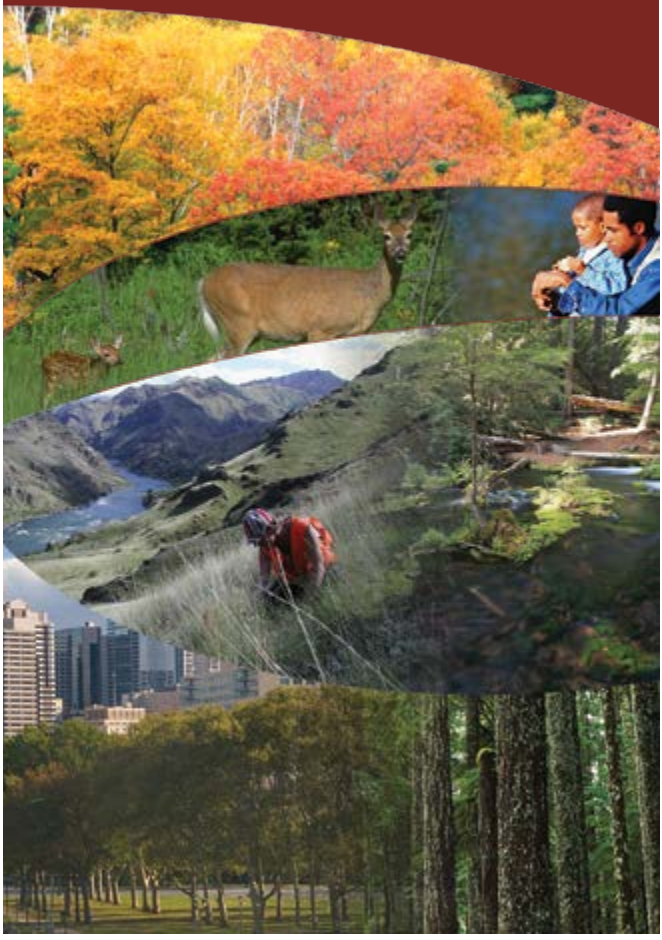
USDA United States Department of Agriculture

U.S. Forest Resource Facts and Historical Trends



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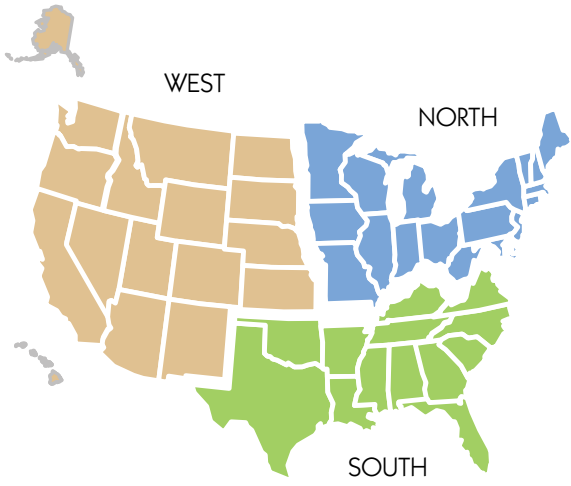
Introduction

The Resources Planning Act (RPA) Assessment Update for 2015 is being prepared in response to the mandate in the Forest and Rangeland Renewable Resources Planning Act of 1974, P.L. 93-378, 88 Stat. 475, as amended. The update consists of a summary report and a data CD (compact disk). The report is available for download at http://www.fs.fed.us/research/rpa. Hard copies of the report and data CD are also available for order at that location.

The *National Report on Sustainable Forests* provides the most comprehensive account of available data on the current condition of the Nation's forest resources. The report is based on 58 indicators for the conservation and sustainable management of forests. The United States and 11 other countries that house 90 percent of the Earth's temperate and boreal forests and 60 percent of all forests endorsed the indicators. Information on this report may be found on the Web at http://www.fs.fed.us/research/sustain/.

This brochure provides selected highlights of the findings of both assessments. Much of the data for this brochure is reported regionally as North, South, and West. In some cases, North and South are combined into a category labeled "East."



Major U.S. reporting regions for this brochure.

Forest Inventory and Other Data

The Forest Inventory and Analysis (FIA) program of the Forest Service, an agency of the U.S. Department of Agriculture (USDA), conducts inventories of the attributes of forest resources and reports them in the RPA Assessment and various supporting documents. The FIA program has been conducting field inventories for more than 80 years, using state-of-the art technology to provide estimates of the status, condition, and trends of the Nation's forests. These estimates are critical to the development and implementation of policies and practices that support sustainable forestry in the United States. Since 1953, 10 national reports based on FIA data have been produced.

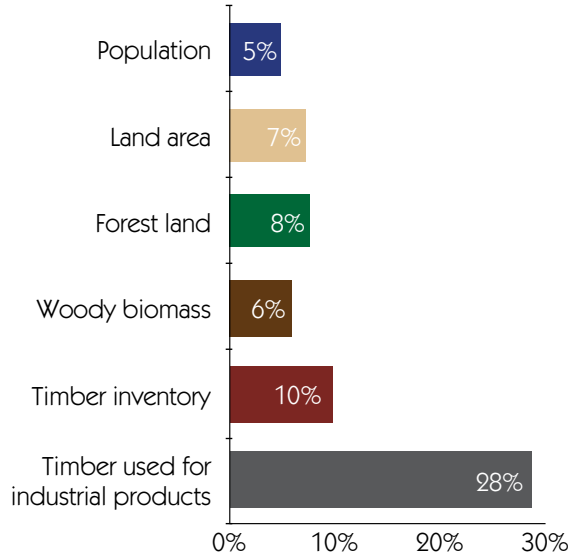
Extensive field measurements from FIA inventories include more than 4.5 million remote sensing plots interpreted for land use; more than 125,000 permanent field plots systematically located across all U.S. forest lands; more than 100 characteristics measured at each plot location; and more than 1.5 million trees measured to evaluate volume, condition, and vigor.

Data for forest ownership and products are from periodic FIA forest ownership and products studies. Data for wildlife, recreation, health, timber trade, and nonwood products were derived from Forest Service scientists' contributions to the *National Report on Sustainable Forests*—2010 and 2015. Web sources for that report and other related data appear in the Web Resources section at the end of this brochure.

This brochure is available in five languages: English, Chinese, French, Russian, and Spanish. Visit the FIA Web site at http://fia.fs.fed.us to obtain copies.

The United States in a Global Context

Global forestry issues are of considerable significance to the United States, which has 5 percent of the Earth's population and consumes an estimated 28 percent of the Earth's industrial wood products. Although domestic timber inventory is only 10 percent of the Earth's total, 96 percent of U.S. consumption of industrial wood comes from domestic supplies. Additional demands on U.S. forests are also of interest and include protected areas for biodiversity and relative contributions of U.S. forests to carbon pools, among others.



The United States as a percent of world totals for selected measures.

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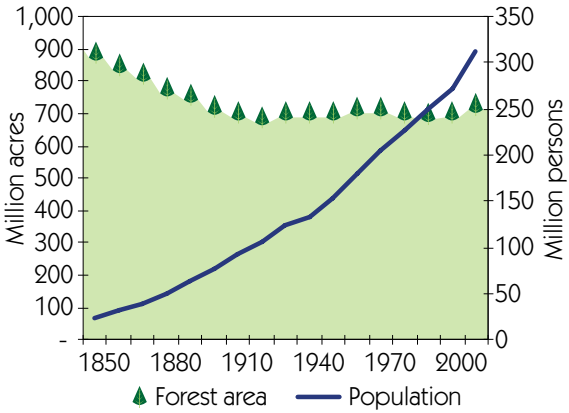
Land and Forest Area

In 1630, the estimated area of U.S. forest land was 1,023 million acres or about 46 percent of the total land area. Since 1630, about 256 million acres of forest land have been converted to other uses—mainly agricultural. Nearly two-thirds of the net conversion to other uses occurred in the second half of the 19th century, when an average of 13 square miles (mi^2) of forest was cleared every day for 50 years. By 1910, the area of forest land had declined to an estimated 754 million acres, or 34 percent of the total land area. In 2012, forest land comprised 766 million acres, or 33 percent of the total land area of the United States. Forest area has been relatively stable since 1910, although the population has more than tripled since then.



Forest area and population trends in the United States, 1850–2010.

Stable forest area, however, does not mean that the character of the forest has not changed. In addition to reversions to and from agriculture and more intensive land uses like urban development, forests respond to human manipulation, aging, and other natural processes. The effects of these changes are reflected in the information presented in this brochure.

Land and forest area trends in the United States[1].

Category	Year	Region			
		U.S.	North	South	West
			Million acres		
Land	2012	2,261	413	533	1,315
Of which:					
Forest	2012	766	176	245	346
	2007	752	172	235	346
	1997	742	170	231	341
	1987	733	165	234	333
	1977	742	164	235	343
	1963	753	166	245	342
	1953	742	161	240	341
	1940	738	159	232	346
	1920	721	149	220	353
Of which:					
Timber land	2012	521	167	210	144
	2007	514	164	204	146
	1997	504	159	201	143
	1987	485	155	195	135
	1977	491	153	198	139
	1963	515	156	209	150
	1953	509	154	205	150
	1940	502	149	200	153
	1920	482	138	194	149
Reserved forest[2]	2012	74	7	4	63
	2007	75	6	3	65
	1997	52	8	4	40
	1987	35	7	3	25
	1977	29	6	2	21
	1963	25	4	1	19
	1953	24	4	1	19
	1940	11	4	0	6
	1920	10	3	0	6
Other forest	2012	187	17	31	139
	2007	162	2	7	134
	1997	187	3	9	157
	1987	211	4	13	173
	1977	215	5	17	182
	1963	216	5	18	173
	1953	217	3	20	172
	1940	233	6	21	187
	1920	238	7	18	197

Land and forest area trends in the United States (continued).

Category	Year	Region			
		U.S.	North	South	West
		Million acres			
Woodlands *(nonforest, see definition)*	2012	53	-	23	30
Total forest and woodlands	2012	819	176	267	376

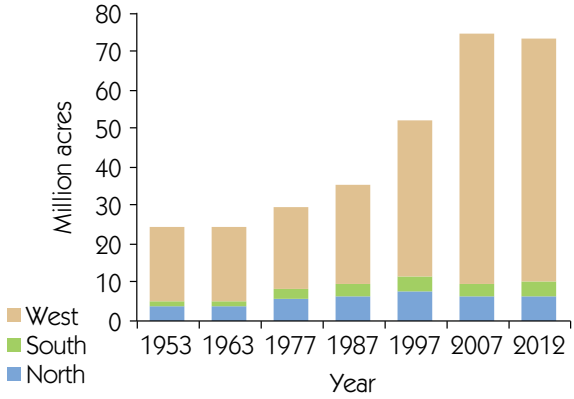
[1]In addition to land area of the United States at that time, estimates for 1920 and 1938 include forest area in the regions that would become the States of Alaska and Hawaii. Estimates for 1630 represent the forest area in North America for regions that would become the 50 States within the current United States. (Source for 1938: U.S. Congress [1938].) (Source for 1907 and 1630: R.S. Kellogg [1909]).

[2]Does not include some protected areas. National forest roadless areas are International Union for Conservation of Nature (IUCN) Class VI but not identified as "reserved" in Forest Inventory and Analysis program (FIA) statistics and total approximately 32 million acres. These lands are currently reported in timber land and other forest land in FIA reports. New inventories will provide more accurate data to place these lands in their proper IUCN classification.

Forest Service

Reserved Forest

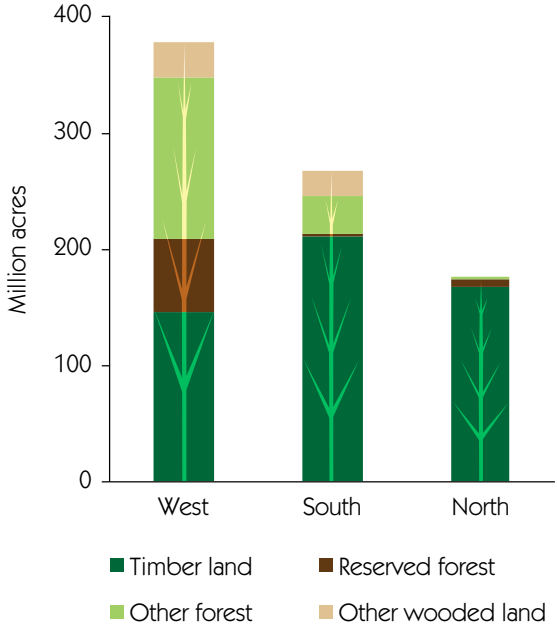
Of the total forest land, 10 percent are classified as reserved. This classification indicates that these forest lands are not managed for timber harvest, which is prohibited by law on these lands in most cases. Reserved forests have changed very little since 2007, with a very small (2 percent) reduction in area. Nationwide, reserved forest area is more than three times what it was only 59 years ago. Most reserved land is in the West, reflecting a larger proportion of publicly owned land in that region. In general, U.S. private forest land is classified as "timber land" by FIA, even if landowners do not intend to harvest timber.



Trends in reserved forest land, by region, 1953–2012.

Timber Land and Other Forest

The South contains 40 percent of the Nation's 521 million acres of timber land. In contrast, the West constitutes only 28 percent of national timber land, and the North 32 percent. The South is often referred to as the "woodbasket" of the United States because of the extensive timber supply, while the West is host to most of the Nation's reserved forest and national parks. Other woodlands, including scrub forests, are found in the highest concentrations in the West and South, with none meeting that definition in the North.



Forest land, by class and region, 2012.

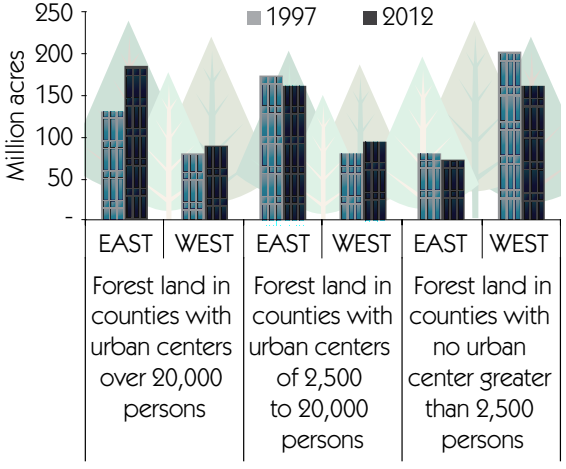
Urban Associated Forest

Urban land in the coterminous United States increased from 2.5 percent of total land area in 1990 to 3.1 percent in 2000 to 3.6 percent in 2010. Urbanization affects the forest resource and its management in many ways. Not only does urban development eliminate some trees and forests, it also increases population density, human activities, and urban infrastructure, which can affect forests and their management. As urban landscapes increase across the Nation, rural forest landscapes are often converted to developed lands. With more than 80 percent of the U.S. population living in urban areas, ecosystem services provided by urban trees and forests are significant and valued in billions of dollars annually.

Nationally, urban areas (population density of at least 500 people/mi^2) have an average tree cover of 35 percent (Nowak and Greenfield 2012a); with tree cover in urban areas on the decline (Nowak and Greenfield 2012b) and most urban tree cover established through natural regeneration (Nowak 2012).

In the United States, an estimated 4 billion urban trees provide many valuable benefits based on their current composition and function. Besides the basic value of the trees—estimated at $2.4 trillion (Nowak et al. 2002), additional benefits of urban trees include air-pollution removal and carbon sequestration. Annual pollution removal (ozone, particulates, nitrogen dioxide, sulfur dioxide, and carbon dioxide) by urban trees is estimated at 711,000 metric tons ($3.8 billion value, according to Nowak et al. 2006) and storage of 643 million metric tons of carbon ($50.5 billion value) with a gross carbon sequestration rate of 25.6 million metric tons C per year ($2.0 billion per year) (Nowak et al. 2013).

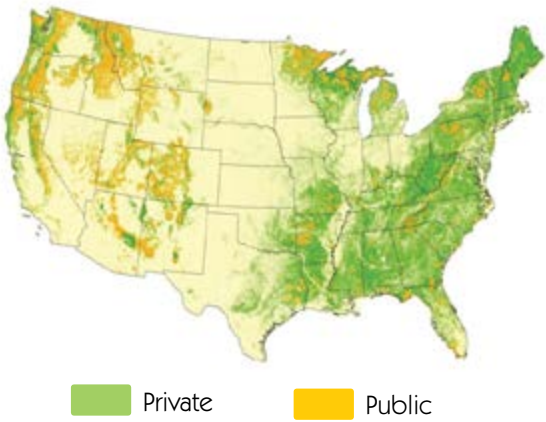
One coarse measure of the expanding urban influence on forests is a simple classification of forest area by county based on population demographics. The following graphic demonstrates that the area of forest in rural counties (no population centers with more than 2,500 people) in the past 15 years has declined by 48 million acres (17 percent). That is, the number of counties with small populations, and their associated forest areas, has declined.



U.S. forest land area, by population influence, 1997 and 2012.

Forest Ownership

U.S. forest ownership patterns are quite diverse with public forests dominant in the West and private forests dominant in the East. Private industrial forest ownership is concentrated in the South, Pacific Northwest, upper Lake States, and northern New England.



U.S. forest land ownership, 2012. (Alaska [not pictured] has 126 million acres of forest that is 72-percent public ownership and Hawaii [not pictured] has 1.7 million acres of forest that is 34-percent public ownership.)

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U.S. forest land, by ownership class, 2012.

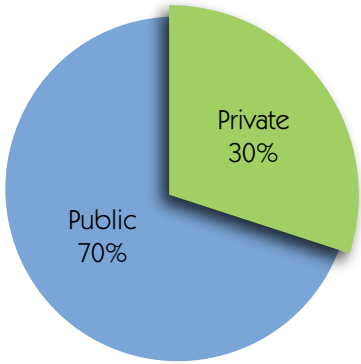
Owner class/ land class	Region			
	U.S.	North	South	West
	Million acres			
All owners	**766**	**176**	**244**	**346**
Timber land	521	167	210	144
Reserved forest	74	7	4	63
Other forest	172	2	31	139
National Forest	**145**	**12**	**13**	**120**
Timber land	98	10	12	75
Reserved forest	27	1	1	24
Other forest	20	0	0	20
Other public	**176**	**35**	**20**	**122**
Timber land	63	29	15	19
Reserved forest	47	5	3	39
Other forest	67	0	2	65
Private corporate	**147**	**29**	**65**	**53**
Timber land	111	29	61	21
Reserved forest	0	-	0	0
Other forest	36	0	4	32
Private non-corporate	**298**	**100**	**147**	**51**
Timber land	249	99	121	28
Reserved forest	0	0	0	0
Other forest	48	1	25	22

Public Forests

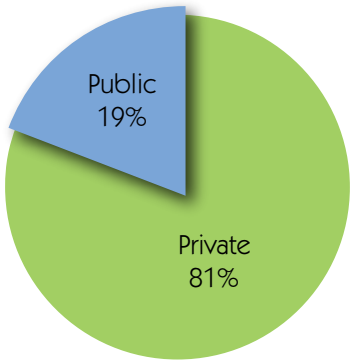
The Federal Government predominantly owns public forest lands in the West and State and county governments own most of the public lands in the East. Of all public forest acres, 75 percent are in the West. Most protected forests are in public ownership while most production forests are in private ownership.

Private Forests

Private ownership accounts for 56 percent of total forest land. More than 10 million individual and family forest landowners own 42 percent of total forest land, representing a diverse group of people who have many reasons for owning their forest land. Most of this family-owned forest is used for the aesthetics that forests provide, as habitat for wildlife, and as part of a family legacy. Corporations, partnerships, and tribes own most of the remaining 14 percent of privately owned U.S. forests.



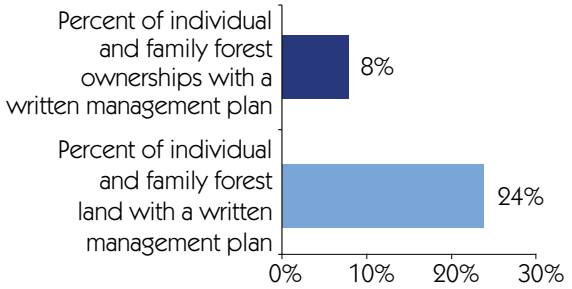
Forest ownership in the Western United States.



Forest ownership in the Eastern United States.

Management and Harvest

Removals have shifted in recent years from public lands in the West to private lands in the East. As the emphasis on timber production shifts from public to private lands, the need for information on the management objectives and behaviors of the private forest land owners has increased. This information is critical for informing U.S. policies promoting sustainable forestry. Recent studies show that only 8 percent of the families and individuals who own U.S. forest land have a written management plan. Those owners with plans manage 24 percent of the total forest land owned by these groups, however.



Percent of individual and family forest owners and percent of family owned land with management plans.

Private forests provided 88 percent of the Nation's timber harvest in 2011. A recent survey indicated that people who commercially harvested trees own nearly two-thirds of private forest land. Most private forest land area owners have 100 acres or more of forest land while most individual owners have less than 10 acres.

Landowner Characteristics

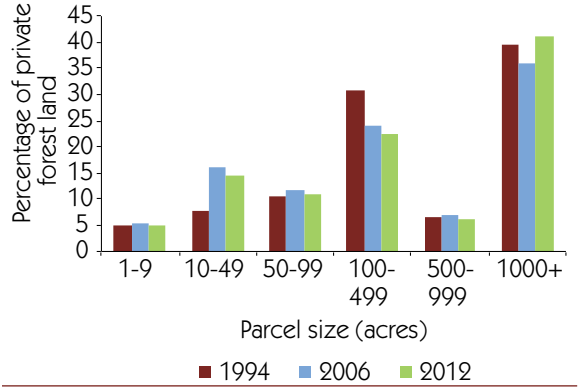
Private forest land holdings that are smaller than 50 acres make up 25 percent of total privately owned forest lands. The small size of most family forests has implications for what landowners can do with their land. In addition, characteristics such as reasons for owning forest land are highly correlated with size. People 75 years old or older currently own 20 percent of family forest land, and people between 65 and 74

years old own an additional 28 percent. This relatively advanced ownership age portends the transfer of a substantial amount of forest land in the near future.

Industrial Forests

Corporations that own forest land with wood-processing facilities traditionally have been a major source of U.S. timber production. In 2001, the forest industry owned 66 million acres (13 percent) of the Nation's 504 million acres of timber land but supplied 29 percent of wood production.

Recent changes in corporate strategies have shifted the traditional view of industrial forests, however. Many forest industry companies have divested some or all of their forest land holdings in the past 20 years. Some of these lands were acquired by timber investment management organizations, and families and individuals purchased other lands.



Trends in private forest area, by size of landholding in the coterminous United States.

Fragmentation of Forests

The Forest Service uses land cover maps derived from high-resolution satellite imagery to determine how much forest land is subject to different types and degrees of fragmentation. Human activities and natural processes cause fragmentation that may lead to the isolation and loss of species and gene pools, degraded

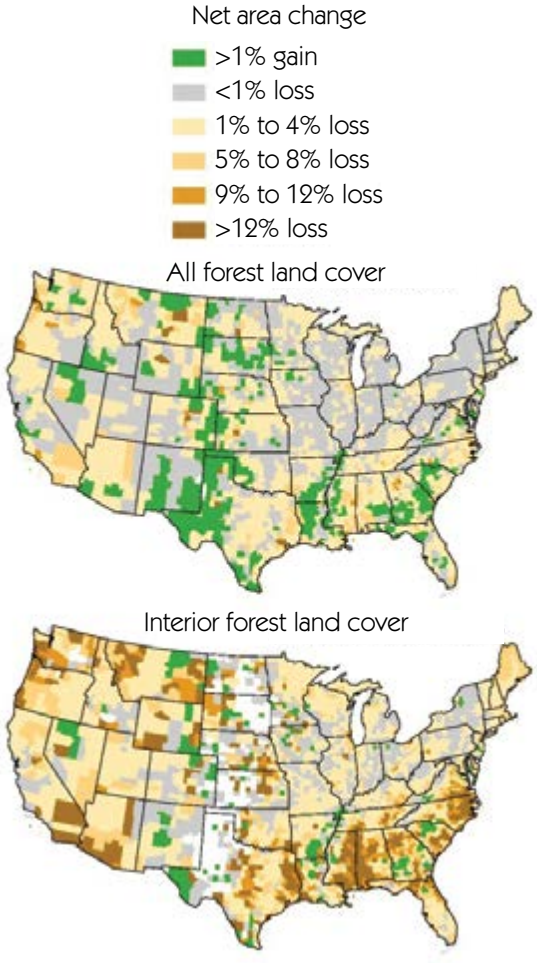
habitat quality, and a reduction in the forests' ability to sustain the natural processes that are necessary to ecosystem health. The fragmentation of forest area into smaller pieces changes ecological processes and alters biological diversity.

Analysis of fragmentation is scale dependent and consequently differs depending on whether the geographic context is large or small. In the United States, areas that are forested tend to be clustered in proximity to other places that are forested, but blocks of forest land are usually fragmented by inclusions of nonforest land. This clustering pattern is repeated across a wide range of spatial scales.

An overall measure of fragmentation is the proportion of the existing forest that is "interior," that is, a forest parcel embedded in a 40-acre landscape that has at least 90-percent forest land cover. Recent data permit analysis of trends in interior forest area from 2001 to 2006. Changes in total forest cover do not necessarily translate directly to changes in interior forest cover because of the unique relationship between forest cover, initial conditions, and adjacent or embedded land use.

Between 2001 and 2006, the coterminous United States experienced a net loss of 1.2 percent of its total forest cover. In comparison, the net loss of interior forest between 2001 and 2006 was 4.3 percent. Forest cover losses tended to occur in or near interior forests, while forest land cover gains did not tend to create new interior forest.

The following figure compares the net percent change in total forest land cover area (top) with net percent change in interior forest area (bottom). For most counties, relatively small percent change in total forest land cover area translated to larger percent change in interior forest area. Relatively few counties experienced increases in interior forest area, and interior forest area was reduced even in some counties that experienced increases in total forest area.

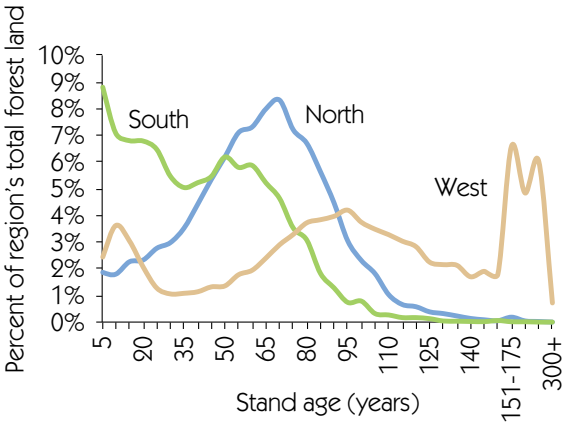


Percent change in total forest land cover area and interior forest area, by U.S. county, 2001 to 2006. White indicates no interior area.

Note: This analysis of forest cover change does not correlate directly to forest area change because of the difference between forest cover and forest land use. Forest cover loss computed using remotely sensed data may include areas such as timber harvest that will reforest in the future because satellite imagery cannot infer land use. Forest area values reported using ground sampling continue to report regenerating harvest land as forest because the land hasn't changed.

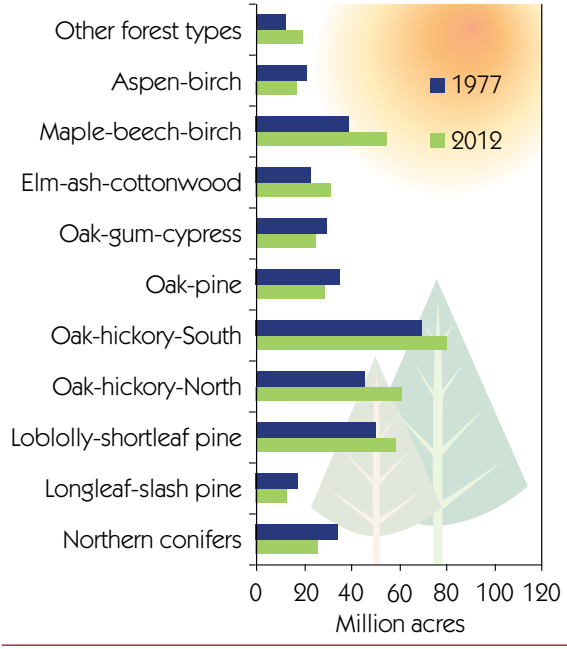
Forest Age and Composition

Predominate U.S. timber stand age varies by region. In the South, where more acres of short-rotation yellow pine trees are planted, 51 percent of timber land is less than 40 years old compared with 20 percent in the North and 22 percent in the West. In contrast, 56 percent of northern timber land is more than 60 years old, compared with 27 percent in the South and 69 percent in the West.

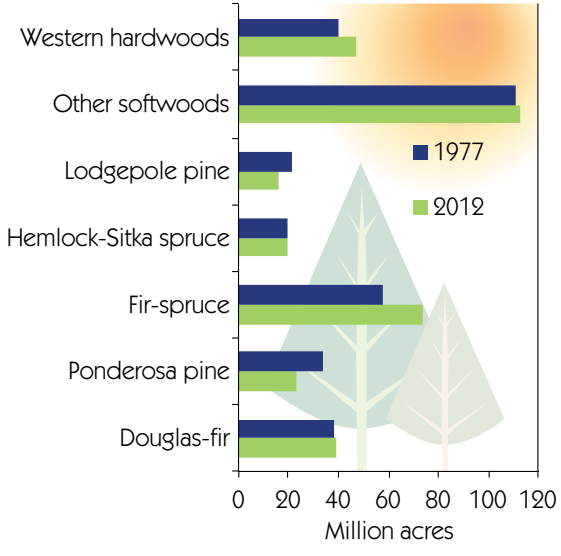


Distribution of forest land by region and stand age, 2012.

U.S. forests reflect a diversity of landforms and precipitation patterns. In the East, deciduous hardwoods and yellow pines prevail. Rapidly reproducing maples have seen an uptick since 1977, while in the South longleaf-slash pine forests have seen a decline. In the West, hemlock-Sitka spruce forests and ponderosa pine have declined since 1977, while western pine forests have increased. Researchers spend a great deal of time studying changing U.S. forest systems and the potential impacts to the economy and environment.

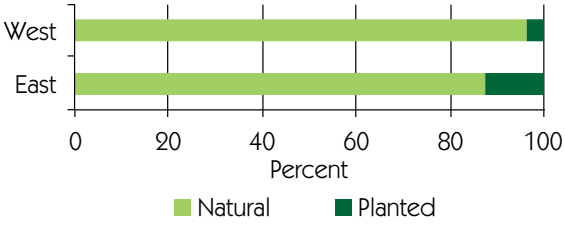


Forest type trends in the East, 1977 to 2012.



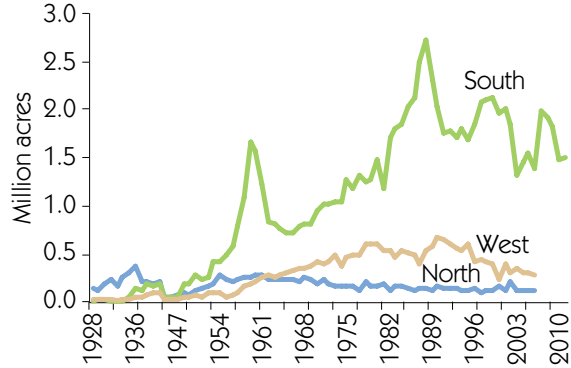
Forest type trends in the West, 1977 and 2007.

U.S. forests are predominantly natural stands of native species. Planted forest land is most common in the East and consists primarily of planted native pine stands in the South. In the West, planting is generally used to augment natural regeneration.



Origin of U.S. forest stands.

U.S. forest planting averages about 2 million acres per year. Yellow pine in the South accounts for the largest area of single-species planting. The Soil Bank Program spiked forest planting in the South in the 1950s, and in the 1980s, the Conservation Reserve Program planted nearly 3 million acres of nonforest land. In recent years, western U.S. forest planting has subsided, a trend that mirrors reduced harvesting in that region.



U.S. forest planting, 1952–2011.

Forest Service

Growing Stock Volume

U.S. timber land growing stock inventory, growth, removals, and mortality, by region and species group, 1952–2012.

Volume category	Year	Region			
		U.S.	North	South	West
All species			*Million cubic feet*		
Inventory	2012	972,395	267,803	306,623	397,968
	2007	932,089	248,005	288,521	395,563
	1997	835,669	214,246	256,359	365,063
	1987	781,656	190,038	244,641	346,977
	1977	733,056	163,008	223,373	346,675
	1963	665,600	128,288	174,072	363,240
	1953	615,884	103,748	148,470	363,666
Growth	2011	26,413	6,516	13,809	6,088
	2006	26,744	6,576	13,272	6,896
	1996	23,577	5,420	10,712	7,445
	1986	22,636	5,512	9,986	7,138
	1976	21,237	5,349	11,323	4,565
	1962	16,705	4,424	8,093	4,188
	1952	13,910	3,716	6,683	3,511
Removals	2011	12,854	2,360	8,048	2,446
	2006	15,533	2,820	9,696	3,017
	1996	16,021	2,772	10,185	3,064
	1986	16,451	2,708	8,699	5,044
	1976	14,229	2,659	6,571	4,999
	1962	11,959	2,078	5,525	4,357
	1952	11,451	2,198	5,489	3,765
Mortality	2011	11,262	2,481	5,102	3,679
	2006	10,281	2,335	4,981	2,966
	1996	7,814	1,628	3,730	2,456
	1986	5,677	1,243	2,705	1,730
	1976	5,074	1,149	2,259	1,666
	1962	5,129	940	1,965	2,225
	1952	4,509	690	1,576	2,242

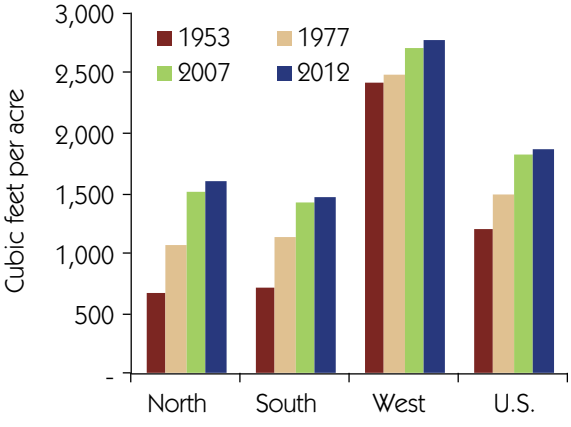
U.S. timber land growing stock inventory, growth, removals, and mortality, by region and species group, 1952–2012 (continued).

Volume category	Year	Region			
		U.S.	North	South	West
Softwoods			*Million cubic feet*		
Volume	2012	547,619	58,761	128,956	359,902
	2007	529,195	55,864	118,472	354,859
	1997	483,837	49,372	104,844	329,621
	1987	467,575	47,618	105,613	314,344
	1977	466,960	43,850	101,208	321,902
	1963	449,760	33,661	75,087	341,012
	1953	431,794	27,053	60,462	344,279
Growth	2011	15,663	1,512	8,808	5,344
	2006	15,241	1,489	7,632	6,120
	1996	13,284	1,169	5,889	6,225
	1986	13,007	1,288	5,499	6,220
	1976	11,910	1,558	6,315	4,037
	1962	9,610	1,211	4,699	3,700
	1952	7,735	973	3,641	3,120
Removals	2011	8,319	640	5,335	2,345
	2006	9,859	677	6,317	2,865
	1996	10,065	668	6,478	2,918
	1986	11,367	726	5,741	4,901
	1976	10,046	705	4,471	4,870
	1962	7,624	540	2,812	4,272
	1952	7,542	712	3,078	3,753
Mortality	2011	5,162	564	1,248	3,350
	2006	4,491	547	1,288	2,657
	1996	3,626	456	1,036	2,135
	1986	2,782	368	841	1,573
	1976	2,466	324	632	1,510
	1962	2,769	293	399	2,077
	1952	2,662	216	333	2,113

U.S. timber land growing stock inventory, growth, removals, and mortality, by region and species group, 1952–2012 (continued).

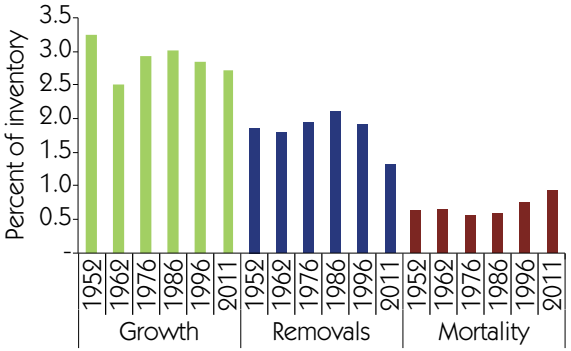
Volume category	Year	Region			
		U.S.	North	South	West
Hardwoods			*Million cubic feet*		
Volume	2012	424,776	209,043	177,667	38,066
	2007	402,894	192,141	170,049	40,704
	1997	351,832	164,874	151,515	35,442
	1987	314,081	142,420	139,028	32,633
	1977	266,096	119,158	122,165	24,773
	1963	215,840	94,627	98,985	22,228
	1953	184,090	76,695	88,008	19,387
Growth	2011	10,750	5,004	5,002	744
	2006	11,503	5,087	5,640	776
	1996	10,294	4,251	4,823	1,220
	1986	9,629	4,224	4,487	918
	1976	9,327	3,791	5,009	528
	1962	7,095	3,213	3,394	488
	1952	6,175	2,743	3,041	391
Removals	2011	4,535	1,720	2,714	101
	2006	5,675	2,143	3,379	152
	1996	5,956	2,104	3,707	146
	1986	5,083	1,983	2,958	143
	1976	4,183	1,953	2,100	129
	1962	4,336	1,538	2,713	85
	1952	3,909	1,486	2,411	12
Mortality	2011	6,100	1,917	3,853	329
	2006	5,790	1,788	3,693	309
	1996	4,188	1,172	2,694	321
	1986	2,896	875	1,864	157
	1976	2,607	824	1,627	156
	1962	2,361	647	1,566	148
	1952	1,847	475	1,243	129

Average growing stock volume per acre continues to increase across the United States with the largest gains in the North and South where volumes per acre are nearly double what they were in 1953.



Volume per acre on timber land.

During the past 60 years, net growing-stock growth has consistently exceeded growing-stock removals in the United States. In terms of percent of standing volume, removals are at the lowest level in the past 60 years and growth has also slowed. The volume of annual net growth is currently 2 times higher than the volume of annual removals. Mortality remains similar to 2006, at less than 1 percent of standing inventory.

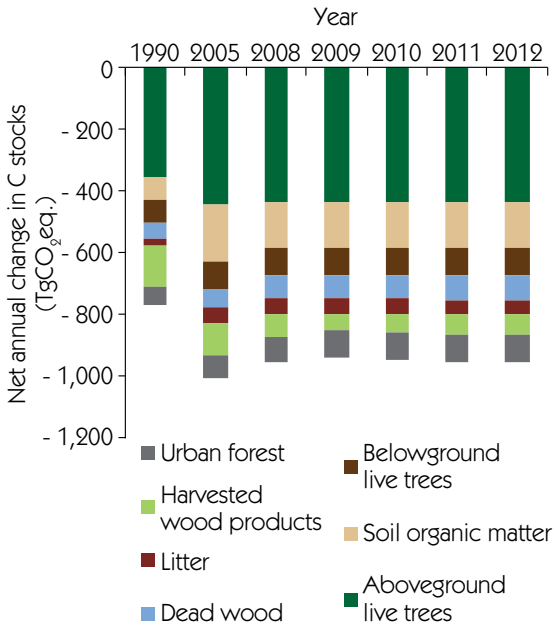


Net growth, removals, and mortality rates for growing stock, 1952—2011.

Forest Carbon and Biomass

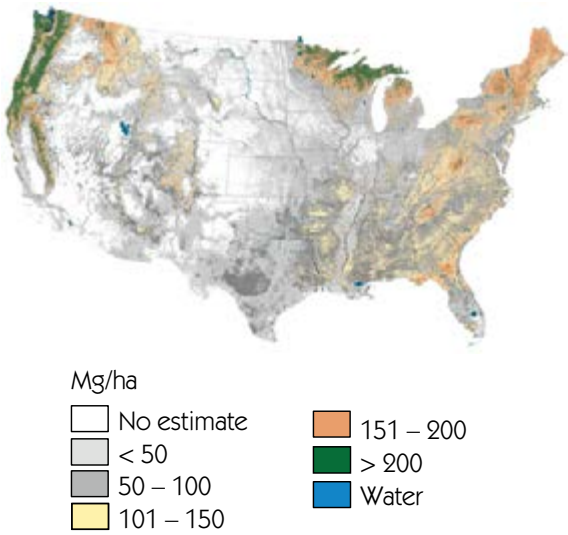
Forest ecosystems are the largest terrestrial carbon sink on earth and their management has been recognized as a relatively cost-effective strategy for offsetting greenhouse gas emissions. The United States quantifies forest carbon stocks and stock changes in national and international reports using data from the national forest inventory administered by the Forest Service.

Forests in the United States continue to sequester more carbon than they emit each year, and combined with urban forest, and harvested wood products, offset nearly 15 percent (955 tetragrams of carbon dioxide equivalent [Tg CO_2 eq.]) of total greenhouse gas emissions in 2012. An additional 270 Tg CO_2 eq. was sequestered in forest ecosystems and subsequently emitted back to the atmosphere through wildfire combustion.



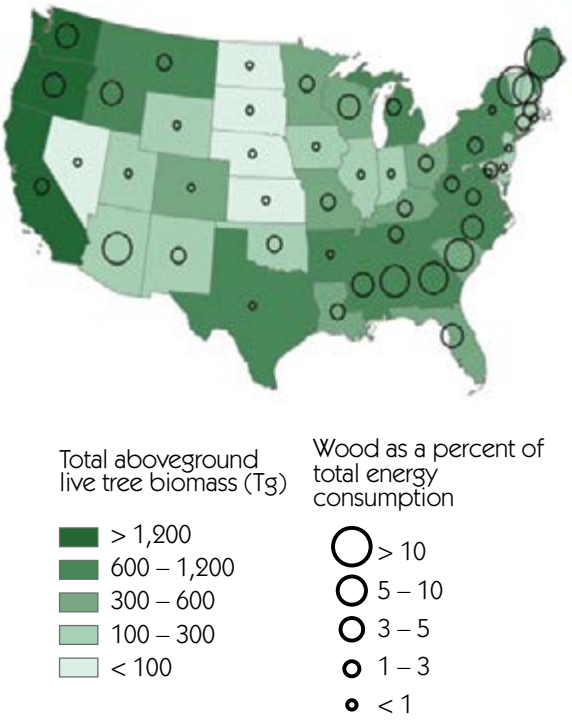
Estimated net annual changes in carbon stocks in forest, urban forest, and harvested wood pools in the United States, 2012. Note that negative values indicate net carbon sequestration. (Sources: U.S. Department of Agriculture, Forest Service 2014a, EPA 2014)

Forests in the United States store an estimated 43,126 Tg carbon in live and dead biomass and soil organic matter. Forest ecosystems in the Pacific Northwest and Northern Lake States have the greatest carbon density, often in excess of 200 megagrams per hectare. Forests in Northeast, Intermountain West, along the Appalachian Mountains, and throughout the Southeast also contain substantial biomass that is distributed throughout the different ecosystem pools.



Estimated forest ecosystem carbon density (megagrams per hectare) imputed from forest inventory plots, coterminous United States, 2001–2009: total forest ecosystem carbon (Source: Wilson et al. 2013.)

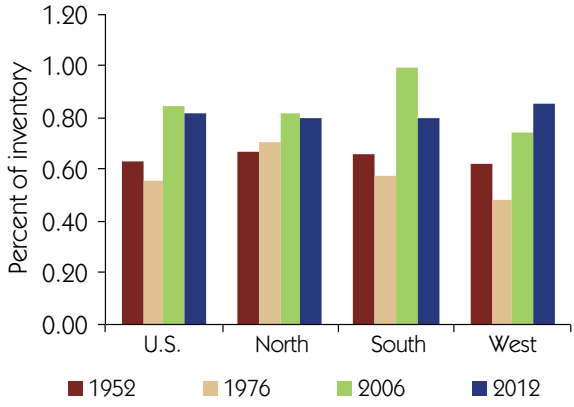
In addition to carbon fossil fuel for energy, forest biomass consumption for energy has declined during the past several years. Despite recent declines, however, wood energy plays a major role in U.S. forested regions and continues to comprise approximately 2 percent of the total U.S. energy consumption.



Estimated total aboveground live tree biomass and wood energy as a percent of total U.S. energy consumption, 2012. (Sources: U.S. Department of Agriculture, Forest Service 2014a, EPA 2014)

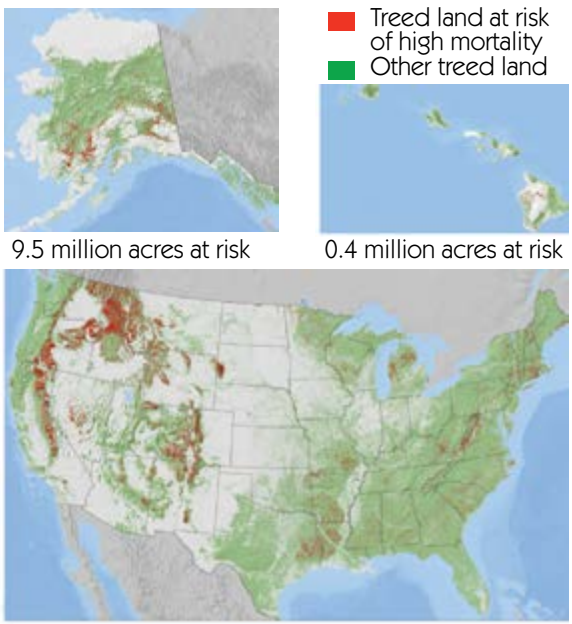
Forest Health and Invasive Species

Mortality rates relative to inventory remain less than 1 percent of standing inventory. Mortality rates in the South have declined since 2006, while they continue to rise in the West where mountain pine beetle affected millions of acres of forest between 2009 and 2010. Root diseases, bark beetles, and oak decline were the leading contributors to mortality risk in the coterminous United States (Krist and others 2014).



Mortality as a percent of standing inventory.

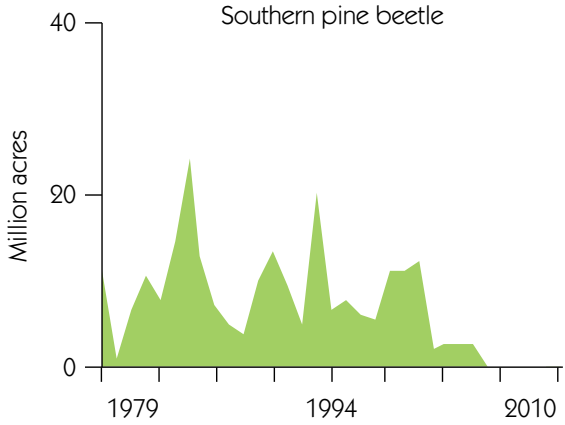
Areas depicted in the following graphic are at potential risk of 25 percent or higher mortality because of insects and disease during the next 15 years.



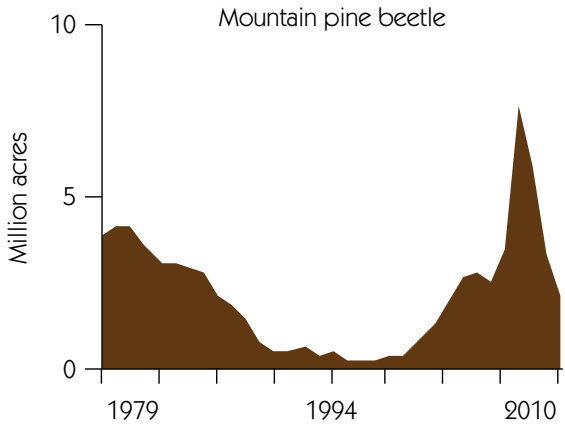
National 2012 Composite Insect and Disease Risk Map (Source: U.S. Department of Agriculture, Forest Service 2014b)

Aerial detection surveys provide information on the extent of major forest pest damage. Some of these pests include—

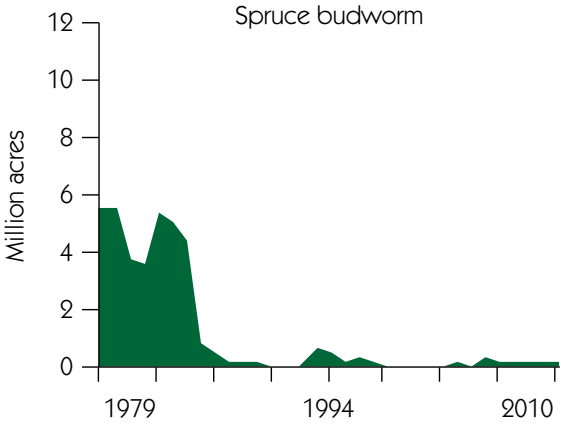
Southern pine beetle activity was at historically high levels throughout the past 20 years, which reflects the widespread availability of its preferred host, loblolly pine. Mortality from southern pine beetle has declined since a high in 2002.



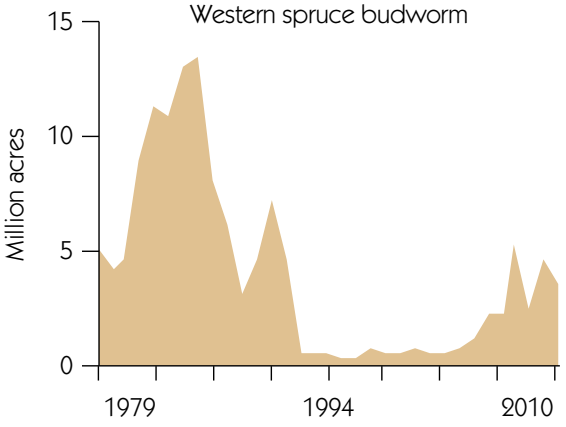
Mountain pine beetle activity was at an all-time high in 2009 and 2010 but showed a steady decline from 2011 to 2012.



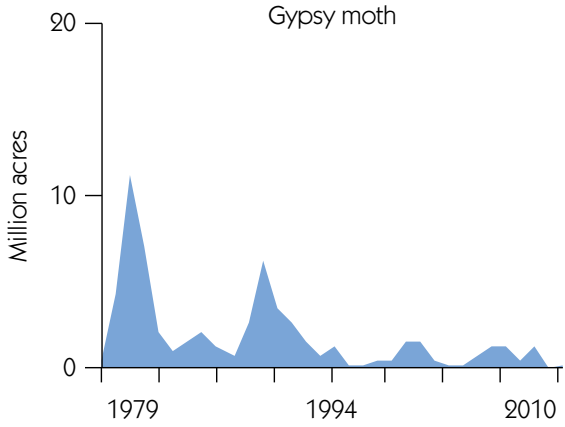
Spruce budworm activity increased after the most recent Forest Facts update in 2006 but began to decline again in 2012.

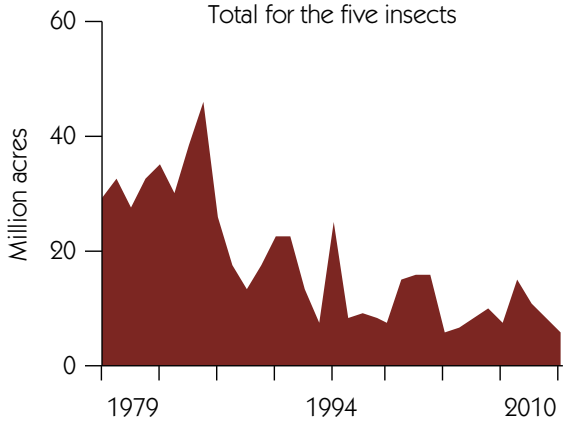


Western spruce budworm defoliation peaked from 1983 to 1992. Many trees weakened by budworm defoliation were subsequently killed by bark beetle attacks.



Gypsy moths defoliated almost 13 million acres of hardwoods in 1980, and annual defoliation averaged 2.8 million acres during the past 20 years. Gypsy moth activity reached unprecedented levels as it spread South and West into better habitat; the great reduction in recent years appears to reflect the effect of *Entomophaga maimaiga* (a fungal pathogen of the Gypsy moth).





Dozens of diseases affect U.S. forests each year. The following table lists the 10 most common tree diseases in the United States.

Disease	Primary species affected
beech bark disease	beech
Dutch elm disease	American elm
dogwood anthracnose	dogwood
dwarf mistletoes	conifers
fusiform rust	southern pines
oak wilt	eastern oaks
Port-Orford cedar root disease	Port-Orford cedar
root rots	many conifers and hardwoods
Sudden Oak Death	California Oak, tanoak
white pine blister rust	five-needle pines

Expanding global trade and travel has increased the risk of introducing new and exotic organisms into forests. When introduced into new ecosystems, invasive species have no natural enemies and can therefore cause extensive damage. Invasive plant species are defined as species moved beyond their natural range or natural zone of potential dispersal, including all domesticated species and hybrids. The consequences of the introduction of invasive species can have major ecological and economic implications and may directly affect human health. One of the major effects of invasive species on biodiversity may be the loss of native species. An estimated 3,723 plants in the United States have origins outside the country. Areas with the highest rates of introduction tend to be along the coasts or major inland waterways. In general, human disruptions of natural communities, such as soil alterations, removal of vegetative cover, or suppression of natural disturbance regimes, seem to promote opportunities for invasive species.

Wildland Fire

Fire Condition Classes

Fire condition classes are a function of the degree of departure from historical fire regimes resulting in alterations of key ecosystem components such as species composition, structural stage, stand age, and canopy closure. Some of the activities that cause these departures include: fire exclusion, timber harvesting, grazing, introduction and establishment of exotic plant species, insects and disease (introduced or native), or other past management activities. Three general condition classes are identified based on four inputs: fire regimes relative to historic range, ecosystem stability relative to intact functioning components, fire frequency relative to historic range, and vegetation attributes (species composition and structure) relative to historic range.

Condition class	Fire regime	Ecosystem stability	Historic fire frequency	Vegetation attributes
1	Near normal	High	Within 1 interval	Within historic range
2	Moderately altered	Moderate	Departure of more than one interval	Moderately altered from historic range
3	Significantly altered	Low	Departure of multiple intervals	Significantly altered from historic range

Wildland fire potential 2012

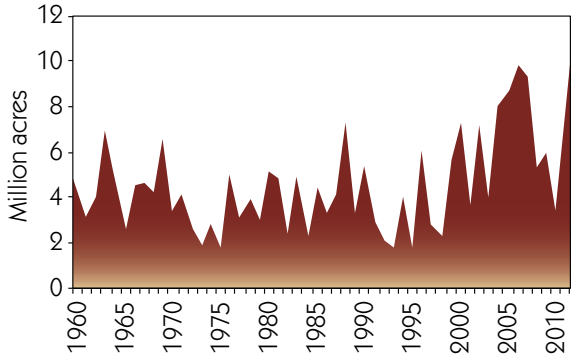
Very low
Low
Water
Very High
High
Moderate
Non-burnable

Wildland fire potential in the coterminous United States, by risk class, 2012.
(Source: Fire Modeling Institute 2013)

Fuel Reduction

Years of fire suppression and other management practices have resulted in increased undergrowth and tree density (both live and dead) creating high fuel levels that have in turn contributed to high-intensity fires that have threatened property, natural resources, and the public. About 12 percent of coterminous U.S. forest land is currently at a high or very high risk for wildfire (http://www.firelab.org). In response to the risks posed by heavy fuel loads, the National Fire Plan (NFP) was established to provide a long-term program of hazardous fuels reduction on Federal and adjacent lands. The NFP emphasizes cooperation and collaboration among Federal agencies; State,

local, and tribal governments; and other stakeholders to achieve the fuel reduction goals and objectives. Reducing hazardous fuels lessens the risk to humans, important landscapes, and municipal watersheds as well as improving forest and rangeland health.



Annual area of wildland fire in the United States, 1960–2011.

Wildland-Urban Interface

Wildland-urban interface (WUI) communities exist wherever homes and businesses are built among trees, brush, and other flammable vegetation. Historically aggressive and effective wildfire suppression has resulted in increased undergrowth and density of trees creating high levels of fuels. In these conditions, fires can move rapidly into the interface areas. A key element in reducing threats to these WUI areas and restoring fire to its natural role in the environment is community education and involvement. The Forest Service and the U.S. Department of the Interior agencies in partnership with the State foresters administer a variety of programs that address living with fire in the WUI.

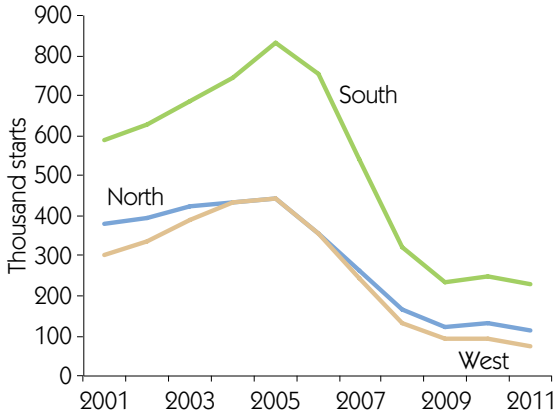
Timber Products and Harvesting

According to the American Forest and Paper Association, the U.S. forest products industry employs about 1 million workers and accounts for approximately 6 percent of the total U.S. manufacturing gross domestic product, or GDP, placing it roughly on par

with the automotive and plastics industry. The forest products industry is among the top 10 manufacturing sector employers in 48 States and generates more than $200 billion a year in sales and about $54 billion in annual payroll. In 2011, it recovered 66.8 percent of paper consumed and is the leading generator and user of renewable energy.

Housing Market Effect on U.S. Forestry

The most significant event in recent years that affected the U.S. forest products industry was the collapse of the housing market and subsequent recession. The U.S. forest products industry experienced a downturn in output to its lowest level in decades. After record highs, a 75-percent drop in the number of single-family housing starts marked the nationwide housing market decline in 2005.

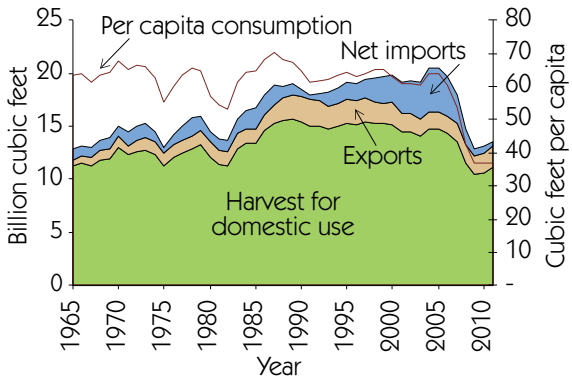


Single-family housing starts, 2001–2011.

The housing situation, coupled with the movement of furniture production to other countries, contributed to sharp declines in solidwood-product output. Meanwhile, globalization of manufacturing and expanded use of electronic communication media contributed to a decline in U.S. pulp, paper, and paperboard output. Job losses in forestry and related economic sectors exceeded 1 million, or nearly 9 percent of all recession-related unemployment. Further fallout came with the temporary and permanent closure of nearly 1,000 wood-processing mills.

Solid Wood and Paper

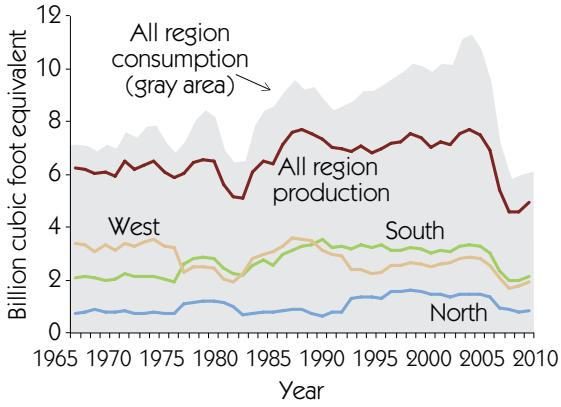
Solidwood and paper products consumed in the United States require both domestic and imported roundwood harvest, plus recycled paper and solidwood products. Since the early 1990s, roundwood harvest for export has declined, and roundwood equivalent of imports has increased. Domestic roundwood harvest increased from 1950 through the mid-1980s, peaking at 15.6 billion cubic feet (ft^3) in 1989, and has remained steady until the recent economic downturn when roundwood harvest declined to 10.5 billion ft^3 by 2009. Roundwood harvest increased to 11.1 billion ft^3 by 2011.



Total and per capita roundwood consumption, by category, 1965–2011.

Lumber

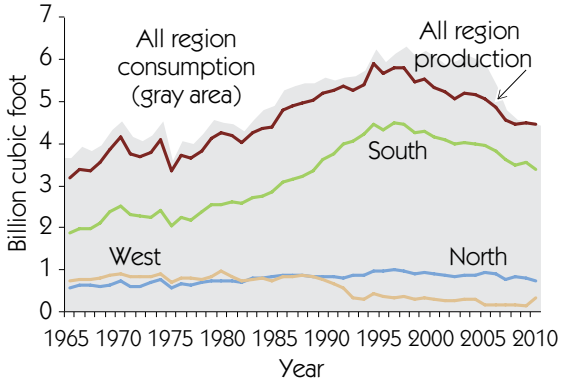
In 2009, lumber production hit the lowest level since 1981 at 5.1 billion ft^3 (30 billion board foot equivalent). This level has not been a normal production level since the 1950s. The early 1980s was a milder recession than the most recent one.



Lumber production and total lumber consumption, by region, 1965–2011.

Pulpwood

While pulpwood production remained relatively stable during the recession, it had declined sharply in the late 1990s and today, like lumber, is at a nearly 30-year production low at 4.5 billion ft^3. While lumber was up in 2011, the pulp sector remained down.



Pulpwood production and total pulpwood consumption, by region, 1965–2011.

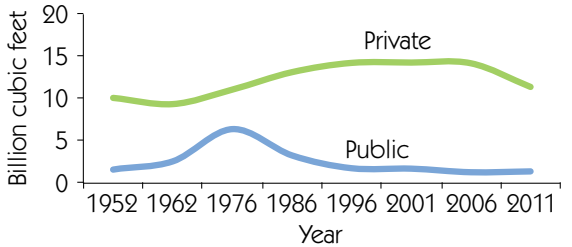
Consumption, Imports, and Exports

Per capita consumption of wood and paper products in 2011 was 907 pounds (lb), down from 1,480 lb in 2006. In addition, 157 lb of fuelwood was consumed per capita in 2011, a 20-percent reduction from 2006.

Net imports to the United States increased from slightly more than 1.0 billion ft^3 in 1965 to 4.2 billion ft^3 in 2005 before declining to slightly more than 400 million ft^3 in 2011. The large decline between 2005 and 2011 was mostly the result of the economic recession that began in 2006. By 2011, net wood imports were less than 500 million ft^3. In 2005, the United States supplied 69 percent of the Nation's timber needs. By 2011, this number increased to 79 percent while imports declined relative to total consumption.

Shifting Timber Harvest

Recent changes in public land policy have had significant impacts on private forests. As harvesting declined on public lands in the West, harvesting increased on private lands in the East, particularly in the South. Overall, domestic harvesting has remained steady to declining in the past decade, and increased imports and paper recycling supported increased demand.

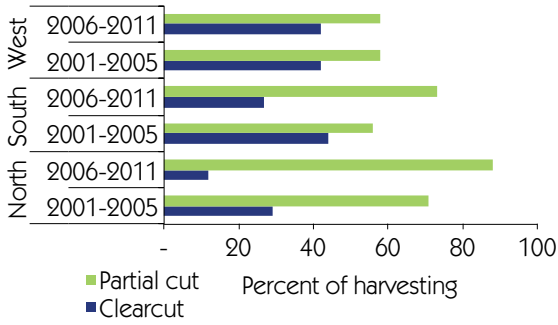


Growing stock removals in the United States, by owner group, 1952–2011.

Harvest Methods and Efficiency

Timber harvests typically occur on about 11 million acres annually. Selective harvesting is prevalent on 61 percent of harvested acres in the United States, and clearcutting occurs on the remaining 39 percent. Clearcutting is most prevalent in areas of managed plantations in the South and areas in the North where pioneer species such as aspen, jack pine, and spruce-fir—which need open sunlight to regenerate—are being managed for timber production. In the West, clearcutting is generally followed by planting to augment natural regeneration. The recent recession not only reduced overall harvesting by 20 percent but also shifted

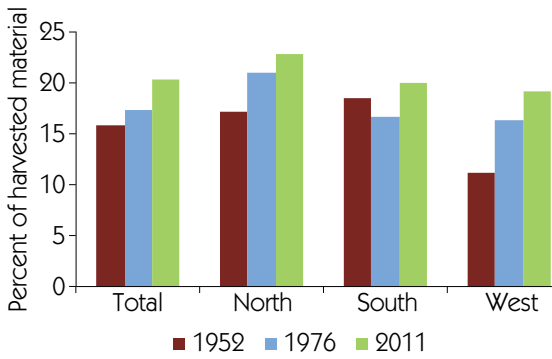
harvesting regimes toward more partial cutting as demand declined. The trend in increased partial cutting is slowly reversing and clearcutting is expected to return to about one-third of all harvesting in the United States.



Proportion of harvested timber land in the United States by method of harvest for periods 2001–2005 and 2006-2011

Logging Residues

Logging residues are portions of trees' stems left behind after logging and are being increasingly considered by companies as a possible resource for bioenergy use. Overall, residues have ranged from an equivalent of 20 to 30 percent of the material taken for products and 15 to 20 percent of total harvest material. In 2011, logging residues totaled 3.7 billion ft^3. Even after leaving a portion of residues for nutrient cycling and soil protection, residue volume has the potential to be a significant resource for wood energy.



Logging residues in the United States as a percent of total harvest, by region, 1952, 1976, and 2011.

Nontimber Forest Products

The gathering of nontimber forest products is a significant use of the Nation's forests that affects forest ecosystems and the economies of households and communities that depend on them. The products include herbal medicines, human and animal food, floral home decorative items, resins and oils for aromatics, arts and crafts, and furs for clothing. The harvest of these products from the Nation's forests is significant for many Americans, who benefit from these products for their recreational, commercial, subsistence, and cultural values.

***Herbal Medicines*—**The spiritual and physical healing of people around the world depends on native medicinal plants. During the past several decades, herbal medicinal products have had an unprecedented increase in demand, unlike many other nontimber forest products. The sale of herbal medicines provides much-needed income for rural harvesters and feeds a multibillion-dollar industry in the United States. The increased harvesting of this native flora has sparked concern for the long-term sustainability of this precious natural resource.

***Food*—**Forest-foraged foods for urbanites is a phenomenon that may have an extraordinary impact on forest resources. This burgeoning industry depends on a steady and reliable source of native plants, some of which may only be available for a short time each year. Although forest-foraged foods may provide a small share of total U.S. food consumption, the cultural and ecological significance is tremendous. Hunting big game (large mammals), small game (rabbits, squirrels, etc.), and migratory game birds (ducks, geese, etc.) to put food on the family table has a long tradition in the United States. Healthy forage for livestock is particularly important in management of Federal lands.

***Floral Decoratives*—**Native plants harvested from U.S. forests for their aesthetic values adorn families' homes, churches, and workplaces throughout the year. The U.S. floral industry uses thousands of pounds of greenery, leaves, twigs, and bark and millions of wild-harvested plants annually. A strong regional character of production and use persists, depending on species availability.

***Aromatic Resins and Oils*—**Extracting essential oils from plants for commercial uses as fragrances has a long history in domestic and international markets.

Industrial chemists use aromatic compounds derived from native plants in air fresheners, bath and body products, inhalants, massage oils, perfumes, and food flavoring.

***Arts and Crafts*—**Arts and crafts are an integral part of innumerable traditions: use of bark, willow, and branches in making baskets, masks, and traditional and ceremonial dress by Native Americans; dollmaking and basketweaving by crafts people in the Appalachians; and production of furniture, birdhouses, bowls, and other well-known and admired products.

***Fur for Clothes*—**At one time, the harvest and trade in animals for their fur was a huge business. During the past 30 years, trapping animals for fur has declined sharply. This trend is expected to continue as consumer preferences change.

In general, nontimber forest product harvests go mostly undocumented, particularly on private forest lands. Few efforts to manage the harvest of these products as a natural resource have been made. Concern among scientists is growing for the conservation and sustainability of the native flora and fauna, because harvesting may have significant effects on forest ecosystems.

Selling wild ramps at market.
Jim Chamberlain, Forest Service

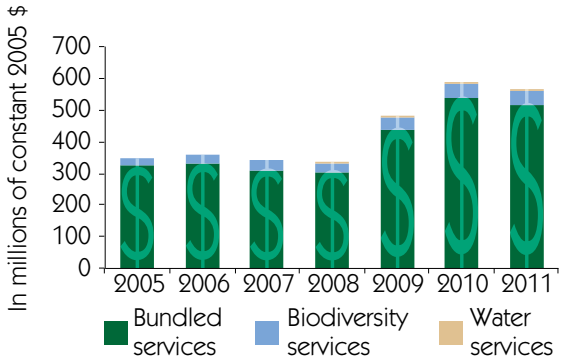
Ecosystem Services

Forests provide a variety of critical services to human societies, including carbon sequestration, water purification, and habitat for millions of species. Because forest landowners have traditionally not been paid for the services their land provides to society, financial incentives are usually too low to sustain production of services at optimal levels. To remedy this issue, a variety of public and private proposals to provide direct payments to landowners have emerged as a strategy to preserve, protect, and restore these ecosystem services.

Large-scale government payments for ecosystem services (PES) were initiated in the 1985 Farm Bill with the creation of the Conservation Reserve Program followed by the Wetlands Reserve Program, Forest Legacy Program, the Forest Stewardship Program, and the Stewardship Incentives Program in the 1990 Farm Bill. Nearly 20 Federal programs currently pay private forest landowners to enhance ecosystem services through improved forest management, retention

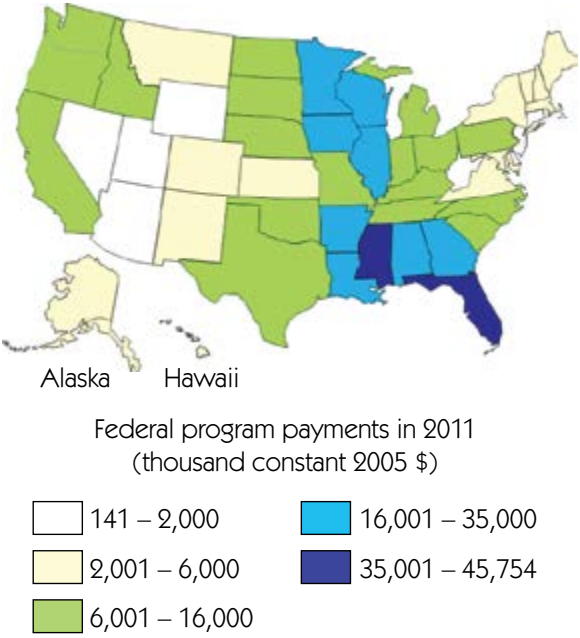
of lands in forest or undeveloped uses, protection of soil and water quality, preservation of forested wetlands, and wildlife habitat improvement. In addition, many privately funded PES programs are operated in the United States. Conservation organizations have been paying forest landowners for decades (through conservation easements) to provide or protect ecosystem services. In addition, a thriving market has long existed comprising hunters purchasing the rights to access wildlife habitat and species through hunting leases with private landowners, especially in the South.

The *National Report on Sustainable Forests* will provide details on PES by Federal and State agencies as well as payments in the private sector. This brochure provides an overview of total Federal Government payments to private landowners from 2005 to 2011. Forest PES by the Federal Government increased about 53 percent from $340 million in 2005 to $520 million in 2011. In 2007, Federal PES accounted for 20 percent of all payments (public and private) to private forest landowners that would translate to total payments from all sources of about $2.6 billion in 2011.



Federal payments to private forest landowners for ecosystem services, 2005–2011.

The distribution of payments among States for payments ecosystem services from the Federal Government in 2011 is shown in the following map. Connecticut landowners received the lowest payments ($149,000), while Florida landowners received the highest ($49 million).



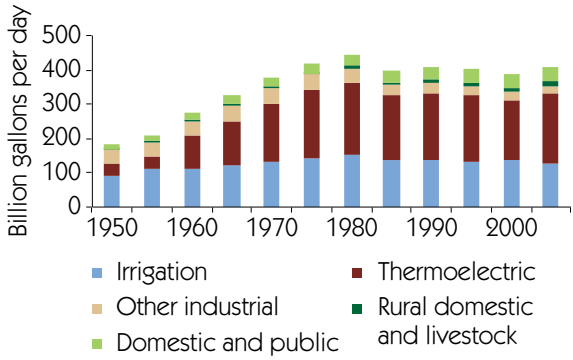
Federal payments to private forest landowners for ecosystem services, by State, 2011.

Water Supplies

In the coterminous United States, 24 percent of the water supply originates on Federal land. Land owned by the Forest Service constitutes 18 percent of originating water sources. Regardless of ownership, about 53 percent of the coterminous water supply originates on forest land. National forests and grasslands supply 51 percent of the water supply in the West.

Water Uses

Estimates of U.S. freshwater use during 2005 indicate that about 350 billion gallons per day were withdrawn for all uses. Since 1985, total freshwater withdrawals increased only 4 percent, while freshwater withdrawals have stabilized for the two largest uses—thermoelectric power and irrigation. In 2005, freshwater withdrawals for these two uses were each about 41 percent of total withdrawals. On a per capita basis, total freshwater withdrawals decreased by 16 percent from 1985 to 2005.



U.S. water uses, by type.

Watershed Management

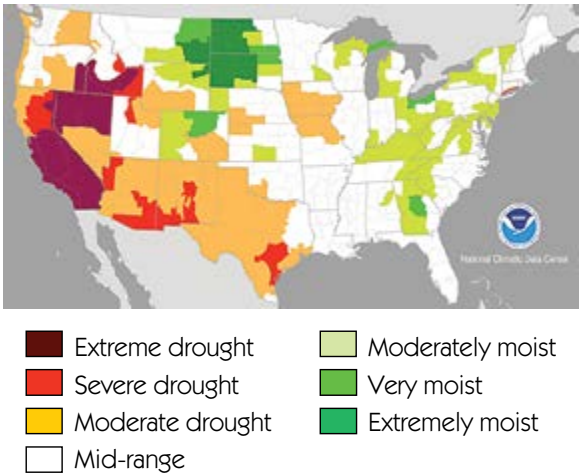
Water quality is becoming an increasingly serious concern among scientists and policymakers in the United States, as well as globally. High-quality watersheds trap sediment and slow runoff, and they provide cooling shade and excellent habitat for wildlife, fish, and plants. Potential watershed management issues include habitat loss and fragmentation, hydrologic alterations, nutrient enrichment of surface waters, and pathogens and toxins. Forests offer significant mitigation opportunities for water management.

Effective watershed management must be based on a planning process that integrates both scientific analysis and public participation. Explore current efforts in watershed management at http://www.partnershipresourcecenter.org/watersheds/index.php.

Drought

Many forests have had fires of unprecedented intensity and extent, and this situation is partially the result of forest management practices that have permitted decades of deadwood (fuels) to accumulate. These problems are exacerbated by climate variability in the form of prolonged periods of drought that have left forests in tinder-dry conditions, and thus more susceptible to intense fires. Public resource agencies are shifting their fire policies from complete suppression to recognition that fire is an integral component of the landscape. Presuppression forests experienced fires

more frequently, but these fires were less destructive than are those experienced post-suppression. These less intense fires served as a means of keeping fuels from accumulating on the forest floor and maintaining low stand density. The composite Palmer Drought Index shown in the following graphic indicates that much of the West is in a medium to high drought stage and patchy areas of the East are also at heightened risk.

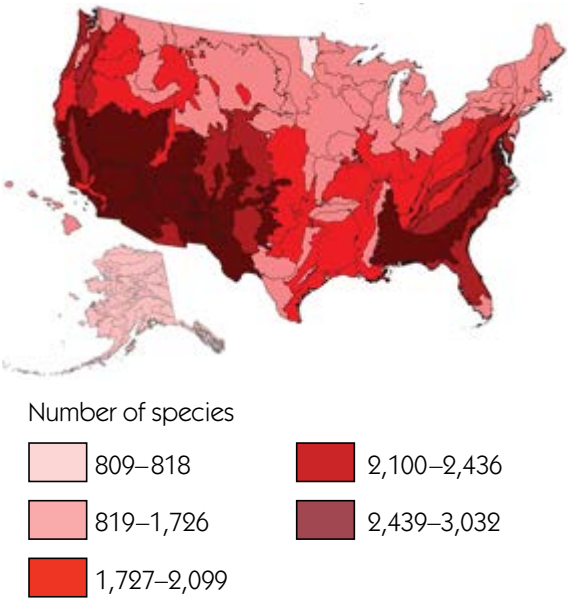


Palmer Hydrological Drought Index Long-term Conditions, 2014 (National Oceanic and Hydrological Administration)

Forest Wildlife

Species Richness

A count of species is a basic and easily understood measure of biological diversity. The following species richness graphic shows where diversity is relatively high or relatively low based on recorded occurrences and geographic ranges of species and their intersection with ecoregional boundaries. Data on the distribution of 9,195 vascular plants and 1,165 vertebrate species associated with forest habitats indicate notable differences in the number of species that can be supported across major U.S. ecoregions. The number of forest-associated species is highest in the Southeast, the arid Southwest, and the Mediterranean climate regions of coastal California.



Geographic variation in the number of forest-associated species occurring within ecoregions for all taxa. (Alaska and Hawaii are shown at a difference scale for presentation.)

Wildlife Trends

Recent historical wildlife trends have varied depending on the species. A general pattern of increasing populations and harvests has been observed among big game and waterfowl species. For many small-game species, particularly among upland game birds, populations and harvests have seen declines. Among species that are not consumptively taken for sport, subsistence, or profit—what are generally referred to as nongame—we lack comprehensive monitoring data. A notable exception is breeding birds. For the 426 species with sufficient data to estimate nationwide trends, 45 percent had stable abundances since the mid-1960s. Among bird species with evidence for an abundance trend, more had declining trends (31 percent) than increasing trends (24 percent). Recent

U.S. trends in species of conservation concern indicate that overall biodiversity has continued to erode. Since 2000, 278 species became formally listed as threatened or endangered, with the greatest increases made among plants, fish, insects, mollusks, and amphibians.

Recreational Use of Forests

Recreation activities are increasingly important as a source of forest-based employment and income. Engaging in outdoor recreation and tourism in forests tends to build support among participants for protecting and managing forests, indirectly building support for sustainable forests.

Twenty-six forest recreation activities have been inventoried (Bowker et al. 2012; Cordell 2012), and those with the greatest numbers of visits are walking for pleasure, viewing/photographing natural scenery, viewing/photographing forest vegetation, bird watching, watching wildlife, hiking, visiting wild areas, off-highway driving, family gatherings, and visiting nature centers. The indexed number of recreation activity days for these activities ranges from more than 8.5 billion (walking for pleasure) to just under 760 million (visiting nature centers, etc.). Snowmobiling, mountain climbing, cross-country skiing, rock climbing, and snowshoeing account for much smaller numbers of activity days (ranging between about 19 to 63 million). Americans appear to be strongly interested in viewing and photographing forest natural life. (The index of recreation activity days measures all incidents of participation in an activity across the population and days of the year and places.) Across all activities, the estimated percentage of recreation activity days that occur in urban forests ranges between 16 and 45 percent. The lowest percentages in urban forests are activities such as hunting, camping, and backpacking. The highest percentages in urban forests include activities such as walking, picnicking, family gatherings, and visiting nature centers.

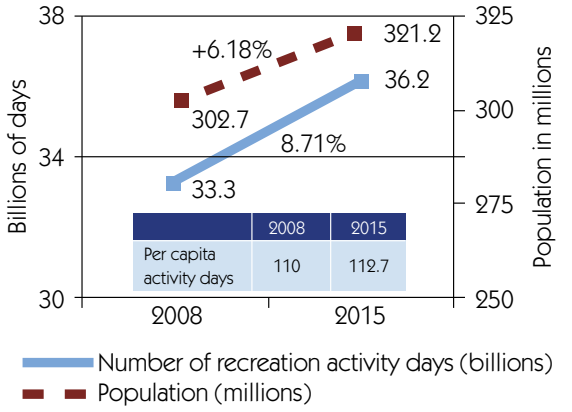
Annual forest recreation days by activity, and estimated percentages in public and urban forests, 2007–15.*

Forest recreation activity (million days)	2007/ 2008	2015 projected	Percent change	Percent on public forests	Percent on urban forests
Walk for pleasure	7,493	8,504	14	54	45
View natural scenery	6,171	6,596	7	62	32
View/photograph birds	3,738	4,060	9	51	38
View other wildlife	3,087	3,300	7	58	32
Day hiking	1,235	1,360	10	76	34
Visit wilderness areas	948	1,007	6	76	25
Off-highway driving	838	892	7	50	23
Mountain biking	463	355	(23)	60	32
Picnicking	456	490	8	68	44
Developed camping	356	383	8	73	21
Big game hunting	280	286	2	46	17
Backpacking	199	211	6	79	22
Visit historic Sites	183	203	11	60	39
Horseback on trails	178	193	9	51	34
Cross country skiing	42	40	(4)	61	34

** Recreation activity day = recreation in each activity equivalent to the activity completed by one person in one day. Sources: 2007–08 NSRE data were used to estimate percentages of visits on public and urban forests. NSRE is the National Survey on Recreation and the Environment. Projections to 2015 were from Bowker et al 2012 (http://www.treesearch.fs.fed.us/pubs/40935).*

The baseline values (2007/08) were taken from the National Report on Sustainable Forests, 2010. The 2015 estimates were derived using projections provided in Bowker et al.'s (2012) and rates published in Cordell (2012) for activities not covered by Bowker.

The following figure summarizes annual activity days of forest recreation across the activities shown above in the previous table. In 2008, the estimated index of total days was 33.3 billion. (This index reports billions because individuals across the U.S. population can participate in a number of different activities in many places on any given day, 365 days a year). Projected for 2015, the total activity days is 36.2 billion, a forecast of an overall percentage increase of 8.7 percent. In this same period, population increases by 6.18 percent, from almost 303 million in 2008 to a forecast of 321 million in 2015. Activity participation is projected to increase at a somewhat greater rate than population by 2015. Percentages projected to rise fastest are gathering mushrooms/berries, walking for pleasure, visiting historic/prehistoric sites, and mountain/rock climbing. Projected to decline were mountain biking and snowmobiling.



Trend in population (in millions) and annual forest recreation activity days (in billions), 2008 to 2015.

Forests of the Caribbean and Pacific Islands

The U.S. Caribbean Islands are composed of Puerto Rico and the U.S. Virgin Islands. In general, the Caribbean Islands are a 3,900-mile (mi) arc of islands, tectonically uplifted from the sea floor separating the Atlantic Ocean from the Caribbean Sea. Low-lying islands often are capped with limestone from ancient coral reefs, and other islands exhibit volcanic activity that has pushed up steep peaks that divert the moisture-laden northeasterly trade winds upward, greatly increasing rainfall.

Location of islands associated with the United States.

The U.S.-affiliated Pacific Islands include American Samoa, Guam, the State of Hawaii, the Republic of the Marshall Islands, the Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, and the Republic of Palau. These islands span a vast and diverse area from Hawaii, 3,900 mi west of the U.S. mainland, to Palau, about 566 mi east of the Philippines. Land masses vary widely and include small coral atolls; small sand islands; moderate-sized islands of mixed limestone and volcanic substrates; and large, high-elevation, volcanic islands.

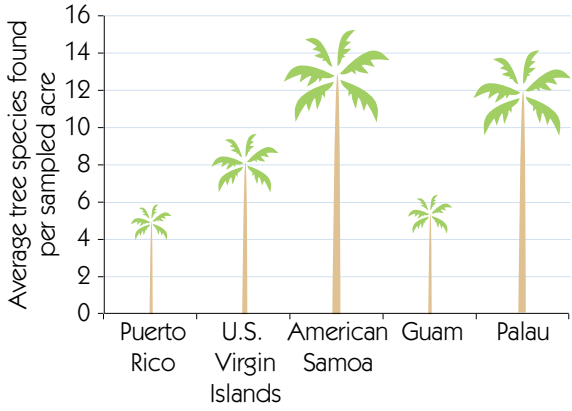
The challenges of mainland forests—such as land use change, altered fire regimes, nonnative species invasions, insect and disease outbreaks, climate change, and other human-caused disturbances—become critical for societies with restricted, more immediately finite resource bases like those found on these islands.

Land and forest area of the U.S. Caribbean and Pacific Islands.

Region and island group	Land area	Forest area	Forest cover
	Acres (thousands)		*Percent*
Caribbean			
Puerto Rico	2,192	1,261	58
U.S. Virgin Islands	86	52	61
Pacific			
American Samoa	48	44	90
Guam	136	64	47
Palau	112	97	87
CNMI	74	54	73
FSM	150	77	51
RMI	44	43	97
Hawaii	4,127	1,491	43
Total	**6,968**	**3,182**	**67**

CNMI = Commonwealth of the Northern Mariana Islands. FSM = the Federated States of Micronesia. RMI = Republic of the Marshall Islands.

The naturally high species diversity of tropical forests has been further augmented by human introduction of tree species from around the globe, some are beneficial and others are invasive.



Species diversity per sampled acre in the Caribbean and Pacific Islands.

The most important forestry concerns within the Islands involve losses of forest cover owing to urbanization, damages from invasive species, and the erosion of soils with subsequent siltation of coral reefs.

Terms

***forest land*—**Land at least 120 feet (ft) (37 meters [m]) wide and at least 1 acre (0.4 hectare) in size with at least 10-percent cover (or equivalent stocking) by live trees including land that formerly had such tree cover and that will be naturally or artificially regenerated. Trees are woody plants having a more or less erect perennial stem(s) capable of achieving at least 3 inches (in) (7.6 centimeters [cm]) in diameter at breast height, or 5 in (12.7 cm) diameter at root collar, and a height of 16.4 ft (5 m) at maturity in situ. Forest land does not include land that is predominantly under agricultural or urban land use.

***growing stock volume*—**Live trees on timber land of commercial species meeting specified standards of quality and vigor. Cull trees are excluded from the volume. The volume includes only trees 5 in in diameter or larger at 4.5 ft above the ground.

***growth (net annual)*—**The net volume increase of growing stock trees during a specified year. Components include the increment in net volume of trees at the beginning of the specific year surviving to its end, plus the net volume of trees reaching the minimum size class during the year, minus the volume of trees that died during the year, and minus the net volume of trees that became cull trees during the year.

***hardwood*—**A dicotyledonous tree that is usually broad leaved and deciduous.

***International Union for Conservation of Nature (IUCN) protection categories*—**The protected area categories are—

> **Category I** is defined as (1) an area of land and/or sea that possesses some outstanding or representative ecosystems, possesses geological or physiological features and/or species, or is available primarily for scientific research and or environmental monitoring, or (2) a large area of unmodified or slightly modified land and/or sea, retaining its

natural character and influence, without permanent or significant habitation, that is protected and managed to preserve its natural condition.

Category II is a natural area of land and/or sea designated to (1) protect the ecological integrity of one or more ecosystems for present and future generations, (2) exclude exploitation or occupation critical to the purposes of designation of the area, and (3) provide a foundation for spiritual, educational, recreational, and visitor opportunities, all of which must be environmentally and culturally comparable.

Category III is an area of land and/or sea containing one or more specific natural or natural/cultural features that are of outstanding or unique value because of their inherent rarity, representative or aesthetic qualities, or cultural significance.

Category IV is an area of land and/or sea that is subject to active intervention for management purposes to ensure the maintenance of habitats and/or to meet the requirements of specific species.

Category V is an area of land with coast and sea, as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological, and/or cultural value and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance, and evolution of such an area.

Category VI is an area of land and/or sea containing predominantly unmodified natural systems, managed to ensure long-term protection and maintenance of biological diversity, while providing a sustainable flow of natural products and services to meet community needs.

***logging residues*—**The unused portions of growing-stock trees that are cut or killed during logging and left in the woods.

***mortality*—**The volume of sound wood in growing stock trees that died from natural causes during a specified year.

***national forest*—**An ownership class of Federal lands, designated by Executive order or statute as national forests or purchase units, and other lands under the administration of the Forest Service.

***other Federal*—**An ownership class of Federal lands other than those administered by the Forest Service. Primarily lands owned by the Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, and the Departments of Energy and Defense.

***other forest land*—**Forest land other than timber land and reserved forest land. It includes available land that is incapable of producing annually at least 20 ft^3 per acre (1.4 m^3/hectare) of industrial wood under natural conditions because of adverse site conditions such as sterile soils, dry climate, poor drainage, high elevation, steepness, or rockiness.

***removals*—**The net volume of growing stock trees removed from the inventory during a specified year by harvesting, cultural operations such as timber stand improvement, or land clearing.

***reserved forest land*—**Forest land that is withdrawn from timber utilization through statute, administrative regulation, or designation. It does not include all land in International Union for Conservation of Nature protection categories.

***roundwood products*—**Logs, bolts, and other round timber that are generated from harvesting trees for industrial or consumer use.

***softwood*—**A coniferous tree, usually evergreen, that has needles or scale-like leaves.

***timber land*—**Forest land that is capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation.

(Note: Areas qualifying as timber land are capable of producing in excess of 20 ft^3 per acre per year of industrial wood in natural stands.)

***woodland*—**Land at least 120 ft (37 m) wide and at least 1 acre (0.4 hectares) in size with sparse trees capable of achieving 16.4 ft (5 m) in height with a tree canopy cover of less than 10 percent combined with shrubs at least 6 ft (2 m) in height to achieve an overall cover of more than 10 percent of woody vegetation. It does not include land that is predominantly under agricultural or urban land use.

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Web Resources

USDA Forest Service
http://www.fs.fed.us

Forest Inventory and Analysis
http://fia.fs.fed.us

National Resource Assessment
http://www.fs.fed.us/research/rpa

Forest Health
http://www.fs.fed.us/foresthealth/
http://www.fs.fed.us/foresthealth/technology/nidrm.shtml

National Report on Sustainable Forests
http://www.fs.fed.us/research/sustain

Recreation/Wilderness
http://www.srs.fs.usda.gov/trends
http://www.fs.fed.us/recreationh

Forest Wildlife
http://www.fs.fed.us/research/rpa

Fire
http://www.nifc.gov/
http://www.firelab.org/project/wildland-fire-potential

Forest Products
http://www.fia.fs.fed.us
http://www.fpl.fs.fed.us

Nontimber Forest Products
http://www.sfp.forprod.vt.edu
http://www.fao.org/forestry/site/6367/en
http://www.ntfpinfo.us/

Forest Ownership
http://www.fia.fs.fed.us/nwos/

Protected Areas
http://www.IUCN.org
http://www.consbio.org

Water Resources
http://water.usgs.gov/watuse
http://www.fs.usda.gov/main/prc/issues#Water
http://www.drought.unl.edu

Global Forest Information
http://www.fao.org/forestry/en/
http://www.fao.org/forestry/databases/en/

Urban Forests
http://www.itreetools.org
http://www.nrs.fs.fed.us/data/urban/

http://fia.fs.fed.us
http://www.fs.fed.us/research/rpa
http://www.fs.fed.us/research/sustain