dirt-biking and other recreational activities. Farms and ranches create identifiable and unique community character and add to the

quality of life. Perhaps it is for these reasons that the contingent valuation studies typically find that people are willing to pay to protect agricultural land from development.

Finally, farming is an integral part of our heritage and our identity as a people. American democracy is rooted in an agricultural past and founded on the principle that all people can own property and earn a living from the land. The ongoing relationship with the agricultural landscape connects Americans to history and to the natural world. Our land is our legacy, both as we look back to the past and as we consider what we have of value to pass on to future generations.

Public awareness of the multiple benefits of working lands has led to greater community appreciation of the importance of keeping land open for fiscal, economic and environmental reasons. As a result, people increasingly are challenging the perspective that new development is necessarily the most desirable use of agricultural land—especially in rural communities and communities undergoing transition from rural to suburban.



*American Farmland Trust works to stop the loss of productive farmland and promote farming practices that lead to a healthy environment.*

### Notes

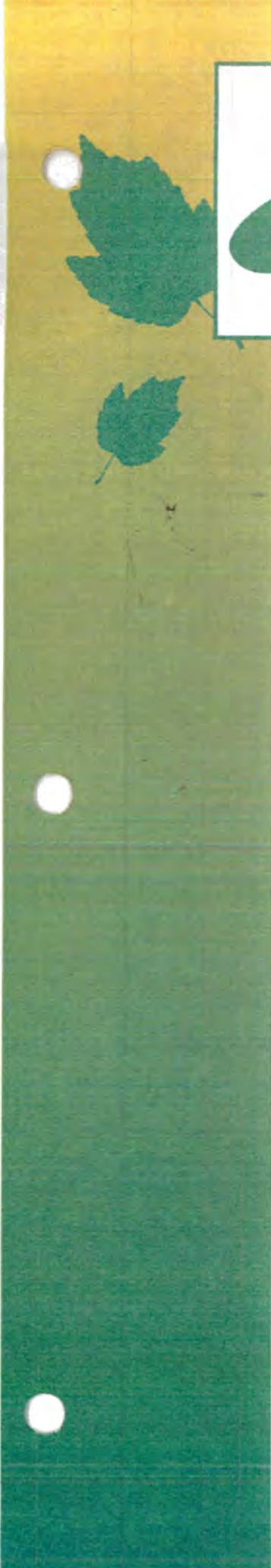
- <sup>1</sup> "A County-Level Measure on Urban Influence," *Rural Development Perspectives*, Vol. 12, No.2, Feb. 1997.
- <sup>2</sup> "How AFT Created Its 2002 Farming on the Edge Map," *Connection*, Vol. V, Issue 4, Fall 2002 (Northampton, Mass.: AFT).
- <sup>3</sup> U.S. Department of Housing and Urban Development, *State of the Cities 2000*, Fourth Annual, June 2000, online at [www.hud.gov/library/bookshelf18/pressrel/socrpt.pdf](http://www.hud.gov/library/bookshelf18/pressrel/socrpt.pdf).
- <sup>4</sup> Ralph E. Heimlich and William D. Anderson, *Development at the Urban Fringe and Beyond: Impacts on Agriculture and Rural Land*, Agricultural Economic Report No. 803 (Washington, D.C.: USDA ERS, 2001), 14.
- <sup>5</sup> Kathryn Lipton, William Edmondson and Alden Manchester, *The Food and Fiber System: Contributing to U.S. and World Economies*, Agricultural Information Bulletin No. 742, July 1998 (Washington, D.C.: USDA ERS).
- <sup>6</sup> U.S. Bureau of the Census, *Statistical Abstract of the United States 2001* (Washington, D.C.: U.S. Department of Commerce), 535.
- <sup>7</sup> United Nations Population Division, *The World at Six Billion*, 3.
- <sup>8</sup> Heimlich and Anderson, *ibid.*
- <sup>9</sup> Julia Freedgood, *Cost of Community Services Studies: Making the Case for Conservation* (Northampton, Mass.: AFT, 2002).
- <sup>10</sup> Deb Brighton, *Community Choices: Thinking Through Land Conservation, Development, and Property Taxes in Massachusetts* (Boston, Mass.: The Trust for Public Land, 1999).
- <sup>11</sup> *New Research on Population, Suburban Sprawl and Smart Growth*, online at [www.sierraclub.org/sprawl](http://www.sierraclub.org/sprawl).
- <sup>12</sup> Real Estate Research Corporation, *The Costs of Sprawl: Environmental and Economic Costs of Alternative Development Patterns at the Urban Fringe* (Washington, D.C.: U.S. Government Printing Office, 1974); Heimlich and Anderson, *ibid.*; Robert W. Burchell, *Impact Assessment of New Jersey Interim State Development and Redevelopment Plan, Report II* (Trenton: N.J.: Office of State Planning, 1992).
- <sup>13</sup> R.J. Perkins, "Septic Tanks, Lot Size and Pollution of Water Table Aquifers," *Journal of Environmental Health* 46 (6), 1984.
- <sup>14</sup> A.J. Gold et al., "Nitrate-Nitrogen Losses to Ground Water from Rural and Suburban Land Uses," *Journal of Soil and Water Conservation*, March-April 1990; *Results of the Nationwide Urban Runoff Program, Volume I - Final Report* (Washington, D.C.: U.S. Environmental Protection Agency, 1983).
- <sup>15</sup> Heimlich, *ibid.*; *The Costs of Sprawl*, Maine State Planning Office, 1997.
- <sup>16</sup> Heimlich, *ibid.*; G. Macintosh, ed., *Preserving Communities and Corridors* (Washington, D.C.: Defenders of Wildlife, 1989); R.F. Noss and A.Y. Cooperrider, *Saving Nature's Legacy* (Washington, D.C.: Island Press, 1994).



THE FARMLAND INFORMATION CENTER is a clearinghouse for information about farmland protection and stewardship. The FIC is a public/private partnership between American Farmland Trust and USDA's Natural Resources Conservation Service.

(800) 370-4879

[www.farmlandinfo.org](http://www.farmlandinfo.org)



# Agroforestry

## *Working Trees for Agriculture*

Imagine for a moment a farm product that could control wind erosion, increase crop yields, and absorb water-polluting runoff. What if it could also protect livestock from cold winter winds and summer heat, improve their weight gain, and reduce energy costs? A product that provides additional sources of income for farmers and ranchers and at the same time helps to create a more diverse and healthy countryside, with clean water and more abundant wildlife and aquatic plants and animals. Most of us would rush out to purchase it!

Of course, no such product exists. However, there is an innovative concept that has contributed its share to doing these very things. It's agroforestry — combining agriculture and forestry. Putting trees to work for agriculture. Agroforestry's working trees help make agricultural systems more sustainable by protecting crops and livestock, conserving natural resources, improving human environments, and providing new sources of income.

Putting trees to work in conservation and production systems for farms, ranches, and communities means planting the right trees in the right places, at the right time, and in the correct design to achieve desired objectives. With agroforestry practices incorporated, an agricultural landscape might include windbreaks in fields, riparian forest buffers along waterways, growing trees and forage together, alley cropping with annual crops and high-value hardwood trees, and "forest farming" operations where high-value specialty crops are grown under the protection of a tree canopy. Look inside for more information on agroforestry practices.

Agroforestry can be a win-win situation for landowners and everyone who cares about the health of our land and water. It provides opportunities to balance productivity and profitability with environmental stewardship, and pass on healthy and sustainable agricultural systems to future generations.



### *Forest Farming*

In forest farming, high-value specialty crops are cultivated under the protection of a forest canopy that has been modified to provide the correct shade level. Crops like ginseng, shiitake mushrooms, and decorative ferns are sold for medicinal, culinary, or ornamental uses. Forest farming provides an added income while trees are being grown for high-quality wood products.



### *Windbreaks*

Windbreaks are planted and managed as part of a crop and/or livestock operation to enhance production, protect livestock, and conserve natural resources. Field windbreaks protect a variety of wind-sensitive row, cereal, vegetable, orchard and vine crops, control wind erosion, and increase bee pollination and pesticide effectiveness. Livestock windbreaks help reduce animal stress and new-born mortality, reduce feed consumption, and help reduce visual impacts and odors. Living snowfences keep roads clear of drifting snow and increase driving safety. They can also spread snow evenly across a field, increasing available soil moisture.

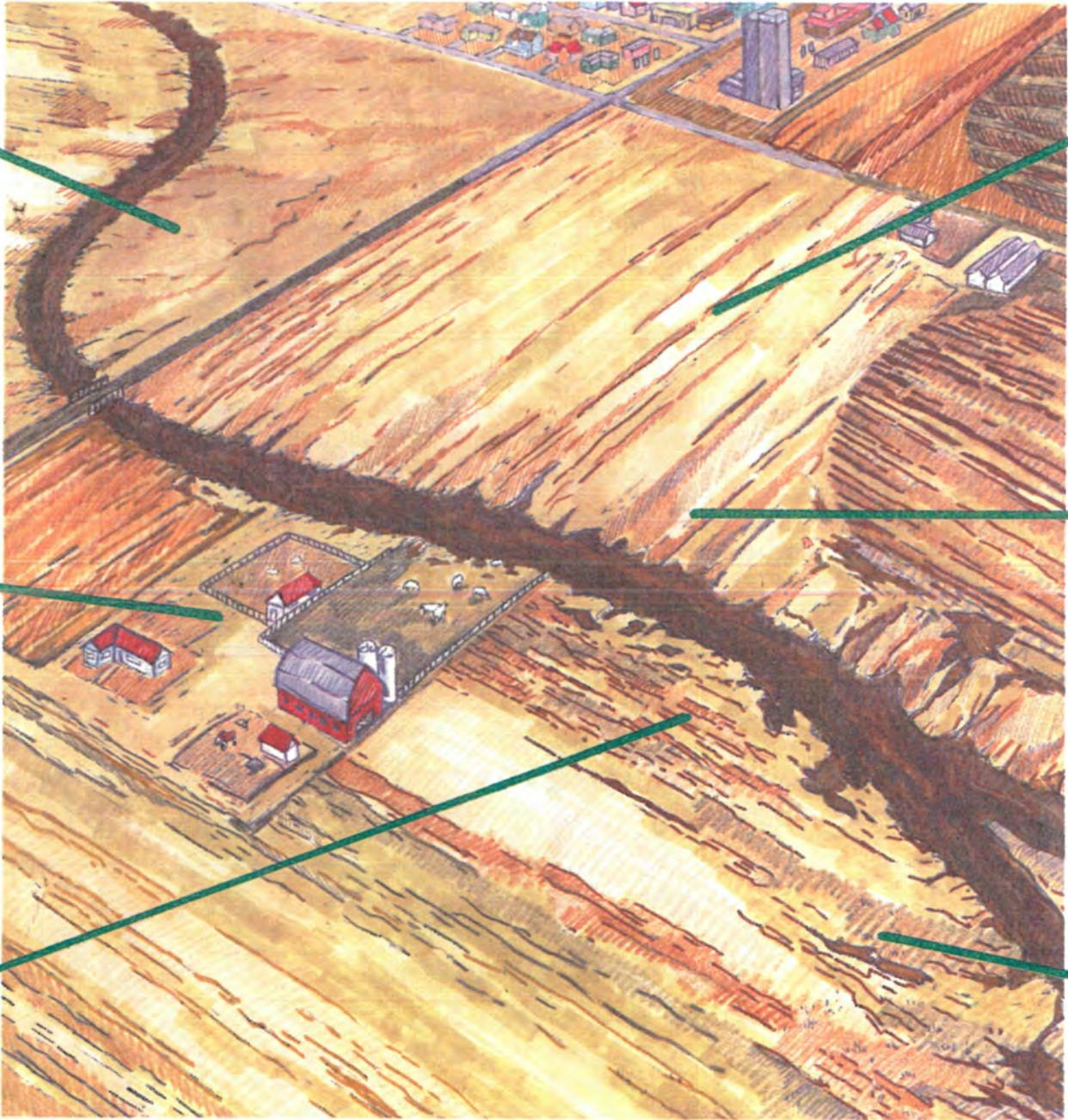


### *Riparian Forest Buffers*

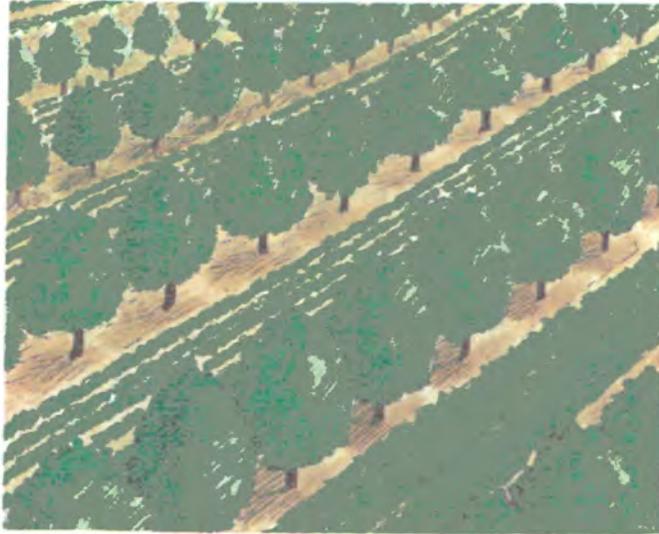
Natural or re-established streamside forests made up of tree, shrub, and grass plantings buffer non-point source pollution of waterways from adjacent land, reduce bank erosion, protect aquatic environments, improve wildlife habitat, and increase biodiversity.



# Agroforestry Practices



A landscape without trees like the one above, is not environmentally sound or aesthetically pleasing. Incorporating appropriate agroforestry practices, as shown in the illustrations to each side, will increase agricultural productivity, protect natural resources, provide new sources of income, and enhance environments for wildlife and people.



### *Alley Cropping*

In an alley cropping system, an agricultural crop is grown simultaneously with a long-term tree crop to provide annual income while the tree crop matures. Fine hardwoods like walnut, oak, ash, and pecan are favored species in alley cropping systems and can potentially provide high-value lumber or veneer logs. Nut crops can be another intermediate product.



### *Silvopasture*

Silvopasture combines trees with forage and livestock production. The trees are managed for high-value sawlogs and at the same time provide shade and shelter for livestock and forage, reducing stress and sometimes increasing forage production. In plantations of conifers for timber or Christmas trees, carefully managed grazing provides added products and income. Some nut and fruit orchards may also be grazed.



### *Special Applications*

Tree and shrub plantings may be used to help solve special farm concerns such as disposal of animal wastes and filtering irrigation tailwater while producing a short or long rotation woody crop. Special multi-row "timberbelts" can be managed both to protect crops or livestock and to produce hardwood timber or a short-rotation woody crop for fuel or fiber. All agroforestry practices can be enhanced to provide wildlife habitat. Combination plantings of trees, shrubs, grasses, and feedgrains provide havens for many wildlife species.

# Agroforestry...

## *...To Diversify Income*

Fluctuating markets, unpredictable weather patterns, and international competition are all a part of today's modern agricultural world. Diversification reduces risk and can make the difference between success and failure for a farming or ranching enterprise. Agroforestry practices can provide a diversified income for a farm or ranch while still working every day to increase crop yields and conserve natural resources.

Valuable products that can be harvested from agroforestry practices include fuel-wood; wood for energy generation, paper production, and landscaping chips; fruits and nuts; wood shavings for animal bedding material; Christmas trees; sawlogs for dimension lumber; high-value timber products such as furniture-quality wood and veneer logs; and high-value specialty crops like decorative ferns, mushrooms, herbs, and medicinal plants.

## *...To Enhance Productivity*

Studies show that farm productivity and product quality can be increased substantially when agroforestry practices are introduced.

Windbreaks protect crops, livestock, and valuable natural resources. Livestock protected by trees show improved weight gains of as much as 10 percent and require up to 50 percent less feed. Milk production can increase by 8 to 20 percent. Survival rate of newborn lambs and calves can increase substantially. And, disastrous losses from blizzards can often be avoided, especially compared to a treeless environment.

Furthermore, tree systems can successfully protect sensitive crops such as vegetables, vines, orchards, herbs, and soft fruits and flowers from temperature stress and wind damage.

During severe weather years, tree windbreaks have increased row-crop productivity by as much as 25 percent and hay yields by 60 to 80 percent. Horticultural crop production and quality are also improved when protected by windbreaks.

## *...To Conserve Energy*

Agroforestry practices can reduce energy use significantly. For example, wood from agroforestry practices provides an alternate source of farm fuel. Living snowfences reduce the need for snow removal, thus saving fuel, and field windbreaks improve crop water-use efficiency thereby reducing irrigation costs.

Trees reduce energy costs. Farm homes protected by windbreaks can expect heating costs to be cut by as much as 30 percent, especially in the high wind, low temperature regions of the United States.

### ...For Conservation

Agroforestry practices connected with other appropriate practices create conservation buffer systems to help control runoff, soil loss, and pollution from heavy rains.

The roots of trees and shrubs along rivers, streams, and ditches filter contaminated shallow groundwater and surface runoff laden with sediment, nutrient, chemical, and biological contaminants before they reach the water course. This helps to keep our water clean and more suitable for recreational use, household water use, and fish and wildlife habitat.

### ...To Create A Healthy Environment

When agroforestry practices are intentionally integrated into conservation systems, the resulting interactions can enhance the soil, water, air, plant, animal, and human resources of the farm or ranch. The challenge is to apply the practices in the key locations of the farm and watershed to maximize the desired benefits.

Agroforestry practices that use only one to five percent of the land area of a farming system can account for over 50 percent of the biodiversity. Agroforestry practices improve both terrestrial and aquatic wildlife habitat. Trees and shrubs grown near crops and gardens harbor birds and beneficial insects that feed on pest insects and mammals.

Populations of valuable wildlife species also increase with the addition of trees and shrubs into agricultural areas. This increase provides opportunities for both hunting and nonconsumptive uses, such as birdwatching. Finally, tree-induced biodiversity adds variety to the landscape and improves aesthetics.

### ...To Meet People's Needs

People and communities are an important part of agricultural systems. Agroforestry addresses human needs by improving quality of life, health, comfort, enjoyment, security, and recreation. Agroforestry can provide a more diverse farm economy leading to more stable farms, ranches, and communities. Agroforestry practices not only apply to rural farms, but communities as well. In fact, agroforestry practices like windbreaks and riparian forest buffers are being put to work in and near communities to protect soil, water, wildlife, roads, buildings, and recreational areas. 



*NAC's Mission:* The National Agroforestry Center is a partnership of the USDA Forest Service, Rocky Mountain Research Station and State & Private Forestry and the USDA Natural Resources Conservation Service. The Center's purpose is to accelerate the development and application of agroforestry technologies to attain more economically, environmentally, and socially sustainable land-use systems. To accomplish its mission, the Center interacts with a national network of cooperators to conduct research, develop technologies and tools, and provide useful information to natural resource professionals.

*Address:* National Agroforestry Center, USDA FS/NRCS, East Campus-UNL, Lincoln, Nebraska 68583-0822. For a supply of brochures, contact Nancy Hammond: [nhammond/rmrs\\_lincoln@fs.fed.us](mailto:nhammond/rmrs_lincoln@fs.fed.us), or call her at 402-437-5178 ext. 11. For more information on the Center, contact Jerry Bratton, 402-437-5178 ext. 24 or Bruce Wight, ext. 36.

Most agroforestry practices can be supported by cost-share incentives provided by federal, state, or local governments through programs like the Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP), and the Stewardship Incentives Program (SIP). Contact your State Forester, local Conservation District, or the Natural Resources Conservation Service (NRCS) for information about technical assistance and the various incentives presently available.

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# Working Trees for Livestock

## Agroforestry: Silvopasture in the Southeast



### **What are “Working Trees”?**

Working trees are trees used in conservation and production systems on farms and ranches. They have a job to do, whether it's increasing income, protecting natural resources, or making our lives a little more enjoyable. “Working Trees” is a theme title designed to promote the science and practice of “agroforestry.” Agroforestry is a term that agriculturists and foresters have defined to include most practices where trees and shrubs are intentionally integrated into agricultural crop, forage, or livestock operations. Practices like windbreaks, riparian buffer strips, alley cropping, forest farming, and silvopasture use the same land to produce both forest and agricultural products, while at the same time conserve natural resources. Using working trees simply means planting the right trees, in the right place, at the right time, and in the right design to get a specific job done.

Silvopasture is the integration of trees with livestock operations. Silvopasture provides multiple benefits to landowners. If managed properly, trees in a livestock operation can reduce stress on livestock, while at the same time maintain forage production. Furthermore, by adding trees to forage systems, a landowner can receive additional income on the same land from timber products, Christmas trees, nut/fruit crops, or commercial wildlife or recreational opportunities.

### **What are Silvopastoral Systems?**

Most people are accustomed to a single use of forest land or rangeland. Forest land and rangeland are basically used to produce crops, forage, livestock, forest products or to support wildlife. Silvopasture applies where livestock uses overlap with forest production. Silvopasture has become an important tool to improve income opportunities on farms and ranches in the Southeastern United States. The concept of silvopasture provides both forest production

and forage or livestock production simultaneously. The trees are ultimately managed for high value sawlogs (intermediate harvesting may produce pulpwood or posts and poles) and at the same time provide shade and shelter for livestock and forage. Trees can be planted into current forage systems, or woodlands can be thinned to accommodate additional growth of forage.

## Benefits of Incorporating a Silvopastoral System

Incorporating long-term timber production into pasture and livestock management operations will provide for both an annual income and a longer-term cash flow. Silvopasture can improve the overall economic performance of a farm enterprise through diversification. The benefits primarily involve those gained in forage production and timber production.

### Forage production

Incorporating trees into an established forage production or grazing system can maintain normal forage production while adding a long-term tree crop. In a study done by Cliff Lewis, USDA Forest Service, pine trees were planted and bahiagrass was seeded the same year. The trees were planted in spacings of 10-feet by 48-feet and 16-feet by 30-feet. The site was cut for hay the first three years, and then grazed for three years. At the end of six years, hay production averaged seven tons per acre (normal for the region) and beef gains averaged 200 pounds per acre during spring and summer grazing periods. After six years the trees were 22 feet in height and averaged 5.2 inches in diameter. This example demonstrates that increased timber growth can be realized with the multiple benefits of silvopasture.

### Timber production

Incorporating grazing or forage production into a forested area can provide added cash flow to the enterprise and may increase wood production as shown in the following example.

A research study done in South Central Georgia found slash pine trees grown in both grazed and fertilized silvopastoral systems grew more rapidly, both in height and diameter, than those planted in ungrazed and nonfertilized native vegetation. In this study, trees were planted on 12-foot by 12-foot spacings and 20-foot by 20-foot spacings. The site was kept weed-free for three years. Bahiagrass, Dallisgrass, and coastal bermudagrass were planted in year four, and grazing commenced the fifth year. Trees in this design produced about 30 percent more wood per acre than surrounding plantations in native vegetation (see charts 1 and 2).

Silvopasture techniques can be convenient and effective. In some parts of the country, a typical timber management cycle involves site disturbance prior to replanting after a clearcut. This may be a good opportunity to seed grasses or even legumes. In the Coastal Plains region, a site-prepared area was seeded to pensacola bahiagrass. A year later, longleaf pine was established on the same site. The site was grazed year-long, and after nine years, there were 967 trees per acre. The longleaf pine trees that were grazed came out of the "grass" stage sooner than those ungrazed, and they grew significantly taller.

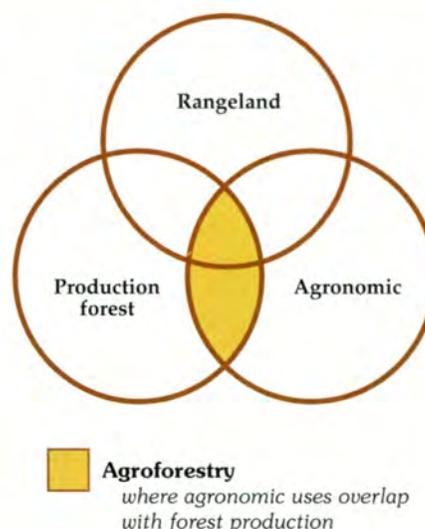


Chart 1-Tree height

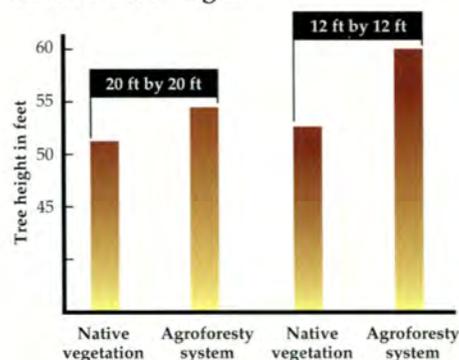
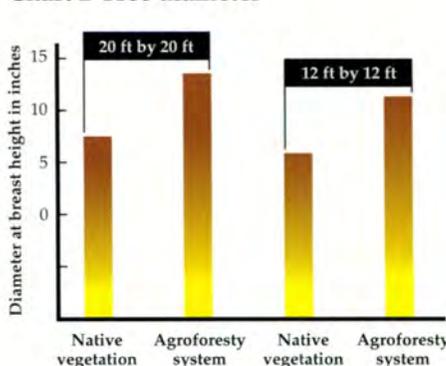


Chart 2-Tree diameter



## Other benefits

Silvopasture practices can:

- Improve overall economic performance of a farm enterprise through diversification
- Maintain or increase tree growth
- Improve cool-season grass production
- Allow warm-season grass production with careful canopy management
- Provide shade for livestock
- Produce pine straw for landscaping and mulch
- Aid in erosion control
- Increase wildlife populations
- Improve water quality
- Increase opportunities for recreation
- Enhance aesthetics and property values



Tree spacing in silvopastoral systems provides for compatible forage and forest production.

## Planning considerations

- **Inventory your resource base.** Begin planning with an inventory of existing resources. A local soil survey, which is available from your USDA Natural Resources Conservation Service office, can help you determine the suitability of different sites for different forage plants and trees. Your silvopastoral system will only be successful if you use plants adapted to your area.
- **Consider newer technologies.** Electrically powered fences may be the only way to afford a conservation grazing approach that matches livestock forage demand with forage production. Practical solar pumps may be used to provide water to previously unusable locations.
- **Analyze the economic implications.** Analyze the economic implications of pasture management, improvements required, and potential return. Then plan a grazing system using a conservative stocking rate. Intense grazing, overgrazing, and poor placement of supplemental troughs, water, or mineral feeders offer the highest potential for unacceptable levels of tree damage. Overstocking or improperly managed grazing can result in destruction of young pine seedlings. Consider a planting arrangement that would enhance self pruning, such as multiple row plantings, or higher density plantings that would require more frequent thinning. Wide-row, low-density planting increases limb retention and, depending upon species, decreases timber quality. For example, trees with large retained branches produce lower quality saw logs for lumber. Pruning is one method for assuring clear saw log production. A general guide is to prune trees when they reach four to six inches in diameter at breast height (dbh) and pruned to approximately where the trunk is four inches in diameter. Care should be taken to remove no more than about 30 percent of the live crown at any one time. (This is an accepted practice for wide spaced silvopastoral systems in other parts of the world.)
- **Special considerations.** To ensure an adequate stand of quality trees, consider the natural range of pests in your area. Cattle-induced injuries to lower limbs of trees may provide opportunities for insect or disease attacks. Stay in touch with others who have had experience with successful, local silvopastoral systems.

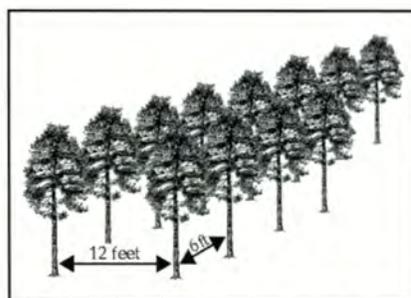


Closed canopy forest eliminates understory and the potential for grazing domestic livestock.

- **Select tree species, forage species, and a management option that assure compatibility.** Some forage plants are more shade tolerant than others. For example, in the Southeast bahiagrass has proven to be more shade tolerant than Dallisgrass or coastal bermudagrass. Nangeela subterranean clover is more shade tolerant than some other varieties available. Selection of forage plants as well as trees that are conducive to silvopasture is important. There appears to be a minor reduction in the digestibility of some forages growing in shade. This does not seem to be significant enough to affect livestock production or gains. There is evidence of increased palatability with some cool-season grasses.

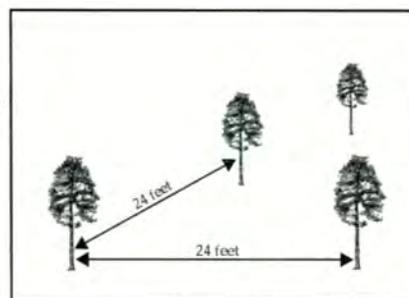
## Management Options

Canopy closure reduces forage production as timber stands mature. In fact, in many ecosystems, when canopy cover exceeds 30 to 50 percent, forage production is curtailed to the point where grazing domestic livestock may not be economically feasible. One method of dealing with fluctuating forage production is through designed thinning (removal or harvest of some of the trees to maintain the desired canopy and competition level). Another method is planting fewer trees initially, which increases the period for canopy closure to occur. Row arrangements significantly impact space and canopy closure, which affect forage production. With proper management, a silvopastoral system can benefit the landowner, the land, and livestock all at the same time.

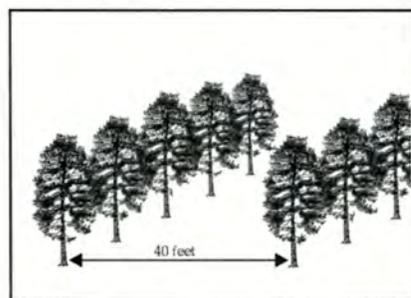


Self pruning will occur on a 6- by 12-foot planting arrangement. Periodic thinnings are needed to maintain forage production. However, forage production will fluctuate with tree density.

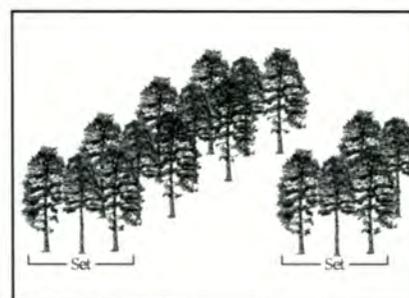
Thinned to



Timely thinnings of original 6- by 12-foot stand to a final stand of 75 trees per acre ensures more consistent forage production.



Single rows are spaced 40 or more feet apart. Pruning is required to produce quality trees. Forage production is easier to maintain.



Trees are planted in closely spaced, 3-row sets with wide spacing between sets. Outside rows are "trainers" and help self prune inside rows. Outside rows are removed for pulp; inside rows are managed for higher quality saw logs.

National  
Agroforestry  
Center



A partnership of the  
Forest Service and  
Natural Resources  
Conservation Service

This brochure was developed by the USDA National Agroforestry Center (NAC) in cooperation with the USDA-NRCS Grazing Lands Institute. Special thanks to Sid Brantly, Regional Grazing Lands Coordinator, USDA-NRCS, Auburn Alabama.

*NAC's Mission:* The USDA National Agroforestry Center (NAC) is a partnership of the USDA Forest Service, Research & Development (RC&D) (Rocky Mountain Research Station) and State & Private Forestry (S&PF) and the USDA Natural Resources Conservation Service (NRCS). The Center's purpose is to accelerate the development and application of agroforestry technologies to attain more economically, environmentally, and socially sustainable land-use systems. To accomplish its mission, the Center interacts with a national network of cooperators to conduct research, develop technologies and tools establish demonstrations, and provide useful information to natural resource professionals.

*Address:* USDA National Agroforestry Center, East Campus-UNL, Lincoln, Nebraska 68583-0822. For a supply of brochures, contact Nancy Hammond, email: [nhammond@fs.fed.us](mailto:nhammond@fs.fed.us), fax: 402-437-5712, or contact Dianne Johnson at 817-509-3212. For more information about the Center and *Working Trees for Livestock*, contact Jim Robinson at 817-509-3215.

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# Working Trees for Wildlife

**A**gricultural activities often lead to a reduction in the amount or effectiveness of wildlife habitat. Although providing quality habitat for wildlife in agricultural settings may be challenging, agroforestry offers a unique opportunity for landowners. Agroforestry technologies “put trees to work” by combining forestry and agricultural practices to make healthier, more sustainable agricultural systems.

Agroforestry practices such as windbreaks, riparian forest buffers, forest farming, alley cropping, and silvopasture, can protect crops and livestock, conserve natural resources, improve human environments and provide new sources of income. With proper planning, utilizing trees in an agricultural setting can also be an excellent way to create or improve wildlife habitat.

Agroforestry practices are often designed for a single purpose, with the assumption that they will also be adequate for wildlife. Although they usually benefit wildlife, practices often are designed far below their capability to provide the basic wildlife needs of food, water, and cover. Why not design the agroforestry practices to fulfill wildlife habitat needs first, and then incorporate traditional conservation functions as well?

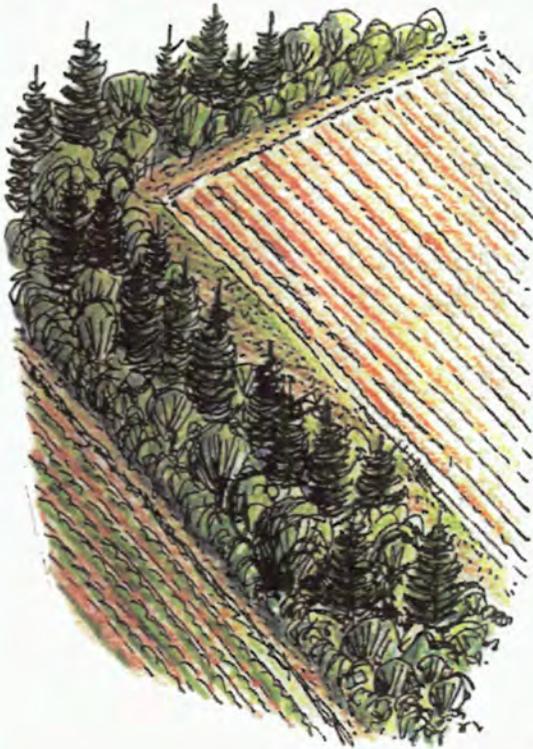


Before beginning a wildlife habitat improvement project, several things need to be considered. If certain wildlife species are desired, habitat requirements of those species should be incorporated into the plan. Soil types, topography, drainage, location of the nearest water source, adjacent land uses, and local climate need to be taken into account. The availability of food is critical, therefore, measures should be taken to provide this for wildlife, especially during the winter

months. Trees and shrubs can provide needed cover for nesting, roosting, loafing, brood rearing, escaping, and protection from the elements.

The goal of “working trees” is to protect all natural resources, including wildlife. Planting trees and shrubs, especially native plants, specifically for wildlife provides habitat while improving the health and sustainability of the agricultural system.

# Windbreaks



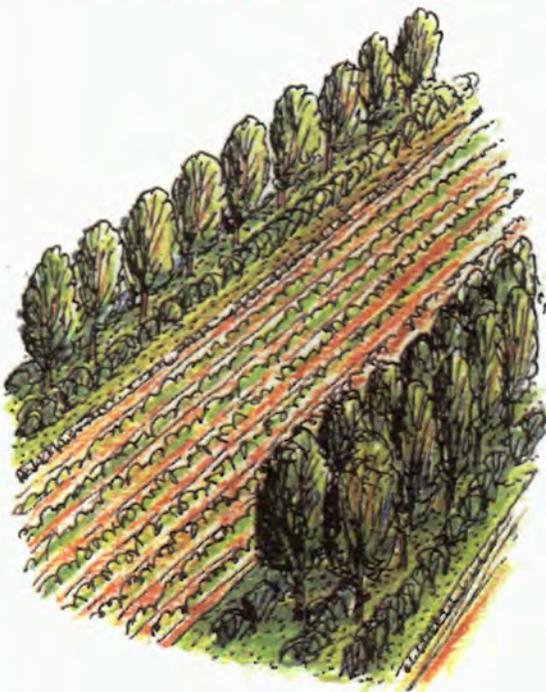
*Windbreaks are multiple rows of trees and shrubs planted and managed to protect farmsteads or incorporated as part of a crop or livestock operation to enhance production, protect livestock, and control soil erosion.*

When designing a windbreak for wildlife, remember to include plant species and arrangements that give desired wildlife the basic essentials of cover and food (and water, if possible.)

- ✓ Try to connect planted windbreaks to other planted or natural sources of cover, streams, ponds, or windmills. If the windbreak cannot be designed to connect, plant travel lanes to connect to other food, cover or water sources.
- ✓ If drifting snow is a problem, plant a "trip row" of shrubs 50 to 100 feet away on the windward side, to help keep snow out of the windbreak. This will also provide additional low-level cover.
- ✓ Plant food plots alongside the windbreak or leave a few rows of standing crops. Cultivating a strip to let native annual plants grow (some people call them weeds) can be a good source of food and cover.
- ✓ Remember, generally speaking, wider plantings are better. A single-row windbreak is less valuable to wildlife than multiple rows. The ultimate might be 20 rows of trees and shrubs up to 300 feet wide. However, few people are willing to give up this much land or maintain this large of a planting.
- ✓ Try to mix different yet compatible plants in the rows to give a natural "feel" to the windbreak. Or, better yet, plant connected groupings of five to seven trees and shrubs. You'll end up with a block planting that resembles a native woodland.

When these design principles are followed, windbreaks designed for wildlife will also protect crops, homes, livestock, or roads with little or no decrease in protection capability.

# Alley Cropping



*Alley cropping is growing an agricultural crop simultaneously with a long-term tree crop to provide annual income while the tree crop matures. Fine hardwoods like walnut, oak, ash, and pecan are favored species in alley cropping systems and can potentially provide high-value lumber or veneer logs. Nut crops can be another intermediate product.*

Alley cropping systems are designed primarily to grow crops between rows of high value trees until they are harvested or the crops are shaded out. The following modifications will benefit wildlife:

- ✓ Rather than clean till or apply chemicals, use ground covers in the tree row areas that are attractive food/cover sources for wildlife, e.g. Desmodiums or clovers are nitrogen-fixing plants that benefit wildlife as well.
- ✓ Plant fruit-bearing shrubs between or adjacent to the trees. Plants with fruit lasting long into the winter are excellent choices.
- ✓ Instead of single tree rows, plant two or three rows of trees between crop rows, creating wider strips of trees between crop alleys. This will add to the cover capability of the planting.
- ✓ With proper planning, the tree rows can be utilized as travel lanes to connect other food, cover, or water sources. The added shrub rows and ground cover will enhance wildlife capacity.
- ✓ A farm operator can leave one to two rows of crop next to the tree rows to provide winter food.

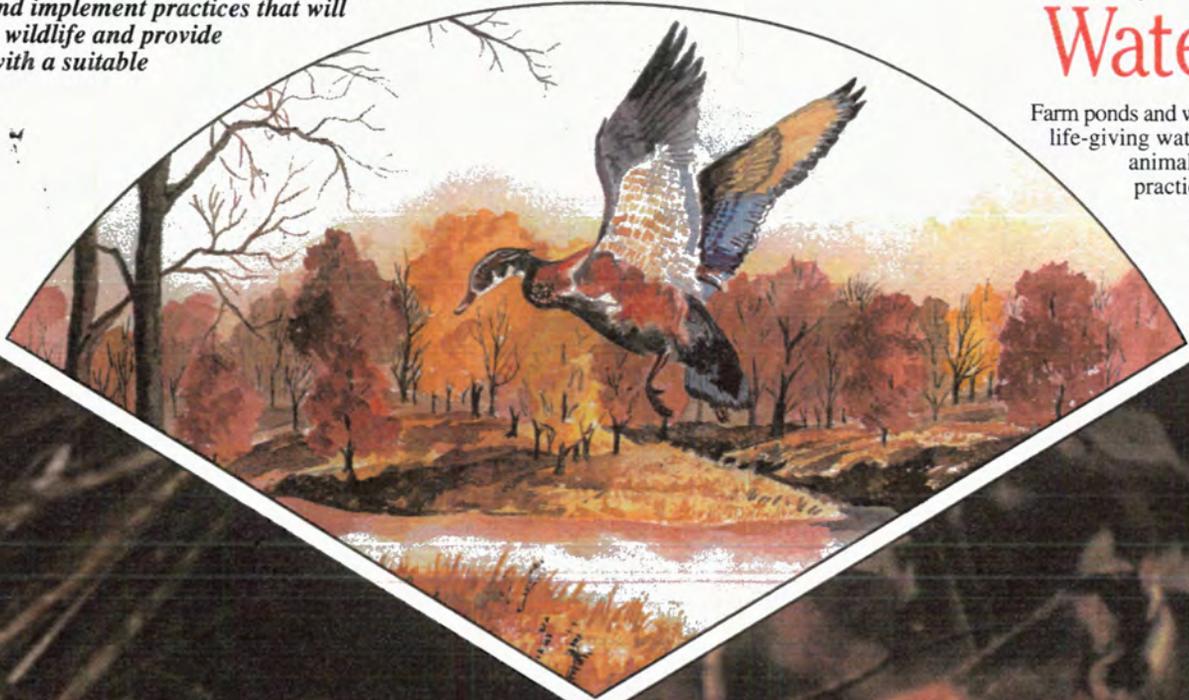
Alley cropping is an intensively managed system that benefits wildlife. With a little ingenuity and foresight, adding native plant components can increase the attraction of desired wildlife species.

# Planning your Practices to Include *Wildlife*

*All wildlife require food, water, and places for protection within reasonable proximity to each other. With awareness of these basic needs, you can plan and implement practices that will attract wildlife and provide them with a suitable home.*

## Water

Farm ponds and wetlands provide life-giving water for birds and animals. Agroforestry practices can provide travel lanes for access to water sources.



## Cover

Trees, shrubs, and ground cover provide protection from predators and shelter from winter cold and summer heat.

## Food

Seeds, berries, nuts, and fruits from trees or shrubs can provide food for many wildlife species.



# Silvopasture

*Silvopasture combines trees with forage and livestock production. The trees are managed for high-value sawlogs and at the same time provide shade and shelter for livestock and forage, reducing stress and sometimes increasing forage production.*



In silvopastoral systems, the forest understory is manipulated to meet forage needs for livestock and are typically less diverse than the natural forest understory or natural ecosystem. To maximize the benefits to wildlife, the needs of the wildlife species desired must also be considered when designing the system.

- ✓ **Wildlife allocation of resources:** The amount and type of understory needed for wildlife must be determined. These resources should be protected for use by the wildlife species desired.
- ✓ **Canopy management:** The amount of light penetration through the canopy must be regulated to allow for the production of forage and other understory plants. Canopy management can also allow a percentage of the canopy tree species to be trees that meet the needs of wildlife rather than the timber crop. In this way canopy management will influence both density and species diversity.
- ✓ **Grazing management:** Manipulation of the understory is done principally through grazing management. The timing, intensity, and duration of grazing to protect the resources allocated for wildlife become key elements in the grazing management plan. Prescribed grazing, prescribed burning, rotational systems, and rest periods are elements of the grazing plan that may be required to manage the understory to achieve wildlife objectives.

It must be recognized that silvopastoral systems generally meet the habitat requirements of specialized wildlife species, due to the constraints of a silvopasture.

# Riparian Forest Buffers

*Riparian Forest Buffers are natural or re-established forests along waterways, made up of tree, shrub, and grass plantings designed to buffer and filter non-point source pollution of waterways by runoff from adjacent land. They also reduce bank erosion, protect aquatic environments, enhance wildlife and increase biodiversity.*

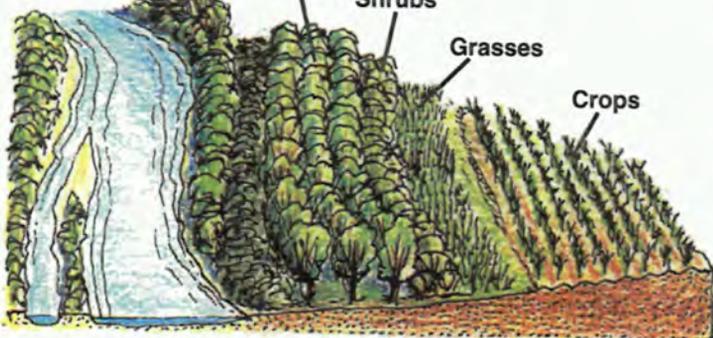
Natural or Re-established Forest

Planted Trees

Shrubs

Grasses

Crops



Trees and woody vegetation near streams, wetlands, or ponds are uniquely positioned to provide habitat for both terrestrial and aquatic wildlife.

- ✓ As with other agroforestry practices designed to encourage wildlife, a diversity of plant species will provide the best habitat for a large number of wildlife species.
- ✓ Native plant species should be encouraged, as wildlife are familiar with them and are adapted to their use.
- ✓ Tall streamside trees with spreading canopies provide shade, food, and in-stream woody structure for fish species.
- ✓ The width of the buffer and the plant species used will depend on the type of wildlife desired.

## What About Forest Farming?

*In forest farming, high-value specialty crops are cultivated under the protection of a forest canopy that has been modified to provide the correct shade level. Crops like ginseng, shiitake mushrooms, and decorative ferns are sold for medicinal, culinary, or ornamental uses. Forest farming provides income while high-value trees are being grown for wood products.*

According to forest farming experts, small rodents and certain birds tend to be "problem" wildlife. By providing a habitat that attracts birds and animals that prey on these pests may benefit both the farmer and preying species. Species that could help control

pest populations in a forest farming area include: fox, coyote, hawk, owl, shrew, bat, mink, weasel, and many beneficial insects.

Additionally, planting good food sources and cover nearby, specifically designed to attract unwanted wildlife may benefit both farmer and wildlife, giving birds, animals, and insects an attractive habitat that may distract them from the forest farming planting.

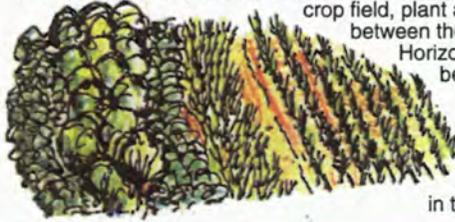
Depending on the understory crop, precautions should be taken to protect it from damaging wildlife like turkey and deer as well as small rodents. Different fencing arrangements, including below-ground fences to block burrowing rodents and electric fences are typical pest management practices.

# Planning for Wildlife . . .

*“Working trees” can provide wildlife habitat in the agricultural landscape but landowners must know how to apply these principles to their agroforestry practice design.*

## Horizontal Structure

Vegetation chosen for planting should be arranged to provide the greatest width practical and transition smoothly into the adjoining land use. For instance, instead of a row of shrubs placed next to a



crop field, plant a strip of native grass between the shrubs and crops. Horizontal structure can also be improved by using clump plantings under a tree canopy or along the outside edge. Minimize straight lines in the design, if possible.

## Reliable Food Sources



The availability of food is critical, especially during winter months when energy needs of birds and animals are greatest. Planting trees and shrubs that keep their fruit during the winter is essential in areas where snow accumulation can make foraging difficult.

## Vertical Structure

Vegetation heights should vary from tall trees to medium size trees and shrubs to lower growing grasses and forbs. Vertical structure is most important for birds, as different species use different layers for nesting, roosting, feeding, or loafing.



## Placement Within Landscape

Placement of agroforestry practices within the larger landscape, known as juxtaposition, is important in determining habitat value for wildlife. Food, cover and water located in the same vicinity creates optimal habitat. Designs should consider the wildlife species and their normal range of mobility. For example, if the desired species seldom feeds more than 200 yards from escape cover, it does little good to provide cover a half mile from the food.

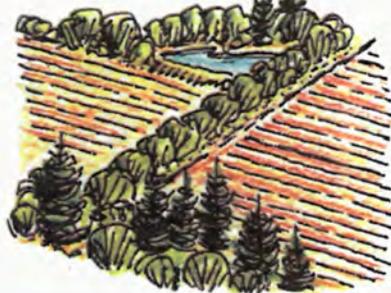


## Width



The width of tree and shrub plantings depends on the agroforestry practice being applied, the wildlife species the landowner wants to attract, and the acreage the landowner wishes to commit to working trees. Proper vertical and horizontal structure benefits most edge-loving wildlife. Increased width along riparian areas provides habitat enhancement for both aquatic and terrestrial species. Generally speaking, “the wider, the better.”

## Travel Lanes



The addition of travel lanes can overcome some of the problems of isolated habitat. Woody vegetation can be used to connect several small isolated cover areas within an agricultural landscape, thus increasing the useable space for wildlife. Sometimes, the addition of such travel lanes creates complete wildlife habitat from isolated components that were formerly unusable.

## Diversity of Vegetation

The greater variety of plants, the better the chances of providing year around habitat for several wildlife species. This also reduces the possibility of losing all plants to disease, insects, or a catastrophic event. Consider coniferous and deciduous trees and shrubs, fall and spring fruiting varieties, perennial and annual herbaceous vegetation, and a variety of flowering dates. Try to use native plants when possible because wildlife are already familiar with them and these plants are adapted to the local climate.



## Disturbance

On most sites, disturbance increases the amount and kind of plants available for wildlife. Most sites require disturbance, while it can be detrimental to others. Vegetation can be disturbed naturally by fire, flood, wind, ice, and browsing by wildlife, or managed by disking, thinning, prescribed burning and grazing. When harvesting and thinning, consider leaving standing dead trees as homes for cavity nesters.



# Other Considerations About Attracting Wildlife



**Economics:** Attracting wildlife to your agroforestry practice could be a way to provide income. There is potential for fee-hunting of game animals as well as opportunities to charge bird-watchers for viewing wildlife on your land.

**Educational Value:** Many agroforestry plantings intended to protect and provide income, can also serve as outdoor classrooms for area school children. Students can learn to identify animals and plants as they learn to value the importance of balanced human and environmental interactions.

**Pollination:** Some agroforestry practices can improve beneficial insect pollination. A properly designed windbreak will increase bee pollination in fruit orchards.

**Wildlife Hazards:** It is easy to forget that it isn't always a good idea to attract wildlife to some areas. For example, when considering an agroforestry planting near an airport, it is best to avoid plants that will attract birds, due to safety reasons. Attracting deer to an area near a city or major highway is not safe for animals or humans.

**Be Considerate:** It is a good idea to talk with your neighbors about your plans to attract wildlife. If the animals or birds must travel through your neighbors' property to get to the habitat, they may not appreciate the intrusion, especially if they perceive the wildlife as causing damage.

**Pest Control:** Creating habitat for bats and certain birds that consume forest and agricultural insects could reduce the need for costly insecticides.

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## Want More Information?

### Local Assistance

There are technical specialists in your area that can assist you with the planning, design, application, and maintenance of your Working Trees for Wildlife practice. Contact your nearest state wildlife agency, state forestry agency, USDA Natural Resources Conservation Service District Office, County Extension Office, or Soil and Water Conservation District.

### National Assistance

Contact the USDA National Agroforestry Center (NAC), East Campus—UNL, Lincoln, NE 68583-0822. Telephone (402) 437-5178; or the NRCS – *Watershed Science Institute*, c/o Dept. of Soil Science, PO Box 7619, Raleigh, NC 27695-7619. Telephone (919) 515-4181; or the NRCS - *Wildlife Habitat Management Institute*, 100 Webster Circle, Suite 3, Madison, MS 39110. Telephone (601) 965-5888. Visit the NAC web site at [www.unl.edu/nac](http://www.unl.edu/nac).

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This brochure was developed by the National Agroforestry Center (NAC) in cooperation with the Natural Resources Conservation Service, Watershed Science Institute and Wildlife Habitat Management Institute.



A partnership of the  
Forest Service and  
Natural Resources  
Conservation Service

**NAC's Mission:** The National Agroforestry Center is a partnership of the USDA Forest Service, Research and Development (Rocky Mountain Research Station) and State & Private Forestry and the USDA Natural Resources Conservation Service. The Center's purpose is to accelerate the development and application of agroforestry technologies to attain more economically, environmentally, and socially sustainable land-use systems. To accomplish its mission, the Center interacts with a national network of cooperators to conduct research, develop technologies and tools, establish demonstrations, and provide useful information to natural resource professionals.

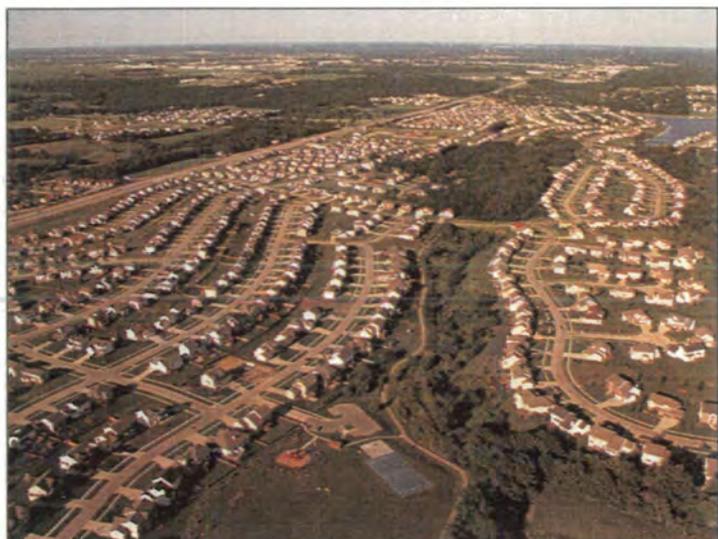
**Address:** USDA National Agroforestry Center, East Campus - UNL, Lincoln, Nebraska 68583-0822. For a supply of brochures, contact Nancy Hammond, [nhammond/rmrs\\_lincoln@fs.fed.us](mailto:nhammond/rmrs_lincoln@fs.fed.us). For more information on the Center, contact Jerry Bratton, 402-437-5178 ext. 24 or Bruce Wight, ext. 36.

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# Working Trees for Communities

*WORKING TREES FOR COMMUNITIES* is the adaption of agroforestry technologies to assist communities of all sizes achieve environmental, social, and economic goals, especially at the rural/urban interface.



Today, communities are challenged with accommodating new growth while maintaining the integrity of existing neighborhoods. Accommodating health, safety, transportation, quality of life, economics, environmental quality, and infrastructure development can often lead to land use conflicts. Compromises are often needed to achieve a workable plan.

Today, community residents, businesses, rural landowners, and local leaders must look beyond their own backyards. What is done by one resident

or business can affect the community and the watershed. The cumulative effects of many individual actions can have significant impact on the overall landscape.

*WORKING TREES FOR COMMUNITIES* are proven agroforestry technologies that are being adapted to meet community needs. When properly placed, *Working Trees* provide benefits to the environment and to people living in and around the community.

Trees clean the air and water, provide protection from the

wind, improve the view from our homes, and provide a cool place on a hot day. *Working Trees* create green space that provides recreational and educational opportunities. They provide food, shelter, and travel corridors for wildlife. Trees along streams cool the water, provide food for stream organisms, add structure to the stream channel, and stabilize streambanks. A planned system unites the community and the surrounding landscape by way of *Working Trees*.

# Environment



*Working Trees* help to conserve and protect our natural resources. In communities they help improve soil, water, and air quality. They provide habitat for wildlife and recreational opportunities for people.

**Nonpoint Source Pollution** — As precipitation and irrigation water move across yards, streets, and parking lots it picks up turf chemicals, oils, and other pollutants that eventually end up in streams and lakes. Trees, shrubs, and grasses planted as bioswales, wetlands, and riparian forest buffers can filter out contaminants as they slow and capture stormwater runoff.

**Streambank Stability** — While sod and other ground cover hold topsoil in place, tree roots penetrate deep and spread out, anchoring large blocks of soil. Densely-planted trees and shrubs can do additional duty by keeping bikes, foot traffic, and motor vehicles off slopes and fragile soils that are prone to wind and water erosion.

**Phytoremediation** — Industrial sites can create solvent, heavy metal, and petroleum residues that can leach into groundwater and wash into rivers and streams. Phytoremediation is the process in which trees, along with shrubs, grasses, and soil organisms absorb and break down some of these contaminants.

**Biodiversity** — Green spaces should be designed with a variety of plant species to guard against major losses from insects and disease and help diversify the urban landscape. These areas can also be havens for native and rare plants and animals.

**Wildlife Habitat** — *Working Trees* provide food, shelter, nesting, and travel corridors for wildlife.

**Visual Screens** — Tree plantings can screen and buffer residents from unattractive sights. Tree and shrub plantings soften the visual harshness of walls and fences that often line the urban landscape.

**Noise** — Combining trees and shrubs with landforms, such as earthen berms, can reduce vehicle road noise by as much as half.

**Carbon Storage** — When coal, gas, and oil are burned, they release carbon dioxide, a “greenhouse gas,” into the atmosphere. A major consideration for rebalancing the global carbon cycle is to plant permanent vegetation to help extract carbon dioxide from the air and store it as wood fiber.

# Health & Safety



*Working Trees* are a tool for building safe places to live, work, and play. Communities are challenged to provide for the health and safety of their residents. Runoff from streets, parking lots, and pesticide- and fertilizer-laden lawns can create serious water quality problems. Trees and other vegetation along streams and strategically planted in and around parking lots and drainage channels can be used to filter these contaminated runoff waters. *Working Trees* also help make roads safer by trapping blowing dirt and snow that can reduce visibility and make roads unsafe.

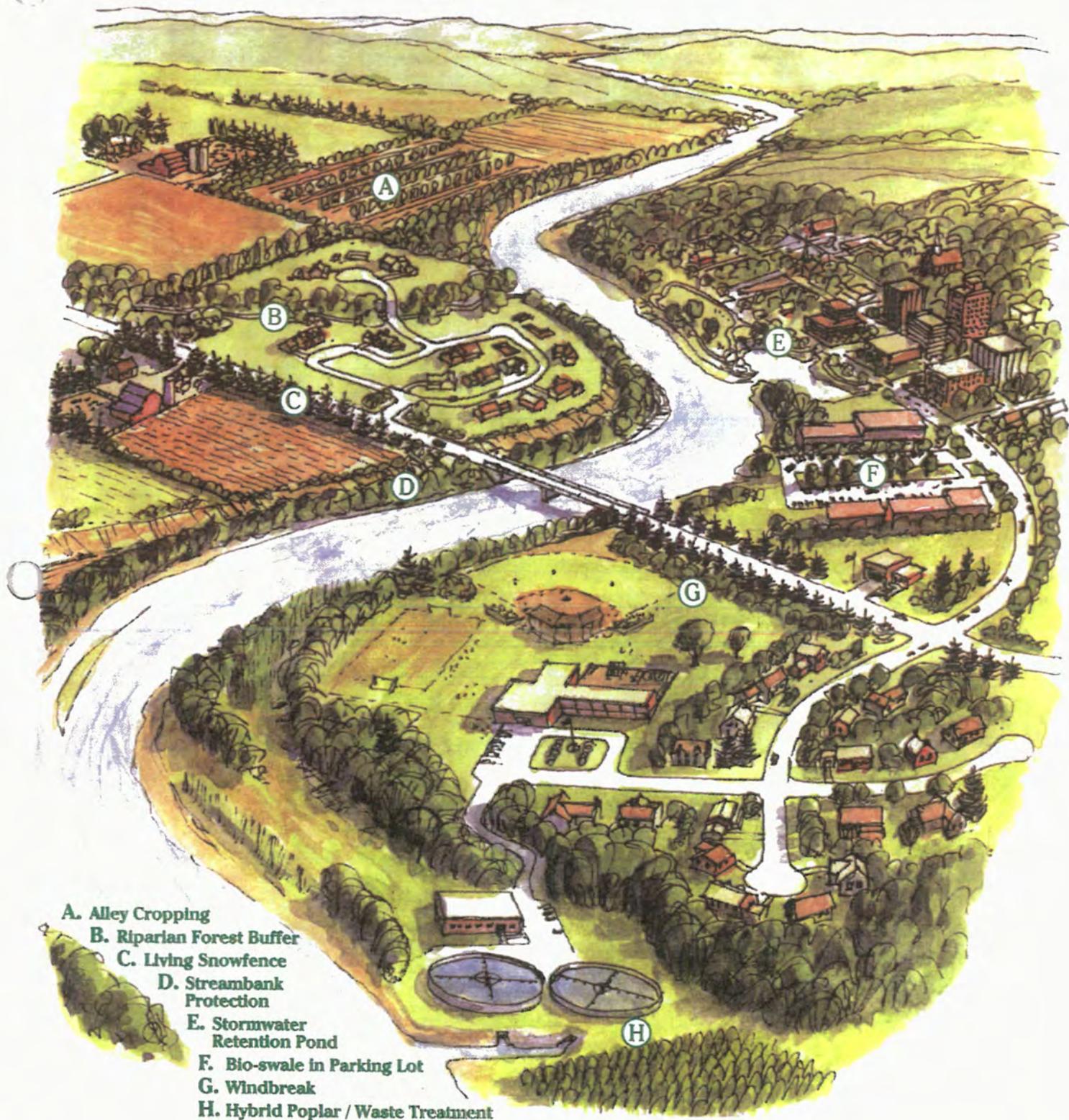
**Air Quality** — Leaves and needles on trees attract and absorb small particles and gasses. Cooler temperatures created by tree canopies have been shown to reduce smog levels. Also, ongoing research indicates that trees and shrubs may be an effective tool in helping to manage industrial and livestock odors.

**Stormwater Management** — Conventional stormwater pipes just move the problem downstream. An effective alternative is to preserve and/or re-establish natural vegetation throughout the watershed. In one study, a 32-foot tall tree intercepting rainfall reduced stormwater runoff by 327 gallons.

**Waste Treatment** — Management of municipal, solid, and liquid waste is an increasing challenge as stricter regulations for water quality are imposed. Tree plantations irrigated with wastewater produce wood products while using nutrients in the effluent that would otherwise pollute streams.

**Sanitary Landfills** — *Working Trees* can trap blowing debris and keep it where it belongs - at the landfill. These same trees and shrubs act as a visual screen, helping to create an aesthetically pleasing living environment.

**Snow Management** — Trees and shrubs properly located on the windward side of roadways can reduce wind speed and deposit snow drifts where they do not interfere with traffic and emergency vehicle movement. These *living snowfences* reduce the amount of snow that must be removed from streets and parking lots, thereby saving money on snow removal.



Incorporating *Working Trees* into existing neighborhoods, new developments, and the watershed can lead to more livable communities that retain the integrity and benefits of natural resources and are ultimately more sustainable.

# Infrastructure

## Blending Gray and Green Infrastructure

When you think of community infrastructure do you imagine roads, sidewalks, water lines, sewage disposal systems, electric power, and telephone lines? This collection refers to *gray infrastructure*. Just as we depend on, and need to maintain, the gray infrastructure of our communities for daily function, so too, our communities need *green infrastructure*. Green infrastructure is the network of open space, woodlands, wildlife habitat, parks, and natural features of the landscape that support healthy, functioning communities.

The concept of green infrastructure represents a dramatic shift in the way we think about our surroundings. In the past our idea of greenspace has been simply a public park, which was most often viewed as a community amenity, rather than a necessity. Today, a growing number of communities are recognizing that green space is a basic *necessity* to quality of life and a functional landscape. However, this necessary green infrastructure needs to be planned for and developed as an interconnected network of tree-lined streets, parks, natural areas along streams and waterways, golf courses, conservation areas, and agricultural lands throughout the watershed and across the landscape.

By recognizing and embracing the essential need for green infrastructure, we can create sustainable communities. Sustainable communities are good for the quality of life for the people who live and work in and around communities, good for the land and environment, and good for economies.



*Working Trees* can help solve some of the growing pains associated with the infrastructure of a community.

**Existing Development** — As communities grow existing gray infrastructure ages and requires repair or replacement. This affords opportunities to consider green infrastructure alternatives. For example, when existing pipes can no longer handle high volumes of runoff, city planners often tear up the street and install a larger pipe. Instead, the existing pipe can often be left in place if a vegetated surface drain system is installed to handle the excess flow. Or, in some cases, communities are finding it cost-effective to remove pipes altogether and restore former streams to their natural state with native vegetation for bank stabilization. Native trees, shrubs, grasses, and wildflowers, rather than concrete can allow stormwater to be retained on-site and infiltrated into the soil. These methods provide greater flexibility for managing stormwater and often increase property values adjacent to urban river walks and open space.

**New Development** — Planning now for future needs allows creative solutions that allow *Working Trees* to be incorporated into new developments. For example, stream channels in existing neighborhoods are often lined with concrete and storm drains are constructed that route runoff into these concrete channels. Instead stream channels could be kept natural and water collected from storm drains could be routed to vegetated retention areas where it can be detained and filtered as it soaks into the soil.



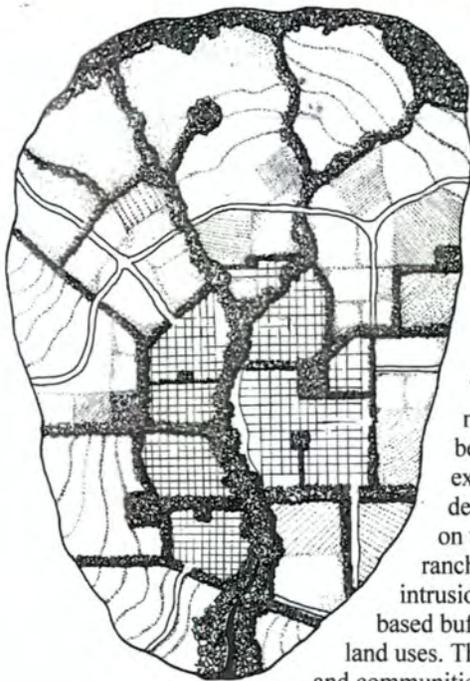
# Social & Economic



Green space ranks among the top five things people look for when moving. But green space does much more than make a community look nice. When it consists of *Working Trees*, green space reduces noise, wind, and blowing dirt. Green space also creates a common place for people to build relationships and a sense of community and neighborhood pride. Research in the Midwest found that people living in inner-city apartments in greener surroundings experience roughly half as many crimes.

Trees also make dollars and cents. One survey found that most people preferred patronizing commercial establishments whose structures and parking lots are beautified with trees and other landscaping. A survey of real estate appraisers reinforced that landscaping added to the dollar value of commercial real estate. According to one study, landscape amenities have the highest correlation with occupancy rates, higher even than direct access to arterial routes.

## Landscape-Scale Approach



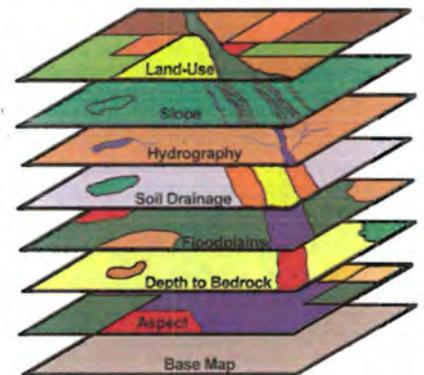
**A Conceptual Watershed Plan demonstrates how *Working Trees* can be used to connect the rural and urban community.**

*Working Trees* play an important role within a community. When planning *Working Trees* in communities, consideration must be given to sources of runoff, hydrologic flow paths, and uptake of water and nutrients by trees, shrubs, and grasses. Buffers can be designed to both reduce stormwater volume and improve water quality for the overall watershed.

Planning now for future needs allows for creative solutions that can provide many benefits in the future.

Typically, a community occupies only a portion of a large watershed. Community residents affect their watershed and are, in turn, affected by their watershed through the activities of others. Watersheds are often shared with the surrounding agricultural community. Everyone must work together to sustain the overall quality of the entire landscape and quality of life.

The rural/urban interface around communities can become a zone of conflict between residents with different goals, expectations, and life styles. Urban residents may object to agriculture's influence on the adjacent environment while farm or ranch neighbors can be resentful of urban intrusion into their day-to-day activities. Tree-based buffers serve as a zone of transition between land uses. This can help to "reconnect" agriculture and communities creating a more sustainable landscape.



### Geographic Information Systems (GIS) Technology Can Aid Project Design

To maximize the benefits that *Working Trees* provide to communities and the landscape, planners can utilize GIS, a collection of computer hardware and software designed to efficiently store, update, analyze, and display all forms of geographically referenced information. Information such as land-use, topography, and soils data can be readily combined in GIS to reveal the best locations for trees to solve multiple issues like improving water quality and wildlife habitat. GIS can help ensure that public resources are spent efficiently and wisely while creating a network of *Working Trees* that achieve community goals.

# Planning & Managing

When considering how or where to incorporate *Working Trees* into your community, keep the following ideas in mind.

**Partnerships** — A broad-based partnership provides necessary public support, funding, knowledge, and skills to meet the diverse needs of any community. In order to put the right trees in the right place to achieve multiple benefits, partners need to rely on each other's expertise in social, environmental, and economic issues. Partnerships should include local natural resource professionals, local government, social groups, neighborhood improvement associations, conservation organizations, tree boards, and special-use districts.

**Policy** — City/County planners and engineers and state environmental quality specialists are invaluable in understanding regulations that may help or hinder the use of green infrastructure approaches. Sometimes it is necessary to develop policy instruments, like ordinances, or incorporate green infrastructure into community comprehensive plans to encourage a different approach to putting *Working Trees* into service.

**Practice** — "Practice makes perfect" is not just an old saying, it's the way we build skill, capacity, understanding, and support for new ideas. Work with partners to compile a list of new development sites and existing sites where *Working Trees* can be incorporated. Then start small; install a bio-swale into an existing parking lot. Larger projects might include establishing a hybrid poplar plantation for use in treating wastewater.

**Public Education** — Engage the public. Educational signs along trails that are located near riparian buffers and constructed wetlands can explain how your community is taking responsibility for water quality and wildlife habitat. The same signs can give credit to all partners involved in making *Working Trees* a reality in your community. Work with local newspapers, radio, and television to promote the good work of your partnership and the benefits to your community. Public education can lead to public support once people understand how they benefit.

**Perspective** — People, water, and wildlife move in and out of every community. Consequently, how we maintain and develop our communities impacts all the resources and people around us, and in turn, our communities are impacted by the surrounding landscape. Always consider how the establishment of *Working Trees* will affect not only the specific planting site but also the surrounding area. Build a network of green infrastructure that ties your community to the larger landscape.

## Where To Get More Information

For local assistance, contact your nearest USDA-NRCS office, County Extension Office, Soil and Water Conservation District, State Forestry Agency or local city forestry office.

For more information at the national level, contact the USDA National Agroforestry Center (NAC), East Campus-UNL, Lincoln, NE 68583-0822. Telephone 402-437-5178.

Visit NAC's web site at [www.unl.edu/nac](http://www.unl.edu/nac) for more information on *Working Trees*.



This brochure was developed by the USDA National Agroforestry Center (NAC) in cooperation with USDA Forest Service Cooperative Forestry, Illinois Department of Natural Resources, Kansas Water Pollution Control Division of Topeka, Kansas, and The Conservation Fund.

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**Address:** USDA National Agroforestry Center, East Campus - UNL, Lincoln, Nebraska 68583-0822. For a supply of brochures, contact Nancy Hammond at [nhammond@fs.fed.us](mailto:nhammond@fs.fed.us), or fax 402-437-5712. For more information on the Center, contact Rich Straight, 402-437-5178 ext. 24 or Bruce Wight, ext. 36.

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# Working Trees for Livestock

Conventional wisdom has been that livestock and trees can't co-exist. Yet modern agricultural practice is showing that livestock and trees not only *can* co-exist, but, if properly managed, can provide additional income from land formerly used for a single crop.

Trees can provide livestock with protection from cold wind and blowing snow in winter, as well as from the hot sun and drying winds of summer. And, if commercially desirable timber or nut trees are planted, landowners can enjoy significant additional income from this diverse use of their land.

This publication will acquaint you with some of the specific ways you and your land can benefit by putting trees to work for your livestock.



# Diversify With Tree/Forage Systems

Utilizing the same acreage for both forage and trees can produce many benefits. By planting the right kinds of crop trees, the air space over existing forage lands can provide income beyond that produced by livestock alone. With proper management to insure adequate sunlight for forage, a pasture with trees can produce substantial beef gains *and* tree crop returns.

*Farm 3-dimensionally—increase your usable acreage*

Trees

Livestock  
& Forage



## Benefits from Adding Trees

On pastures or grasslands without existing trees, plant rows of pines or nut-producing trees, spaced to allow adequate sunlight penetration for forage growth. If needed, spaces between rows can be planted in shade-tolerant grasses suitable for your area and climate. When livestock are used to graze the forage, a planned grazing system will be needed to assure proper management of the forage, trees, and wildlife habitat.



### • Wood Products

Timber harvesting for lumber, furniture, or pulpwood can be an ongoing source of income as trees are thinned, selectively cut, or harvested at maturity.



### • Nuts & Fruit

Nuts in commercial demand include walnuts, almonds, pecans, and hazelnuts. A wide variety of orchard fruits and berries may also be produced.



### • Wildlife

Many songbirds, game birds, and animal species are attracted by the food, nesting sites, and protection provided by trees that are added to existing forage land.



## Benefits from Adding Forage

Many coniferous woodlands and a few select hardwood plantations can be transformed into silvopasture systems. By selectively removing/harvesting the correct number of trees, enough light will reach the soil to allow growth of forage under the tree canopy. Remaining trees should grow faster and have increased value. Proper livestock grazing or haying of the forages allows for annual returns while the trees mature. Desirable wildlife are often attracted to the extra food and cover.



### • Hay

Forage not utilized for your own cattle can be mowed, baled and sold as a source of supplemental income. Or, a pasture may be rented to others for grazing.



### • Livestock

The shaded and sheltered forest pasture environment provides protected grazing where livestock can grow faster with less environmental stress.

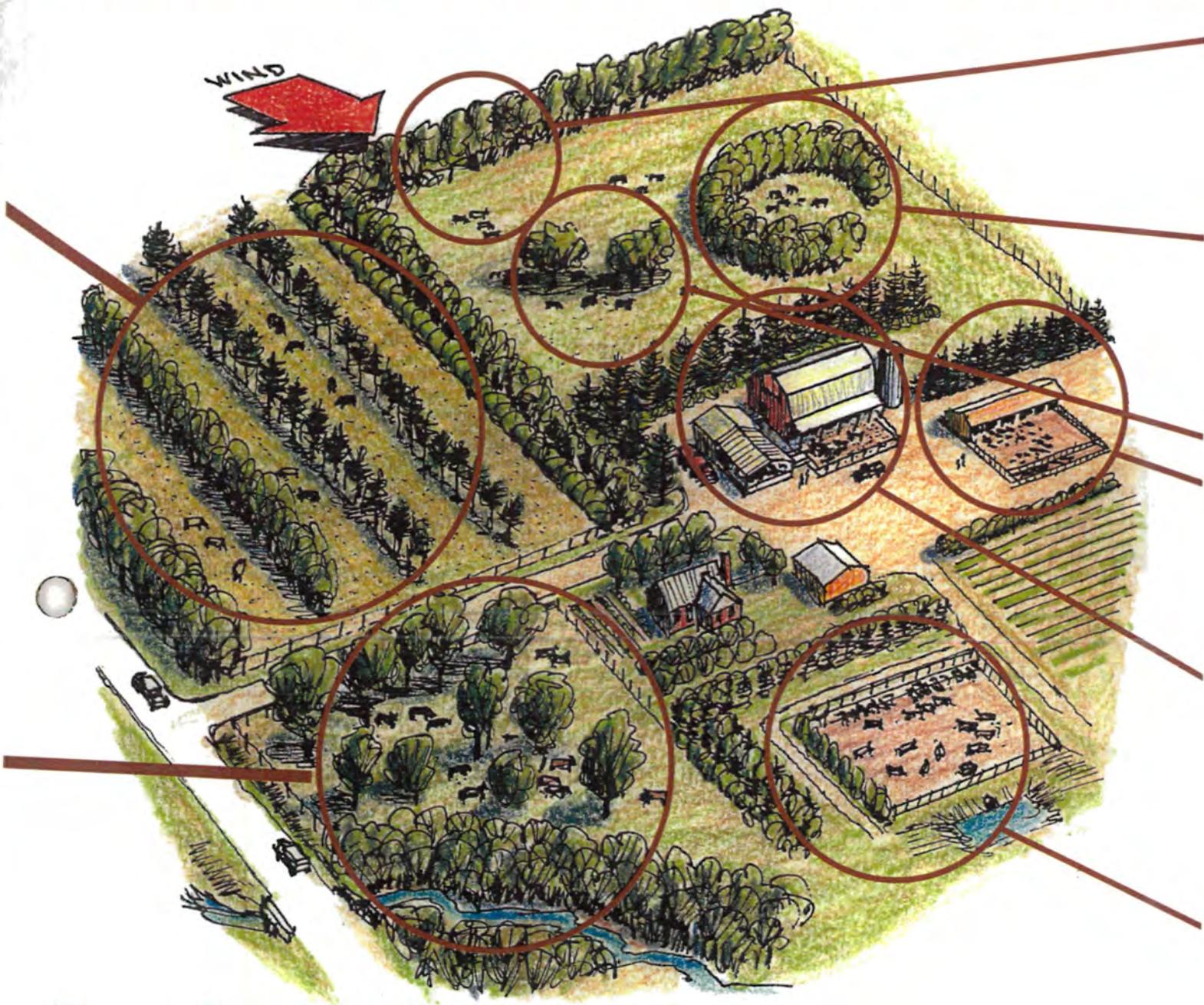


### • Wildlife

A forested area that also includes forage is often a more attractive habitat for wildlife than an area with trees alone.



# Working Trees for Livestock



## Benefits for All . . .

Putting trees to work for livestock produces the following benefits for:

- **Water**—trees break the fall of heavy rain, allowing water to percolate into the ground. Tree roots help filter pollutants from runoff and groundwater.
- **The Air**—trees help reduce offensive odors and reduce airborne dust from concentrated livestock areas.

- **The Soil**—tree foliage breaks the fall of heavy rain, helping to prevent erosion and allowing water to infiltrate into the ground. Tree roots hold soil in place.
- **Wildlife**—tree/forage systems and windbreaks provide diversity of habitat and cover for many species of terrestrial wildlife. Fish and other aquatic animals are benefited by the role of trees in reducing erosion and filtering pollutants and agricultural runoff.

- **Plants**—trees in an agricultural setting provide greater plant diversity, making for a healthier ecosystem.
- **Humans**—trees create a more aesthetically pleasing landscape, provide a source of income and economic activity, and create settings for active and passive outdoor recreation.

# Protect Your Livestock With Trees

## • Pasture Windbreaks



A windbreak at the edge of a pasture provides herds with protection from wind and blowing snow.

Trees can be utilized in a number of ways to provide protection for livestock. Windbreaks at the edge of pastures, near feedlots, and near dairy, hog, and poultry facilities protect livestock from the stressful effects of winter winds and snow. Living barns and shade trees provide protection to herds in open pastures or on the range. A few examples of these practices are shown below.

## • Living Barns



The encircling trees of a living barn can be the difference in herd survival in open pastures or range in the winter.

## • Shade Trees



Shade trees in a pasture provide welcome places where livestock can find relief on hot summer days.

## • Hog & Poultry Facilities



Swine and poultry benefit from protective windbreaks and shade-providing trees.

## • Feedlot Windbreaks



A feedlot windbreak like this one can reduce wind velocity as much as 70 percent, reducing animal stress.

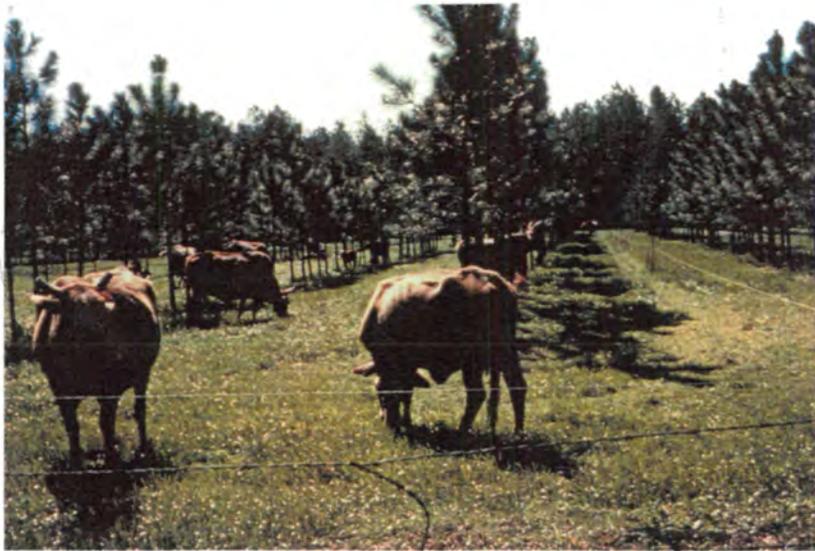
## • Dairy Herd Protection



Barns, pens, and milking parlors that are protected by trees can increase milk yields from dairy herds.

# Putting Trees to Work . . .

## . . . To Diversify Your Farm



The planting of income-producing trees or shrubs interspersed with grasses and other forage species—can provide landowners with additional crop income from the same acres. In addition to extra income from timber, nuts or fruit, trees provide habitat for wildlife and lend natural beauty to the rural landscape.

With modern agroforestry methods, it is possible to balance tree density with sufficient sunlight penetration to insure healthy forage growth.

## . . . To Protect Your Livestock



When planted as windbreaks or living barns, trees can reduce wind velocity as much as 70 percent, greatly diminishing the effect of cold temperatures on livestock. This can significantly lower stress on animals and, consequently reduce feed energy requirements. The benefits to farmers and ranchers include better animal health, lower feed costs, and greater financial gain.

During the summer months, trees can reduce livestock stress by providing cooling shade and protection from hot winds.



Turn to Learn More

# Want More Information?

## Local Assistance

There are technical specialists in your area who can assist you with the planning, design, application, and maintenance of your Working Trees for Livestock practice. Contact your nearest State Forestry agency, USDA Natural Resources Conservation Service, County Extension Office, or Soil and Water Conservation District.

Some working tree practices can be supported by cost share incentives provided by the Federal, State, or Local government. Contact your local conservation agencies for information about the various incentives available.

## National Assistance

Contact the **USDA National Agroforestry Center**, East Campus—UNL, Lincoln, NE 68583-0822. Telephone (402) 437-5178; or the Natural Resources Conservation Service — **Grazing Lands Technology Institute**, 501 W. Felix Street, PO Box 6567, Fort Worth, TX 76115. Telephone (817) 334-5232.



This brochure was developed by the USDA National Agroforestry Center (NAC) in cooperation with The Natural Resources Conservation Service, Grazing Lands Technology Institute.



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**NAC's Mission:** The National Agroforestry Center is a partnership of the USDA Forest Service, Research & Development (R&D) (Rocky Mountain Research Station) and State & Private Forestry (S&PF); and the USDA Natural Resources Conservation Service. The Center's purpose is to accelerate the development and application of agroforestry technologies to attain more economically, environmentally, and socially sustainable land-use systems. To accomplish its mission, the Center interacts with a national network of cooperators to conduct research, develop technologies and tools, establish demonstrations, and provide useful information to natural resource professionals.

**Address:** USDA National Agroforestry Center, East Campus - UNL, Lincoln, Nebraska 68583-0822. For a supply of brochures, contact Nancy Hammond, [nhammond@fs.fed.gov](mailto:nhammond@fs.fed.gov), or Fax 402-437-5712. For more information on the Center, contact Rich Straight, 402-437-5178 ext. 24 or Bruce Wight, ext. 36.

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# Working Trees for Treating Waste

*A natural alternative for using nutrients from livestock and farm operations, municipalities, and industries.*

Excess nutrients and other chemicals from agricultural, municipal, and industrial operations impact surface and ground water quality. Plant science and engineering have combined forces forming a natural partnership between treating waste and growing trees. The technology of putting fast growing trees to work recycling nutrients from solid and liquid waste is available and increasingly being adopted. This waste treatment approach has emerged as an alternative to other more expensive treatment technologies, such as constructed treatment plants.

**What to do?** Turn waste into a product by applying it to trees. This waste is actually a nutrient and water source for trees. Trees absorb excess nutrients and breakdown harmful chemicals, providing a natural cleaning process for soil and water resources. A major advantage is that trees can be used for a variety of products generating extra income that can potentially diversify the rural economy. Tree plantings also provide visual, noise, and odor buffers, while directly aiding in reducing atmospheric carbon dioxide by storing carbon in the wood and soil.



*These hybrid poplars are nourished by wastewater from an industrial plant.*



The increase in atmospheric carbon dioxide levels has become a worldwide concern. Trees use carbon dioxide for growth and store large amounts of carbon in wood tissue, both above and below ground.

#### **Is it right for your operation?**

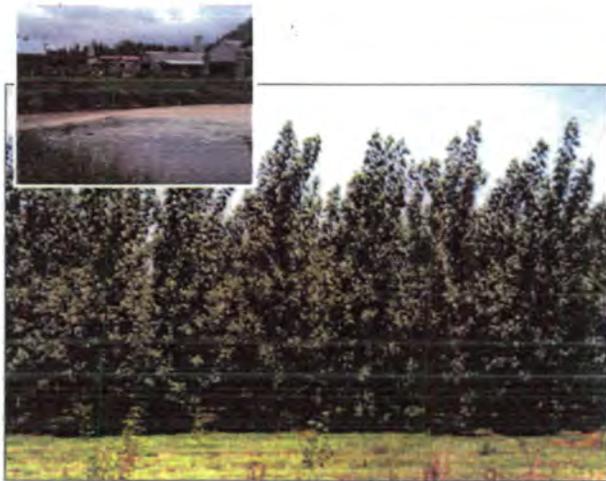
This publication addresses the concept of using trees to treat waste and also some key management questions to ask yourself before trees are put to work as your natural solution to water pollution.

# On Agricultural Land . . .



## Irrigation Tailwater

Excess irrigation water applied to crops contains high levels of nutrients (nitrogen, phosphorous, potassium), pesticides, and other compounds. Unless treated, this contaminated water will eventually reach surface and ground water. Trees can be planted to intercept this drainage water, or the water can be diverted, stored in a pond, and then applied to tree plantations. The trees can recycle this water, use many excess nutrients, and break down hazardous pesticides and other compounds. Tree species selection, irrigation water management, and soil and water quality monitoring are important planning elements to assure tree plantations accomplish their multiple purposes.



## Animal Waste

Livestock operations, such as dairies, hog confinements, cattle feedlots, and poultry barns, generate both solid and liquid waste. Applying this waste to tree plantations is recognized as a treatment alternative throughout the United States. These tree plantations can also serve as a visual buffer to livestock operations and can reduce the drift of odors. Tree species need to be tolerant of high salt and sodium levels. Monitoring soil and ground water nutrient and pathogen levels will be important to protect water quality, where high levels of nutrients are applied to limited acreage (maximum loading). Treat the greatest number of acres possible to achieve a return on your investment from the harvest of wood products. It is important to use qualified technical assistance, conservation planning, and obtain appropriate permits.

## Development and Site Management

Productive tree plantations used to recycle waste require close attention to tree establishment, stand management, and irrigation system design and monitoring. Since these working tree plantations are dual purpose plantings, it is important that adequate tree growth occurs to both sufficiently use the waste and produce a wood product. Below are some key planning considerations:

**Soils/site** — The best sites have deep loamy soil for good root development, as highly porous soil can contaminate ground water. Suitability of soils/site depends on tree species selected. Other considerations include slope, proximity to surface water, and proximity to people.

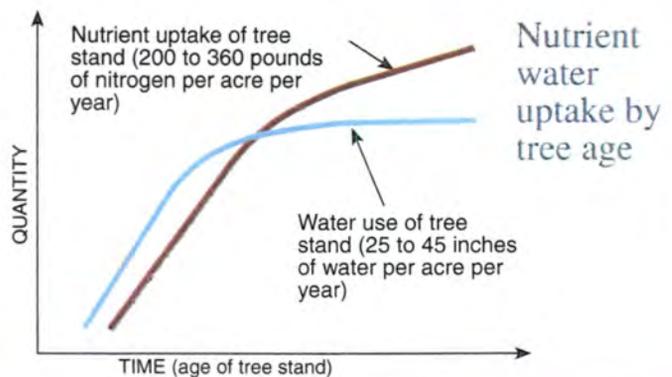
**Tree species selection** — Trees should be suited to the soil and have growth characteristics conducive to high nutrient uptake. Wood product qualities can be important selection criteria.

**Tree spacing** — Spacing affects future tree size and wood product potential as well as how rapidly the canopy will close.

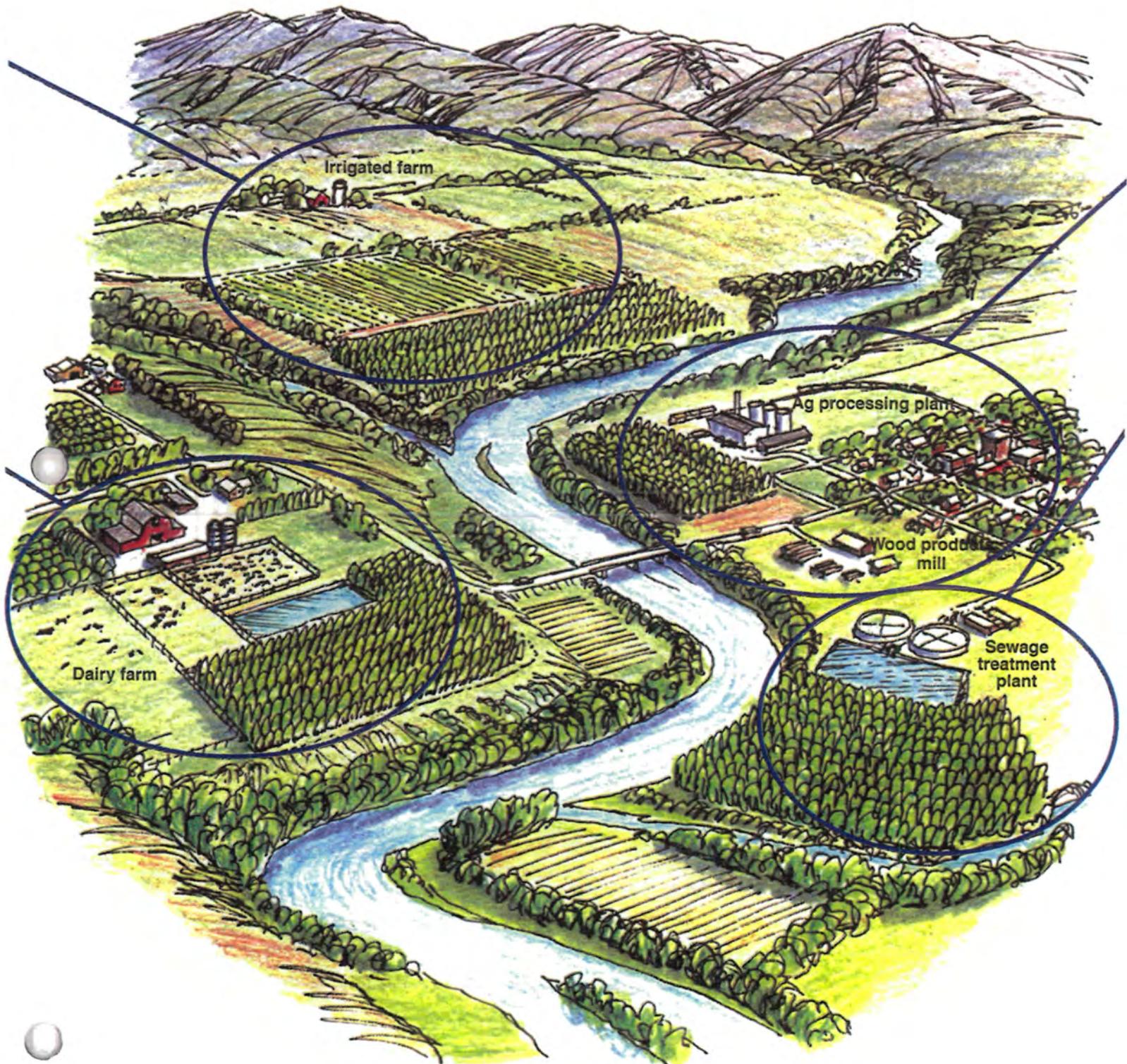
**Stand establishment** — Proper site preparation, planting, and maintenance are essential to maximize tree growth. Three to five years of weed control are needed to establish trees, depending on species and initial spacing.

**Management** — The tree plantation should be protected from animals (livestock, deer, mice/voles) during establishment. Eventually, the trees may need to be thinned and pruned if high quality sawlogs are an intended product.

**Irrigation system design/monitoring** — The quantity and quality of waste being applied is important. The delivery system must efficiently apply the waste to maximize waste/nutrient uptake. Monitoring nutrient loading rates and water requirements of the trees is important for sustainable tree growth while protecting ground water quality.



# Putting trees to work on waste and waste water. . .



# ... In Communities

## Municipal and Industrial Waste

Management of municipal and industrial effluent and biosolids is becoming increasingly challenged, as stricter regulations to improve water quality are imposed within our Nation's rivers, lakes, and ground water. The beneficial use of municipal and industrial wastes in tree plantations is one of the innovative approaches being developed. The trees use nutrients in the effluent and biosolids that would otherwise contribute to the problem of nutrient loading in the streams. In addition, the plantations enhance landscape aesthetics, and generate income from the production of wood products.



## Benefits and Opportunities



**Economic**—A direct economic benefit is obtained from the sale of wood products. Wood products can be in the form of chips, fuelwood, mulch, veneer, lumber, paneling, molding, and specialty products. This helps offset the cost of treatment, making it less expensive than most structural treatment alternatives.

**Aesthetic**—The visual environment can be improved by providing a buffer to adjacent land uses. Also, the tree plantation can help reduce the drifting of odors to neighbors and communities.

**Environmental**—Working trees protect water quality and safeguard clean water supplies for communities, fish, wildlife, recreation, and people. Tree plantations provide wildlife habitat for a variety of birds and animals. The tree canopy catches dust particles and air pollutants, thereby improving air quality. Trees store carbon dioxide in their wood as they grow, and can contribute greatly to reducing atmospheric carbon dioxide levels. Carbon credits, whose value will be market based, may be sold to industries and utilities. The amount of carbon dioxide stored in a tree plantation will depend on the species, growth rate, age, and management.

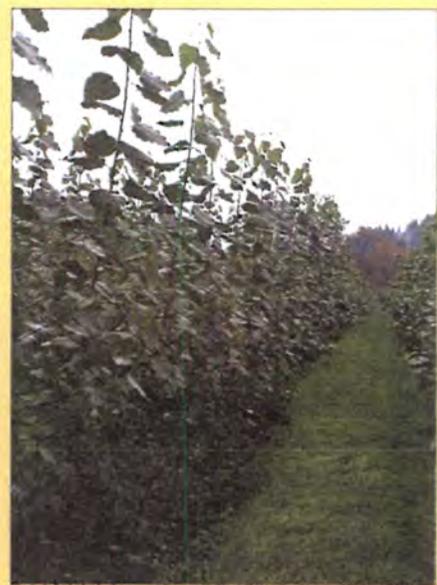
# Waste from one species can benefit another.

Trees require sunlight, carbon dioxide, water, and nutrients to grow. Waste from municipal sewage treatment plants, livestock operations, irrigated farming operations, and industrial processing contains nutrients that can be used by trees. Trees can often be substituted for more costly engineered practices.

Of the nutrients commonly found in these wastes, large amounts of nitrogen, phosphorus, potassium, magnesium, calcium, and sulphur are needed by trees in large quantities.

The nutrients taken up are distributed throughout cells in the tree, with the highest concentration ending up in the leaves. The leaves conduct photosynthesis, the process by which sunlight is used to convert carbon dioxide into sugars that accumulate primarily in the wood. Year after year, as the tree grows, nutrients are stored in the wood of branches, stems, and roots. Rapidly growing trees provide a better sink for these wastes than older trees.

In addition to the benefit of using the nutrients from wastes, the trees can be harvested after six to 15 years, depending on species and climate. Products derived from the wood can provide a substantial cash return to the landowner or operator.



Fast growing trees, such as hybrid poplars, can take up large amounts of nutrients, making them ideal for treating wastes.

## Which trees?

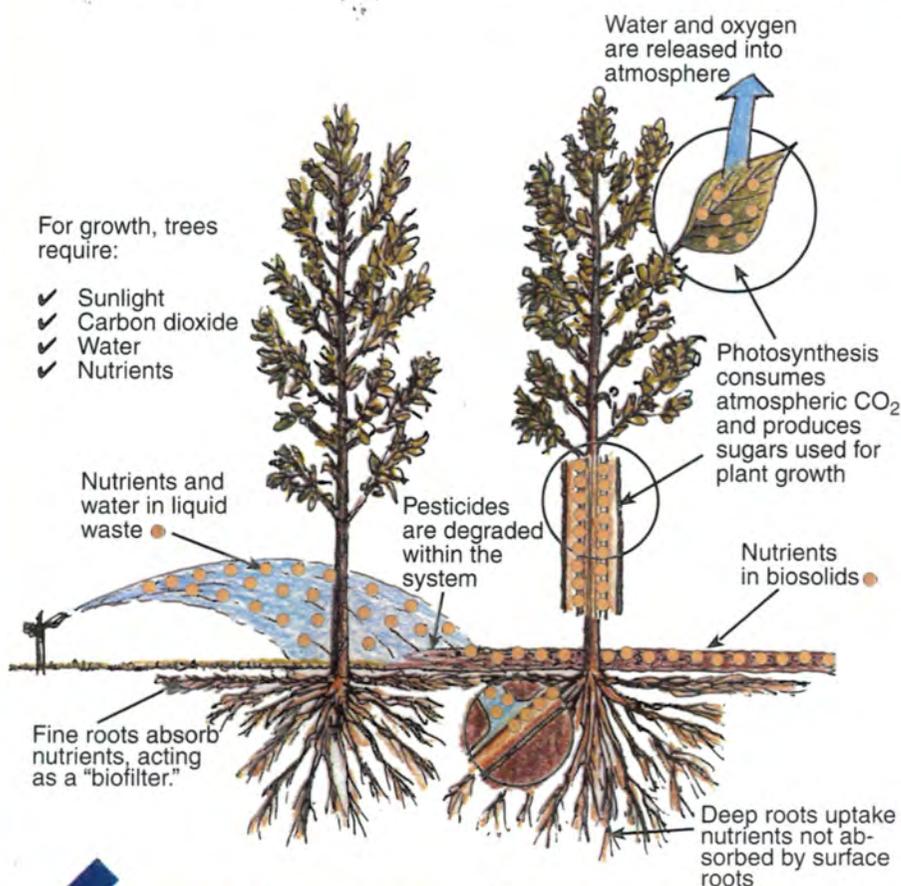
Success in using trees to remove wastes depends on the species and the length of the growing season. Trees that are well-suited for treating wastes include several species with rapid growth rates, which allow more nutrients to be absorbed than trees that grow more slowly. Extensive and deep root systems are also desirable, enabling nutrients to be effectively filtered out and keeping them from moving into ground water.

Fast growing tree species that can be planted for nutrient uptake include:

- Hybrid poplar (grows in many regions of the U.S.)
- Hybrid willow (Northeast U.S.)
- Sweetgum, sycamore, and yellow poplar (Mid-Atlantic and Southeast U.S.)
- Loblolly pine (Southeast U.S.)

Both hybrid poplar and hybrid willow are especially attractive because of their ease of regeneration.

When selecting trees for eventual harvesting, check with local mills on the potential market for wood products.



← Open to learn more

# Will it work for you?

## Planning considerations

In considering whether or not to use trees to treat waste in your particular situation, answer the following questions. Technical assistance is available to accurately determine some of the information.

- Do you have available land with adequate soils for tree growth?
- What is the composition and amount of the waste material?
  - Quantity (volume and/or flow rate)
  - Quality (concentration of nutrients and heavy metals)
  - Form (liquid or solid)
- Does the need for dealing with these materials coincide with the growing season? If not, is there adequate storage for waste accumulated during the winter months?
- Are you willing to commit time and resources for the planning, design, installation, and maintenance of the trees?
- What is the desired end use for the trees? (timber, aesthetics, wood chips)
  - Acreage (optimal size needed for increased profits)
  - Cooperatives (harvesting and marketing advantages)
  - Products mix

The harvesting of animal waste requires special consideration and should be part of a comprehensive nutrient management plan (CNMP). For further assistance contact your local Natural Resources Conservation Service (NRCS) field office.

## Where to get more information

Developing a successful program for using trees to treat waste is not a do-it-yourself project. Specialists are available in both the public and private sectors. For more information at the national level, contact the **USDA, National Agroforestry Center (NAC)**, East Campus – UNL, Lincoln, NE 68583-0822. Telephone (402) 437-5178, or visit NAC's web site at [www.unl.edu/nac](http://www.unl.edu/nac).

For local assistance, contact your nearest USDA, NRCS office, County Extension Office, Soil and Water Conservation District, State Forestry agency, state water quality agency, state land grant university, and/or reputable consultants working in this field.



A partnership of the  
Forest Service and  
Natural Resources  
Conservation Service

This brochure was developed by the USDA National Agroforestry Center (NAC) in cooperation with Washington State University, The Upper Columbia Resource Conservation and Development Council (RC&D), and Greenwood Resources, Inc.

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# COOPERATIVE FORESTRY

## TECHNOLOGY UPDATE

## DECEMBER 2002

United States Department of Agriculture • Forest Service • Southern Region • 1720 Peachtree Road, N.W. • Atlanta, GA 30309 Management Bulletin R8-MB 101

## Tax Tips for Forest Landowners for the 2002 Tax Year

by *Larry M. Bishop, Forest Management and Taxation Specialist*

Here is some information to keep in mind when you prepare your Federal income tax return for the 2002 tax year. This discussion is necessarily brief, and you should consult other sources for a more comprehensive treatment of the issues. This information is current as of December 1, 2002 and supersedes Management Bulletin R8-MB 90.

### Basis and Tax Records

Part of the price you receive from a timber sale is taxable income, but part is also your investment (i.e., basis) in the timber sold. Allocate your total costs of acquiring purchased forestland—or the value of inherited forestland—among land, timber, and other capital accounts as soon as possible. Adjust this basis up for new purchases or investments and down for sales or other disposals. When you sell your timber, you can take a depletion deduction equal to  $((\text{Adjusted basis} \div \text{Total timber volume just before the sale}) \times (\text{Timber volume sold}))$ . Good records include a written management plan and a map of your forestland. Keep records that support current deductions 6 years beyond the date the return is due. Keep records that support your basis 6 years beyond your period of ownership. Report basis and timber depletion on IRS Form T (Timber), Schedule B.

### Passive Loss Rules

The passive loss rules are too complex to cover in detail here, but what follows is a very brief summary. Under the passive loss rules, you can be classified in one of three categories: (1) investor, (2) passive participant in a trade or business, or (3) active participant (materially participating) in a trade or business.

The law's intent is that you are "materially participating" if your involvement is regular, continuous, and substantial; however, a low level of activity is adequate if that level is all that is required to sustain the trade or business. This means that record keeping is very important! To show material participation, landowners will need to keep records of all business transactions related to managing their timber stands. Likewise, it would be a good idea to keep records of other business-related activities such as landowner meetings attended, odometer readings to and from meetings, cancelled checks for registration fees, and copies of meeting agendas. Generally, you will get the best tax advantage if you are "materially participating" in a timber business because all management expenses, property taxes, and interest on indebtedness are fully deductible against income from any source. However, if you are "materially participating," you must dispose of your timber under the provisions of Section 631 to qualify for capital gains. (This means that you must sell your timber on a "pay-as-cut" or "cut and convert" basis, rather than lump sum.) If you have considerable passive income (such as annual rental payments), it may be to your advantage to be considered "passive." Most of the discussion that follows applies to forest landowners who are "materially participating."

### Reforestation Tax Credit and Amortization

The reforestation tax credit and 7-year amortization is one of the best tax advantages for forest landowners. If you reforested during 2002, you can claim a 10-percent investment tax credit for the first \$10,000 you spent for reforestation during the tax year. In addition, you can amortize (deduct) all of your 2002 reforestation costs (up to \$10,000), minus half the tax credit taken, over the next 7 years (actually 8 tax years). **The election to amortize must be made on a timely tax return for the year in which the reforestation expenses were incurred.** Elect to amortize reforestation expenses on Form 4562. (Passive owners may or may not be eligible for the amortization and credit).

Here's how it works. Assume you spent \$4,000 to reforest a cutover tract in 2002. You claim a \$400 tax credit (10 percent of \$4,000) for 2002. You can also deduct 95 percent of these reforestation costs over the next 8 tax years. Due to a half-year convention you can only claim one-half of the annual amortizable portion for 2002. This means that on your 2002 tax return you can deduct one-half of  $(0.95 \times \$4,000 \div 7)$  or \$271. For the next 6 tax years you can deduct  $(0.95 \times \$4,000 \div 7)$  or \$543, and the remaining \$271 can be deducted the 8th tax year.

The annual reforestation amortization is claimed on Form 1040 on the line for adjustments rather than being claimed on Schedule A under miscellaneous deductions. (If you use Schedule A for this purpose, you can claim only aggregated miscellaneous deductions that exceed 2 percent of adjusted gross income). Use Form 3468 to claim the investment tax credit.

Any reforestation costs exceeding the \$10,000 annual limit should be capitalized (entered into your timber account). You can recover (deduct) these costs when you sell your timber.

A final word of caution: the tax credit and 7-year amortization deductions are subject to recapture if you dispose of your trees—within 5 years of planting for the credit and within 10 years of planting for the amortization.

### Capital Gains and Self-employment Taxes

If you report your timber sale income as ordinary income, you could pay significantly more in taxes than you would if you report it as a capital gain. Also, capital gains are not subject to the self-employment tax, as is ordinary income. The net self-employment tax rate for 2002 is 15.3 percent for self-employment income of \$400 or more. The rate consists of a 12.4 percent component for old age, survivors, and disability insurance (OASDI) and a 2.9-percent component for hospital insurance (Medicare). The maximum income subject to the OASDI component of the tax rate is \$84,900, while the Medicare component is unlimited. However, if wages subject to Social Security or Railroad Retirement tax are received during the tax year, the maximum is reduced by the amount

Continued on back

of wages on which these taxes were paid. To qualify for long-term capital gains treatment, timber sold after December 31, 1997 must have been held longer than 12 months. The maximum long-term capital gains rate for timber sold in 2002 is 20%. (For taxpayers in the lowest income bracket, the maximum rate is 10%).

### Cost-share Payments

If you received cost-share assistance under one or more of the Federal or State cost-share programs during 2002, you may have to report some or all of it as ordinary income. You have two options. You have the option to include it as income and then recover the part that you pay plus the cost-share payment through the amortization and reforestation tax credit already described. You also have the option to exclude the "excludable portion" from income if certain conditions are met. These conditions are (1) the cost-share program has to be approved for exclusion by the IRS and (2) the maximum amount excludable per acre is the greater of: (a) the present value of \$2.50 per acre or (b) the present value of 10 percent of the average income per acre for the past 3 tax years. This second requirement gets rather complicated because you have to determine an appropriate interest rate to compute the present values. Programs approved for exclusion by the IRS include the Forestry Incentives Program (FIP), the Forest Stewardship Incentive Program (SIP), the Wetlands Reserve Program (WRP), the Environmental Quality Incentives Program (EQIP), and the Wildlife Habitat Incentive Program (WHIP), plus several State programs (check with your State Forestry Agency for approved programs in your State).

Generally, if you harvested the tract within the last 3 years, probably all of the cost-shares received can be excluded from income. In some cases, taxpayers may be better off to exclude cost-share payments. Other taxpayers may be better off not to exclude cost-share payments. Instead, they may be better off to claim the cost-share payments as part of the reforestation tax credit/7-year amortization. The important point here is: **You must report cost-share payments.** If you decide to exclude, attach a statement to your return that states specifically what cost-share payments you received, that you choose to exclude some or all of them, and how you determined the excludable amount.

### Conservation Reserve Program

If you planted trees during 2002 under the Conservation Reserve Program (CRP), you must report your annual payment as ordinary income. If you received CRP cost-share assistance funds for planting your trees, you must also report these as ordinary income. CRP cost-share payments used to establish trees can be claimed as part of the reforestation expenses reported for the reforestation tax credit/7-year amortization.

Farmers may treat expenditures for soil and water conservation on farmland as expenses in the year incurred, rather than capitalizing them (CRP expenditures qualify). However, the amount deductible in any year shall not exceed 25 percent of the gross income from farming.

### Casualty Losses

A casualty loss must result from some event that is (1) identifiable, (2) damaging to property, and (3) sudden and unexpected or unusual in nature. Examples include wildfire and storms. A 1999 Revenue Ruling identified the depletion block—the unit you use to keep track of the adjusted basis of the affected timber—as the appropriate measure of the "single identifiable property damaged or destroyed" in calculating a casualty loss deduction.

The IRS has issued Revenue Rulings on southern pine beetle losses in timber stands, drought losses of planted seedlings, and casualty loss deductions. It ruled that beetle and drought losses generally do not qualify for a casualty loss deduction because they are not sudden. They may, however, qualify for a business- or investment-loss deduction. A 1999 Revenue Ruling identified the depletion block—the unit you use to keep track of the adjusted basis of the affected timber—as the appropriate measure of the "single identifiable property damaged or destroyed" in calculating a casualty loss deduction.

### Management and Maintenance Expenses

Generally, your annual expenses for the management and maintenance of an existing stand of timber can be expensed or capitalized. In most cases, you are better off to expense those costs during the tax year they are incurred, rather than capitalizing them. If it is not to your advantage to itemize deductions for 2002, you should capitalize these expenses. If you choose to itemize deductions, you can deduct these expenses, but the passive loss rules apply.

### Conclusion

Congress provided these favorable tax advantages to stimulate increased productivity from the nation's privately owned forestlands. When you take advantage of these favorable provisions you avoid paying unnecessary income taxes, and you earn more income from your woodland operations.

### Reference

Haney, H. L., Jr.; Hoover, W. L.; Siegel, W. C.; and Greene, John L. 2001. *Forest Landowners Guide to the Federal Income Tax*. Agric. Handb. 718 Washington, DC: U.S., Department of Agriculture. 157 pp.

(The above handbook is available for sale from the U. S. Government Bookstore at 404-347-1900. The price is \$20.00 per copy. Major credit cards are accepted.)

### Tax Information on the Internet

USDA Forest Service publications are available at: [www.fs.fed.us/spf/coop](http://www.fs.fed.us/spf/coop) and [www.southernregion.fs.fed.us/spf/coop/taxation](http://www.southernregion.fs.fed.us/spf/coop/taxation)

IRS publications and forms are available at: [www.irs.gov](http://www.irs.gov)

National Timber Tax Site is located at: [www.timbertax.org](http://www.timbertax.org)

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## 6. Resources



## FARMLAND INFORMATION CENTER

The **FARMLAND INFORMATION CENTER (FIC)** is a clearinghouse for information about farmland protection and stewardship. It is a public/private partnership between the USDA Natural Resources Conservation Service and American Farmland Trust.

The FIC provides an online collection of literature, statistics and technical resources at [www.farmlandinfo.org](http://www.farmlandinfo.org). Information specialists provide technical assistance by phone, fax and e-mail.

The FIC Web site is currently being redesigned. The following statistics sheets are drawn from the new site and give you a glimpse of the resources that will be available.

As a follow up to this training, we invite you to preview the new site when it goes online this fall. We will e-mail login instructions when it is available for review. Your comments and suggestions will help us support you as you continue to work to sustain working lands in your communities.

In the meantime, feel free to call us for information!

FARMLAND INFORMATION CENTER  
(800) 370-4879  
[www.farmlandinfo.org](http://www.farmlandinfo.org)

## National Statistics Sheet

Choose State:

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	<b>1992-1997</b>
Agricultural land converted to developed uses (acres)	6,172,800
Percentage of agricultural land converted to developed uses	1
State rank by percentage of agricultural land converted to developed uses	
Average annual rate of agricultural land converted to developed uses (acres)	1,234,560
Prime agricultural land converted to developed uses (acres)	2,416,200
Rural land converted to developed uses (acres)	11,392,400
Average annual rate of rural land converted to developed uses (acres)	2,278,480
Prime rural land converted to developed uses (acres)	3,225,400

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	<b>1987</b>	<b>1992</b>	<b>1997</b>
Farms	2,087,759	1,925,300	1,911,859
Land in farms (acres)	964,470,625	945,531,506	931,795,255
Total land area (acres)	2,265,104,932	2,262,443,863	2,262,462,025
Full-time operators	1,138,179	1,053,150	961,560
Part-time operators	949,580	872,150	950,299
Percentage of operators 55 and older	45	47	48
Land managed by operators 55 and older (acres)		460,933,245	462,562,500
Market value of agricultural products sold (\$1,000)	136,048,516	162,608,334	196,864,649
Percentage from crop production	43	46	50
Percentage from livestock production	57	54	50

### Farmland Information Center Fact Sheets

[Go to FIC fact sheets & technical memos](#)

	<b>2002</b>	<b>2003</b>
Agricultural land protected by state and local PACE programs (acres)	1,135,941	1,314,140
Funds spent to date by state and local PACE programs (\$)	1,983,850,281	2,257,700,649



## Alabama Statistics Sheet

Choose State:

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	1992-1997
Agricultural land converted to developed uses (acres)	111,000
Percentage of agricultural land converted to developed uses	1
State rank by percentage of agricultural land converted to developed uses	20
Average annual rate of agricultural land converted to developed uses (acres)	22,200
Prime agricultural land converted to developed uses (acres)	67,400
Rural land converted to developed uses (acres)	318,300
Average annual rate of rural land converted to developed uses (acres)	63,660
Prime rural land converted to developed uses (acres)	113,800

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	1987	1992	1997
Farms	43,318	37,905	41,384
Land in farms (acres)	9,145,753	8,450,823	8,704,385
Total land area (acres)	32,490,995	32,480,154	32,480,154
Full-time operators	16,398	15,712	15,568
Part-time operators	26,920	22,193	25,816
Percentage of operators 55 and older	47	51	51
Land managed by operators 55 and older (acres)		4,506,450	4,806,381
Market value of agricultural products sold (\$1,000)	1,906,303	2,369,179	3,098,989
Percentage from crop production	26	27	20
Percentage from livestock production	74	73	80

### Farmland Information Center Fact Sheets

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	2002	2003
Agricultural land protected by state and local PACE programs (acres)	0	0
Funds spent to date by state and local PACE programs (\$)	0	0



## Arkansas Statistics Sheet

Choose State:

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	1992-1997
Agricultural land converted to developed uses (acres)	84,000
Percentage of agricultural land converted to developed uses	1
State rank by percentage of agricultural land converted to developed uses	29
Average annual rate of agricultural land converted to developed uses (acres)	16,800
Prime agricultural land converted to developed uses (acres)	54,600
Rural land converted to developed uses (acres)	171,800
Average annual rate of rural land converted to developed uses (acres)	34,360
Prime rural land converted to developed uses (acres)	71,600

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	1987	1992	1997
Farms	48,242	43,937	45,142
Land in farms (acres)	14,355,611	14,127,711	14,364,955
Total land area (acres)	33,330,073	33,328,208	33,328,208
Full-time operators	24,210	23,273	22,300
Part-time operators	24,032	20,664	22,842
Percentage of operators 55 and older	43	46	47
Land managed by operators 55 and older (acres)		6,082,807	6,510,390
Market value of agricultural products sold (\$1,000)	3,320,258	4,159,505	5,479,692
Percentage from crop production	38	41	40
Percentage from livestock production	62	59	60

### Farmland Information Center Fact Sheets

[Go to FIC fact sheets & technical memos](#)

	2002	2003
Agricultural land protected by state and local PACE programs (acres)	0	0
Funds spent to date by state and local PACE programs (\$)	0	0

## Florida Statistics Sheet

Choose State:

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	<b>1992-1997</b>
Agricultural land converted to developed uses (acres)	454,800
Percentage of agricultural land converted to developed uses	4
State rank by percentage of agricultural land converted to developed uses	4
Average annual rate of agricultural land converted to developed uses (acres)	90,960
Prime agricultural land converted to developed uses (acres)	6,200
Rural land converted to developed uses (acres)	826,600
Average annual rate of rural land converted to developed uses (acres)	165,320
Prime rural land converted to developed uses (acres)	15,200

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	<b>1987</b>	<b>1992</b>	<b>1997</b>
Farms	36,556	35,204	34,799
Land in farms (acres)	11,194,090	10,766,077	10,454,217
Total land area (acres)	34,657,843	34,558,261	34,558,261
Full-time operators	15,821	16,557	15,782
Part-time operators	20,735	18,647	19,017
Percentage of operators 55 and older	49	52	54
Land managed by operators 55 and older (acres)		5,629,248	6,033,118
Market value of agricultural products sold (\$1,000)	4,351,383	5,266,033	6,004,554
Percentage from crop production	76	80	80
Percentage from livestock production	24	20	20

### Farmland Information Center Fact Sheets

[Go to FIC fact sheets & technical memos](#)

	<b>2002</b>	<b>2003</b>
Agricultural land protected by state and local PACE programs (acres)	0	0
Funds spent to date by state and local PACE programs (\$)	0	0



## Georgia Statistics Sheet

Choose State:

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	1992-1997
Agricultural land converted to developed uses (acres)	201,700
Percentage of agricultural land converted to developed uses	2
State rank by percentage of agricultural land converted to developed uses	11
Average annual rate of agricultural land converted to developed uses (acres)	40,340
Prime agricultural land converted to developed uses (acres)	98,300
Rural land converted to developed uses (acres)	859,100
Average annual rate of rural land converted to developed uses (acres)	171,820
Prime rural land converted to developed uses (acres)	184,000

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	1987	1992	1997
Farms	43,552	40,759	40,334
Land in farms (acres)	10,744,718	10,025,581	10,671,246
Total land area (acres)	37,155,705	37,067,991	37,067,991
Full-time operators	19,449	18,817	17,523
Part-time operators	24,103	21,942	22,811
Percentage of operators 55 and older	47	51	53
Land managed by operators 55 and older (acres)		5,059,011	5,559,351
Market value of agricultural products sold (\$1,000)	2,814,592	3,521,217	4,992,918
Percentage from crop production	36	41	38
Percentage from livestock production	64	59	62

### Farmland Information Center Fact Sheets

[Go to FIC fact sheets & technical memos](#)

	2002	2003
Agricultural land protected by state and local PACE programs (acres)	0	0
Funds spent to date by state and local PACE programs (\$)	0	0



## Kentucky Statistics Sheet

Choose State:

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	<b>1992-1997</b>
Agricultural land converted to developed uses (acres)	164,100
Percentage of agricultural land converted to developed uses	1
State rank by percentage of agricultural land converted to developed uses	21
Average annual rate of agricultural land converted to developed uses (acres)	32,820
Prime agricultural land converted to developed uses (acres)	72,000
Rural land converted to developed uses (acres)	241,800
Average annual rate of rural land converted to developed uses (acres)	48,360
Prime rural land converted to developed uses (acres)	80,000

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	<b>1987</b>	<b>1992</b>	<b>1997</b>
Farms	92,453	90,281	82,273
Land in farms (acres)	14,012,700	13,665,798	13,334,234
Total land area (acres)	25,388,313	25,428,692	25,428,692
Full-time operators	41,451	40,175	33,841
Part-time operators	51,002	50,106	48,432
Percentage of operators 55 and older	45	46	47
Land managed by operators 55 and older (acres)		6,570,203	6,541,329
Market value of agricultural products sold (\$1,000)	2,075,571	2,663,702	3,064,460
Percentage from crop production	43	54	52
Percentage from livestock production	57	46	48

### Farmland Information Center Fact Sheets

[Go to FIC fact sheets & technical memos](#)

	<b>2002</b>	<b>2003</b>
Agricultural land protected by state and local PACE programs (acres)	4,708	15,173
Funds spent to date by state and local PACE programs (\$)	2,295,176	15,276,401



## Louisiana Statistics Sheet

Choose State:

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	<b>1992-1997</b>
Agricultural land converted to developed uses (acres)	73,600
Percentage of agricultural land converted to developed uses	1
State rank by percentage of agricultural land converted to developed uses	25
Average annual rate of agricultural land converted to developed uses (acres)	14,720
Prime agricultural land converted to developed uses (acres)	58,100
Rural land converted to developed uses (acres)	138,900
Average annual rate of rural land converted to developed uses (acres)	27,780
Prime rural land converted to developed uses (acres)	83,700

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	<b>1987</b>	<b>1992</b>	<b>1997</b>
Farms	27,350	25,652	23,823
Land in farms (acres)	8,007,173	7,837,545	7,876,528
Total land area (acres)	28,493,696	27,882,310	27,882,310
Full-time operators	13,496	12,931	11,281
Part-time operators	13,854	12,721	12,542
Percentage of operators 55 and older	44	48	48
Land managed by operators 55 and older (acres)		3,233,844	3,371,730
Market value of agricultural products sold (\$1,000)	1,340,162	1,607,511	2,031,277
Percentage from crop production	69	69	69
Percentage from livestock production	31	31	31

### Farmland Information Center Fact Sheets

[Go to FIC fact sheets & technical memos](#)

	<b>2002</b>	<b>2003</b>
Agricultural land protected by state and local PACE programs (acres)	0	0
Funds spent to date by state and local PACE programs (\$)	0	0



## Mississippi Statistics Sheet

Choose State:

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	1992-1997
Agricultural land converted to developed uses (acres)	82,700
Percentage of agricultural land converted to developed uses	1
State rank by percentage of agricultural land converted to developed uses	27
Average annual rate of agricultural land converted to developed uses (acres)	16,540
Prime agricultural land converted to developed uses (acres)	49,000
Rural land converted to developed uses (acres)	208,700
Average annual rate of rural land converted to developed uses (acres)	41,740
Prime rural land converted to developed uses (acres)	84,800

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	1987	1992	1997
Farms	34,074	31,996	31,318
Land in farms (acres)	10,746,190	10,188,362	10,124,822
Total land area (acres)	30,228,908	30,024,752	30,024,752
Full-time operators	15,111	14,463	12,753
Part-time operators	18,963	17,535	18,565
Percentage of operators 55 and older	50	53	53
Land managed by operators 55 and older (acres)		5,127,943	5,144,405
Market value of agricultural products sold (\$1,000)	1,862,903	2,336,737	3,127,383
Percentage from crop production	49	49	41
Percentage from livestock production	51	51	59

### Farmland Information Center Fact Sheets

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	2002	2003
Agricultural land protected by state and local PACE programs (acres)	0	0
Funds spent to date by state and local PACE programs (\$)	0	0



## North Carolina Statistics Sheet

Choose State:

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	<b>1992-1997</b>
Agricultural land converted to developed uses (acres)	172,300
Percentage of agricultural land converted to developed uses	2
State rank by percentage of agricultural land converted to developed uses	12
Average annual rate of agricultural land converted to developed uses (acres)	34,460
Prime agricultural land converted to developed uses (acres)	88,800
Rural land converted to developed uses (acres)	513,300
Average annual rate of rural land converted to developed uses (acres)	102,660
Prime rural land converted to developed uses (acres)	168,300

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	<b>1987</b>	<b>1992</b>	<b>1997</b>
Farms	59,284	51,854	49,406
Land in farms (acres)	9,447,705	8,936,015	9,122,379
Total land area (acres)	31,259,756	31,179,568	31,179,568
Full-time operators	30,687	27,376	24,355
Part-time operators	28,597	24,478	25,051
Percentage of operators 55 and older	49	51	51
Land managed by operators 55 and older (acres)		4,193,390	4,360,545
Market value of agricultural products sold (\$1,000)	3,541,419	4,834,218	7,676,523
Percentage from crop production	41	41	34
Percentage from livestock production	59	59	66

### Farmland Information Center Fact Sheets

[Go to FIC fact sheets & technical memos](#)

	<b>2002</b>	<b>2003</b>
Agricultural land protected by state and local PACE programs (acres)	5,755	5,704
Funds spent to date by state and local PACE programs (\$)	5,274,908	5,032,408



## Oklahoma Statistics Sheet

Choose State:

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	<b>1992-1997</b>
Agricultural land converted to developed uses (acres)	143,400
Percentage of agricultural land converted to developed uses	0
State rank by percentage of agricultural land converted to developed uses	38
Average annual rate of agricultural land converted to developed uses (acres)	28,680
Prime agricultural land converted to developed uses (acres)	59,800
Rural land converted to developed uses (acres)	185,800
Average annual rate of rural land converted to developed uses (acres)	37,160
Prime rural land converted to developed uses (acres)	63,300

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	<b>1987</b>	<b>1992</b>	<b>1997</b>
Farms	70,228	66,937	74,214
Land in farms (acres)	31,541,977	32,143,030	33,218,677
Total land area (acres)	43,932,270	43,954,269	43,954,269
Full-time operators	33,052	33,279	33,060
Part-time operators	37,176	33,658	41,154
Percentage of operators 55 and older	49	52	52
Land managed by operators 55 and older (acres)		17,072,255	18,465,540
Market value of agricultural products sold (\$1,000)	2,714,892	3,562,646	4,146,351
Percentage from crop production	22	22	22
Percentage from livestock production	78	78	78

### Farmland Information Center Fact Sheets

[Go to FIC fact sheets & technical memos](#)

	<b>2002</b>	<b>2003</b>
Agricultural land protected by state and local PACE programs (acres)	0	0
Funds spent to date by state and local PACE programs (\$)	0	0

## South Carolina Statistics Sheet

Choose State:  

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	<b>1992-1997</b>
Agricultural land converted to developed uses (acres)	104,400
Percentage of agricultural land converted to developed uses	2
State rank by percentage of agricultural land converted to developed uses	9
Average annual rate of agricultural land converted to developed uses (acres)	20,880
Prime agricultural land converted to developed uses (acres)	44,300
Rural land converted to developed uses (acres)	365,600
Average annual rate of rural land converted to developed uses (acres)	73,120
Prime rural land converted to developed uses (acres)	86,200

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	<b>1987</b>	<b>1992</b>	<b>1997</b>
Farms	20,517	20,242	20,189
Land in farms (acres)	4,758,631	4,472,569	4,593,452
Total land area (acres)	19,330,156	19,271,119	19,271,119
Full-time operators	8,983	8,866	7,959
Part-time operators	11,534	11,376	12,230
Percentage of operators 55 and older	51	52	53
Land managed by operators 55 and older (acres)		2,340,746	2,473,502
Market value of agricultural products sold (\$1,000)	878,683	1,066,079	1,588,173
Percentage from crop production	51	53	50
Percentage from livestock production	49	47	50

### Farmland Information Center Fact Sheets

[Go to FIC fact sheets & technical memos](#)

	<b>2002</b>	<b>2003</b>
Agricultural land protected by state and local PACE programs (acres)	0	0
Funds spent to date by state and local PACE programs (\$)	0	0



## Tennessee Statistics Sheet

Choose State:

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	<b>1992-1997</b>
Agricultural land converted to developed uses (acres)	212,500
Percentage of agricultural land converted to developed uses	2
State rank by percentage of agricultural land converted to developed uses	14
Average annual rate of agricultural land converted to developed uses (acres)	42,500
Prime agricultural land converted to developed uses (acres)	98,800
Rural land converted to developed uses (acres)	405,100
Average annual rate of rural land converted to developed uses (acres)	81,020
Prime rural land converted to developed uses (acres)	124,000

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	<b>1987</b>	<b>1992</b>	<b>1997</b>
Farms	79,711	75,076	76,818
Land in farms (acres)	11,731,386	11,169,086	11,122,363
Total land area (acres)	26,339,033	26,380,477	26,380,477
Full-time operators	30,745	29,878	27,680
Part-time operators	48,966	45,198	49,138
Percentage of operators 55 and older	49	50	52
Land managed by operators 55 and older (acres)		5,763,608	5,845,156
Market value of agricultural products sold (\$1,000)	1,617,636	1,933,506	2,178,389
Percentage from crop production	43	50	53
Percentage from livestock production	57	50	47

### Farmland Information Center Fact Sheets

[Go to FIC fact sheets & technical memos](#)

	<b>2002</b>	<b>2003</b>
Agricultural land protected by state and local PACE programs (acres)	0	0
Funds spent to date by state and local PACE programs (\$)	0	0



## Texas Statistics Sheet

Choose State:

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	<b>1992-1997</b>
Agricultural land converted to developed uses (acres)	767,700
Percentage of agricultural land converted to developed uses	1
State rank by percentage of agricultural land converted to developed uses	31
Average annual rate of agricultural land converted to developed uses (acres)	153,540
Prime agricultural land converted to developed uses (acres)	299,200
Rural land converted to developed uses (acres)	915,300
Average annual rate of rural land converted to developed uses (acres)	183,060
Prime rural land converted to developed uses (acres)	332,800

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	<b>1987</b>	<b>1992</b>	<b>1997</b>
Farms	188,788	180,644	194,301
Land in farms (acres)	130,502,792	130,886,608	131,308,286
Total land area (acres)	167,690,598	167,625,165	167,625,165
Full-time operators	83,684	85,937	83,284
Part-time operators	105,104	94,707	111,017
Percentage of operators 55 and older	52	56	55
Land managed by operators 55 and older (acres)		71,852,828	73,639,188
Market value of agricultural products sold (\$1,000)	10,548,907	12,004,385	13,766,527
Percentage from crop production	28	28	31
Percentage from livestock production	72	72	69

### Farmland Information Center Fact Sheets

[Go to FIC fact sheets & technical memos](#)

	<b>2002</b>	<b>2003</b>
Agricultural land protected by state and local PACE programs (acres)	0	0
Funds spent to date by state and local PACE programs (\$)	0	0



## Virginia Statistics Sheet

Choose State:

### National Resources Inventory

[Go to NRI Web site](#)

[FIC technical memo about the NRI](#)

	<b>1992-1997</b>
Agricultural land converted to developed uses (acres)	116,300
Percentage of agricultural land converted to developed uses	2
State rank by percentage of agricultural land converted to developed uses	16
Average annual rate of agricultural land converted to developed uses (acres)	23,260
Prime agricultural land converted to developed uses (acres)	50,500
Rural land converted to developed uses (acres)	347,400
Average annual rate of rural land converted to developed uses (acres)	69,480
Prime rural land converted to developed uses (acres)	105,000

### Census of Agriculture

[Go to Census of Agriculture Web site](#)

	<b>1987</b>	<b>1992</b>	<b>1997</b>
Farms	44,799	42,222	41,095
Land in farms (acres)	8,676,336	8,297,011	8,228,226
Total land area (acres)	25,410,252	24,900,924	24,900,924
Full-time operators	20,617	19,571	18,410
Part-time operators	24,182	22,651	22,685
Percentage of operators 55 and older	51	53	54
Land managed by operators 55 and older (acres)		4,520,906	4,573,228
Market value of agricultural products sold (\$1,000)	1,588,770	2,055,958	2,343,518
Percentage from crop production	29	34	33
Percentage from livestock production	71	66	67

### Farmland Information Center Fact Sheets

[Go to FIC fact sheets & technical memos](#)

	<b>2002</b>	<b>2003</b>
Agricultural land protected by state and local PACE programs (acres)	6,021	8,399
Funds spent to date by state and local PACE programs (\$)	7,180,747	14,474,464



*American Farmland Trust*

**SOURCES OF DATA**  
**NATIONAL DEMOGRAPHIC AND LAND USE DATA SOURCES**

**CENSUS OF AGRICULTURE**

**Description**

The Census of Agriculture is the only source of uniform, comprehensive data on United States agricultural production and operator characteristics. The census compiles data on:

- Land use and ownership;
- Crop and livestock production;
- Value of agricultural products sold;
- Value of agricultural assets;
- Operator expenses;
- Federal farm program participation and payments; and
- Operator characteristics such as age, days worked off farm, and principal occupation.

The census compiles information for each U.S. county and state, Puerto Rico, Guam, and the U.S. Virgin Islands.

The census is conducted every five years during years ending in “2” and “7”. Report forms are mailed to approximately 3.2 million individuals, businesses and organizations that can be identified as associated with agriculture. Federal law requires recipients to complete the form.

Historically, the Census of Agriculture was conducted by the U.S. Department of Commerce, Bureau of the Census. However, beginning in 1997, the Census of Agriculture was turned over to the USDA National Agricultural Statistics Service (NASS). Changes in reporting resulted in an apparent increase in the number of farms and acres of farmland in many counties and some states. NASS expanded the definition of agriculture in 1997 to classify Christmas tree and maple syrup production as agriculture instead of forestry. In addition, NASS counted entire farms enrolled in the Conservation Reserve Program (CRP). In the past, whole farms enrolled in CRP were left out of the census. Finally, NASS collected and interpreted the data differently than the Bureau of the Census.

**Availability**

NASS compiles the census data into tables that are published in hard copy and electronically. The census can be found at many libraries and government offices, and is posted on the NASS Web site at: [www.nass.usda.gov/census](http://www.nass.usda.gov/census).

**Limitations**

- Land use data in the census cannot be used to determine agricultural land converted to other uses.
- The expanded definition of agriculture in 1997 makes it difficult to compare 1997 land use data with previous census data.

## **NATIONAL RESOURCES INVENTORY**

### **Description**

The National Resources Inventory (NRI) is the most comprehensive natural resource database in the United States. It is a statistically valid survey of the nation's nonfederal lands that documents natural resource conditions and trends, including the conversion of agricultural land to developed uses. Important data elements include, but are not limited to:

- Land cover and land use (e.g., developed areas, water areas, cropland and forestland);
- Soil erosion;
- Selected conservation practices;
- Wildlife habitat; and
- Wetlands.

The NRI is conducted every five years by the USDA Natural Resources Conservation Service (NRCS) in cooperation with Iowa State University's statistical laboratory. National resource inventories were performed in 1977, 1982, 1987, 1992 and 1997. Data elements were consistent for the last four inventories and provide information on trends over 15 years. NRI figures are statistically significant at the national and state level.

The NRI compiles data from 300,000 Primary Sample Units and about 800,000 sample points. For the 1997 NRI, NRCS staff primarily interpreted aerial photographs and used other remote sensing techniques to monitor natural resource conditions and trends. They supplemented this information with on-site visits and ancillary materials, such as field office records and NRCS soil surveys. Inventory data cover the 48 contiguous states, Hawaii, Puerto Rico, the U.S. Virgin Islands, and for 1997, the Pacific Basin and portions of Alaska.

### **Availability**

NRCS compiles the data in graphs, maps and tables. Summaries and comprehensive reports on individual resource topics are available. The NRI is also posted on the NRCS Web site at: [www.nrcs.usda.gov/technical/NRI](http://www.nrcs.usda.gov/technical/NRI).

### **Limitations**

- NRI figures are estimates based on a statistically valid sample, not absolute values based on a census;
- Although county level figures may be available, the statistical reliability can be low at this level; and
- The NRI may under-report low-density residential development.

## **ECONOMIC RESEARCH SERVICE (ERS) FACT SHEETS**

### **Description**

The USDA Economic Research Service (ERS) fact sheets contain frequently used agricultural statistics and socioeconomic data assembled into a concise format. Data are presented on:

- Population, employment and income (all sectors of the economy);
- Farm characteristics; and
- Farm financial indicators.

The ERS compiles data from the Census of Agriculture, Bureau of Economic Analysis, Census Bureau, Bureau of Labor Statistics and Economic Research Service to create the fact sheets and revises them frequently to include the most current data.

### **Availability**

There are 50 individual “State” fact sheets and one for the “United States,” which incorporates data from 50 states. The fact sheets are posted on an ERS Web site at:

[www.ers.usda.gov/StateFacts](http://www.ers.usda.gov/StateFacts).

## **STATE POPULATION RANKINGS SUMMARY**

### **Description**

The State Population Rankings Summary is a report by state for the period 1995 to 2025 that shows:

- Population projections;
- Rate of change;
- State population rankings; and
- Migration gains and losses.

The U.S. Census Bureau has developed a methodology to make estimates of the current population by adding to or subtracting from the measured components of population change (births, deaths, immigration, emigration) that are included in each census.

The U.S. Census Bureau Population Division collects population data and posts this report and a series of other reports based on that data.

### **Availability**

The individual state summary reports are available on a U.S. Census Bureau Web site at:

[www.census.gov/population/www/projections/9525rank.html](http://www.census.gov/population/www/projections/9525rank.html).



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## REVISED 1997 NATIONAL RESOURCES INVENTORY: CHANGES IN LAND COVER/USE

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### ABSTRACT

The National Resources Inventory (NRI) is the most comprehensive natural resource database in the United States. The USDA Natural Resources Conservation Service (NRCS) conducts the NRI every five years. NRCS field staff collect data from 300,000 Primary Sample Units and about 800,000 sample points. Researchers at Iowa State University expand this information to develop a national picture of natural resource conditions and trends. In addition to providing information about soil erosion, wildlife habitat, wetlands and conservation practices, the NRI is the best source for agricultural land conversion data. The 1997 NRI originally was released on December 7, 1999. Revised 1997 data, dated December 2000, were released on January 9, 2001, and continue to show accelerated conversion of productive agricultural land to developed uses. This fact sheet provides general information about the NRI and a more detailed discussion of changes in land cover/use.

### HIGHLIGHTS

Revised 1997 NRI data show that between 1992 and 1997 more than 11 million acres of land were converted to developed uses. Of this amount, more than 6 million acres were agricultural land (crop, pasture, range and land enrolled in the Conservation Reserve Program). This translates to an average annual agricultural land conversion rate of roughly 1.2 million acres per year between 1992 and 1997—a 51 percent increase above the average annual rate reported for 1982 to 1992.

### DESCRIPTION

The NRI is a statistically valid survey of the nation's non-federal lands. It documents natural resource conditions and trends, including the conversion of agricultural land to

developed uses. Important data elements include, but are not limited to:

- Land cover and land use (e.g., developed areas, water areas, cropland and forest land);
- Soil erosion;
- Selected conservation practices;
- Wildlife habitat; and
- Wetlands.

The NRI is conducted every five years by the NRCS in cooperation with Iowa State University's statistical laboratory. National resource inventories were performed in 1977, 1982, 1987, 1992 and 1997. Data elements were consistent for the last four inventories and provide information on trends over 15 years. NRI figures are statistically significant at the national and state level. Data also may be statistically valid for some counties.

### FUNCTIONS AND PURPOSE

The NRI was developed to fulfill NRCS reporting requirements and to help measure the effectiveness of conservation practices and programs. Resource inventory activities were authorized by the federal Rural Development Act of 1972. The act directed the U.S. secretary of agriculture to create a land inventory and monitoring program and to report on the conditions and trends of soil, water and related resources at regular intervals not to exceed five years. The Soil and Water Resources Conservation Act of 1977 and the Food Security Act of 1985 underlined the need for a periodic assessment of the nation's natural resources.

## DATA COLLECTION

NRCS field staff collect data from 300,000 Primary Sample Units (PSUs) and about 800,000 sample points. PSUs are blocks of land that range in size from 40 to 640 acres. Sample points are specific locations within PSUs identified by map coordinates.

For the 1997 NRI, NRCS staff primarily interpreted aerial photographs and used other remote sensing techniques to monitor natural resource conditions and trends. They supplemented this information with on-site visits and ancillary materials, such as field office records and NRCS soil surveys. Data were compiled from July 1997 through October 1998.

Some data elements are collected for entire PSUs; others are collected only at sample points. Estimates for land converted to developed uses are based on changes observed over the entire PSU. NRCS field staff use a set of standard, detailed guidelines to make their determinations. For example, to qualify as “built-up,” strip development must occur at a specified density—five structures per half mile along one side of the road or five structures per quarter mile along both sides of the road. For this reason, the NRI does not capture low-density development.

Researchers at Iowa State University expand data gathered from PSUs and sample points to develop a picture of natural resource conditions and trends. Information collected prior to 1997 was reviewed and adjusted during the most recent inventory to correct past reporting errors and update figures obtained from other sources. Additionally, in March 2000, the NRCS discovered a programming error in the statistical software used to calculate estimates for the inventory. Revised data, dated December 2000, were released in January 2001. All figures, including those from earlier reporting periods, have changed. For these reasons, comparisons between two reporting periods must be based on the data released with the revised 1997 NRI.

## USES

The NRI is the most comprehensive natural resource database in the United States. In addition to providing information about soil erosion, wildlife habitat, wetlands and selected conservation practices, the NRI is the best source for agricultural land conversion data. The NRI reports on all land use changes over a given time period. In particular,

the NRI documents the amount of crop, CRP, range and pasture land converted to developed uses over a given time period.

Many individuals use the Census of Agriculture to try to understand agricultural land conversion. However, the census only captures net changes in “land in farms” and does not explain what happened to land taken out of production or where additional acres came from. Decreases in “land in farms” do not necessarily equal the amount of farmland developed. In addition, recent reporting changes, like the expansion of “land in farms” to include short woody crops and entire farms enrolled in the CRP, have inflated farmland figures in many regions and make it difficult to compare statistics over time. The census supplies a wealth of information about agricultural production and operator characteristics, but it does not provide a complete picture of land use trends.

## LIMITATIONS

- NRI figures are estimates based on a statistically valid sample, not absolute values based on a census;
- Although county level figures may be available, users must be aware that statistical reliability can be low; and
- The NRI may under-report low-density residential development.

## AVAILABILITY

The revised 1997 NRI, dated December 2000, was released on January 9, 2001. Press releases, information about data collection and statistical reliability, and national results are available at:

<http://www.nhq.nrcs.usda.gov/NRI/1997/>. National statistics are presented in maps, other graphics, “Highlights of the 1997 NRI” and the “1997 NRI Summary Report.”

The summary report provides a good overview. It contains background information about the NRI and a series of figures and tables that portray selected national data. State data tables will be posted on NRCS state office Web pages and the official NRI Web site located at:

[http://www.nhq.nrcs.usda.gov/NRI/1997/state\\_info.html](http://www.nhq.nrcs.usda.gov/NRI/1997/state_info.html).

The directory for NRCS state offices is located at: <http://www.nrcs.usda.gov/NRCstate.html>. Additional statistics not included in the summary tables can be obtained by contacting NRCS NRI specialists. NRI specialists are typically stationed in NRCS state headquarters.



## HOW TO READ THE TABLES

Tables 5, 6, 7 and 8 of the summary report (Table 8 is attached here) depict changes in land cover/use for four different reporting periods. The numbers represent thousands of acres. Row headings refer to land cover/use at the beginning of the reporting period; column headings refer to the land cover/use at the end of the reporting period. Read the table horizontally to determine how a land use was distributed at the end of the reporting period. Read vertically to find out where land cover/use reported at the end of the reporting period came from. Instructions are provided at the bottom of each table.

For example, to determine how much agricultural land was developed between 1992 and 1997, read down the "Developed Land" column in Table 8. The table shows that 2,902,100 acres of crop; 7,700 acres of CRP; 1,979,800 acres of pasture, and 1,283,200 acres of rangeland were converted to developed uses over five years.

To calculate the net change in land cover/use categories, subtract the total acres reported at the beginning of the reporting period (displayed in the last column of Tables 5, 6, 7 and 8) from the total acres reported at the end of the reporting period (displayed in the last row of Tables 5, 6, 7 and 8). For instance, between 1992 and 1997, developed land increased by 11,217,000 acres.

The state-level tables may break out data into additional land cover/use categories. Specifically, "Developed Land" may be reported in state tables as "Urban Built-Up" and "Rural Transportation"; "Cropland" may be expressed as "Cultivated Cropland" and "Non-Cultivated Cropland"; and "Water Areas and Federal Land" may be reported as "Small Water," "Census Water" and "Federal." These combinations are referenced in the glossary that accompanies the NRI summary report.

## GLOSSARY OF SELECTED TERMS

**Developed Land:** A land cover/use category equal to the sum of urban built-up areas and rural transportation land.

**Land Cover/Use:** General categories used to present NRI data that account for all the surface area of the United States. Land cover is the vegetation or other kind of mater-

ial that covers the land surface. Land use is the purpose of or human activity on the land.

**Other Rural Land:** A land cover/use category that includes farmsteads and ranch headquarters, other farm structures, field windbreaks, barren land and marshland.

**Rural Transportation Land:** A land cover/use category that includes highways, roads, railroads and associated rights-of-way outside urban and built-up areas. This category includes private roads to farmsteads or ranch headquarters, logging roads and other private roads.

**Urban Built-Up Areas:** A land cover/use category that includes residential, industrial, commercial and institutional land, construction sites, public administrative sites, railroad yards, cemeteries, airports, golf courses, landfills, sewage treatment plants, dams and spillways, small parks within urban and built-up areas, and highways, railroads and other transportation facilities if they are surrounded by urban areas. Parcels less than 10 acres that are surrounded by urban built-up land also are included.

A complete glossary of terms is available at:

[http://www.nhq.nrcs.usda.gov/NRI/1997/summary\\_report/original/glossary.html](http://www.nhq.nrcs.usda.gov/NRI/1997/summary_report/original/glossary.html)

January 2003



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## ATTACHMENT A


**Summary Report  
1997 National Resources Inventory  
Revised December 2000**

Table 8—Changes in land cover/use between 1992 and 1997

Land cover/use in 1992	Land cover/use in 1997								1992 total
	Cropland	CRP land	Pastureland	Rangeland	Forest land	Other rural land	Developed land	Water areas & federal land	
	1,000 acres								
Cropland	362,606.3	2,062.6	9,210.5	1,555.5	1,937.1	1,722.2	2,902.1	318.9	382,315.2
CRP land	2,250.8	30,464.9	796.6	297.2	184.4	40.2	7.7	0.3	34,042.1
Pastureland	8,523.5	96.6	106,543.2	1,562.3	6,272.3	897.1	1,979.8	172.7	126,047.5
Rangeland	1,977.8	21.1	696.4	400,770.5	1,600.8	779.0	1,283.2	250.9	407,379.7
Forest land	759.9	22.9	1,887.7	1,170.0	395,273.0	950.2	4,771.1	372.2	405,207.0
Other rural land	707.7	27.9	753.5	474.0	1,447.4	46,744.4	448.5	22.4	50,625.8
Developed land	27.9	0.0	24.0	53.7	76.0	2.8	86,850.3	0.0	87,034.7
Water areas and federal land	144.0	0.0	80.0	94.0	164.2	5.6	9.0	450,980.9	451,477.7
1997 total	376,997.9	32,696.0	119,991.9	405,977.2	406,955.2	51,141.5	98,251.7	452,118.3	1,944,129.7

1992 land cover/use totals are listed in the right hand vertical column, titled "1992 total." 1997 land cover/use totals are listed in the bottom horizontal row, titled "1997 total." The number at the intersection of rows and columns with the same land cover/use designation represents acres that did not change from 1992 to 1997. Reading to the right or left of this number are the acres that were lost to another cover/use by 1997. Reading up or down from this number are the acres that were gained from another cover/use by 1997.





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**SUGGESTED READING**

**Agricultural Conservation Easements**

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Wear, David N. and John C. Greis. *The Southern Forest Resource Assessment*. Asheville, N.C.: USDA Forest Service, Southern Research Station, 2002.

### **Minority Land Loss**

Gilbert, Jess, Spencer D. Wood and Gwen Sharp. "Who Owns the Land?" *Rural America*, Winter 2002, Vol. 17, Issue 4. Washington, D.C.: USDA ERS.

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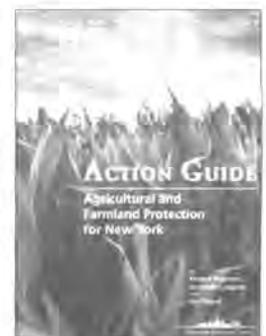


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  - Differential Assessment and Circuit Breaker Tax Programs (September 1998)
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  - Status of Local PACE Programs (July 2002)
  - Status of State PACE Programs (July 2002)
  - Right-to-Farm Laws (September 1998)
  - Transfer of Development Rights (January 2001)
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