Rare _____ P < 0.1
Transitional _ 0.4 ≤ P < 0.6
Interior _____ 0.9 ≤ P < 1.0
Patch _____ 0.1 ≤ P < 0.4
Dominant ___ 0.6 ≤ P < 0.9
Core _____ P = 1.0

Notes: The percent change of area in the interior plus core categories from 2001 to 2011 is shown at the end of the bar. Forest type groups are sorted by decreasing percentage of interior plus core categories. Area-weighted statistics for all forest type groups are shown for comparison.

Figure 1-15. Fragmentation is indicated by the distribution of total forest type group area among six fragmentation categories. Fragmentation categories are defined by the proportion (P) of the surrounding 40-acre neighborhood that had forest cover in 2011.

Woodlands

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Historically the primary interest area for national inventories was timber. Consequently, the national inventory framework and collection protocols were focused on productive timberlands (USDA Forest Service 2005). Over time, information such as estimations of carbon sequestration, wildfire fuel loads, and nontimber forest products and services (e.g., biofuels and wildlife habitat) has become topics of increasing interest. The FIA program—the national inventory used in the United States—broadened the focus of its surveys to include non-timberland forests, including woodlands, better aligning with these changing focus areas.

Woodlands generally occur in less productive growing conditions, such as the arid Southwestern United States. Woodlands provide much, if not all, of the same services provided by forests; that is, they function as important wildlife habitat, improve water quality, serve as carbon sinks (or sources, in the event of wildfires), and provide fuel during wildfire season. The species that comprise woodlands differ in characteristics from most trees. On average, woodland species tend to be slower growing, smaller in stature, and of a form with more forks and branches near the base of the tree. Woodland species often grow as clumps of stems rather than one central stem. Beyond the characteristics of the trees classified as woodland species, specific parameters pertain to classification of the land use category of woodlands, while the Resources Planning Act (RPA) derives calculations of woodland for this report from the FIA data, the FIA and RPA definitions of woodland differ somewhat, as outlined in the following paragraphs.

Forest Inventory and Analysis Definitions and Parameters

FIA defines woodlands strictly along the lines of species composition and associated forest types, and considers woodlands a subset of forest lands. The FIA recognizes nine woodland forest types: three softwood and six hardwood (table 1-1). To qualify

Table 1-1. Forest Inventory and Analysis forest types comprising the woodland forest subset.

Deciduous oak woodland
Evergreen oak woodland
Mesquite woodland
Cercocarpus woodland
Intermountain maple woodland
Miscellaneous woodland hardwoods
Pinyon-juniper woodland
Juniper woodland
Rocky Mountain juniper

as one of these woodland forest types, the majority stocking must comprise 1 or more of the 38 FIA-defined woodland tree species (table 1-2). Although woodlands will typically have less crown cover than traditional forests, they must meet the minimum crown cover threshold (10 percent) to be included in FIA forest and woodland estimations (USDA Forest Service 2014).

Table 1-2. Forest Inventory and Analysis-defined woodland species.

Woodland species common name	Woodland species scientific name
Pinchot juniper	*Juniperus pinchotii*
Redberry juniper	*Juniperus coahuilensis*
Drooping juniper	*Juniperus flaccida*
Utah juniper	*Juniperus osteoperma*
Rocky Mountain juniper	*Juniperus scopulorum*
Oneseed juniper	*Juniperus monosperma*
Ashe juniper	*Juniperus ashei*
California juniper	*Juniperus californica*
Alligator juniper	*Juniperus deppeana*
Common pinyon	*Pinus edulis*
Singleleaf pinyon	*Pinus monophylla*
Border pinyon	*Pinus discolor*
Four-leaf pine	*Pinus quadirfolia*
Mexican pinyon pine	*Pinus cembroides*
Papershell pinyon pine	*Pinus remota*
Arizona pinyon pine	*Pinus monophylla var.fallax*
Acacia spp.	*Acacia spp.*
Sweet acacia	*Acacia farmesiana*
Catclaw acacia	*Acacia greggi*
Rocky Mountain maple	*Acer glabrum*
Bigtooth maple	*Acer grandidentatum*
Texas madrone	*Arbutus xalapensis*
Curlleaf mountain-mahogany	*Cerocarpus ledifolius*
Knockaway	*Ehretia anacua*
Mesquite spp.	*Prosopis spp.*
Honey mesquite	*Prosopis glandulosa*
Velvet mesquite	*Prosopis velutina*
Screwbean mesquite	*Prosopis pubescens*
Arizona white oak	*Quercus arizonica*
Emory oak	*Quercus emoryi*
Gambel oak	*Quercus gambelii*
Mexican blue oak	*Quercus oblongifolia*
Silverleaf oak	*Quercus hypoleucoides*
Gray oak	*Quercus grisea*
Netleaf oak	*Quercus rugosa*
Bluewood	*Condalia hookeri*
New Mexico locust	*Robinia neomexicana*
Desert ironwood	*Olneya tesota*

Woodland species must meet the same diameter requirements as other trees (i.e., 5 inches) to be included in FIA estimations. Form characteristics make taking diameter at the normal location (4.5 feet from the ground) unmanageable, however, and therefore the diameters for these trees are taken at the root collar or ground level (USDA Forest Service 2014).

While notations of woodland species and woodland forest groups are made in publicly available guides, they are not highlighted or separated, making them somewhat difficult to distinguish (O'Connell et al. 2015; USDA Forest Service 2014). Thus, consumers of FIA data seeking information based in narrower or more traditional parameters of forest land may not realize that both woodland trees and forests are being included in these totals. Conversely, database users who do parse out woodlands may exclude all of the woodland forest types, including those exhibiting characteristics similar to standard trees and forests (table 1-3).

Table 1-3. Associated area differences for the Rocky Mountain region (the region with the greatest amount of woodlands), using FIA versus RPA woodland categorization.

Woodland definition used	All forests and woodlands	Woodlands	Nonwoodland forests
	Million acres		
FIA	159.6	67.1	92.5
RPA	159.7	29.0	130.6

FIA = Forest Inventory and Analysis. RPA= Resources Planning Act.

Resources Planning Act Definitions and Parameters

The woodland tree species are the same as FIA defines. For RPA, however, lands qualifying as woodland are categorized as a highly related—but completely separate—land cover, rather than a subset of forest lands. RPA considers lands meeting the following criteria to be woodlands: classified as one of the nine FIA-defined woodland forest types; having a site productivity level of less than 20 cubic feet per acre per year; located in one of nine ecological provinces: Colorado Plateau Semidesert Province, Southwest Plateau and Plains Dry Steppe and Shrub Province, Chihuahuan Semidesert Province, American Semidesert and Desert Province, Great Plains-Palouse Dry Steppe Province, Great Plains Steppe Province, Intermountain Semidesert and Desert Province, and Intermountain Semidesert Province (McNab et al., comps. 2007); and having average tree heights less than 16.4042 feet (table 1-3). This definition is used for the amounts and descriptions in the following section.

Area and Location of Woodlands

The United States has a total of 57 million acres of woodlands, about 3 percent of total land area. The woodlands occur in 14 States, 3 of the 4 major RPA assessment regions, and 5 of the 9

subregions (figure 1-16). At 22 million acres, or 39 percent of total woodland acres, Texas accounts for more woodlands than any other State. Part of this is due to the large size of Texas. Taken as a percentage of total land area, Texas has 13 percent of land area in woodlands, followed by Utah (12 percent), Arizona (11 percent), and New Mexico (10 percent). The intermountain subregion contains the majority of woodland acres (figure 1-17), and the Rocky Mountain contains the most by broader region.
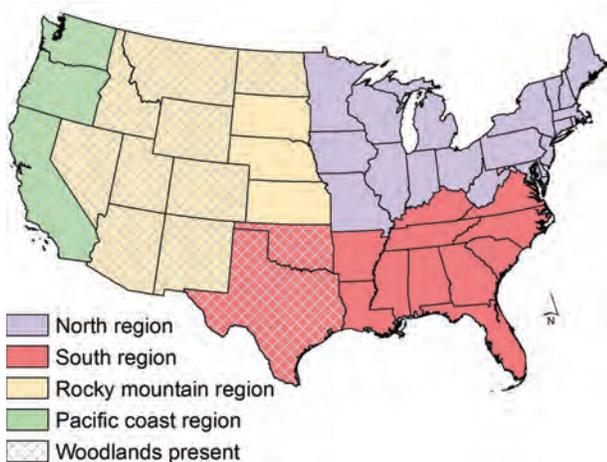

Figure 1-16. Map of conterminous United States showing States and regions with woodlands present (Alaska and Hawaii contained no woodland area).
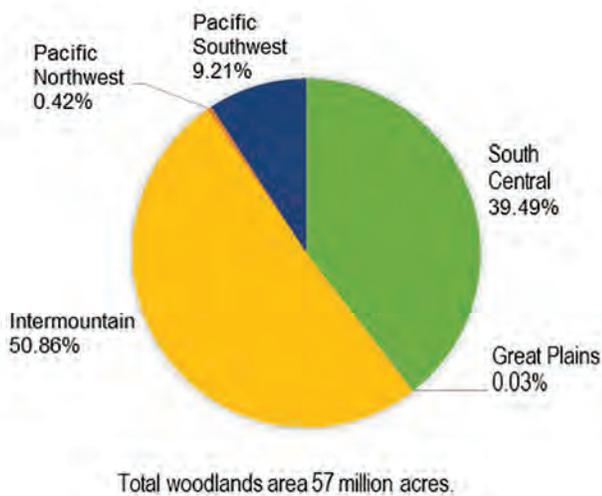

Figure 1-17. Distribution of woodland areas among subregions.

Woodland Distribution According to Human Factors

Woodlands occur across the urban to rural spectrum (as defined by county population). They occur most often in counties whose populations reside in small towns, and least often in counties whose majority populations are in large towns (figure 1-18).

Nearly one-half of woodlands are owned by private noncorporate land owners (figure 1-19). As woodlands inhabit low productivity sites, and comprise tree species uncommon in timber markets, it is no surprise that only 2,000 of the 57 million acres of woodlands are planted. All of the planted acres occur on national forest land.
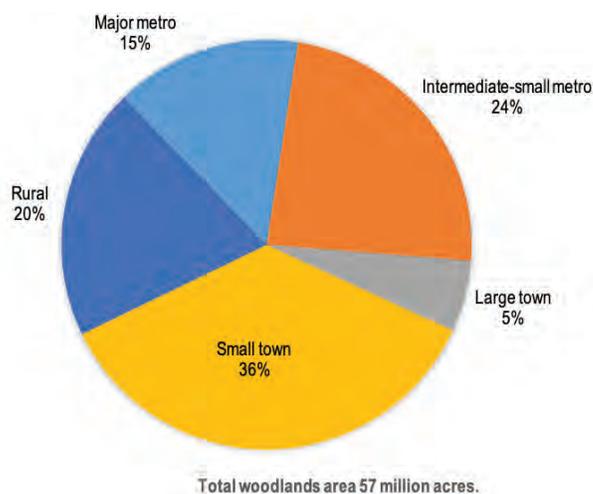

Figure 1-18. Proportion of woodlands located along urban to rural continuum, based on predominant county population.
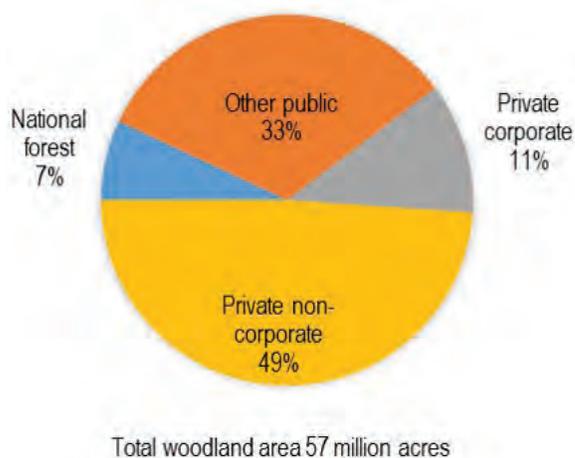

Figure 1-19. Ownership of woodland acres.

▲ The first significant snowfall in 2012 for the Spring Mountains National Recreation Area, Humboldt-Toiyabe National Forest, NV, occurred in December and dusted Cathedral Rock with a frosty layer of white. USDA Forest Service photo by Michael Balen.

Amount of Woodland by Size Class

Almost 27 million of the 57 million acres of woodland, or about 47 percent, are comprised of woody plants averaging greater than 10.0 inches in diameter. Interestingly, stands with predominately sapling-sized stems make up nearly as much of the total area, at 24 million acres, with woody vegetation in the 5.0–9.9 inch class accounting for less than 11 percent of woodland area (figure 1-20).
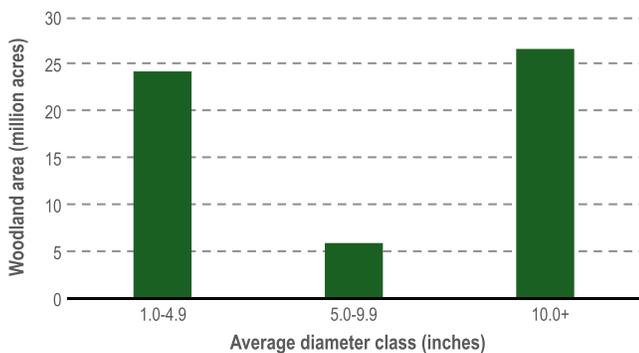

Figure 1-20. Amount of woodland area by size class. Total woodland area: 57 million acres.

Woodland Species Contribution to Biomass

Aboveground biomass was calculated for all forest and woodlands and broken down by component. One component was woodland species. In total, woodland species greater than 5 inches diameter and occurring on forest and woodlands hold approximately 570.3 million dry short tons of aboveground biomass. This is only about 2 percent of the total aboveground dry biomass in the United States. The proportional contri-bution is much greater in woodland heavy areas, however. In Nevada, for example, 79 percent of the biomass reported came from woodland species (table 1-4).

Table 1-4. Portion of forest land biomass from woodland species (in States with woodland proportions greater than 2 percent).

State	Percent
Nevada	79
Arizona	40
Utah	37
New Mexico	35
Texas	14
Colorado	12
North Dakota	4