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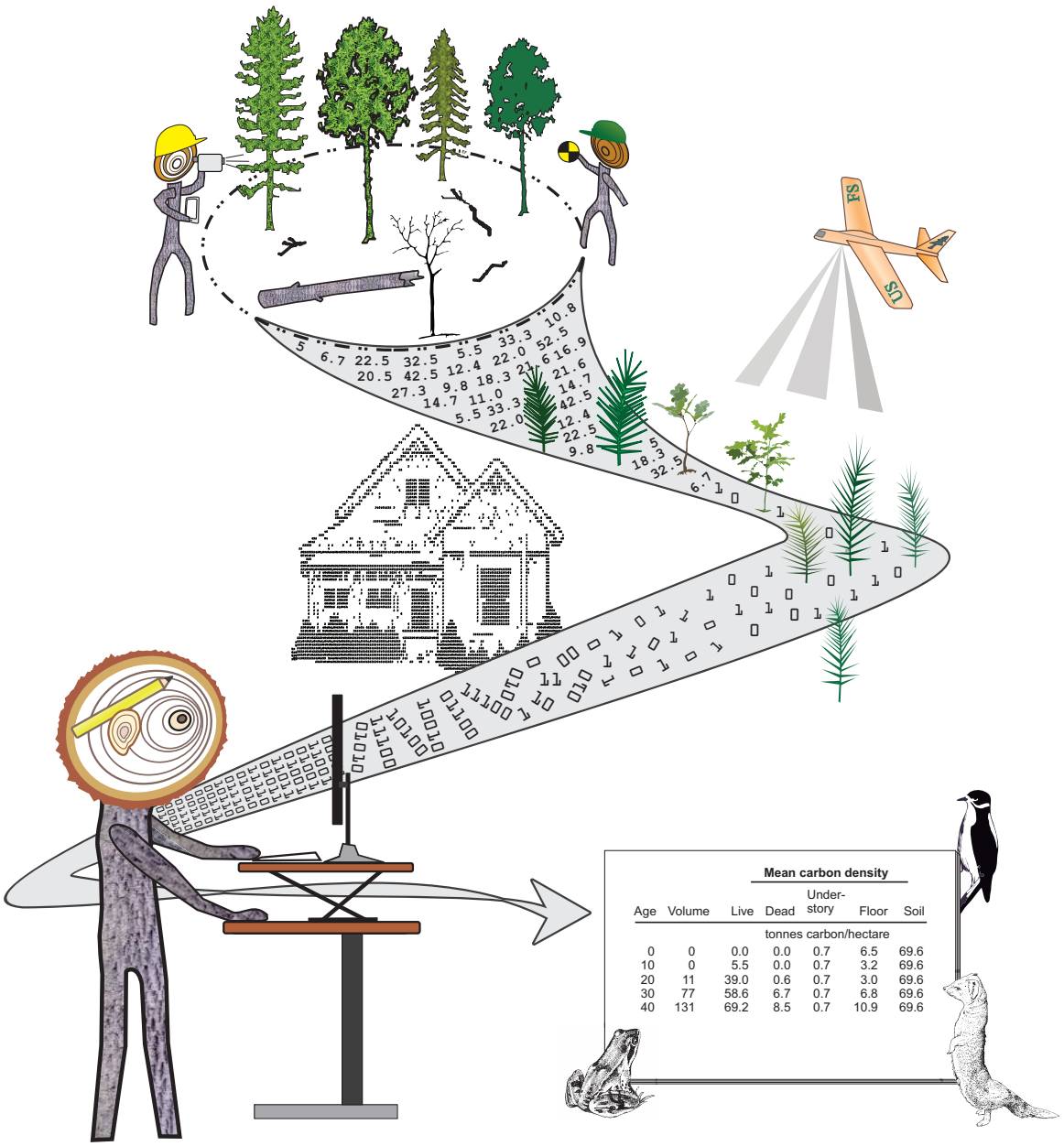
Standard Estimates of Forest Ecosystem Carbon for Forest Types of the United States

Coeli M. Hoover, Ben Bagdon, and Aaron Gagnon



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Abstract

This document presents forest ecosystem carbon yield tables, representing stand-level merchantable volume and carbon stocks as a function of stand age, for 53 forest types within 11 regions of the United States. These tables are an update from previous forest carbon stock estimates and were developed in support of U.S. Department of Agriculture greenhouse gas estimation guidelines for agriculture and forestry. The uncertainty of results obtained with these methods may be high relative to other techniques that use site- or project-specific data. The estimates presented here nonetheless provide representative forest carbon stock values that can be applied when site-specific data are not available.

KEYWORDS: forest carbon sequestration, carbon yield tables, carbon stock, forest carbon project, carbon estimation

Cover Art

Illustration depicting sources of forest carbon, and the variety of professionals, data collection methods, modeling, and evaluation involved in estimating forest ecosystem carbon stocks. Artwork by Eric Fiegenbaum (used with permission).

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Introduction

Background

Though reports of greenhouse gas emissions by individual corporations and other entities are not required in the United States, Federally sponsored voluntary greenhouse gas reporting programs have been in place for decades. The U.S. Department of Agriculture (USDA) Forest Service, Research and Development has developed forest carbon estimation methods and guidelines in support of these programs, which have evolved over time but consistently include forest carbon accounting.

Section 1605(b) of the Energy Policy Act of 1992 established a program that allowed any party to report greenhouse gas emissions and emission reductions, with a focus on projects that reduced emissions (U.S. Department of Energy 2011). Technical guidance on reporting emissions and sequestration was released in 1994 (U.S. Department of Energy 1994) and included methods for estimating carbon sequestered in forests. Reporting under this Voluntary Reporting of Greenhouse Gases (or 1605(b)) Program occurred between 1995 and 2006.

In February 2002, the White House announced its Global Climate Change Initiative, which included direction to the U.S. Department of Energy (DOE) and USDA to revise and improve the 1605(b) greenhouse gas reporting system (United States, Office of the Press Secretary 2002). With this revision, the focus shifted from project-level to entity-wide greenhouse gas accounting (U.S. Department of Energy 2011). In addition, the rules and guidelines for estimating carbon sequestration by the forest sector were revised and expanded; the final rule and updated guidance were released in April 2006 and went into effect on June 1, 2006 (Guidelines for Voluntary Greenhouse Gas Reporting 2006).

In response to the 1605(b) Program, USDA developed many tools and publications for the forest sector, some of which remain in use today. Fundamental work on estimating forest carbon stocks was produced, based on methods in Birdsey (1996) and other products such as the FORCARB forest carbon estimation framework (Heath et al. 2010). For consistency and comparability, to the extent possible, tools and approaches were based on the Forest Service's Forest Inventory and Analysis (FIA) data (see Heath (2012) for carbon tools discussion; see USDA Forest Service (2021) FIA library for information on FIA data).

A widely used product is a compilation of tables of average forest ecosystem carbon estimates for forest types of the conterminous United States, published by the Forest Service in General Technical Report NE-343 (Smith et al. 2006) and referred to as "GTR 343." The report defines the carbon pools in forest ecosystems. It briefly describes methods used to develop the estimates and provides tables of values for the underlying components needed to compute estimates. Appendixes provide carbon stock and timber volume estimates

by forest type and geographic region for two scenarios: afforestation (stand establishment on land that was not forest), and regeneration following clearcut harvesting. Other appendixes provide regional estimates of carbon in harvested wood products, as well as the components and methods used to develop those estimates. The estimates of carbon stocks were produced by using a combination of timber projection systems, forest carbon models (ATLAS and FORCARB), and FIA data (see Smith et al. (2006) for details) and are based on relationships between stand age and volume.

The 1605(b) Program ended in 2011, but Federal efforts to update and refine greenhouse gas estimation approaches continued. Language contained in Section 2709 of the Food, Conservation, and Energy Act of 2008 (also known as the 2008 Farm Bill) directed USDA to develop methods to estimate the "environmental services benefits" of land management actions. As part of its response, USDA began a collaborative, multiyear process to develop technical guidelines or methods for estimating entity-wide greenhouse gas emissions and sequestration for the forestry and agriculture sectors. The department had specific requirements, which included consistency with other accounting systems, transparency, scientific rigor, and applicability at a variety of scales (Eve et al. 2014). Four working groups developed the greenhouse gas estimation methods, published in 2014 (Eve et al. 2014): Croplands/ Grazing Lands, Wetlands, Animal Agriculture, and Forestry. The methods were designed to enable landowners to assess the impacts of changes in land management practices on greenhouse gas emissions.

Following the publication of USDA's 2014 guidelines, the process of updating carbon stock estimates by region and forest type group contained in GTR 343 began; updated estimates are presented here as Appendix A and Appendix B. They reflect updates to data and methods occurring since publication of GTR 343 (Smith et al. 2006) and were developed in a modeling framework to enable the assessment of management impacts and incorporation into a decision support system. These estimates represent average estimates of forest carbon stocks in major forest types and geographic regions of the United States and may be used as a general estimate where site-specific or local data are not available (See Box 1 for more information).

Box 1: Important Notes About Forest Carbon Lookup Tables

While standard forest carbon estimates for common U.S. forest types are a convenient and useful tool, there are limitations to their use. It is important to understand how to use these estimates appropriately.

The estimates in this report (as well as those in GTR 343):

CAN

- Provide a quick estimate, based on regional data
- Serve as a "reality check" against which to compare your estimates
- Give a general estimate of what kind of carbon stock increases might occur over time

CAN'T

- Substitute for field inventory for a specific project area
- Serve as a definitive projection of future conditions for a project area
- Reflect possible outcomes of management actions
- Estimate carbon stocks from tree planting projects

The afforestation tables reflect carbon stocks expected when forests develop naturally on land that was previously in another use, such as agriculture (the differences are in the nonliving carbon pools), as opposed to tree planting. In a tree planting scenario, competition is often managed during the early stages of stand development, resulting in differences in growth and yield from what would be expected from a natural regeneration scenario. See the "Discussion" section for further information about tree planting projects.

The updated estimates presented in this report are meant to serve as general, reasonable carbon stock estimates for major forest type groups for a set of geographic regions in the United States. They are not a summary of current FIA data, nor can they capture the inherent variability of forested ecosystems. The FIA benchmark data were selected to capture a representative set of stands for each of the forest type groups in the regions, with the goal of developing broad regional estimates, and as such, they cannot represent every local situation. Local conditions, such as site productivity, moisture regime, elevation, and aspect—and management actions—will influence actual carbon stock measurements.

Rationale for Current Approach

With each update of forest carbon accounting guidance, methods and estimates evolve as new data become available and new techniques are developed. The approaches and stock estimates in GTR 343 represented major changes from previous guidance, due in part to enhanced understanding of carbon estimation, but also changes in FIA inventory protocols and new biomass models. Similarly, these new estimates reflect changes in methods and data that were updated by using a different approach from GTR 343. The forest sector working group (Eve et al. 2014) chose to use the Forest Service's Forest Vegetation Simulator (FVS; Dixon 2002) growth and yield simulator with FIA data as inputs to produce carbon stock estimates because this approach can be readily incorporated into estimation and decision support tools for land managers and landowners, a key goal of the 2014 USDA effort. Forest management practices vary widely by region and forest type, so extensive simulation capabilities were needed. The FVS model has those capabilities and includes a large number of geographic model variants that provide coverage for the conterminous United States and coastal Alaska. Using FVS for standard carbon stock estimates applies a consistent approach across the forest sector. Through the Fire and Fuels Extension (FFE), FVS

includes the capability to report forest carbon pools including carbon in harvested wood products (when a harvest is simulated) or carbon lost through fire (when fire is simulated). The change in the definitions of the forest floor and down dead wood pools is the result of how these pools are defined in FFE (see Hoover and Rebain 2011, Rebain 2010).

Carbon Pools Reported

The carbon pools used in this study and their definitions are:

- Live trees: Live trees (including foliage) for which a diameter at breast height (d.b.h.) is recorded (usually ≥2.5 cm, or 1 inch), including carbon in live coarse roots (≥2 mm, or 0.08 inch). Calculated according to Jenkins et al. (2003).
- Standing dead trees: Dead trees, including coarse roots. Calculated using FVS-FFE methods (snag model) and initial default values, which are a function of the dominant cover type and percent canopy cover (Rebain 2010).
- Understory vegetation: Live herbs and shrubs, calculated according to FVS-FFE methods (Rebain 2010). Note that these are not simulated directly but are default values based on cover type and stand density.
- Down dead wood: All woody debris material resting on the ground, regardless of size. Calculated according to FVS-FFE methods, including initial values (Rebain 2010). Note that FFE simulates dynamics of the nonliving carbon pool, so that material transfers between pools over time as decomposition occurs.
- Forest floor: All nonliving nonwoody surface material. Calculated according to FVS-FFE methods, including initial values. Unlike the live and dead tree, understory, and down dead wood pools, for which carbon is estimated as 50 percent of dry biomass, forest floor carbon is calculated as 37 percent dry biomass (Rebain 2010).
- Soil organic carbon: Belowground carbon (including fine roots ≥2 mm, or 0.08 inch) and organic carbon not included in other pools, to a depth of 1 m (3.3 feet). These values are the estimates used in GTR 343; FVS does not include the soil carbon pool.

Key Differences Between 2021 and 2006 Standard Forest Carbon Estimates

Though the updated tables of forest carbon estimates contain the same type of information as the 2006 tables and retain the general format, there are key differences between the two:

- The definition of the down dead wood carbon pool has changed. The updated estimates of down dead wood include down woody debris of any size. In GTR 343 woody debris 7.5 cm (3 inches) or longer is considered down woody debris.
- The definition of the forest floor has changed. The forest floor category now consists of leaf material in all stages of decomposition. In GTR 343, woody debris less than 7.5 cm in length is included in the forest floor pool.
- Results are presented here in metric tons (tonnes) and cubic meters per hectare, and tons and cubic feet per acre, in a single table for each forest type group and region. GTR 343 contains two tables for each forest type group and region; output is given in tons (and cubic feet) per acre as well as a hybrid unit of metric tons (and cubic meters) per acre.
- Geographic regions are defined differently. Eleven regions are defined for the updated estimates (Fig. 1). The 2006 tables include 10 regions.
- The forest type groups included have changed in some regions. The "Methods" section describes selection criteria for forest type groups.

Figure 1.—Geographic regions used for current reporting of carbon in forest ecosystems of the contiguous United States.

- Stand volume is reported as merchantable volume. This category is slightly different from growing-stock volume as reported in GTR 343, which generally includes deductions for trees that are rotten or of poor form.
- The updated live tree carbon estimates were computed by calculating dry biomass and then converting to carbon. The live tree carbon estimates in GTR 343 were developed using a volume-to-biomass approach, which involves converting growing-stock volume to total volume, total volume to biomass, and then biomass to carbon.
- Merchantability standards differ between the FIA definitions and those used by FVS, which in turn vary between and within the geographic submodels. For this reason, the volume estimates reported here may be substantially different from those reported in GTR 343, particularly early in stand development (for more information refer to the "Forest Ecosystem Carbon Tables" section of GTR 343; Smith et al. 2006).
- Understory carbon is defined differently. Default values for herbs and shrubs in FVS-FFE are based on cover type and stand density (Rebain 2010). In GTR 343, understory is defined as trees with a d.b.h. less than 2.5 cm as well as shrubs (see Birdsey 1996 for methods for estimating understory carbon).
- In the updated estimates, the nonliving carbon pools and their dynamics are simulated with the snag and fuel models in FFE (Rebain 2010). In GTR 343, standing dead tree carbon is estimated from growing-stock volume (as is live tree carbon), and down dead wood and forest floor carbon are estimated as a function of live tree carbon.
- The new estimates include forest ecosystem carbon only and do not address carbon in harvested wood products (refer to GTR 343 for information on carbon in harvested wood products; Smith et al. 2006). While the ability to estimate carbon in harvested wood products is available through the carbon reports in FVS-FFE, results are available only when harvesting activities occur.

Methods

Benchmark Dataset and Chronosequence

Area of forest land from the FIA database was summarized by region (as defined in Figure 1) and forest type group (as defined by FIA). As mentioned earlier, the forest types in these tables differ from those in GTR 343 (Smith et al. 2006). A forest type group was included if its area represented at least 5 percent of the forest land in that region. Exceptions include redwoods in the Pacific Southwest, which do not meet the area threshold but are locally important, and woodland hardwoods in the Great Plains, which represent a substantial component by area but are difficult to model accurately and are not commonly commercially managed. Pinyon-juniper was not included because it is not typically managed, and acceptable model fits could not be achieved. For a few forest type groups and regions, high productivity stands

were identified and treated separately, as in GTR 343. These stands were identified by using the site productivity codes in the FIA database; high productivity types are Douglas-fir, Pacific Northwest, West; loblolly-shortleaf pine, Southeast and South Central; and longleaf-slash pine, Southeast. In each region, a working dataset was developed which included all FIA plots of a given forest type group; only plots for which remeasurement data were available were included (to enable use of calibration functions in FVS). Additionally, no partial plots were used (the condition class for the entire plot must be forest), and any plots identified as having recent management activity were excluded. In cases where a forest type group met the 5 percent area threshold in a region but was represented by an insufficient number of FIA plots that met selection criteria, carbon stock estimates were not developed.

For each region and forest type group, a benchmark chronosequence was developed from the inventory data for the selected plots. Mean values and 95 percent confidence intervals were plotted for the following variables: live and dead tree carbon, total stand volume, basal area, average height of dominant and co-dominant trees, quadratic mean diameter, and trees per acre. These benchmark chronosequences served as targets during the FVS parameterization and calibration process.

Development of Carbon Stock Estimates from Forest Vegetation Simulator Projections

The updated forest carbon stock estimates were produced by using FVS through a multistep process which was repeated for each combination of forest type group and region, using the "bare ground" simulation option and the appropriate geographic model variant (Fig. 1). The FIA dataset includes data on seedling counts, which were used to initialize the simulations because FVS does not have this information (except for a few geographic variants, the user must specify seedling regeneration). The most common species (based on proportion of relative basal area) were modeled as having been planted; in some cases, the species mix was adjusted to better reflect the forest type group (due to the way that FIA protocols assign forest type groups, occasionally plots may contain few or no stems of the namesake species). The number of seedlings "planted" per species was based on the mean seedling counts from the inventory records.

Though FVS can be run using default settings, it is highly recommended that the user adjust parameters and calibrate growth and mortality factors to reflect local conditions. Various data sources may be used; in this process, remeasurement data from the benchmark dataset were used to calibrate growth, while other parameters were adjusted through an iterative process until model output achieved a good fit to the benchmark chronosequences for all variables. Components that were adjusted from FVS default values include diameter growth, mortality rate, maximum basal area, basal area increment, site index, and small tree height increment. While many of these

adjustments are standard, some, such as the small height tree increment, were necessary because the simulations started from bare ground. In this situation the entire stand is projected with the small tree growth model until stems reach the diameter cutoff where the large tree growth model applies. The growth functions in FVS are built on empirical data, and as is often the case in growth and yield modeling, fewer data are available for stems in the nonmerchantable size classes. Consequently, model behavior may be less robust. In FVS, small trees are defined as having a diameter below a certain threshold value (typically 12.7 cm, or 5 inches) and the models used for small tree growth are mostly height driven (see variant guides for specifics; USDA Forest Service 2019–2020). While various methods are used to predict small tree height growth across variants, FVS tended to underpredict height growth when compared to FIA data across the forest type groups. Therefore, small tree height multipliers were used to compensate in many cases.

In general, parameters were adjusted to increase mortality rates and trigger mortality earlier than default settings, since initial simulations resulted in a strong bias toward overprediction of stand variables (carbon, volume, height, basal area, and quadratic mean diameter) and an underprediction of mortality compared to the benchmark dataset. Site index has a strong influence on the prediction of stand-level variables in FVS, and this parameter is one of the most important to adjust when simulating stand growth. Site index was adjusted based on the values reported in the FIA dataset, which greatly improved the fit of predicted height growth relative to the benchmark FIA data.

Assessment of Predicted Values Against Benchmark Chronosequences

Once parameter adjustments were finalized, FVS simulations were run for each combination of forest type group and region using the seedling data as described in the preceding section with the appropriate model adjustments. Live and dead tree carbon, basal area, trees per acre, stand volume, quadratic mean diameter, and mean height were predicted and plotted against the benchmark chronosequences to assess predictions. Statistical measures of goodness of fit were computed for carbon and volume using the openair package (Carslaw 2015, Carslaw and Ropkins 2012) and included root mean square error (RMSE), mean bias, relative RMSE, R^2, the fraction of predictions within a factor of two (FAC2), efficiency (after Legates and McCabe 1999), and index of agreement (Wilmott et al. 2012). The observed values were defined as the FIA data and the predicted values were the FVS projections. Key targets for live tree carbon estimates were to have efficiency greater than 0 (preferably >0.3), index of agreement greater than 0.5, and FAC2 greater than 0.5. Observed and predicted values for live tree carbon, merchantable volume, and basal area are shown in Figure 2 for loblolly-shortleaf pine in the Southeast region, an example of a forest type group meeting acceptable fit criteria. Additional parameter adjustments were made in cases where

fit statistics did not meet the efficiency target. Model fit results for live tree carbon indicate that 98 percent of estimates had positive efficiency values, with 81 percent at or above 0.3 and 49 percent at or above 0.5. The index of agreement exceeded 0.5 for 98 percent of the estimates (with 74 percent at or above 0.7), while 98 percent of estimates had a FAC2 greater than 0.7 (Table C1 in Appendix C). In a few types, one or more of the fit criteria were not met; an example is ponderosa pine in the Pacific Southwest (Fig. 3).

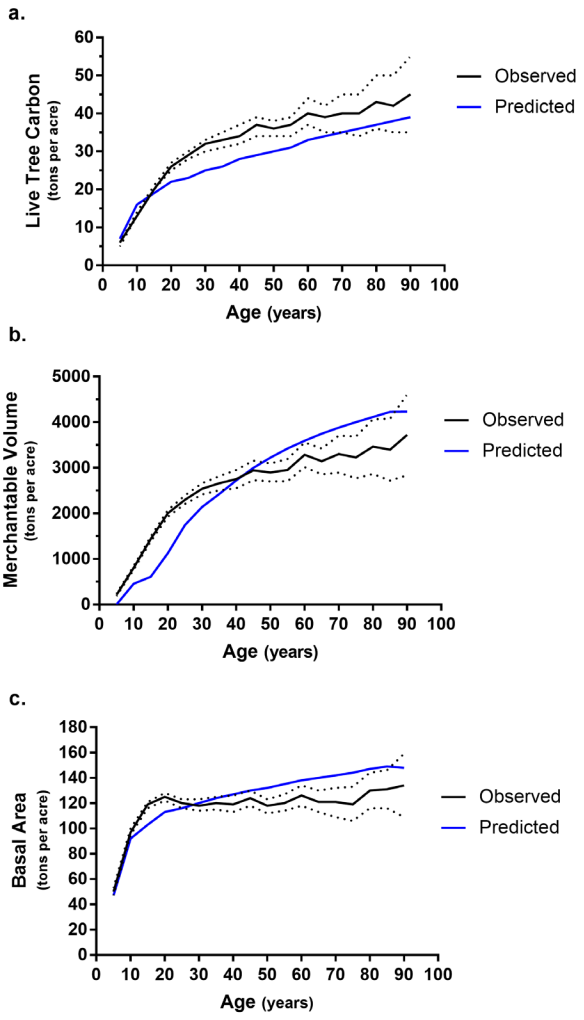

Figure 2.—Observed (Forest Service, Forest Inventory and Analysis [FIA] benchmark data) and predicted (estimates reported in Appendixes A and B) values for loblolly-shortleaf pine in the Southeast region for (a) live tree carbon, (b) merchantable volume, and (c) basal area. Dotted lines indicate 95 percent confidence interval of FIA data. This is an example of a forest type group with acceptable model evaluation statistics: fraction of predictions within a factor of two (FAC2), coefficient of efficiency (COE), and index of agreement (IOA). For live tree carbon: FAC2 = 1, COE = 0.4, and IOA = 0.7; for merchantable volume: FAC2 = 0.9, COE = 0.3, and IOA = 0.7.

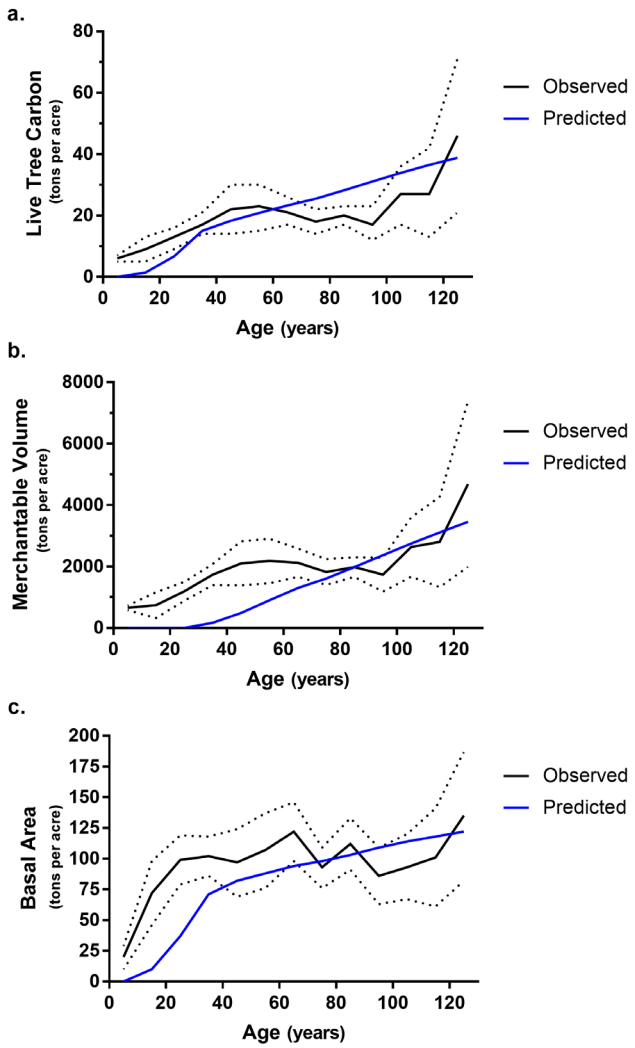

Figure 3.—Observed (Forest Service, Forest Inventory and Analysis [FIA] benchmark data) and predicted (estimates reported in Appendixes A and B) values for ponderosa pine in the Pacific Southwest region for (a) live tree carbon, (b) merchantable volume, and (c) basal area. Dotted line indicates 95 percent confidence interval of FIA data. This is an example of a forest type group with unacceptable model evaluation statistics: fraction of predictions within a factor of two (FAC2), coefficient of efficiency (COE), and index of agreement (IOA). For live tree carbon: FAC2 = 0.8, COE = 0, and IOA = 0.5; for merchantable volume: FAC2 = 0.5, COE = -0.2, and IOA = 0.4.

Volume equations in FVS are tied to the geographic variant employed for a simulation and vary in form. The Jenkins et al. (2003) equations used to calculate biomass are national and not tied to geographic locations. These equations, unlike most volume equations, do not include a height variable. The volume and carbon estimates are developed from two different equation sets, so in some cases it was not possible to maximize the goodness of fit for both volume and carbon. In these cases, the fit of the carbon estimates was prioritized because our focus is on carbon. However, the fit statistics for volume were generally good; 81 percent of estimates had positive efficiency values, with 66 percent meeting or exceeding 0.3 (and 45 percent at or above 0.5). Index of agreement values met or exceeded the 0.5 threshold for 89 percent of projections, with 85 percent at or above 0.7. Values for FAC2 were at or above 0.5 in all cases and met or exceeded the 0.7 level for 74 percent of the projections (Table C2 in Appendix C).

Forest Ecosystem Carbon Tables

Forest ecosystem carbon varies widely by geographic region and forest type group and is also affected by prior land use. The format used in the tables of regional estimates of timber volume and forest carbon stocks (Appendixes A and B) mirrors that of the tables provided in GTR 343 (Smith et al. 2006). Each table contains carbon stock estimates by stand age for the live tree, dead tree, understory vegetation, down dead wood, forest floor, and soil organic carbon pools, as defined in the "Carbon Pools Reported" section of this report. Average merchantable stand volume is also included (the definition of merchantability differs between FVS geographic variants, and details may be found in the variant overviews; USDA Forest Service 2019–2020). Each table has two sections. The first section reports values in metric units of cubic meters per hectare (m^3/hectare) and metric tons per hectare (tonnes/hectare). The second section includes English units: cubic feet per acre (ft^3/acre) and short tons per acre (tons/acre).

Two sets of tables are provided for each forest type group and region. Appendix A represents estimated average stand-level carbon stocks after a clearcut harvest, and Appendix B presents estimated average carbon stocks following afforestation of land previously not in forest (see Box 2 for guidance on using the tables). In addition, for some commercially important species, separate tables for high productivity sites are also provided, as they are in GTR 343. Pools are defined and calculated as described in the "Methods" section. The clearcut harvest and afforestation estimates differ in the down dead wood, forest floor, and soil organic carbon stock estimates. Following the approach used in GTR 343, in the afforestation scenario the down dead wood and forest floor pools contain no carbon at age zero. The forest floor and down dead wood pools then accumulate from zero following the FVS-FFE protocols (as in the clearcut scenario). Understory carbon is also set to zero at age zero in the afforestation scenario. Estimates of soil organic carbon follow the methods (and are based on the same underlying data) in Smith et al. (2006). Soil organic carbon is set to 75 percent of the value at stand maturity and then increases following the approach in West et al. (2004).

Box 2: How to Use These Tables

All lookup tables have limitations, since they are meant to provide broad regional estimates. Such estimates may differ considerably from local conditions. General notes for using these lookup tables follow.

- Using the map (Fig. 1), locate the appropriate geographic region.
- Choose the forest type group that best represents the forest cover in the area of interest. Note that these are FIA forest type groups, each of which contains multiple forest types. For a list of forest types in each forest type group, consult Appendix D in the FIA Database user guide (Burrill et al. 2021), available at: https://www.fia.fs.fed.us/library/database-documentation/current/ver90/FIADB%20User%20Guide%20P2_9-0-1_final.pdf. Note that links are active as of the date of publication.
- If the area of interest is currently forested, use the tables in Appendix A.
- If the area of interest is currently not forested, and no forest floor or woody debris is present, select the tables in Appendix B.
- If local data for any of the carbon pools are available, those data can be substituted, and the tabular values can be used to fill in any "missing" pools. For example, if a user has local data for the live and standing dead carbon pools, the values in these tables can be used for the forest floor, down dead wood, understory, and soil organic carbon estimates.
- To calculate change in carbon stocks over a given period of time, the equation is: (carbon stock at time 2 minus the carbon stock at time 1) ÷ number of years between time 2 and time 1. This will give an estimate of average annual change in carbon for the time period of interest, in either tonnes of carbon/hectare/year or tons of carbon/acre/year. This computation may be done for any carbon pool or group of pools of interest—for example, live tree carbon, all live carbon, or all dead wood carbon.
- These estimates are not intended to represent tree planting scenarios; for further detail, please consult the section "Applicability of the Estimates for Tree Planting Projects" in the "Discussion" section (see also Box 1).

Discussion

Applicability of the Estimates for Tree Planting Projects

The estimates in this report were developed to provide broad regional estimates of forest carbon stocks. The benchmark stands were selected to be representative of the forest type group and region. In a naturally regenerating stand, seedlings may occur in large numbers and are patchily distributed; a proportion of these survives to the sapling stage, and an even smaller proportion grows tall enough to enter the forest canopy. In contrast, planted seedlings are grown in a nursery, are larger in size at time of planting than a typical germinant, and are planted at wider routine spacings than would occur naturally. Site preparation, fertilization, protection from animal browsing, and control of competing vegetation may also occur in the stand. This greatly affects the trajectory of early stand development. The estimates in Appendixes A and B are thus not likely to provide reliable estimates of carbon stocks in planted scenarios, at least for the earlier years.

Note that even though the term "afforestation" was used in GTR 343 and in this report, the term is not meant to imply that tree planting has occurred. "Afforestation" and "reforestation" have slightly different meanings in the context of international carbon programs, related to the amount of time that the land has not been in forest cover. The difference between the tables in Appendix A and B is in the nonliving carbon pools. In the clearcut harvest tables the forest floor and down dead wood pools are nonzero at year zero, and the soil carbon pool is unchanged, whereas in the afforestation tables the forest floor and down dead wood pools are zero at year zero and the soil organic carbon pool is reduced from the value given for a mature forest. An inherent assumption with afforestation as used here is that the land has been in a nonforest use for long enough that any past forest floor material or woody debris has decomposed. Therefore, the number of years since past forest cover is not a part of the classification.

Mortality rates for seedlings and small trees are extremely variable and subject to a variety of factors such as animal browse, weather events, insects, and competition with other plants. By default, FVS does not take these types of factors into account when calculating mortality rates. To develop the estimates presented here, simulations were parameterized to produce output that matched the benchmark stands—in effect, adjusting to reflect the various mortality factors that come into play during stand development. In order to use FVS to produce estimates for tree planting projects, credible estimates would be needed for seedling and small tree survival rates. For example, in an area with a high deer (*Odocoileus* spp.) or elk (*Cervus elaphus*) population, large numbers of susceptible seedlings and small trees may be lost or experience reduced growth due to browsing. In an area prone to weather events such as long dry periods or early freezing temperatures, seedling

survival may be reduced in some years, particularly for species that are not tolerant of these extremes. In an area with heavy cover of shrubs or other vegetation, seedlings may not be able to compete well.

If credible estimates of seedling and small tree survival rates can be obtained, that information can be used in FVS simulations to adjust mortality rates over time. This adjustment will provide for more informed simulation of the resulting forest than would be possible otherwise. Seedling densities and species mix can then be adjusted in the simulations to obtain the desired future forest condition. Of course, there is no guarantee that actual growth will resemble the simulations, but improved estimates of small tree mortality should help to start the simulations with appropriate numbers of small trees of each species planted. Various site preparation, fertilization, or other management actions may also be incorporated into the simulation. In addition to running simulations with the expected mortality rates, it is recommended that users run simulations with mortality rates at the low end and high end of the expected mortality range to obtain a range of simulation outcomes.

A Closer Look at Differences Between Carbon and Volume Estimates

There are differences between the estimates in this report and those in GTR 343 due to the different approach and changes in pool definitions. The understory values are lower because small trees (<2.5 cm) are not included in the understory pool, and are not dynamically simulated (for more detail, see Rebain 2010). Understory values may appear as zero in some types and regions where the values are very low, because the estimates are reported to a single decimal place. In GTR 343 a regression approach was used (Smith et al. 2006) to generate volume estimates for younger age classes to avoid discontinuities in the yield tables that occur when a stand is composed of trees below the merchantability specifications. This approach was not employed for the updated estimates; because a "bare earth" simulation was used (no trees present at start of simulation), merchantable volume may not be present for one or more time intervals, until trees meet merchantability specifications. Note that while FIA uses a standard definition of merchantability—minimum d.b.h. of 5 inches (12.7 cm), a 1 foot (30.5 cm) stump, and a 4 inch (10.2 cm) top—merchantability specifications in FVS vary across geographic variants and are noticeably different between eastern and western variants. Minimum d.b.h. in some western variants may be as high as 9 inches (22.9 cm) (consult the variant overviews for specifics; USDA Forest Service 2019–2020). These merchantability specifications affect the volumes reported, especially in the earlier phases of stand development, but do not affect the tree carbon estimates, which were computed based on Jenkins et al. (2003) and are independent of the volume estimates. In addition, the volume equations employed for these FVS simulations are from the National Volume Library, and in many cases are unlikely to be the same equations used during the

development of GTR 343. Volume equations perform differently depending on equation form, so volume estimates here may differ considerably from those in GTR 343, which in turn may differ from those available in local yield tables.

These carbon stock estimates, despite being developed using a different process than those in GTR 343, are in general agreement, although there are forest type groups and regions where the live tree carbon estimates differ substantially. For example, large discrepancies occur for Douglas-fir (in all regions), Northern Lake States spruce-fir, and Rocky Mountain, North ponderosa pine. In these cases, estimated stocks in the older age classes are considerably higher in GTR 343. The FVS model is a stand-level growth and yield simulator that was parameterized to produce results aligned with the benchmark FIA data for key attributes such as diameter, height, live tree carbon, and merchantable volume. The estimates in GTR 343 are largely based on age and volume relationships within the ATLAS timber projection system (Haynes 2003, Mills and Kincaid 1992, Mills and Zhou 2003), which was designed to project large-scale timber inventories. Because most growth and yield frameworks are built from one or two decades of data, the longer the timeframe of a projection, the more likely overpredictions or underpredictions are to occur. Carbon estimation methods and FIA data have been updated considerably since the development of the tables in GTR 343 and different tools were used when developing the tables, so a lack of agreement in some instances is not unexpected. As an additional comparison, the values presented here were compared to current FIA live tree carbon data (USDA Forest Service 2020) for selected regional and forest type group estimates including Douglas-fir in the Pacific Northwest, Lake States spruce-fir, and Southeast loblolly-slash pine, and were in agreement (note that the comparison FIA dataset is distinct from the benchmark dataset used to adjust model parameters and includes all plots classified as 100 percent forest).

Conclusions

The estimates presented here are not meant to represent any specific forest stand but are intended to serve as generalized regional estimates of expected forest carbon stocks in various forest types. The set of FIA data used to benchmark the estimates was selected to provide a representation of average conditions in a forest type group and region in order to meet the goal of providing broad regional averages. Users may refer to the tables for quick estimates of forest carbon stocks, as a benchmark against which to compare the potential of an existing stand to store additional carbon, or to estimate potential rates of carbon accumulation to assist in project planning.

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Appendix A: Estimates of Forest Ecosystem Yield and Carbon Stocks for Reforestation

Tables A1 through A53 present estimates of timber volume and carbon stocks on forest land after clearcut harvest, by forest type group and region. Please see Figure 1 for a map of the regions. Table numbers and content are as follows:

A1. White-red-jack pine, Northeast

A2. Maple-beech-birch, Northeast

A3. Oak-hickory, Northeast

A4. Spruce-fir, Northeast

A5. White-red-jack pine, Northern Lake States

A6. Aspen-birch, Northern Lake States

A7. Maple-beech-birch, Northern Lake States

A8. Elm-ash-cottonwood, Northern Lake States

A9. Oak-hickory, Northern Lake States

A10. Spruce-fir, Northern Lake States

A11. Elm-ash-cottonwood, Great Plains

A12. Oak-hickory, Great Plains

A13. Elm-ash-cottonwood, Central States

A14. Oak-hickory, Central States

A15. Douglas-fir, Pacific Northwest, East

A16. Fir-spruce-mountain hemlock, Pacific Northwest, East

A17. Lodgepole pine, Pacific Northwest, East

A18. Ponderosa pine, Pacific Northwest, East

A19. Alder-maple, Pacific Northwest, West

A20. Douglas-fir, Pacific Northwest, West

A21. Douglas-fir, high productivity, Pacific Northwest, West

A22. Fir-spruce-mountain hemlock, Pacific Northwest, West

A23. Hemlock-Sitka spruce, Pacific Northwest, West

A24. Hemlock-Sitka spruce, high productivity, Pacific Northwest, West

A25. Ponderosa pine, Pacific Southwest

A26. Fir-spruce-mountain hemlock, Pacific Southwest

A27. Western oak, Pacific Southwest

A28. Redwood, Pacific Southwest

A29. California mixed conifer, Pacific Southwest

A30. Tanoak-laurel, Pacific Southwest

A31. Other western softwoods, Pacific Southwest

A32. Douglas-fir, Rocky Mountain, North

A33. Ponderosa pine, Rocky Mountain, North

A34. Fir-spruce-mountain hemlock, Rocky Mountain, North

A35. Lodgepole pine, Rocky Mountain, North

A36. Douglas-fir, Rocky Mountain, South

A37. Ponderosa pine, Rocky Mountain, South

A38. Fir-spruce-mountain hemlock, Rocky Mountain, South

A39. Lodgepole pine, Rocky Mountain, South

A40. Aspen-birch, Rocky Mountain, South

A41. Longleaf-slash pine, Southeast

A42. Longleaf-slash pine, high productivity, Southeast

A43. Loblolly-shortleaf pine, Southeast

A44. Loblolly-shortleaf pine, high productivity, Southeast

A45. Oak-pine, Southeast

A46. Oak-hickory, Southeast

A47. Oak-gum-cypress, Southeast

A48. Loblolly-shortleaf pine, South Central

A49. Loblolly-shortleaf pine, high productivity, South Central

A50. Oak-pine, South Central

A51. Oak-hickory, South Central

A52. Oak-gum-cypress, South Central

A53. Elm-ash-cottonwood, South Central

Notes: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

For common and scientific names of species, refer to Appendix F in the FIA Database user guide (Burrill et al. 2021), available at: https://www.fia.fs.fed.us/library/database-documentation/current/ver90/FIADB%20User%20Guide%20P2_9-0-1 final.pdf.

Table A1.—Regional estimates of timber volume and carbon stocks for white-red-jack pine stands on forest land after clearcut harvest in the Northeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	0.7	9.7	11.8	78.1	22.2
10	0	3.7	0.0	0.7	4.6	9.3	78.1	18.3
20	8	36.9	0.4	0.7	3.5	10.2	78.1	51.7
30	99	46.1	6.2	0.7	7.1	11.3	78.1	71.4
40	135	53.6	7.6	0.7	7.8	11.6	78.1	81.4
50	163	59.5	8.9	0.7	8.6	11.9	78.1	89.6
60	187	65.1	9.2	0.7	9.4	12.2	78.1	96.7
70	209	70.6	9.5	0.7	9.6	12.5	78.1	102.9
80	230	75.9	9.6	0.7	9.7	12.8	78.1	108.8
90	248	81.0	9.6	0.7	10.1	13.1	78.1	114.6
100	266	86.0	9.6	0.7	10.5	13.4	78.1	120.2
110	282	90.8	9.6	0.7	10.8	13.7	78.1	125.6
120	297	95.5	9.5	0.7	11.2	14.0	78.1	130.9

continued on next page

Table A1 (continued).— Regional estimates of timber volume and carbon stocks for white-red-jack pine stands on forest land after clearcut harvest in the Northeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.3	4.3	5.3	34.9	9.9
10	0	1.6	0.0	0.3	2.1	4.1	34.9	8.1
20	115	16.5	0.2	0.3	1.6	4.6	34.9	23.1
30	1,420	20.6	2.8	0.3	3.2	5.0	34.9	31.8
40	1,930	23.9	3.4	0.3	3.5	5.2	34.9	36.3
50	2,323	26.5	4.0	0.3	3.8	5.3	34.9	40.0
60	2,674	29.1	4.1	0.3	4.2	5.4	34.9	43.1
70	2,992	31.5	4.2	0.3	4.3	5.6	34.9	45.9
80	3,282	33.9	4.3	0.3	4.3	5.7	34.9	48.5
90	3,551	36.1	4.3	0.3	4.5	5.9	34.9	51.1
100	3,799	38.4	4.3	0.3	4.7	6.0	34.9	53.6
110	4,031	40.5	4.3	0.3	4.8	6.1	34.9	56.0
120	4,245	42.6	4.2	0.3	5.0	6.3	34.9	58.4

Table A2.—Regional estimates of timber volume and carbon stocks for maple-beech-birch stands on forest land after clearcut harvest in the Northeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.7	6.5	8.3	69.6	15.4
10	0	5.5	0.0	0.7	3.2	6.9	69.6	16.3
20	0	39.0	0.6	0.7	3.0	8.1	69.6	51.4
30	11	58.6	6.7	0.7	6.8	9.3	69.6	82.1
40	77	69.2	8.5	0.7	10.9	9.8	69.6	99.1
50	131	80.1	9.5	0.7	12.2	10.3	69.6	112.8
60	168	91.6	11.7	0.7	12.7	10.9	69.6	127.7
70	185	95.3	17.2	0.7	14.6	11.4	69.6	139.3
80	200	99.3	17.9	0.7	16.7	11.8	69.6	146.3
90	214	104.1	17.1	0.7	18.2	12.2	69.6	152.2
100	228	109.0	16.5	0.7	19.0	12.6	69.6	157.8
110	240	113.9	16.0	0.7	19.7	13.0	69.6	163.3
120	251	118.8	15.5	0.7	20.2	13.4	69.6	168.7
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.3	2.9	3.7	31.0	6.9
10	0	2.5	0.0	0.3	1.4	3.1	31.0	7.3
20	0	17.4	0.3	0.3	1.3	3.6	31.0	22.9
30	159	26.2	3.0	0.3	3.0	4.1	31.0	36.6
40	1,103	30.9	3.8	0.3	4.9	4.4	31.0	44.2
50	1,865	35.7	4.2	0.3	5.5	4.6	31.0	50.3
60	2,407	40.9	5.2	0.3	5.7	4.9	31.0	56.9
70	2,645	42.5	7.7	0.3	6.5	5.1	31.0	62.1
80	2,853	44.3	8.0	0.3	7.5	5.3	31.0	65.3
90	3,060	46.4	7.6	0.3	8.1	5.4	31.0	67.9
100	3,252	48.6	7.4	0.3	8.5	5.6	31.0	70.4
110	3,430	50.8	7.1	0.3	8.8	5.8	31.0	72.8
120	3,594	53.0	6.9	0.3	9.0	6.0	31.0	75.2

Table A3.—Regional estimates of timber volume and carbon stocks for oak-hickory stands on forest land after clearcut harvest in the Northeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.7	3.8	4.0	53.1	8.5
10	0	5.3	0.0	0.7	1.3	3.0	53.1	10.3
20	0	38.1	0.4	0.7	1.8	4.1	53.1	45.1
30	0	58.9	6.3	0.7	7.8	5.3	53.1	79.0
40	107	72.1	8.5	0.7	13.0	6.1	53.1	100.4
50	148	81.9	13.0	0.7	13.5	6.8	53.1	115.8
60	176	88.7	15.8	0.7	15.8	7.4	53.1	128.4
70	205	96.8	15.4	0.7	17.3	7.9	53.1	138.1
80	227	101.7	17.6	0.7	17.9	8.5	53.1	146.4
90	245	105.0	18.7	0.7	19.5	9.0	53.1	152.8
100	259	108.6	17.4	0.7	20.9	9.4	53.1	157.1
110	267	110.4	17.8	0.7	22.1	9.8	53.1	160.8
120	268	109.7	19.6	0.7	22.7	10.2	53.1	162.9
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.3	1.7	1.8	23.7	3.8
10	0	2.4	0.0	0.3	0.6	1.3	23.7	4.6
20	0	17.0	0.2	0.3	0.8	1.8	23.7	20.1
30	0	26.3	2.8	0.3	3.5	2.4	23.7	35.2
40	1,528	32.2	3.8	0.3	5.8	2.7	23.7	44.8
50	2,115	36.5	5.8	0.3	6.0	3.0	23.7	51.7
60	2,522	39.6	7.0	0.3	7.1	3.3	23.7	57.3
70	2,936	43.2	6.9	0.3	7.7	3.5	23.7	61.6
80	3,246	45.3	7.8	0.3	8.0	3.8	23.7	65.3
90	3,496	46.8	8.3	0.3	8.7	4.0	23.7	68.1
100	3,696	48.4	7.8	0.3	9.3	4.2	23.7	70.1
110	3,816	49.2	7.9	0.3	9.9	4.4	23.7	71.7
120	3,837	48.9	8.7	0.3	10.1	4.5	23.7	72.7

Table A4.—Regional estimates of timber volume and carbon stocks for spruce-fir stands on forest land after clearcut harvest in the Northeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.7	4.6	1.7	98.0	7.1
10	0	3.5	0.0	0.7	1.6	1.0	98.0	6.8
20	0	29.4	4.7	0.7	1.2	1.8	98.0	37.8
30	32	36.7	5.3	0.7	3.9	2.4	98.0	49.0
40	63	41.6	5.4	0.7	4.7	2.9	98.0	55.3
50	84	46.3	4.9	0.7	5.4	3.4	98.0	60.6
60	104	50.4	4.5	0.7	5.6	3.9	98.0	65.1
70	115	51.6	5.6	0.7	5.5	4.3	98.0	67.7
80	123	51.8	6.0	0.7	5.1	4.8	98.0	68.4
90	131	52.6	5.4	0.7	5.1	5.2	98.0	69.0
100	139	54.0	5.0	0.7	4.7	5.6	98.0	70.0
110	155	58.4	3.0	0.7	4.2	5.9	98.0	72.2
120	169	62.5	2.8	0.7	3.3	6.4	98.0	75.7
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.3	2.1	0.8	43.7	3.1
10	0	1.6	0.0	0.3	0.7	0.4	43.7	3.0
20	0	13.1	2.1	0.3	0.6	0.8	43.7	16.8
30	458	16.4	2.4	0.3	1.8	1.1	43.7	21.9
40	904	18.6	2.4	0.3	2.1	1.3	43.7	24.6
50	1,204	20.6	2.2	0.3	2.4	1.5	43.7	27.0
60	1,481	22.5	2.0	0.3	2.5	1.7	43.7	29.0
70	1,637	23.0	2.5	0.3	2.5	1.9	43.7	30.2
80	1,755	23.1	2.7	0.3	2.3	2.1	43.7	30.5
90	1,866	23.4	2.4	0.3	2.3	2.3	43.7	30.8
100	1,984	24.1	2.2	0.3	2.1	2.5	43.7	31.2
110	2,208	26.1	1.3	0.3	1.9	2.6	43.7	32.2
120	2,409	27.9	1.3	0.3	1.5	2.8	43.7	33.7

Table A5.—Regional estimates of timber volume and carbon stocks for white-red-jack pine stands on forest land after clearcut harvest in the Northern Lake States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.6	10.0	120.8	10.5
10	0	1.1	0.0	0.1	0.2	8.2	120.8	9.6
20	0	9.9	0.1	0.1	0.2	8.3	120.8	18.5
30	41	27.2	0.6	0.1	1.0	8.7	120.8	37.7
40	105	45.0	2.0	0.1	2.6	9.4	120.8	59.1
50	157	55.0	3.5	0.1	4.9	10.0	120.8	73.5
60	208	64.6	2.5	0.1	7.0	10.4	120.8	84.6
70	230	66.6	6.7	0.1	8.9	10.8	120.8	93.2
80	251	69.2	6.8	0.1	11.0	11.1	120.8	98.3
90	270	71.7	7.6	0.1	11.6	11.4	120.8	102.5
100	289	74.2	7.5	0.3	12.2	11.8	120.8	106.1
110	304	76.6	7.4	0.3	11.6	12.1	120.8	108.1
120	317	78.8	7.3	0.3	11.0	12.4	120.8	109.8
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.3	4.4	53.9	4.7
10	0	0.5	0.0	0.0	0.1	3.7	53.9	4.3
20	0	4.4	0.1	0.0	0.1	3.7	53.9	8.3
30	588	12.1	0.3	0.0	0.5	3.9	53.9	16.8
40	1,506	20.1	0.9	0.0	1.2	4.2	53.9	26.4
50	2,249	24.5	1.6	0.0	2.2	4.4	53.9	32.8
60	2,976	28.8	1.1	0.0	3.1	4.6	53.9	37.7
70	3,280	29.7	3.0	0.0	4.0	4.8	53.9	41.6
80	3,586	30.9	3.0	0.0	4.9	5.0	53.9	43.9
90	3,856	32.0	3.4	0.0	5.2	5.1	53.9	45.7
100	4,123	33.1	3.3	0.1	5.4	5.3	53.9	47.3
110	4,341	34.2	3.3	0.1	5.2	5.4	53.9	48.2
120	4,527	35.1	3.3	0.1	4.9	5.5	53.9	49.0

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table A6.—Regional estimates of timber volume and carbon stocks for aspen-birch stands on forest land after clearcut harvest in the Northern Lake States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	6.2	8.8	146.1	15.0
10	0	4.4	0.1	0.0	3.0	8.0	146.1	15.4
20	17	30.8	3.3	0.0	2.9	9.3	146.1	46.2
30	73	34.2	3.5	0.0	13.5	9.5	146.1	60.7
40	114	49.8	3.6	0.0	8.1	10.3	146.1	71.7
50	129	54.6	6.8	0.0	7.2	10.9	146.1	79.5
60	140	57.7	6.6	0.0	8.4	11.1	146.1	83.9
70	149	60.4	7.1	0.0	8.4	11.3	146.1	87.2
80	157	62.7	4.4	0.0	9.8	11.5	146.1	88.3
90	161	63.9	4.5	0.0	9.1	11.6	146.1	89.1
100	163	64.4	4.7	0.0	8.3	11.8	146.1	89.2
110	107	44.4	13.0	0.0	13.2	11.5	146.1	82.1
120	82	33.7	10.3	0.0	15.5	11.0	146.1	70.5
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	2.8	3.9	65.2	6.7
10	0	2.0	0.0	0.0	1.4	3.5	65.2	6.9
20	249	13.7	1.5	0.0	1.3	4.1	65.2	20.6
30	1,045	15.3	1.6	0.0	6.0	4.2	65.2	27.1
40	1,627	22.2	1.6	0.0	3.6	4.6	65.2	32.0
50	1,845	24.4	3.0	0.0	3.2	4.8	65.2	35.4
60	2,002	25.7	3.0	0.0	3.8	4.9	65.2	37.4
70	2,134	26.9	3.2	0.0	3.8	5.1	65.2	38.9
80	2,243	28.0	2.0	0.0	4.4	5.1	65.2	39.4
90	2,297	28.5	2.0	0.0	4.1	5.2	65.2	39.7
100	2,324	28.7	2.1	0.0	3.7	5.3	65.2	39.8
110	1,535	19.8	5.8	0.0	5.9	5.1	65.2	36.6
120	1,172	15.0	4.6	0.0	6.9	4.9	65.2	31.4

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table A7.—Regional estimates of timber volume and carbon stocks for maple-beech-birch stands on forest land after clearcut harvest in the Northern Lake States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	0.0	9.1	2.6	134.3	11.8
10	0	2.8	0.0	0.0	4.1	2.1	134.3	9.1
20	0	21.8	0.4	0.0	2.7	3.1	134.3	27.9
30	89	51.1	5.7	0.0	4.9	4.6	134.3	66.3
40	125	62.8	8.6	0.0	10.7	5.6	134.3	87.8
50	140	67.1	9.0	0.0	15.0	6.2	134.3	97.3
60	161	74.3	6.3	0.0	16.7	6.6	134.3	103.9
70	178	80.1	7.4	0.0	14.4	7.3	134.3	109.1
80	187	82.1	9.2	0.0	13.7	7.7	134.3	112.7
90	193	83.6	9.3	0.0	14.3	8.1	134.3	115.2
100	202	86.2	9.2	0.0	14.3	8.4	134.3	118.2
110	210	88.9	9.7	0.0	14.0	8.8	134.3	121.5
120	219	92.3	9.4	0.0	14.6	9.2	134.3	125.4
years	*ft^3/acre*	---------- *tons carbon/acre* ----------						
0	0	0.0	0.0	0.0	4.1	1.2	59.9	5.2
10	0	1.3	0.0	0.0	1.8	1.0	59.9	4.1
20	0	9.7	0.2	0.0	1.2	1.4	59.9	12.5
30	1,271	22.8	2.5	0.0	2.2	2.1	59.9	29.6
40	1,782	28.0	3.8	0.0	4.8	2.5	59.9	39.1
50	2,002	29.9	4.0	0.0	6.7	2.8	59.9	43.4
60	2,298	33.1	2.8	0.0	7.4	2.9	59.9	46.3
70	2,545	35.7	3.3	0.0	6.4	3.2	59.9	48.7
80	2,667	36.6	4.1	0.0	6.1	3.4	59.9	50.3
90	2,764	37.3	4.1	0.0	6.4	3.6	59.9	51.4
100	2,889	38.4	4.1	0.0	6.4	3.8	59.9	52.7
110	3,005	39.7	4.3	0.0	6.3	3.9	59.9	54.2
120	3,127	41.2	4.2	0.0	6.5	4.1	59.9	56.0

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table A8.—Regional estimates of timber volume and carbon stocks for elm-ash-cottonwood stands on forest land after clearcut harvest in the Northern Lake States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	4.1	18.7	179.9	22.8
10	0	4.4	0.0	0.0	1.9	17.5	179.9	23.9
20	58	38.6	1.1	0.0	2.1	18.4	179.9	60.2
30	95	48.7	4.5	0.0	6.3	19.4	179.9	78.9
40	107	51.3	7.5	0.0	9.2	19.6	179.9	87.5
50	119	55.5	5.3	0.0	11.6	19.5	179.9	91.9
60	133	61.6	5.8	0.0	10.1	19.8	179.9	97.2
70	139	63.8	7.1	0.0	10.9	19.8	179.9	101.7
80	141	65.0	7.2	0.0	11.4	19.9	179.9	103.5
90	141	65.3	7.9	0.0	11.5	19.8	179.9	104.6
100	144	67.0	7.3	0.0	10.9	19.8	179.9	105.0
110	146	68.5	7.0	0.0	10.1	19.8	179.9	105.4
120	148	70.4	7.2	0.0	9.8	19.8	179.9	107.2
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	1.8	8.4	80.3	10.2
10	0	2.0	0.0	0.0	0.9	7.8	80.3	10.7
20	822	17.2	0.5	0.0	0.9	8.2	80.3	26.9
30	1,360	21.7	2.0	0.0	2.8	8.7	80.3	35.2
40	1,529	22.9	3.4	0.0	4.1	8.7	80.3	39.0
50	1,703	24.7	2.4	0.0	5.2	8.7	80.3	41.0
60	1,904	27.5	2.6	0.0	4.5	8.8	80.3	43.4
70	1,980	28.5	3.2	0.0	4.9	8.8	80.3	45.4
80	2,015	29.0	3.2	0.0	5.1	8.9	80.3	46.2
90	2,017	29.1	3.5	0.0	5.1	8.8	80.3	46.6
100	2,055	29.9	3.2	0.0	4.9	8.8	80.3	46.8
110	2,080	30.6	3.1	0.0	4.5	8.8	80.3	47.0
120	2,110	31.4	3.2	0.0	4.4	8.8	80.3	47.8

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table A9.—Regional estimates of timber volume and carbon stocks for oak-hickory stands on forest land after clearcut harvest in the Northern Lake States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	2.3	3.7	97.1	6.0
10	0	2.7	0.0	0.0	0.9	3.3	97.1	7.0
20	0	19.6	0.4	0.0	1.3	4.2	97.1	25.6
30	96	52.5	2.4	0.0	5.4	5.6	97.1	65.8
40	103	62.0	8.5	0.0	11.6	6.4	97.1	88.5
50	107	66.1	12.6	0.0	16.5	7.1	97.1	102.2
60	115	71.4	13.1	0.0	18.6	7.6	97.1	110.8
70	126	77.0	12.8	0.0	18.9	8.1	97.1	116.7
80	135	81.1	12.3	0.0	18.0	8.6	97.1	120.0
90	146	86.3	11.2	0.0	16.3	9.0	97.1	122.8
100	157	92.2	10.4	0.0	15.6	9.4	97.1	127.5
110	168	97.2	9.4	0.0	15.4	9.8	97.1	131.8
120	168	96.7	13.2	0.0	15.5	10.2	97.1	135.6
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	1.0	1.6	43.3	2.7
10	0	1.2	0.0	0.0	0.4	1.5	43.3	3.1
20	7	8.7	0.2	0.0	0.6	1.9	43.3	11.4
30	1,369	23.4	1.1	0.0	2.4	2.5	43.3	29.3
40	1,479	27.7	3.8	0.0	5.2	2.9	43.3	39.5
50	1,533	29.5	5.6	0.0	7.4	3.2	43.3	45.6
60	1,648	31.9	5.9	0.0	8.3	3.4	43.3	49.4
70	1,795	34.3	5.7	0.0	8.4	3.6	43.3	52.1
80	1,936	36.2	5.5	0.0	8.0	3.8	43.3	53.5
90	2,082	38.5	5.0	0.0	7.3	4.0	43.3	54.8
100	2,237	41.1	4.6	0.0	7.0	4.2	43.3	56.9
110	2,394	43.4	4.2	0.0	6.8	4.4	43.3	58.8
120	2,396	43.1	5.9	0.0	6.9	4.6	43.3	60.5

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table A10.—Regional estimates of timber volume and carbon stocks for spruce-balsam fir stands on forest land after clearcut harvest in the Northern Lake States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	1.7	0.3	261.8	2.0
10	0	1.4	0.0	0.1	0.7	0.4	261.8	2.6
20	0	8.2	0.4	0.1	0.5	1.0	261.8	10.2
30	7	17.5	0.9	0.1	1.1	1.5	261.8	21.1
40	33	26.6	1.6	0.1	1.9	1.9	261.8	32.1
50	51	32.4	2.6	0.1	3.1	2.5	261.8	40.7
60	63	34.8	3.2	0.1	4.3	2.9	261.8	45.3
70	73	36.8	3.3	0.1	4.8	3.3	261.8	48.3
80	83	39.3	3.6	0.1	4.4	3.6	261.8	51.0
90	90	40.8	3.7	0.1	4.5	4.0	261.8	53.1
100	95	41.9	4.1	0.1	4.5	4.2	261.8	54.8
110	100	43.1	4.2	0.1	4.3	4.5	261.8	56.2
120	105	44.3	4.5	0.1	4.3	4.7	261.8	57.9
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.8	0.1	116.8	0.9
10	0	0.6	0.0	0.0	0.3	0.2	116.8	1.2
20	0	3.7	0.2	0.0	0.2	0.5	116.8	4.5
30	100	7.8	0.4	0.0	0.5	0.7	116.8	9.4
40	476	11.9	0.7	0.0	0.8	0.9	116.8	14.3
50	725	14.4	1.2	0.0	1.4	1.1	116.8	18.2
60	899	15.5	1.4	0.0	1.9	1.3	116.8	20.2
70	1,048	16.4	1.5	0.0	2.1	1.5	116.8	21.6
80	1,187	17.5	1.6	0.0	2.0	1.6	116.8	22.7
90	1,289	18.2	1.7	0.0	2.0	1.8	116.8	23.7
100	1,364	18.7	1.8	0.0	2.0	1.9	116.8	24.4
110	1,433	19.2	1.9	0.0	1.9	2.0	116.8	25.1
120	1,495	19.8	2.0	0.0	1.9	2.1	116.8	25.8

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table A11.—Regional estimates of timber volume and carbon stocks for elm-ash-cottonwood stands on forest land after clearcut harvest in the Great Plains

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	11.2	5.3	58.4	16.6
10	0	4.5	0.0	0.0	4.6	4.7	58.4	13.9
20	26	17.8	0.2	0.0	2.6	5.0	58.4	25.6
30	92	56.0	0.9	0.0	2.7	5.5	58.4	65.2
40	86	55.1	7.8	0.0	13.3	5.8	58.4	82.1
50	86	39.9	20.0	0.0	17.0	6.2	58.4	83.1
60	121	48.6	12.1	0.0	18.8	6.4	58.4	85.9
70	161	59.6	11.2	0.0	15.8	6.9	58.4	93.6
80	195	70.4	11.5	0.0	14.1	7.3	58.4	103.4
90	229	81.3	12.7	0.0	14.4	7.8	58.4	116.2
100	264	93.3	13.4	0.0	15.8	8.3	58.4	130.8
110	298	105.7	15.1	0.0	17.3	8.8	58.4	147.0
120	320	114.3	20.4	0.0	19.0	9.4	58.4	163.1
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	5.0	2.4	26.0	7.4
10	0	2.0	0.0	0.0	2.1	2.1	26.0	6.2
20	372	7.9	0.1	0.0	1.2	2.2	26.0	11.4
30	1,318	25.0	0.4	0.0	1.2	2.5	26.0	29.1
40	1,236	24.6	3.5	0.0	6.0	2.6	26.0	36.6
50	1,222	17.8	8.9	0.0	7.6	2.8	26.0	37.1
60	1,732	21.7	5.4	0.0	8.4	2.8	26.0	38.3
70	2,294	26.6	5.0	0.0	7.1	3.1	26.0	41.7
80	2,793	31.4	5.1	0.0	6.3	3.3	26.0	46.1
90	3,267	36.3	5.7	0.0	6.4	3.5	26.0	51.8
100	3,769	41.6	6.0	0.0	7.1	3.7	26.0	58.3
110	4,260	47.1	6.8	0.0	7.7	3.9	26.0	65.6
120	4,567	51.0	9.1	0.0	8.5	4.2	26.0	72.7

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table A12.—Regional estimates of timber volume and carbon stocks for oak-hickory stands on forest land after clearcut harvest in the Great Plains

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	1.6	4.3	44.3	5.9
10	0	1.5	0.0	0.0	0.6	1.8	44.3	4.0
20	1	12.8	0.3	0.0	0.7	2.0	44.3	15.9
30	34	31.0	1.2	0.0	2.5	2.5	44.3	37.2
40	56	40.6	2.1	0.0	4.2	2.9	44.3	49.9
50	59	41.5	4.9	0.0	7.9	3.1	44.3	57.4
60	63	43.9	8.2	0.0	7.7	3.4	44.3	63.2
70	73	50.9	5.1	0.0	8.6	3.7	44.3	68.4
80	80	56.7	5.6	0.0	8.9	3.9	44.3	75.1
90	82	59.7	7.6	0.0	10.1	4.2	44.3	81.7
100	84	63.5	11.2	0.0	8.8	4.7	44.3	88.2
110	96	74.2	6.7	0.0	10.0	5.0	44.3	95.9
120	101	78.8	8.1	0.0	9.7	5.3	44.3	102.0
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.7	1.9	19.7	2.6
10	0	0.7	0.0	0.0	0.3	0.8	19.7	1.8
20	14	5.7	0.1	0.0	0.3	0.9	19.7	7.1
30	489	13.8	0.5	0.0	1.1	1.1	19.7	16.6
40	794	18.1	0.9	0.0	1.9	1.3	19.7	22.3
50	850	18.5	2.2	0.0	3.5	1.4	19.7	25.6
60	905	19.6	3.7	0.0	3.4	1.5	19.7	28.2
70	1,049	22.7	2.3	0.0	3.8	1.6	19.7	30.5
80	1,145	25.3	2.5	0.0	4.0	1.8	19.7	33.5
90	1,170	26.6	3.4	0.0	4.5	1.9	19.7	36.4
100	1,205	28.3	5.0	0.0	3.9	2.1	19.7	39.3
110	1,379	33.1	3.0	0.0	4.4	2.2	19.7	42.8
120	1,437	35.2	3.6	0.0	4.3	2.4	19.7	45.5

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table A13.—Regional estimates of timber volume and carbon stocks for elm-ash-cottonwood stands on forest land after clearcut harvest in the Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	10.1	4.4	89.0	14.5
10	22	24.7	0.5	0.0	4.4	2.8	89.0	32.5
20	64	28.0	15.0	0.0	12.3	3.4	89.0	58.7
30	115	42.4	12.1	0.0	16.1	3.9	89.0	74.4
40	154	54.0	10.2	0.0	16.0	4.3	89.0	84.5
50	187	63.6	14.6	0.0	15.9	4.9	89.0	99.0
60	204	68.7	15.5	0.0	20.4	5.3	89.0	109.9
70	225	74.9	14.7	0.0	21.2	5.7	89.0	116.7
80	242	80.9	16.6	0.0	20.0	6.2	89.0	123.8
90	264	88.9	16.9	0.0	20.3	6.7	89.0	132.9
100	287	96.9	16.5	0.0	19.8	7.3	89.0	140.4
110	309	105.9	18.3	0.0	19.4	7.8	89.0	151.4
120	335	117.0	20.1	0.0	21.3	8.3	89.0	166.7
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	4.5	2.0	39.7	6.5
10	319	11.0	0.2	0.0	2.0	1.2	39.7	14.5
20	913	12.5	6.7	0.0	5.5	1.5	39.7	26.2
30	1,644	18.9	5.4	0.0	7.2	1.7	39.7	33.2
40	2,200	24.1	4.6	0.0	7.1	1.9	39.7	37.7
50	2,666	28.4	6.5	0.0	7.1	2.2	39.7	44.1
60	2,919	30.6	6.9	0.0	9.1	2.4	39.7	49.0
70	3,221	33.4	6.6	0.0	9.5	2.6	39.7	52.0
80	3,454	36.1	7.4	0.0	8.9	2.8	39.7	55.2
90	3,776	39.7	7.5	0.0	9.1	3.0	39.7	59.3
100	4,107	43.2	7.3	0.0	8.8	3.2	39.7	62.6
110	4,421	47.2	8.2	0.0	8.7	3.5	39.7	67.6
120	4,787	52.2	9.0	0.0	9.5	3.7	39.7	74.4

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table A14.—Regional estimates of timber volume and carbon stocks for oak-hickory stands on forest land after clearcut harvest in the Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	7.4	8.0	47.3	15.5
10	0	4.5	0.0	0.0	3.1	3.9	47.3	11.6
20	1	37.7	0.6	0.0	2.8	4.6	47.3	45.7
30	91	48.9	12.4	0.0	14.7	5.3	47.3	81.3
40	115	58.1	10.6	0.0	16.3	5.7	47.3	90.8
50	128	63.2	13.4	0.0	17.4	6.1	47.3	100.2
60	141	68.8	13.3	0.0	18.5	6.6	47.3	107.3
70	154	74.1	14.0	0.0	17.3	7.0	47.3	112.5
80	166	79.4	14.5	0.0	17.2	7.4	47.3	118.5
90	175	84.8	13.0	0.0	17.2	7.8	47.3	122.8
100	183	89.0	14.3	0.0	16.1	8.1	47.3	127.6
110	193	94.4	14.9	0.0	17.1	8.5	47.3	134.9
120	203	99.7	13.8	0.0	17.1	8.9	47.3	139.6
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	3.3	3.6	21.1	6.9
10	0	2.0	0.0	0.0	1.4	1.7	21.1	5.2
20	17	16.8	0.3	0.0	1.3	2.0	21.1	20.4
30	1,295	21.8	5.5	0.0	6.5	2.4	21.1	36.3
40	1,639	25.9	4.7	0.0	7.3	2.6	21.1	40.5
50	1,823	28.2	6.0	0.0	7.8	2.7	21.1	44.7
60	2,018	30.7	5.9	0.0	8.3	2.9	21.1	47.9
70	2,202	33.1	6.2	0.0	7.7	3.1	21.1	50.2
80	2,374	35.4	6.5	0.0	7.7	3.3	21.1	52.9
90	2,506	37.8	5.8	0.0	7.7	3.5	21.1	54.8
100	2,613	39.7	6.4	0.0	7.2	3.6	21.1	56.9
110	2,752	42.1	6.6	0.0	7.6	3.8	21.1	60.2
120	2,896	44.5	6.2	0.0	7.6	4.0	21.1	62.3

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table A15.—Regional estimates of timber volume and carbon stocks for Douglas-fir stands on forest land after clearcut harvest in the Pacific Northwest, East

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	1.1	7.6	1.9	94.8	10.7
10	0	5.8	0.0	1.1	4.0	2.1	94.8	12.9
20	0	38.3	2.6	1.1	2.8	2.8	94.8	47.6
30	0	56.9	12.6	1.1	6.7	3.5	94.8	80.8
40	60	71.9	13.7	1.1	10.2	3.7	94.8	100.7
50	93	77.1	17.4	1.1	13.4	3.9	94.8	112.9
60	118	81.0	18.0	1.1	16.9	4.1	94.8	121.1
70	140	86.2	17.2	1.1	18.6	4.2	94.8	127.3
80	160	91.4	17.6	1.1	17.8	4.4	94.8	132.3
90	177	96.1	19.5	1.1	16.5	4.6	94.8	137.8
100	191	100.7	20.6	1.1	15.7	4.7	94.8	142.8
110	203	105.0	21.1	1.1	15.7	4.9	94.8	147.7
120	214	109.7	20.6	1.1	16.3	5.0	94.8	152.7
years	*ft^3/acre*	---------- *tons carbon/acre* ----------						
0	0	0.0	0.0	0.5	3.4	0.9	42.3	4.8
10	0	2.6	0.0	0.5	1.8	0.9	42.3	5.8
20	0	17.1	1.2	0.5	1.2	1.2	42.3	21.2
30	0	25.4	5.6	0.5	3.0	1.6	42.3	36.0
40	854	32.1	6.1	0.5	4.5	1.7	42.3	44.9
50	1,332	34.4	7.7	0.5	6.0	1.8	42.3	50.4
60	1,692	36.1	8.0	0.5	7.5	1.8	42.3	54.0
70	1,995	38.4	7.7	0.5	8.3	1.9	42.3	56.8
80	2,292	40.8	7.8	0.5	7.9	2.0	42.3	59.0
90	2,530	42.9	8.7	0.5	7.4	2.0	42.3	61.5
100	2,723	44.9	9.2	0.5	7.0	2.1	42.3	63.7
110	2,903	46.8	9.4	0.5	7.0	2.2	42.3	65.9
120	3,060	48.9	9.2	0.5	7.3	2.2	42.3	68.1

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table A16.—Regional estimates of timber volume and carbon stocks for fir-spruce-mountain hemlock stands on forest land after clearcut harvest in the Pacific Northwest, East

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.1	7.6	1.9	62.1	10.7
10	0	2.9	0.0	1.1	4.3	2.1	62.1	10.4
20	0	16.8	0.6	1.1	2.9	2.8	62.1	24.2
30	0	41.3	1.2	1.1	3.3	3.8	62.1	50.7
40	0	69.4	7.3	1.1	5.0	4.9	62.1	87.7
50	0	81.6	14.6	1.1	11.0	5.5	62.1	113.8
60	39	91.4	17.7	1.1	16.9	5.8	62.1	133.0
70	170	99.5	19.3	1.1	21.3	6.2	62.1	147.4
80	198	105.5	22.5	1.1	23.3	6.5	62.1	159.0
90	210	110.5	27.1	1.1	23.9	6.7	62.1	169.3
100	218	115.6	26.9	1.1	27.2	7.0	62.1	177.8
110	224	121.2	27.2	1.1	28.6	7.3	62.1	185.4
120	259	126.3	28.4	1.1	28.5	7.6	62.1	191.9
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.5	3.4	0.9	27.7	4.8
10	0	1.3	0.0	0.5	1.9	0.9	27.7	4.6
20	0	7.5	0.3	0.5	1.3	1.3	27.7	10.8
30	0	18.4	0.5	0.5	1.5	1.7	27.7	22.6
40	0	31.0	3.3	0.5	2.2	2.2	27.7	39.1
50	0	36.4	6.5	0.5	4.9	2.5	27.7	50.8
60	552	40.8	7.9	0.5	7.5	2.6	27.7	59.3
70	2,433	44.4	8.6	0.5	9.5	2.7	27.7	65.8
80	2,831	47.1	10.0	0.5	10.4	2.9	27.7	70.9
90	3,004	49.3	12.1	0.5	10.7	3.0	27.7	75.5
100	3,115	51.5	12.0	0.5	12.1	3.1	27.7	79.3
110	3,200	54.1	12.1	0.5	12.8	3.2	27.7	82.7
120	3,707	56.4	12.7	0.5	12.7	3.4	27.7	85.6

Table A17.—Regional estimates of timber volume and carbon stocks for lodgepole pine stands on forest land after clearcut harvest in the Pacific Northwest, East

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.1	4.4	1.9	52.0	7.4
10	0	3.5	0.0	0.8	2.1	2.1	52.0	8.5
20	0	22.4	2.6	0.8	1.3	2.6	52.0	29.6
30	0	27.7	7.0	0.8	3.4	2.9	52.0	41.7
40	71	33.4	7.8	1.1	5.8	3.0	52.0	51.2
50	110	40.3	8.1	1.1	7.4	3.2	52.0	60.1
60	129	46.4	8.0	1.1	8.7	3.4	52.0	67.7
70	148	50.0	9.8	1.1	9.6	3.6	52.0	74.1
80	167	52.4	10.6	1.1	11.3	3.8	52.0	79.2
90	177	54.9	11.0	1.1	12.5	3.9	52.0	83.3
100	189	57.2	11.0	1.1	13.3	4.1	52.0	86.8
110	197	59.7	10.8	1.1	13.9	4.3	52.0	89.8
120	203	62.0	10.3	1.1	14.3	4.5	52.0	92.3
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.5	2.0	0.9	23.2	3.3
10	0	1.6	0.0	0.4	0.9	0.9	23.2	3.8
20	0	10.0	1.1	0.4	0.6	1.2	23.2	13.2
30	0	12.3	3.1	0.4	1.5	1.3	23.2	18.6
40	1,011	14.9	3.5	0.5	2.6	1.3	23.2	22.8
50	1,565	18.0	3.6	0.5	3.3	1.4	23.2	26.8
60	1,837	20.7	3.6	0.5	3.9	1.5	23.2	30.2
70	2,119	22.3	4.4	0.5	4.3	1.6	23.2	33.1
80	2,387	23.4	4.7	0.5	5.0	1.7	23.2	35.3
90	2,525	24.5	4.9	0.5	5.6	1.8	23.2	37.2
100	2,700	25.5	4.9	0.5	6.0	1.8	23.2	38.7
110	2,816	26.6	4.8	0.5	6.2	1.9	23.2	40.1
120	2,903	27.7	4.6	0.5	6.4	2.0	23.2	41.1

Table A18.—Regional estimates of timber volume and carbon stocks for ponderosa pine stands on forest land after clearcut harvest in the Pacific Northwest, East

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	0.4	11.2	5.0	50.7	16.6
10	0	1.7	0.0	0.4	7.4	5.0	50.7	14.5
20	0	14.0	0.1	0.4	5.2	5.2	50.7	24.9
30	0	26.2	1.9	0.5	4.3	5.5	50.7	38.4
40	27	36.9	3.1	0.5	5.3	5.6	50.7	51.4
50	100	46.6	3.8	0.5	6.5	5.7	50.7	63.1
60	116	51.4	6.4	0.5	8.3	5.7	50.7	72.1
70	124	55.5	7.2	0.5	9.7	5.6	50.7	78.5
80	129	57.7	8.8	0.5	10.6	5.6	50.7	83.1
90	132	59.6	9.4	0.5	11.3	5.5	50.7	86.3
100	132	61.3	9.1	0.5	12.0	5.5	50.7	88.4
110	134	63.0	8.9	0.5	12.2	5.5	50.7	90.1
120	135	64.6	8.6	0.5	12.3	5.5	50.7	91.4
years	*ft^3/acre*	---------- *tons carbon/acre* ----------						
0	0	0.0	0.0	0.2	5.0	2.2	22.6	7.4
10	0	0.7	0.0	0.2	3.3	2.2	22.6	6.5
20	0	6.2	0.0	0.2	2.3	2.3	22.6	11.1
30	0	11.7	0.8	0.2	1.9	2.4	22.6	17.1
40	381	16.4	1.4	0.2	2.4	2.5	22.6	22.9
50	1,426	20.8	1.7	0.2	2.9	2.5	22.6	28.1
60	1,654	22.9	2.8	0.2	3.7	2.5	22.6	32.2
70	1,777	24.7	3.2	0.2	4.3	2.5	22.6	35.0
80	1,845	25.7	3.9	0.2	4.7	2.5	22.6	37.1
90	1,893	26.6	4.2	0.2	5.0	2.5	22.6	38.5
100	1,888	27.4	4.1	0.2	5.4	2.5	22.6	39.4
110	1,921	28.1	4.0	0.2	5.5	2.4	22.6	40.2
120	1,927	28.8	3.8	0.2	5.5	2.4	22.6	40.8

Table A19.—Regional estimates of timber volume and carbon stocks for alder-maple stands on forest land after clearcut harvest in the Pacific Northwest, West

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	5.9	10.3	115.2	18.9
10	0	5.7	0.2	0.4	4.0	9.9	115.2	20.2
20	0	34.1	1.0	0.4	3.2	10.6	115.2	49.3
30	78	70.1	3.2	0.4	3.5	11.9	115.2	89.2
40	387	98.4	10.9	0.4	5.8	13.2	115.2	128.7
50	495	120.9	19.3	0.4	7.4	14.2	115.2	162.2
60	562	135.6	27.4	0.4	10.0	15.0	115.2	188.4
70	600	144.6	28.2	0.4	13.8	15.6	115.2	202.7
80	629	149.3	34.7	0.4	13.6	16.1	115.2	214.1
90	657	152.4	35.3	0.4	16.2	16.6	115.2	220.9
100	669	159.0	31.1	0.4	16.9	17.0	115.2	224.4
110	702	169.8	26.5	0.4	15.3	17.6	115.2	229.6
120	720	177.2	24.0	0.4	15.3	18.1	115.2	235.1
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	2.7	4.6	51.4	8.4
10	0	2.5	0.1	0.2	1.8	4.4	51.4	9.0
20	0	15.2	0.4	0.2	1.4	4.7	51.4	22.0
30	1,109	31.3	1.4	0.2	1.6	5.3	51.4	39.8
40	5,536	43.9	4.9	0.2	2.6	5.9	51.4	57.4
50	7,068	53.9	8.6	0.2	3.3	6.3	51.4	72.4
60	8,031	60.5	12.2	0.2	4.4	6.7	51.4	84.0
70	8,576	64.5	12.6	0.2	6.2	7.0	51.4	90.4
80	8,992	66.6	15.5	0.2	6.1	7.2	51.4	95.5
90	9,385	68.0	15.8	0.2	7.2	7.4	51.4	98.5
100	9,557	70.9	13.9	0.2	7.5	7.6	51.4	100.1
110	10,035	75.7	11.8	0.2	6.8	7.9	51.4	102.4
120	10,290	79.0	10.7	0.2	6.8	8.1	51.4	104.9

Table A20.—Regional estimates of timber volume and carbon stocks for Douglas-fir stands on forest land after clearcut harvest in the Pacific Northwest, West

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	30.0	10.4	94.8	43.1
10	0	3.8	0.2	1.3	20.7	10.2	94.8	36.2
20	0	56.8	0.5	0.4	15.9	10.4	94.8	84.1
30	194	114.1	19.8	0.4	16.4	11.5	94.8	162.2
40	328	169.9	17.7	0.4	20.2	12.0	94.8	220.2
50	413	188.3	26.0	0.4	24.0	12.3	94.8	251.0
60	481	205.6	33.3	0.4	25.8	12.5	94.8	277.6
70	542	221.0	33.5	0.4	30.8	12.7	94.8	298.5
80	585	229.8	41.5	0.4	31.8	12.9	94.8	316.4
90	627	242.4	44.7	0.4	33.6	13.1	94.8	334.3
100	663	252.5	46.8	0.4	37.0	13.3	94.8	350.1
110	692	261.5	51.1	0.4	38.2	13.5	94.8	364.8
120	722	273.2	50.9	0.4	40.7	13.7	94.8	379.0
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	13.4	4.6	42.3	19.2
10	0	1.7	0.1	0.6	9.2	4.6	42.3	16.2
20	0	25.3	0.2	0.2	7.1	4.6	42.3	37.5
30	2,768	50.9	8.8	0.2	7.3	5.1	42.3	72.3
40	4,684	75.8	7.9	0.2	9.0	5.4	42.3	98.2
50	5,902	84.0	11.6	0.2	10.7	5.5	42.3	112.0
60	6,871	91.7	14.8	0.2	11.5	5.6	42.3	123.8
70	7,748	98.6	15.0	0.2	13.7	5.7	42.3	133.1
80	8,356	102.5	18.5	0.2	14.2	5.7	42.3	141.1
90	8,965	108.1	19.9	0.2	15.0	5.8	42.3	149.1
100	9,468	112.6	20.9	0.2	16.5	5.9	42.3	156.2
110	9,884	116.6	22.8	0.2	17.0	6.0	42.3	162.7
120	10,318	121.8	22.7	0.2	18.2	6.1	42.3	169.0

Table A21.—Regional estimates of timber volume and carbon stocks for Douglas-fir stands on forest land after clearcut harvest in the Pacific Northwest, West; volumes are for high-productivity sites (growth rate greater than 165 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	30.0	10.4	94.8	43.1
10	0	5.0	0.1	1.1	20.7	10.3	94.8	37.2
20	40	81.2	1.1	0.4	16.0	10.5	94.8	109.2
30	281	149.4	33.8	0.4	19.0	11.9	94.8	214.5
40	430	203.4	29.8	0.4	25.6	12.4	94.8	271.5
50	532	227.1	40.1	0.4	31.4	12.7	94.8	311.8
60	622	248.3	47.7	0.4	35.9	13.0	94.8	345.4
70	694	263.4	58.1	0.4	38.2	13.3	94.8	373.4
80	759	281.5	58.7	0.4	43.8	13.6	94.8	398.0
90	818	296.4	63.3	0.4	46.4	13.8	94.8	420.3
100	863	309.3	68.0	0.4	50.0	14.1	94.8	441.8
110	896	319.6	68.8	0.4	56.5	14.4	94.8	459.7
120	930	331.5	72.0	0.4	58.5	14.7	94.8	477.1
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	13.4	4.6	42.3	19.2
10	0	2.2	0.1	0.5	9.2	4.6	42.3	16.6
20	570	36.2	0.5	0.2	7.1	4.7	42.3	48.7
30	4,012	66.6	15.1	0.2	8.5	5.3	42.3	95.7
40	6,138	90.7	13.3	0.2	11.4	5.5	42.3	121.1
50	7,606	101.3	17.9	0.2	14.0	5.7	42.3	139.1
60	8,892	110.7	21.3	0.2	16.0	5.8	42.3	154.1
70	9,912	117.5	25.9	0.2	17.0	5.9	42.3	166.6
80	10,842	125.6	26.2	0.2	19.5	6.0	42.3	177.5
90	11,684	132.2	28.2	0.2	20.7	6.2	42.3	187.5
100	12,333	137.9	30.3	0.2	22.3	6.3	42.3	197.1
110	12,801	142.5	30.7	0.2	25.2	6.4	42.3	205.0
120	13,292	147.8	32.1	0.2	26.1	6.5	42.3	212.8

Table A22.—Regional estimates of timber volume and carbon stocks for fir-spruce-mountain hemlock stands on forest land after clearcut harvest in the Pacific Northwest, West

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.6	12.3	10.2	62.1	25.1
10	0	0.7	0.0	2.3	7.3	9.9	62.1	20.2
20	0	4.7	0.5	1.3	4.6	10.0	62.1	21.0
30	0	10.6	0.9	0.9	3.5	10.2	62.1	26.0
40	21	42.7	0.4	0.3	3.0	10.7	62.1	57.1
50	209	91.3	0.4	0.3	3.8	11.6	62.1	107.4
60	334	122.7	18.7	0.3	6.0	12.6	62.1	160.3
70	417	144.5	33.8	0.3	11.9	13.0	62.1	203.5
80	476	159.4	39.2	0.3	20.6	13.2	62.1	232.7
90	509	170.8	45.4	0.3	26.7	13.5	62.1	256.7
100	564	186.3	47.4	0.3	29.9	13.9	62.1	277.8
110	599	200.8	48.5	0.3	33.8	14.2	62.1	297.5
120	638	216.3	48.2	0.3	35.7	14.5	62.1	315.0
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.1	5.5	4.6	27.7	11.2
10	0	0.3	0.0	1.0	3.3	4.4	27.7	9.0
20	0	2.1	0.2	0.6	2.0	4.5	27.7	9.4
30	0	4.7	0.4	0.4	1.6	4.5	27.7	11.6
40	303	19.1	0.2	0.1	1.3	4.8	27.7	25.5
50	2,985	40.7	0.2	0.1	1.7	5.2	27.7	47.9
60	4,767	54.7	8.4	0.1	2.7	5.6	27.7	71.5
70	5,966	64.5	15.1	0.1	5.3	5.8	27.7	90.8
80	6,801	71.1	17.5	0.1	9.2	5.9	27.7	103.8
90	7,273	76.2	20.2	0.1	11.9	6.0	27.7	114.5
100	8,062	83.1	21.1	0.1	13.4	6.2	27.7	123.9
110	8,562	89.5	21.6	0.1	15.1	6.3	27.7	132.7
120	9,111	96.5	21.5	0.1	15.9	6.5	27.7	140.5

Table A23.—Regional estimates of timber volume and carbon stocks for hemlock-Sitka spruce stands on forest land after clearcut harvest in the Pacific Northwest, West

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m³/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	16.4	10.4	116.3	29.4
10	0	4.3	0.0	0.6	11.5	9.9	116.3	26.4
20	0	66.3	0.7	0.4	9.1	11.5	116.3	88.1
30	277	107.1	29.9	0.4	15.4	13.5	116.3	166.5
40	414	140.8	42.2	0.4	31.2	13.7	116.3	228.4
50	525	166.4	49.8	0.4	43.3	13.8	116.3	273.8
60	615	189.2	62.7	0.4	47.0	13.9	116.3	313.3
70	702	208.2	68.5	0.4	53.6	14.2	116.3	344.9
80	788	230.0	62.4	0.4	65.0	14.4	116.3	372.2
90	889	257.8	62.7	0.4	65.3	14.6	116.3	400.9
100	996	287.5	53.3	0.4	71.8	14.8	116.3	427.9
110	1,102	319.0	52.0	0.4	70.9	15.1	116.3	457.3
120	1,211	350.4	47.3	0.4	71.9	15.3	116.3	485.4
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	7.3	4.6	51.9	13.1
10	0	1.9	0.0	0.3	5.1	4.4	51.9	11.8
20	0	29.6	0.3	0.2	4.0	5.1	51.9	39.3
30	3,958	47.8	13.3	0.2	6.9	6.0	51.9	74.2
40	5,910	62.8	18.8	0.2	13.9	6.1	51.9	101.9
50	7,509	74.2	22.2	0.2	19.3	6.2	51.9	122.1
60	8,792	84.4	28.0	0.2	21.0	6.2	51.9	139.7
70	10,036	92.8	30.6	0.2	23.9	6.3	51.9	153.8
80	11,259	102.6	27.8	0.2	29.0	6.4	51.9	166.0
90	12,706	115.0	28.0	0.2	29.1	6.5	51.9	178.8
100	14,227	128.2	23.8	0.2	32.0	6.6	51.9	190.8
110	15,742	142.3	23.2	0.2	31.6	6.7	51.9	204.0
120	17,312	156.3	21.1	0.2	32.1	6.8	51.9	216.5

Table A24.—Regional estimates of timber volume and carbon stocks for hemlock-Sitka spruce stands on forest land after clearcut harvest in the Pacific Northwest, West; volumes are for high-productivity sites (growth rate greater than 225 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down Wdead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	16.4	10.4	116.3	29.4
10	0	7.6	0.0	0.4	11.5	9.9	116.3	29.6
20	0	76.5	9.4	0.4	9.7	12.9	116.3	109.0
30	194	120.9	39.9	0.4	19.9	15.3	116.3	196.4
40	472	157.4	52.6	0.4	36.9	15.7	116.3	263.1
50	626	186.1	58.6	0.4	52.8	16.0	116.3	313.9
60	755	213.4	60.8	0.4	62.9	16.3	116.3	353.9
70	854	236.5	63.3	0.4	68.8	16.6	116.3	385.7
80	933	255.3	72.0	0.4	71.0	16.8	116.3	415.5
90	1,000	272.5	81.7	0.4	70.5	17.1	116.3	442.3
100	1,061	290.1	83.9	0.4	74.2	17.3	116.3	466.0
110	1,104	302.3	86.3	0.4	79.4	17.6	116.3	486.1
120	1,153	317.5	86.7	0.4	84.0	17.9	116.3	506.5
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	7.3	4.6	51.9	13.1
10	0	3.4	0.0	0.2	5.2	4.4	51.9	13.2
20	0	34.1	4.2	0.2	4.3	5.8	51.9	48.6
30	2,768	53.9	17.8	0.2	8.9	6.8	51.9	87.6
40	6,745	70.2	23.5	0.2	16.5	7.0	51.9	117.3
50	8,942	83.0	26.1	0.2	23.5	7.1	51.9	140.0
60	10,784	95.2	27.1	0.2	28.1	7.3	51.9	157.8
70	12,210	105.5	28.2	0.2	30.7	7.4	51.9	172.0
80	13,330	113.9	32.1	0.2	31.7	7.5	51.9	185.3
90	14,287	121.5	36.5	0.2	31.4	7.6	51.9	197.3
100	15,159	129.4	37.4	0.2	33.1	7.7	51.9	207.9
110	15,774	134.8	38.5	0.2	35.4	7.9	51.9	216.8
120	16,478	141.6	38.7	0.2	37.5	8.0	51.9	225.9

Table A25.—Regional estimates of timber volume and carbon stocks for ponderosa pine stands on forest land after clearcut harvest in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.4	9.1	6.1	41.3	16.5
10	0	1.0	0.0	1.3	8.0	5.8	41.3	16.2
20	0	7.9	0.1	1.2	7.1	6.0	41.3	22.4
30	0	23.7	0.5	1.0	6.8	6.9	41.3	38.8
40	34	44.8	0.6	0.8	7.4	7.9	41.3	61.5
50	52	47.6	9.1	0.8	11.2	8.2	41.3	77.0
60	83	51.9	11.3	0.8	17.8	8.4	41.3	90.3
70	104	56.4	13.0	0.8	23.8	8.5	41.3	102.4
80	129	61.4	14.7	0.8	29.3	8.5	41.3	114.7
90	152	67.3	15.0	0.8	34.4	8.3	41.3	125.9
100	181	73.3	16.0	0.8	38.4	8.4	41.3	136.8
110	207	79.1	16.5	0.8	41.9	8.4	41.3	146.7
120	230	84.8	15.5	0.8	45.0	8.4	41.3	154.5
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.6	4.1	2.7	18.4	7.4
10	0	0.4	0.0	0.6	3.6	2.6	18.4	7.2
20	0	3.5	0.0	0.5	3.2	2.7	18.4	10.0
30	0	10.6	0.2	0.5	3.0	3.1	18.4	17.3
40	485	20.0	0.3	0.4	3.3	3.5	18.4	27.4
50	749	21.2	4.0	0.4	5.0	3.7	18.4	34.3
60	1,182	23.1	5.1	0.4	7.9	3.8	18.4	40.3
70	1,488	25.1	5.8	0.4	10.6	3.8	18.4	45.7
80	1,843	27.4	6.6	0.4	13.1	3.8	18.4	51.2
90	2,178	30.0	6.7	0.4	15.4	3.7	18.4	56.2
100	2,592	32.7	7.2	0.4	17.1	3.7	18.4	61.0
110	2,959	35.3	7.3	0.4	18.7	3.7	18.4	65.4
120	3,294	37.8	6.9	0.3	20.1	3.8	18.4	68.9

Table A26.—Regional estimates of timber volume and carbon stocks for fir-spruce-mountain hemlock stands on forest land after clearcut harvest in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.6	9.6	10.2	51.9	21.4
10	0	1.1	0.0	1.9	8.1	9.9	51.9	21.1
20	0	11.8	0.3	1.1	7.1	10.2	51.9	30.5
30	0	36.6	1.1	0.3	7.5	11.1	51.9	56.6
40	0	69.5	3.0	0.3	9.9	12.0	51.9	94.8
50	93	89.1	14.8	0.3	15.0	12.8	51.9	132.0
60	215	107.0	24.1	0.3	24.5	13.2	51.9	169.0
70	279	118.0	34.5	0.4	37.0	13.4	51.9	203.3
80	336	126.7	37.5	0.6	51.3	13.4	51.9	229.4
90	390	135.5	33.9	0.7	63.6	13.5	51.9	247.2
100	446	144.3	33.4	0.7	72.0	13.6	51.9	264.0
110	504	153.6	34.2	0.8	78.4	13.8	51.9	280.9
120	553	162.1	34.9	0.9	83.8	14.0	51.9	295.6
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.7	4.3	4.6	23.2	9.6
10	0	0.5	0.0	0.8	3.6	4.4	23.2	9.4
20	0	5.3	0.1	0.5	3.2	4.5	23.2	13.6
30	0	16.3	0.5	0.1	3.3	4.9	23.2	25.2
40	0	31.0	1.4	0.1	4.4	5.4	23.2	42.3
50	1,326	39.8	6.6	0.1	6.7	5.7	23.2	58.9
60	3,068	47.7	10.7	0.1	10.9	5.9	23.2	75.4
70	3,985	52.7	15.4	0.2	16.5	6.0	23.2	90.7
80	4,802	56.5	16.7	0.3	22.9	6.0	23.2	102.3
90	5,579	60.4	15.1	0.3	28.4	6.0	23.2	110.2
100	6,378	64.3	14.9	0.3	32.1	6.1	23.2	117.8
110	7,204	68.5	15.3	0.4	35.0	6.2	23.2	125.3
120	7,905	72.3	15.6	0.4	37.4	6.2	23.2	131.9

Table A27.—Regional estimates of timber volume and carbon stocks for western oak stands on forest land after clearcut harvest in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.0	0.2	2.4	27.6	3.6
10	0	21.2	0.0	0.5	0.2	0.3	27.6	22.2
20	0	32.9	1.1	0.5	1.1	4.2	27.6	39.7
30	0	45.3	2.8	0.5	3.2	6.0	27.6	57.8
40	23	53.3	6.8	0.5	7.5	7.5	27.6	75.7
50	67	63.4	6.7	0.5	14.1	8.6	27.6	93.3
60	99	74.4	8.1	0.5	19.4	10.0	27.6	112.5
70	113	81.2	11.9	0.5	26.1	11.1	27.6	130.8
80	126	87.3	14.0	0.5	34.6	11.9	27.6	148.4
90	137	91.7	15.6	0.5	43.8	12.6	27.6	164.2
100	146	95.6	17.6	0.5	53.5	13.1	27.6	180.3
110	163	104.0	14.6	0.5	62.4	13.8	27.6	195.4
120	171	107.7	18.3	0.5	69.3	14.5	27.6	210.4
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.4	0.1	1.1	12.3	1.6
10	0	9.4	0.0	0.2	0.1	0.1	12.3	9.9
20	0	14.7	0.5	0.2	0.5	1.9	12.3	17.7
30	0	20.2	1.2	0.2	1.4	2.7	12.3	25.8
40	325	23.8	3.0	0.2	3.4	3.4	12.3	33.7
50	952	28.3	3.0	0.2	6.3	3.8	12.3	41.6
60	1,408	33.2	3.6	0.2	8.7	4.5	12.3	50.2
70	1,608	36.2	5.3	0.2	11.6	5.0	12.3	58.3
80	1,801	38.9	6.2	0.2	15.4	5.3	12.3	66.2
90	1,951	40.9	7.0	0.2	19.5	5.6	12.3	73.3
100	2,089	42.6	7.9	0.2	23.8	5.9	12.3	80.4
110	2,328	46.4	6.5	0.2	27.9	6.2	12.3	87.1
120	2,450	48.0	8.2	0.2	30.9	6.5	12.3	93.8

Table A28.—Regional estimates of timber volume and carbon stocks for redwood stands on forest land after clearcut harvest in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	5.4	4.4	53.8	12.5
10	0	22.7	0.0	0.4	4.2	4.1	53.8	31.5
20	13	63.3	0.0	0.4	4.6	5.3	53.8	73.6
30	128	107.5	0.0	0.4	6.4	5.9	53.8	120.3
40	279	152.5	0.0	0.4	8.5	6.3	53.8	167.8
50	454	197.4	0.0	0.4	10.7	6.5	53.8	215.1
60	621	228.7	7.8	0.4	13.0	6.6	53.8	256.6
70	792	257.4	13.0	0.4	16.6	6.7	53.8	294.2
80	975	285.7	15.7	0.4	21.2	6.8	53.8	329.9
90	1,167	313.7	17.0	0.4	26.2	6.9	53.8	364.3
100	1,336	335.2	23.7	0.4	30.6	7.1	53.8	397.1
110	1,429	341.3	38.3	0.4	36.0	7.2	53.8	423.4
120	1,513	347.7	48.3	0.4	44.2	7.4	53.8	448.1
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	2.4	2.0	24.0	5.6
10	0	10.1	0.0	0.2	1.9	1.8	24.0	14.0
20	182	28.2	0.0	0.2	2.0	2.4	24.0	32.8
30	1,830	47.9	0.0	0.2	2.9	2.6	24.0	53.6
40	3,988	68.0	0.0	0.2	3.8	2.8	24.0	74.8
50	6,495	88.0	0.0	0.2	4.8	2.9	24.0	95.9
60	8,878	102.0	3.5	0.2	5.8	2.9	24.0	114.5
70	11,314	114.8	5.8	0.2	7.4	3.0	24.0	131.2
80	13,938	127.4	7.0	0.2	9.5	3.0	24.0	147.2
90	16,680	139.9	7.6	0.2	11.7	3.1	24.0	162.5
100	19,091	149.5	10.6	0.2	13.6	3.2	24.0	177.1
110	20,421	152.2	17.1	0.2	16.1	3.2	24.0	188.8
120	21,618	155.1	21.5	0.2	19.7	3.3	24.0	199.9

Table A29.—Regional estimates of timber volume and carbon stocks for California mixed conifer stands on forest land after clearcut harvest in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.4	9.1	6.1	49.8	16.5
10	0	2.7	0.0	2.1	7.7	5.7	49.8	18.2
20	0	24.1	0.2	0.9	7.0	6.4	49.8	38.6
30	13	55.9	0.9	0.4	7.5	7.1	49.8	71.8
40	79	79.0	8.6	0.4	9.6	7.7	49.8	105.3
50	170	98.9	16.5	0.4	15.0	8.0	49.8	138.8
60	245	111.1	24.2	0.6	23.6	8.3	49.8	167.7
70	322	122.3	24.0	0.7	33.5	8.5	49.8	188.9
80	384	131.2	25.8	0.8	41.5	8.7	49.8	208.0
90	438	138.7	30.6	0.9	48.1	8.9	49.8	227.2
100	481	143.5	35.8	1.0	55.5	9.1	49.8	244.9
110	525	147.5	37.5	1.1	63.9	9.2	49.8	259.3
120	552	147.6	42.8	1.2	72.1	9.4	49.8	273.0
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.6	4.1	2.7	22.2	7.4
10	0	1.2	0.0	0.9	3.5	2.6	22.2	8.1
20	0	10.8W	0.1	0.4	3.1	2.9	22.2	17.2
30	180	24.9	0.4	0.2	3.3	3.2	22.2	32.0
40	1,128	35.2	3.8	0.2	4.3	3.4	22.2	47.0
50	2,436	44.1	7.3	0.2	6.7	3.6	22.2	61.9
60	3,506	49.5	10.8	0.3	10.5	3.7	22.2	74.8
70	4,600	54.6	10.7	0.3	14.9	3.8	22.2	84.3
80	5,493	58.5	11.5	0.4	18.5	3.9	22.2	92.8
90	6,262	61.9	13.6	0.4	21.5	4.0	22.2	101.3
100	6,878	64.0	16.0	0.4	24.8	4.1	22.2	109.2
110	7,503	65.8	16.7	0.5	28.5	4.1	22.2	115.6
120	7,886	65.8	19.1	0.5	32.2	4.2	22.2	121.8

Table A30.—Regional estimates of timber volume and carbon stocks for tanoak-laurel stands on forest land after clearcut harvest in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.4	11.2	5.3	27.6	19.0
10	0	36.2	0.2	0.5	9.3	5.5	27.6	51.5
20	49	51.2	18.5	0.5	11.0	9.6	27.6	90.7
30	94	69.4	25.3	0.5	27.9	10.4	27.6	133.6
40	140	92.5	31.7	0.5	47.3	11.9	27.6	183.8
50	179	108.6	42.1	0.5	68.0	13.0	27.6	232.2
60	230	128.0	43.3	0.5	91.7	13.9	27.6	277.2
70	279	142.8	48.5	0.5	112.2	14.8	27.6	318.7
80	337	159.7	49.8	0.5	131.2	15.7	27.6	356.9
90	387	170.6	50.7	0.5	147.9	16.5	27.6	386.3
100	412	173.1	56.0	0.5	164.5	16.9	27.6	410.9
110	476	189.9	45.7	0.5	176.2	17.9	27.6	430.2
120	496	187.5	62.4	0.5	179.7	18.9	27.6	449.0
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.1	5.0	2.4	12.3	8.5
10	0	16.1	0.1	0.2	4.1	2.4	12.3	23.0
20	699	22.8	8.3	0.2	4.9	4.3	12.3	40.4
30	1,342	31.0	11.3	0.2	12.5	4.7	12.3	59.6
40	1,994	41.2	14.1	0.2	21.1	5.3	12.3	82.0
50	2,565	48.4	18.8	0.2	30.3	5.8	12.3	103.6
60	3,285	57.1	19.3	0.2	40.9	6.2	12.3	123.6
70	3,987	63.7	21.6	0.2	50.0	6.6	12.3	142.2
80	4,811	71.2	22.2	0.2	58.5	7.0	12.3	159.2
90	5,533	76.1	22.6	0.2	66.0	7.4	12.3	172.3
100	5,885	77.2	25.0	0.2	73.4	7.5	12.3	183.3
110	6,797	84.7	20.4	0.2	78.6	8.0	12.3	191.9
120	7,085	83.6	27.8	0.2	80.2	8.4	12.3	200.3

Table A31.—Regional estimates of timber volume and carbon stocks for other western softwood stands on forest land after clearcut harvest in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.6	29.1	10.3	49.8	42.0
10	0	1.1	0.0	2.2	27.2	9.9	49.8	40.5
20	0	5.1	0.2	1.8	25.5	9.9	49.8	42.4
30	0	8.6	0.9	1.5	24.0	9.9	49.8	44.9
40	0	12.1	2.1	1.3	23.0	9.9	49.8	48.4
50	19	15.4	3.4	1.2	22.7	9.9	49.8	52.7
60	26	18.5	4.8	1.2	23.1	10.0	49.8	57.7
70	37	21.5	6.0	1.2	24.0	10.2	49.8	62.9
80	47	24.4	7.0	1.2	25.4	10.3	49.8	68.3
90	55	27.4	7.7	1.2	27.2	10.5	49.8	74.0
100	62	30.9	8.2	1.2	29.1	10.8	49.8	80.2
110	66	34.5	8.6	1.2	30.9	11.1	49.8	86.4
120	71	38.9	8.7	1.2	32.7	11.4	49.8	93.0
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.1	13.0	4.6	22.2	18.7
10	0	0.5	0.0	1.0	12.1	4.4	22.2	18.0
20	0	2.3	0.1	0.8	11.4	4.4	22.2	18.9
30	0	3.8	0.4	0.7	10.7	4.4	22.2	20.0
40	0	5.4	0.9	0.6	10.3	4.4	22.2	21.6
50	268	6.9	1.5	0.5	10.1	4.4	22.2	23.5
60	372	8.3	2.2	0.5	10.3	4.5	22.2	25.7
70	530	9.6	2.7	0.5	10.7	4.5	22.2	28.1
80	674	10.9	3.1	0.5	11.4	4.6	22.2	30.5
90	782	12.2	3.4	0.5	12.1	4.7	22.2	33.0
100	881	13.8	3.7	0.5	13.0	4.8	22.2	35.8
110	947	15.4	3.8	0.5	13.8	4.9	22.2	38.5
120	1,019	17.4	3.9	0.5	14.6	5.1	22.2	41.5

Table A32.—Regional estimates of timber volume and carbon stocks for Douglas-fir stands on forest land after clearcut harvest in the Rocky Mountain, North

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	2.7	5.4	4.4	38.8	12.5
10	0	0.1	0.0	2.7	3.4	4.1	38.8	10.3
20	0	1.0	0.2	2.3	2.6	4.2	38.8	10.1
30	0	11.4	0.2	0.9	2.2	4.3	38.8	18.9
40	0	25.6	0.9	0.4	2.1	4.6	38.8	33.7
50	0	37.0	2.8	0.4	2.6	4.9	38.8	47.7
60	9	47.2	4.7	0.4	3.7	5.1	38.8	61.1
70	61	56.7	6.5	0.4	5.3	5.2	38.8	74.2
80	96	64.0	8.6	0.4	7.4	5.4	38.8	85.9
90	132	69.8	10.0	0.4	10.0	5.5	38.8	95.7
100	149	74.3	11.7	0.4	12.7	5.6	38.8	104.7
110	169	78.8	12.3	0.4	15.5	5.7	38.8	112.8
120	179	82.8	12.8	0.4	18.2	5.8	38.8	120.0
years	*ft^3/acre*	---------- *tons carbon/acre* ----------						
0	0	0.0	0.0	1.2	2.4	2.0	17.3	5.6
10	0	0.1	0.0	1.2	1.5	1.8	17.3	4.6
20	0	0.4	0.1	1.0	1.1	1.9	17.3	4.5
30	0	5.1	0.1	0.4	1.0	1.9	17.3	8.5
40	0	11.4	0.4	0.2	0.9	2.1	17.3	15.0
50	0	16.5	1.3	0.2	1.1	2.2	17.3	21.3
60	125	21.0	2.1	0.2	1.6	2.3	17.3	27.3
70	870	25.3	2.9	0.2	2.4	2.3	17.3	33.1
80	1,367	28.5	3.8	0.2	3.3	2.4	17.3	38.3
90	1,881	31.1	4.5	0.2	4.4	2.5	17.3	42.7
100	2,127	33.1	5.2	0.2	5.7	2.5	17.3	46.7
110	2,417	35.1	5.5	0.2	6.9	2.5	17.3	50.3
120	2,553	36.9	5.7	0.2	8.1	2.6	17.3	53.5

Table A33.—Regional estimates of timber volume and carbon stocks for ponderosa pine stands on forest land after clearcut harvest in the Rocky Mountain, North

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	0.4	1.6	1.1	34.3	3.0
10	0	0.1	0.0	0.4	1.1	0.7	34.3	2.3
20	0	2.0	0.1	0.4	0.9	0.7	34.3	4.1
30	0	16.0	0.3	0.5	0.9	1.1	34.3	18.7
40	16	29.2	2.1	0.5	1.4	1.7	34.3	34.9
50	42	36.7	4.9	0.5	2.8	2.0	34.3	46.9
60	59	41.1	7.7	0.5	4.9	2.3	34.3	56.4
70	73	44.3	8.1	0.5	7.4	2.4	34.3	62.7
80	84	46.5	8.8	0.5	9.5	2.6	34.3	67.9
90	93	49.1	9.5	0.5	11.8	2.7	34.3	73.5
100	100	50.9	10.4	0.5	13.7	2.9	34.3	78.4
110	108	52.3	10.2	0.5	15.3	3.0	34.3	81.3
120	115	53.6	10.9	0.5	16.6	3.1	34.3	84.7
years	*ft^3/acre*	---------- *tons carbon/acre* ----------						
0	0	0.0	0.0	0.2	0.7	0.5	15.3	1.4
10	0	0.1	0.0	0.2	0.5	0.3	15.3	1.0
20	0	0.9	0.0	0.2	0.4	0.3	15.3	1.8
30	0	7.1	0.1	0.2	0.4	0.5	15.3	8.4
40	234	13.0	0.9	0.2	0.6	0.7	15.3	15.6
50	605	16.4	2.2	0.2	1.3	0.9	15.3	20.9
60	850	18.3	3.4	0.2	2.2	1.0	15.3	25.2
70	1,041	19.8	3.6	0.2	3.3	1.1	15.3	27.9
80	1,194	20.7	3.9	0.2	4.3	1.1	15.3	30.3
90	1,324	21.9	4.2	0.2	5.2	1.2	15.3	32.8
100	1,429	22.7	4.7	0.2	6.1	1.3	15.3	35.0
110	1,546	23.3	4.6	0.2	6.8	1.3	15.3	36.2
120	1,637	23.9	4.9	0.2	7.4	1.4	15.3	37.8

Table A34.—Regional estimates of timber volume and carbon stocks for fir-spruce-mountain hemlock stands on forest land after clearcut harvest in the Rocky Mountain, North

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	2.6	9.6	10.2	44.1	22.4
10	0	0.1	0.0	2.6	6.5	9.8	44.1	19.1
20	0	1.5	0.3	2.0	5.0	9.8	44.1	18.7
30	0	18.3	0.2	0.6	4.3	10.0	44.1	33.4
40	2	43.5	2.6	0.3	4.2	10.8	44.1	61.4
50	56	64.2	8.5	0.3	5.7	11.5	44.1	90.2
60	128	76.9	14.2	0.3	9.4	11.8	44.1	112.6
70	170	85.6	18.6	0.3	14.5	12.0	44.1	130.9
80	205	91.6	20.7	0.3	19.8	12.1	44.1	144.4
90	227	96.7	22.2	0.3	24.7	12.1	44.1	156.1
100	248	101.5	22.5	0.3	29.6	12.2	44.1	166.0
110	274	106.3	22.6	0.3	33.3	12.2	44.1	174.7
120	293	110.5	22.7	0.3	36.3	12.3	44.1	182.1
years	*ft^3/acre*	---------- *tons carbon/acre* ----------						
0	0	0.0	0.0	1.1	4.3	4.6	19.7	10.0
10	0	0.1	0.0	1.1	2.9	4.4	19.7	8.5
20	0	0.7	0.1	0.9	2.2	4.4	19.7	8.3
30	0	8.1	0.1	0.3	1.9	4.5	19.7	14.9
40	25	19.4	1.2	0.1	1.9	4.8	19.7	27.4
50	805	28.6	3.8	0.1	2.6	5.1	19.7	40.2
60	1,835	34.3	6.3	0.1	4.2	5.3	19.7	50.2
70	2,435	38.2	8.3	0.1	6.5	5.3	19.7	58.4
80	2,935	40.8	9.2	0.1	8.9	5.4	19.7	64.4
90	3,243	43.1	9.9	0.1	11.0	5.4	19.7	69.6
100	3,550	45.3	10.0	0.1	13.2	5.4	19.7	74.0
110	3,913	47.4	10.1	0.1	14.9	5.5	19.7	77.9
120	4,189	49.3	10.1	0.1	16.2	5.5	19.7	81.2

Table A35.—Regional estimates of timber volume and carbon stocks for lodgepole pine stands on forest land after clearcut harvest in the Rocky Mountain, North

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.6	9.1	6.1	37.2	17.7
10	0	0.4	0.1	1.6	6.5	5.8	37.2	14.3
20	0	13.1	0.3	0.4	5.3	6.0	37.2	25.0
30	0	32.8	2.6	0.3	4.8	6.8	37.2	47.3
40	8	43.9	7.9	0.3	6.1	7.4	37.2	65.7
50	81	53.5	11.1	0.3	9.7	7.8	37.2	82.5
60	141	61.1	14.1	0.3	14.3	8.2	37.2	98.0
70	171	66.2	16.2	0.3	19.3	8.6	37.2	110.7
80	192	70.1	17.7	0.3	24.4	9.0	37.2	121.5
90	208	73.1	17.7	0.3	28.8	9.2	37.2	129.2
100	225	75.9	17.8	0.3	32.6	9.5	37.2	136.1
110	235	78.2	18.2	0.3	35.6	9.7	37.2	142.1
120	248	80.6	17.5	0.3	38.3	9.9	37.2	146.6
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.1	4.1	2.7	16.6	7.9
10	0	0.2	0.0	0.7	2.9	2.6	16.6	6.4
20	0	5.8	0.1	0.2	2.4	2.7	16.6	11.2
30	0	14.6	1.2	0.2	2.1	3.0	16.6	21.1
40	111	19.6	3.5	0.2	2.7	3.3	16.6	29.3
50	1,160	23.9	4.9	0.2	4.3	3.5	16.6	36.8
60	2,015	27.2	6.3	0.2	6.4	3.7	16.6	43.7
70	2,441	29.5	7.2	0.2	8.6	3.8	16.6	49.4
80	2,742	31.3	7.9	0.2	10.9	4.0	16.6	54.2
90	2,969	32.6	7.9	0.2	12.9	4.1	16.6	57.6
100	3,215	33.8	7.9	0.2	14.5	4.2	16.6	60.7
110	3,365	34.9	8.1	0.2	15.9	4.3	16.6	63.4
120	3,551	35.9	7.8	0.2	17.1	4.4	16.6	65.4

Table A36.—Regional estimates of timber volume and carbon stocks for Douglas-fir stands on forest land after clearcut harvest in the Rocky Mountain, South

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	2.7	5.4	4.4	30.9	12.5
10	0	2.9	0.0	1.8	4.3	4.2	30.9	13.1
20	0	9.1	0.0	1.1	3.7	4.7	30.9	18.6
30	0	19.6	0.1	0.7	3.4	5.3	30.9	29.1
40	0	34.8	0.2	0.4	3.6	6.0	30.9	45.1
50	31	42.9	5.3	0.5	4.7	6.8	30.9	60.1
60	49	48.0	8.7	0.6	7.4	7.1	30.9	71.8
70	69	53.7	10.0	0.8	10.8	7.2	30.9	82.4
80	93	60.7	10.4	0.9	14.0	7.3	30.9	93.2
90	98	65.9	9.8	1.0	16.9	7.4	30.9	100.9
100	124	69.4	8.6	1.0	19.2	7.5	30.9	105.7
110	127	72.8	8.3	1.1	20.6	7.6	30.9	110.4
120	147	76.4	8.3	1.1	22.0	7.7	30.9	115.5
years	*ft^3/acre*	---------- *tons carbon/acre* ----------						
0	0	0.0	0.0	1.2	2.4	2.0	13.8	5.6
10	0	1.3	0.0	0.8	1.9	1.9	13.8	5.9
20	0	4.0	0.0	0.5	1.6	2.1	13.8	8.3
30	0	8.7	0.1	0.3	1.5	2.4	13.8	13.0
40	0	15.5	0.1	0.2	1.6	2.7	13.8	20.1
50	442	19.1	2.4	0.2	2.1	3.0	13.8	26.8
60	704	21.4	3.9	0.3	3.3	3.1	13.8	32.0
70	983	23.9	4.4	0.4	4.8	3.2	13.8	36.8
80	1,324	27.1	4.7	0.4	6.2	3.2	13.8	41.6
90	1,403	29.4	4.4	0.4	7.5	3.3	13.8	45.0
100	1,776	30.9	3.8	0.5	8.6	3.3	13.8	47.1
110	1,809	32.5	3.7	0.5	9.2	3.4	13.8	49.2
120	2,105	34.1	3.7	0.5	9.8	3.4	13.8	51.5

Table A37.—Regional estimates of timber volume and carbon stocks for ponderosa pine stands on forest land after clearcut harvest in the Rocky Mountain, South

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	0.4	1.6	6.1	24.1	8.0
10	0	0.6	0.0	0.4	1.3	6.0	24.1	8.3
20	0	13.7	0.1	0.5	1.3	6.1	24.1	21.6
30	0	21.1	6.0	0.5	2.0	7.4	24.1	37.0
40	21	28.0	8.0	0.5	5.1	7.7	24.1	49.3
50	42	35.1	7.4	0.5	8.6	7.7	24.1	59.3
60	58	39.3	8.4	0.4	11.5	7.7	24.1	67.4
70	74	43.2	8.7	0.4	14.3	7.5	24.1	74.2
80	92	47.8	7.9	0.4	16.8	7.4	24.1	80.4
90	107	50.5	8.7	0.4	18.9	7.4	24.1	85.9
100	119	53.4	9.0	0.4	21.1	7.3	24.1	91.2
110	131	56.1	8.8	0.4	22.9	7.3	24.1	95.6
120	144	58.7	8.5	0.4	24.6	7.3	24.1	99.5
years	*ft^3/acre*	---------- *tons carbon/acre* ----------						
0	0	0.0	0.0	0.2	0.7	2.7	10.8	3.6
10	0	0.2	0.0	0.2	0.6	2.7	10.8	3.7
20	0	6.1	0.0	0.2	0.6	2.7	10.8	9.7
30	0	9.4	2.7	0.2	0.9	3.3	10.8	16.5
40	306	12.5	3.6	0.2	2.3	3.4	10.8	22.0
50	596	15.7	3.3	0.2	3.9	3.4	10.8	26.5
60	822	17.5	3.8	0.2	5.1	3.4	10.8	30.0
70	1,064	19.3	3.9	0.2	6.4	3.4	10.8	33.1
80	1,321	21.3	3.5	0.2	7.5	3.3	10.8	35.9
90	1,524	22.5	3.9	0.2	8.4	3.3	10.8	38.3
100	1,694	23.8	4.0	0.2	9.4	3.3	10.8	40.7
110	1,873	25.0	3.9	0.2	10.2	3.2	10.8	42.6
120	2,055	26.2	3.8	0.2	11.0	3.3	10.8	44.4

Table A38.—Regional estimates of timber volume and carbon stocks for fir-spruce-mountain hemlock stands on forest land after clearcut harvest in the Rocky Mountain, South

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.6	12.3	10.2	31.5	25.1
10	0	1.0	0.0	2.4	10.4	9.9	31.5	23.8
20	0	14.0	0.2	1.0	9.2	10.6	31.5	34.9
30	24	38.7	0.9	0.4	9.2	12.5	31.5	61.7
40	37	45.9	8.5	0.7	11.2	14.0	31.5	80.2
50	64	49.3	11.1	0.9	15.5	14.2	31.5	91.0
60	76	51.1	12.3	1.2	19.2	14.0	31.5	97.9
70	89	54.1	13.2	1.4	22.4	14.0	31.5	105.1
80	112	62.6	7.9	1.4	25.2	13.9	31.5	111.1
90	143	71.1	3.7	1.4	25.7	14.0	31.5	115.9
100	160	77.7	4.8	1.4	23.8	14.3	31.5	122.0
110	182	84.7	4.1	1.4	23.8	14.6	31.5	128.6
120	192	86.6	6.6	1.5	24.6	14.8	31.5	134.0
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.1	5.5	4.6	14.0	11.2
10	0	0.4	0.0	1.1	4.7	4.4	14.0	10.6
20	0	6.2	0.1	0.4	4.1	4.7	14.0	15.6
30	346	17.3	0.4	0.2	4.1	5.6	14.0	27.5
40	531	20.5	3.8	0.3	5.0	6.2	14.0	35.8
50	921	22.0	5.0	0.4	6.9	6.3	14.0	40.6
60	1,089	22.8	5.5	0.5	8.6	6.3	14.0	43.7
70	1,268	24.1	5.9	0.6	10.0	6.2	14.0	46.9
80	1,595	27.9	3.5	0.6	11.2	6.2	14.0	49.5
90	2,040	31.7	1.6	0.6	11.5	6.3	14.0	51.7
100	2,288	34.6	2.1	0.6	10.6	6.4	14.0	54.4
110	2,599	37.8	1.9	0.6	10.6	6.5	14.0	57.4
120	2,745	38.6	2.9	0.7	11.0	6.6	14.0	59.8

Table A39.—Regional estimates of timber volume and carbon stocks for lodgepole pine stands on forest land after clearcut harvest in the Rocky Mountain, South

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.6	9.1	6.1	27.0	16.7
10	0	2.9	0.0	1.5	7.7	5.9	27.0	18.0
20	0	12.3	0.1	1.2	6.9	6.9	27.0	27.3
30	0	24.1	0.3	1.0	6.6	7.8	27.0	39.9
40	0	31.0	3.8	1.0	6.8	7.9	27.0	50.4
50	0	37.7	5.5	1.0	8.4	8.2	27.0	60.8
60	0	45.6	5.3	1.0	10.5	8.4	27.0	70.8
70	82	53.1	6.1	1.0	12.3	8.7	27.0	81.1
80	150	59.7	6.7	1.0	14.2	8.9	27.0	90.5
90	203	66.0	7.7	1.0	16.5	9.0	27.0	100.3
100	214	69.9	9.6	1.1	19.2	9.1	27.0	108.8
110	255	73.9	10.5	1.1	22.6	9.1	27.0	117.3
120	259	77.6	10.3	1.1	26.3	9.1	27.0	124.4
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.7	4.1	2.7	12.0	7.5
10	0	1.3	0.0	0.6	3.4	2.7	12.0	8.0
20	0	5.5	0.0	0.5	3.1	3.1	12.0	12.2
30	0	10.7	0.1	0.5	3.0	3.5	12.0	17.8
40	0	13.8	1.7	0.4	3.0	3.5	12.0	22.5
50	0	16.8	2.5	0.4	3.8	3.6	12.0	27.1
60	0	20.4	2.4	0.4	4.7	3.7	12.0	31.6
70	1,175	23.7	2.7	0.4	5.5	3.9	12.0	36.2
80	2,146	26.6	3.0	0.4	6.3	4.0	12.0	40.4
90	2,896	29.4	3.4	0.5	7.4	4.0	12.0	44.7
100	3,062	31.2	4.3	0.5	8.5	4.1	12.0	48.5
110	3,640	33.0	4.7	0.5	10.1	4.1	12.0	52.3
120	3,707	34.6	4.6	0.5	11.7	4.1	12.0	55.5

Table A40.—Regional estimates of timber volume and carbon stocks for aspen-birch stands on forest land after clearcut harvest in the Rocky Mountain, South

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	1.7	11.2	5.3	58.8	18.2
10	0	2.9	0.0	1.0	8.7	4.9	58.8	17.6
W20	0	9.4	0.1	0.6	7.4	5.5	58.8	23.0
30	0	17.9	0.3	0.6	7.3	6.1	58.8	32.1
40	0	27.6	0.5	0.6	7.7	6.8	58.8	43.1
50	0	38.5	0.8	0.6	8.9	7.5	58.8	56.2
60	1	50.3	1.0	0.6	11.0	8.3	58.8	71.2
70	102	60.1	3.1	0.6	14.7	9.1	58.8	87.6
80	143	69.6	3.7	0.6	19.9	9.8	58.8	103.5
90	168	79.7	4.1	0.6	24.5	10.6	58.8	119.4
100	191	85.2	7.2	0.6	29.5	11.3	58.8	133.7
110	220	89.7	8.3	0.6	34.8	11.8	58.8	145.1
120	220	93.2	9.5	0.6	40.3	12.3	58.8	155.7
years	*ft^3/acre*	---------- *tons carbon/acre* ----------						
0	0	0.0	0.0	0.8	5.0	2.4	26.2	8.1
10	0	1.3	0.0	0.4	3.9	2.2	26.2	7.8
20	0	4.2	0.1	0.3	3.3	2.5	26.2	10.3
30	0	8.0	0.1	0.3	3.3	2.7	26.2	14.3
40	0	12.3	0.2	0.3	3.4	3.0	26.2	19.2
50	0	17.2	0.3	0.3	4.0	3.3	26.2	25.1
60	14	22.4	0.5	0.3	4.9	3.7	26.2	31.8
70	1,457	26.8	1.4	0.3	6.6	4.1	26.2	39.1
80	2,050	31.0	1.6	0.3	8.9	4.4	26.2	46.2
90	2,395	35.5	1.8	0.3	10.9	4.7	26.2	53.3
100	2,728	38.0	3.2	0.3	13.2	5.0	26.2	59.6
110	3,137	40.0	3.7	0.3	15.5	5.3	26.2	64.7
120	3,149	41.6	4.2	0.3	18.0	5.5	26.2	69.5

Table A41.—Regional estimates of timber volume and carbon stocks for longleaf-slash pine stands on forest land after clearcut harvest in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.7	2.7	12.5	110.0	16.9
5	0	2.1	0.0	2.5	1.7	7.3	110.0	13.5
10	39	30.6	0.1	3.8	1.1	7.3	110.0	42.9
15	56	34.1	3.3	5.7	1.7	8.2	110.0	53.0
20	73	37.4	4.0	5.7	4.0	8.4	110.0	59.4
25	100	42.3	3.3	5.7	5.2	8.5	110.0	65.1
30	122	47.1	3.7	5.7	5.3	8.7	110.0	70.6
35	137	49.8	5.9	5.7	5.4	8.9	110.0	75.8
40	152	52.5	6.5	5.7	6.5	9.1	110.0	80.3
45	166	54.8	7.1	5.7	7.1	9.3	110.0	83.9
50	178	56.7	7.6	5.7	7.6	9.4	110.0	87.0
55	188	58.5	7.4	5.7	8.0	9.6	110.0	89.2
60	196	59.9	8.1	5.7	8.0	9.7	110.0	91.5
65	203	61.2	8.3	5.7	8.2	9.9	110.0	93.4
70	209	62.0	8.9	5.7	8.3	10.1	110.0	95.0
75	212	62.6	9.2	5.7	8.5	10.2	110.0	96.2
80	214	63.0	9.2	5.7	8.7	10.3	110.0	96.8
85	214	62.8	9.5	5.7	8.7	10.5	110.0	97.2
90	212	62.3	9.8	5.7	8.7	10.6	110.0	97.2

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Table A41 (continued).—Regional estimates of timber volume and carbon stocks for longleaf-slash pine stands on forest land after clearcut harvest in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.8	1.2	5.6	49.1	7.5
5	0	0.9	0.0	1.1	0.7	3.2	49.1	6.0
10	555	13.6	0.1	1.7	0.5	3.3	49.1	19.1
15	807	15.2	1.4	2.5	0.8	3.7	49.1	23.6
20	1,046	16.7	1.8	2.5	1.8	3.7	49.1	26.5
25	1,423	18.9	1.5	2.5	2.3	3.8	49.1	29.0
30	1,739	21.0	1.6	2.5	2.4	3.9	49.1	31.5
35	1,951	22.2	2.7	2.5	2.4	4.0	49.1	33.8
40	2,175	23.4	2.9	2.5	2.9	4.1	49.1	35.8
45	2,372	24.4	3.1	2.5	3.2	4.1	49.1	37.4
50	2,538	25.3	3.4	2.5	3.4	4.2	49.1	38.8
55	2,685	26.1	3.3	2.5	3.6	4.3	49.1	39.8
60	2,807	26.7	3.6	2.5	3.6	4.3	49.1	40.8
65	2,908	27.3	3.7	2.5	3.7	4.4	49.1	41.6
70	2,981	27.7	4.0	2.5	3.7	4.5	49.1	42.4
75	3,034	27.9	4.1	2.5	3.8	4.6	49.1	42.9
80	3,054	28.1	4.1	2.5	3.9	4.6	49.1	43.2
85	3,056	28.0	4.2	2.5	3.9	4.7	49.1	43.3
90	3,035	27.8	4.4	2.5	3.9	4.7	49.1	43.3

Table A42.—Regional estimates of timber volume and carbon stocks for longleaf-slash pine stands on forest land after clearcut harvest in the Southeast; volumes are for high-productivity sites (growth rate greater than 85 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	3.1	2.7	12.5	110.0	18.3
5	0	2.8	0.0	3.9	1.7	7.3	110.0	15.7
10	0	15.4	0.0	5.3	1.0	7.4	110.0	29.1
15	24	26.1	0.2	7.2	1.2	7.8	110.0	42.4
20	70	39.9	0.7	7.2	2.1	8.1	110.0	57.8
25	104	45.9	7.0	7.2	3.3	8.5	110.0	71.9
30	137	52.5	7.7	7.2	6.9	8.8	110.0	83.1
35	171	59.4	8.9	7.2	8.5	9.1	110.0	93.0
40	195	63.4	12.2	7.2	9.5	9.4	110.0	101.7
45	213	66.0	14.0	7.2	11.4	9.6	110.0	108.2
50	228	68.7	14.1	7.2	12.9	9.9	110.0	112.8
55	238	70.8	15.6	7.2	13.5	10.2	110.0	117.2
60	242	71.0	16.2	7.2	14.3	10.4	110.0	119.0
65	248	72.4	15.6	7.2	14.6	10.6	110.0	120.4
70	256	74.6	15.1	7.2	14.2	10.8	110.0	122.0
75	263	76.5	14.5	7.2	13.7	11.1	110.0	122.9
80	270	78.7	13.9	7.2	13.0	11.3	110.0	124.2
85	277	80.9	13.8	7.2	12.3	11.6	110.0	125.8
90	284	83.0	13.1	7.2	11.9	11.8	110.0	127.0

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Table A42 (continued).—Regional estimates of timber volume and carbon stocks for longleaf-slash pine stands on forest land after clearcut harvest in the Southeast; volumes are for high-productivity sites (growth rate greater than 85 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.4	1.2	5.6	49.1	8.2
5	0	1.3	0.0	1.8	0.7	3.2	49.1	7.0
10	0	6.9	0.0	2.3	0.5	3.3	49.1	13.0
15	350	11.6	0.1	3.2	0.5	3.5	49.1	18.9
20	1,001	17.8	0.3	3.2	0.9	3.6	49.1	25.8
25	1,480	20.5	3.1	3.2	1.5	3.8	49.1	32.1
30	1,964	23.4	3.4	3.2	3.1	3.9	49.1	37.1
35	2,440	26.5	4.0	3.2	3.8	4.0	49.1	41.5
40	2,782	28.3	5.5	3.2	4.2	4.2	49.1	45.3
45	3,037	29.5	6.2	3.2	5.1	4.3	49.1	48.3
50	3,259	30.6	6.3	3.2	5.8	4.4	49.1	50.3
55	3,404	31.6	6.9	3.2	6.0	4.5	49.1	52.3
60	3,456	31.7	7.2	3.2	6.4	4.6	49.1	53.1
65	3,547	32.3	6.9	3.2	6.5	4.7	49.1	53.7
70	3,661	33.3	6.8	3.2	6.3	4.8	49.1	54.4
75	3,759	34.1	6.5	3.2	6.1	5.0	49.1	54.8
80	3,862	35.1	6.2	3.2	5.8	5.1	49.1	55.4
85	3,962	36.1	6.2	3.2	5.5	5.2	49.1	56.1
90	4,063	37.0	5.8	3.2	5.3	5.3	49.1	56.6

Table A43.—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands on forest land after clearcut harvest in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.3	3.8	9.1	72.9	14.2
5	0	15.0	0.0	1.6	2.4	5.1	72.9	24.0
10	32	36.9	5.5	2.1	1.8	5.5	72.9	51.9
15	43	42.9	2.8	2.9	5.4	6.0	72.9	60.0
20	79	48.8	3.3	2.9	6.0	6.2	72.9	67.1
25	122	52.1	6.1	2.9	6.6	6.4	72.9	74.0
30	150	55.5	6.6	2.9	7.8	6.5	72.9	79.3
35	169	58.6	7.0	2.9	8.1	6.7	72.9	83.3
40	191	61.7	7.3	2.9	8.3	6.8	72.9	87.0
45	210	64.7	7.1	2.9	8.3	7.0	72.9	90.1
50	225	67.6	7.2	2.9	8.2	7.2	72.9	92.9
55	240	70.4	7.2	2.9	8.1	7.3	72.9	95.9
60	252	73.0	7.0	2.9	8.0	7.5	72.9	98.4
65	262	75.6	7.3	2.9	7.8	7.7	72.9	101.2
70	272	78.1	6.9	2.9	7.7	7.8	72.9	103.4
75	280	80.6	7.0	2.9	7.4	8.0	72.9	105.9
80	288	83.2	7.6	2.9	7.4	8.1	72.9	109.2
85	296	85.8	6.8	2.9	7.6	8.3	72.9	111.4
90	296	86.4	8.5	2.9	7.4	8.5	72.9	113.6

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Table A43 (continued).—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands on forest land after clearcut harvest in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.6	1.7	4.0	32.5	6.3
5	0	6.7	0.0	0.7	1.1	2.3	32.5	10.7
10	457	16.5	2.5	0.9	0.8	2.5	32.5	23.2
15	611	19.1	1.3	1.3	2.4	2.7	32.5	26.7
20	1,129	21.8	1.5	1.3	2.7	2.8	32.5	29.9
25	1,743	23.3	2.7	1.3	2.9	2.8	32.5	33.0
30	2,139	24.7	2.9	1.3	3.5	2.9	32.5	35.4
35	2,421	26.2	3.1	1.3	3.6	3.0	32.5	37.2
40	2,724	27.5	3.3	1.3	3.7	3.1	32.5	38.8
45	2,996	28.9	3.2	1.3	3.7	3.1	32.5	40.2
50	3,221	30.1	3.2	1.3	3.6	3.2	32.5	41.5
55	3,424	31.4	3.2	1.3	3.6	3.3	32.5	42.8
60	3,595	32.6	3.1	1.3	3.6	3.3	32.5	43.9
65	3,747	33.7	3.2	1.3	3.5	3.4	32.5	45.1
70	3,882	34.8	3.1	1.3	3.4	3.5	32.5	46.1
75	4,002	35.9	3.1	1.3	3.3	3.6	32.5	47.2
80	4,115	37.1	3.4	1.3	3.3	3.6	32.5	48.7
85	4,226	38.3	3.0	1.3	3.4	3.7	32.5	49.7
90	4,233	38.5	3.8	1.3	3.3	3.8	32.5	50.7

Table A44.—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands on forest land after clearcut harvest in the Southeast; volumes are for high-productivity sites (growth rate greater than 85 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.1	3.8	9.1	72.9	15.0
5	0	13.5	0.0	2.5	2.4	5.1	72.9	23.4
10	34	42.0	3.6	3.0	1.7	5.5	72.9	55.8
15	85	50.4	4.4	3.7	3.9	6.1	72.9	68.6
20	142	56.6	6.6	3.7	6.1	6.3	72.9	79.3
25	170	59.5	10.6	3.7	7.6	6.5	72.9	88.0
30	205	64.0	10.5	3.7	10.1	6.7	72.9	95.0
35	232	67.4	12.4	3.7	10.8	6.9	72.9	101.3
40	258	71.3	12.1	3.7	11.9	7.1	72.9	106.1
45	278	74.3	13.4	3.7	12.0	7.3	72.9	110.8
50	298	78.0	12.3	3.7	12.6	7.6	72.9	114.3
55	314	81.0	12.9	3.7	12.3	7.8	72.9	117.7
60	327	83.8	12.9	3.7	12.3	8.0	72.9	120.8
65	338	86.5	13.6	3.7	12.2	8.2	72.9	124.3
70	345	88.0	14.1	3.7	12.4	8.5	72.9	126.7
75	350	89.4	14.4	3.7	12.7	8.7	72.9	128.9
80	359	91.7	13.7	3.7	12.9	8.9	72.9	130.9
85	354	90.9	17.6	3.7	12.6	9.1	72.9	133.9
90	360	92.8	14.2	3.7	14.3	9.3	72.9	134.3

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Table A44 (continued).—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands on forest land after clearcut harvest in the Southeast; volumes are for high-productivity sites (growth rate greater than 85 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.9	1.7	4.0	32.5	6.7
5	0	6.0	0.0	1.1	1.1	2.3	32.5	10.5
10	491	18.8	1.6	1.3	0.7	2.4	32.5	24.9
15	1,220	22.5	2.0	1.7	1.8	2.7	32.5	30.6
20	2,024	25.2	2.9	1.7	2.7	2.8	32.5	35.4
25	2,426	26.5	4.7	1.7	3.4	2.9	32.5	39.2
30	2,924	28.5	4.7	1.7	4.5	3.0	32.5	42.4
35	3,319	30.1	5.6	1.7	4.8	3.1	32.5	45.2
40	3,681	31.8	5.4	1.7	5.3	3.2	32.5	47.3
45	3,971	33.2	6.0	1.7	5.4	3.3	32.5	49.4
50	4,261	34.8	5.5	1.7	5.6	3.4	32.5	51.0
55	4,485	36.1	5.7	1.7	5.5	3.5	32.5	52.5
60	4,671	37.4	5.7	1.7	5.5	3.6	32.5	53.9
65	4,833	38.6	6.1	1.7	5.4	3.7	32.5	55.4
70	4,926	39.2	6.3	1.7	5.5	3.8	32.5	56.5
75	5,006	39.9	6.4	1.7	5.7	3.9	32.5	57.5
80	5,128	40.9	6.1	1.7	5.8	4.0	32.5	58.4
85	5,066	40.6	7.9	1.7	5.6	4.1	32.5	59.7
90	5,141	41.4	6.3	1.7	6.4	4.1	32.5	59.9

Table A45.—Regional estimates of timber volume and carbon stocks for oak-pine stands on forest land after clearcut harvest in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.3	5.7	8.5	61.4	15.4
5	0	11.5	0.0	1.6	3.6	5.2	61.4	21.8
10	0	30.8	1.3	2.1	2.4	5.6	61.4	42.2
15	17	37.4	6.1	2.9	3.2	6.1	61.4	55.6
20	31	42.3	6.4	2.9	6.2	6.4	61.4	64.2
25	54	45.8	7.0	2.9	8.2	6.6	61.4	70.5
30	85	49.1	7.9	2.9	9.7	6.8	61.4	76.4
35	114	52.2	8.7	2.9	10.5	7.0	61.4	81.2
40	137	56.9	7.4	2.9	11.0	7.2	61.4	85.4
45	159	61.8	7.7	2.9	10.4	7.4	61.4	90.2
50	179	66.6	8.1	2.9	10.2	7.7	61.4	95.4
55	197	71.5	8.2	2.9	10.2	8.0	61.4	100.7
60	207	73.7	10.7	2.9	10.3	8.2	61.4	105.8
65	215	75.7	11.4	2.9	11.5	8.4	61.4	109.9
70	221	77.8	11.1	2.9	12.1	8.7	61.4	112.5
75	227	79.9	10.9	2.9	12.1	8.9	61.4	114.7
80	232	82.5	11.3	2.9	11.9	9.1	61.4	117.6
85	238	85.3	11.0	2.9	11.9	9.3	61.4	120.4
90	243	87.9	10.7	2.9	11.6	9.6	61.4	122.6

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Table A45 (continued).—Regional estimates of timber volume and carbon stocks for oak-pine stands on forest land after clearcut harvest in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.6	2.5	3.8	27.4	6.9
5	0	5.1	0.0	0.7	1.6	2.3	27.4	9.7
10	0	13.7	0.6	0.9	1.1	2.5	27.4	18.8
15	240	16.7	2.7	1.3	1.4	2.7	27.4	24.8
20	447	18.9	2.8	1.3	2.8	2.8	27.4	28.6
25	777	20.4	3.1	1.3	3.7	2.9	27.4	31.5
30	1,211	21.9	3.5	1.3	4.3	3.0	27.4	34.1
35	1,624	23.3	3.9	1.3	4.7	3.1	27.4	36.2
40	1,965	25.4	3.3	1.3	4.9	3.2	27.4	38.1
45	2,271	27.6	3.5	1.3	4.6	3.3	27.4	40.3
50	2,558	29.7	3.6	1.3	4.5	3.4	27.4	42.6
55	2,817	31.9	3.6	1.3	4.6	3.6	27.4	44.9
60	2,953	32.9	4.8	1.3	4.6	3.7	27.4	47.2
65	3,067	33.8	5.1	1.3	5.1	3.8	27.4	49.0
70	3,156	34.7	4.9	1.3	5.4	3.9	27.4	50.2
75	3,240	35.6	4.9	1.3	5.4	4.0	27.4	51.2
80	3,318	36.8	5.0	1.3	5.3	4.1	27.4	52.5
85	3,400	38.1	4.9	1.3	5.3	4.2	27.4	53.7
90	3,467	39.2	4.8	1.3	5.2	4.3	27.4	54.7

Table A46.—Regional estimates of timber volume and carbon stocks for oak-hickory stands on forest land after clearcut harvest in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	1.3	5.8	8.5	45.3	15.5
5	0	1.9	0.0	1.6	3.7	5.0	45.3	12.2
10	0	16.2	0.0	2.1	2.4	5.2	45.3	26.0
15	25	40.9	0.7	2.9	2.5	5.7	45.3	52.7
20	38	48.5	7.4	2.9	4.5	6.3	45.3	69.6
25	40	53.8	4.3	2.9	9.2	6.5	45.3	76.8
30	56	59.4	4.3	2.9	10.3	6.7	45.3	83.6
35	77	65.1	4.7	2.9	11.2	7.0	45.3	90.8
40	100	70.0	6.0	2.9	12.4	7.2	45.3	98.5
45	124	74.5	6.9	2.9	14.1	7.4	45.3	105.7
50	145	79.1	8.1	2.9	15.6	7.6	45.3	113.3
55	163	83.8	9.2	2.9	17.2	7.9	45.3	120.9
60	178	88.3	10.2	2.9	18.7	8.1	45.3	128.2
65	194	93.7	9.2	2.9	19.8	8.4	45.3	134.0
70	210	99.5	8.9	2.9	19.5	8.7	45.3	139.5
75	224	105.2	9.1	2.9	18.8	9.0	45.3	144.9
80	237	110.0	9.7	2.9	18.1	9.3	45.3	150.0
85	248	115.0	9.8	2.9	17.7	9.6	45.3	154.9
90	258	119.5	10.2	2.9	17.3	9.9	45.3	159.7

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Table A46 (continued).—Regional estimates of timber volume and carbon stocks for oak-hickory stands on forest land after clearcut harvest in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.6	2.6	3.8	20.2	6.9
5	0	0.9	0.0	0.7	1.7	2.2	20.2	5.4
10	0	7.2	0.0	0.9	1.1	2.3	20.2	11.6
15	357	18.3	0.3	1.3	1.1	2.5	20.2	23.5
20	544	21.6	3.3	1.3	2.0	2.8	20.2	31.1
25	574	24.0	1.9	1.3	4.1	2.9	20.2	34.3
30	803	26.5	1.9	1.3	4.6	3.0	20.2	37.3
35	1,106	29.0	2.1	1.3	5.0	3.1	20.2	40.5
40	1,432	31.2	2.7	1.3	5.6	3.2	20.2	44.0
45	1,775	33.2	3.1	1.3	6.3	3.3	20.2	47.2
50	2,071	35.3	3.6	1.3	7.0	3.4	20.2	50.5
55	2,326	37.4	4.1	1.3	7.7	3.5	20.2	53.9
60	2,540	39.4	4.5	1.3	8.4	3.6	20.2	57.2
65	2,770	41.8	4.1	1.3	8.9	3.7	20.2	59.8
70	2,996	44.4	4.0	1.3	8.7	3.9	20.2	62.2
75	3,208	46.9	4.1	1.3	8.4	4.0	20.2	64.6
80	3,381	49.1	4.3	1.3	8.1	4.1	20.2	66.9
85	3,549	51.3	4.4	1.3	7.9	4.3	20.2	69.1
90	3,691	53.3	4.6	1.3	7.7	4.4	20.2	71.2

Table A47.—Regional estimates of timber volume and carbon stocks for oak-gum-cypress stands on forest land after clearcut harvest in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.7	4.7	6.8	158.0	12.1
5	0	3.0	0.0	1.0	2.9	4.7	158.0	11.7
10	0	12.5	0.0	1.5	1.9	5.1	158.0	21.1
15	0	27.0	0.1	2.3	1.8	5.5	158.0	36.8
20	41	42.3	3.4	2.3	2.8	6.0	158.0	56.8
25	42	52.0	3.3	2.3	5.6	6.4	158.0	69.5
30	51	61.1	3.9	2.3	7.4	6.7	158.0	81.4
35	85	70.1	5.1	2.3	9.1	7.0	158.0	93.6
40	131	77.7	7.5	2.3	11.1	7.3	158.0	105.9
45	162	80.8	11.8	2.3	13.4	7.6	158.0	115.9
50	187	85.4	12.3	2.3	16.8	7.8	158.0	124.6
55	205	89.2	13.7	2.3	18.9	8.1	158.0	132.2
60	222	94.1	13.4	2.3	20.5	8.3	158.0	138.7
65	236	98.4	13.9	2.3	20.9	8.6	158.0	144.1
70	249	102.4	14.2	2.3	21.0	8.8	158.0	148.8
75	262	106.2	14.1	2.3	21.4	9.0	158.0	153.1
80	273	109.9	14.3	2.3	21.6	9.3	158.0	157.4
85	285	113.9	14.0	2.3	21.6	9.6	158.0	161.5
90	295	117.4	13.9	2.3	21.4	9.9	158.0	164.9

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Table A47 (continued).—Regional estimates of timber volume and carbon stocks for oak-gum-cypress stands on forest land after clearcut harvest in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.3	2.1	3.0	70.5	5.4
5	0	1.3	0.0	0.4	1.3	2.1	70.5	5.2
10	0	5.6	0.0	0.7	0.8	2.3	70.5	9.4
15	0	12.1	0.1	1.0	0.8	2.4	70.5	16.4
20	590	18.8	1.5	1.0	1.3	2.7	70.5	25.3
25	594	23.2	1.5	1.0	2.5	2.8	70.5	31.0
30	726	27.3	1.8	1.0	3.3	3.0	70.5	36.3
35	1,214	31.3	2.3	1.0	4.1	3.1	70.5	41.8
40	1,877	34.7	3.3	1.0	5.0	3.3	70.5	47.2
45	2,314	36.0	5.2	1.0	6.0	3.4	70.5	51.7
50	2,667	38.1	5.5	1.0	7.5	3.5	70.5	55.6
55	2,931	39.8	6.1	1.0	8.4	3.6	70.5	59.0
60	3,177	42.0	6.0	1.0	9.2	3.7	70.5	61.8
65	3,374	43.9	6.2	1.0	9.3	3.8	70.5	64.3
70	3,559	45.7	6.3	1.0	9.4	3.9	70.5	66.3
75	3,739	47.4	6.3	1.0	9.6	4.0	70.5	68.3
80	3,898	49.0	6.4	1.0	9.7	4.2	70.5	70.2
85	4,070	50.8	6.3	1.0	9.7	4.3	70.5	72.0
90	4,210	52.4	6.2	1.0	9.5	4.4	70.5	73.6

Table A48.—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands on forest land after clearcut harvest in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.3	3.8	9.1	41.9	14.2
5	0	12.7	0.0	1.6	2.4	5.1	41.9	21.7
10	36	46.0	2.8	2.1	1.7	5.4	41.9	58.0
15	80	51.3	6.2	2.9	3.7	6.1	41.9	70.2
20	123	54.7	6.6	2.9	6.8	6.3	41.9	77.2
25	155	56.7	9.4	2.9	8.0	6.4	41.9	83.4
30	189	62.1	7.2	2.9	9.8	6.6	41.9	88.5
35	223	67.4	7.1	2.9	9.1	6.8	41.9	93.3
40	245	69.4	10.4	2.9	8.8	7.0	41.9	98.4
45	262	70.8	11.1	2.9	10.2	7.2	41.9	102.2
50	276	72.2	11.7	2.9	11.1	7.3	41.9	105.1
55	285	72.7	12.9	2.9	11.6	7.5	41.9	107.6
60	295	73.8	12.1	2.9	12.4	7.7	41.9	108.8
65	305	75.2	11.5	2.9	12.1	7.8	41.9	109.5
70	314	76.4	11.6	2.9	11.5	8.0	41.9	110.3
75	323	77.9	11.0	2.9	11.1	8.2	41.9	111.1
80	330	79.3	10.8	2.9	10.6	8.3	41.9	111.9
85	338	80.9	11.0	2.9	10.3	8.5	41.9	113.5
90	345	82.3	10.5	2.9	10.3	8.6	41.9	114.5

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Table A8 (continued).—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands on forest land after clearcut harvest in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.6	1.7	4.0	18.7	6.3
5	0	5.7	0.0	0.7	1.1	2.3	18.7	9.7
10	513	20.5	1.3	0.9	0.7	2.4	18.7	25.9
15	1,147	22.9	2.8	1.3	1.6	2.7	18.7	31.3
20	1,758	24.4	3.0	1.3	3.0	2.8	18.7	34.5
25	2,210	25.3	4.2	1.3	3.6	2.9	18.7	37.2
30	2,696	27.7	3.2	1.3	4.4	2.9	18.7	39.5
35	3,192	30.1	3.2	1.3	4.1	3.0	18.7	41.6
40	3,497	30.9	4.7	1.3	3.9	3.1	18.7	43.9
45	3,739	31.6	5.0	1.3	4.5	3.2	18.7	45.6
50	3,943	32.2	5.2	1.3	4.9	3.3	18.7	46.9
55	4,074	32.4	5.8	1.3	5.2	3.3	18.7	48.0
60	4,222	32.9	5.4	1.3	5.5	3.4	18.7	48.5
65	4,363	33.5	5.1	1.3	5.4	3.5	18.7	48.8
70	4,484	34.1	5.2	1.3	5.1	3.6	18.7	49.2
75	4,611	34.8	4.9	1.3	5.0	3.6	18.7	49.5
80	4,716	35.4	4.8	1.3	4.7	3.7	18.7	49.9
85	4,826	36.1	4.9	1.3	4.6	3.8	18.7	50.6
90	4,925	36.7	4.7	1.3	4.6	3.8	18.7	51.1

Table A49.—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands on forest land after clearcut harvest in the South Central States; volumes are for high-productivity sites (growth rate greater than 120 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.1	3.8	9.1	41.9	15.0
5	0	12.8	0.0	2.5	2.4	5.1	41.9	22.7
10	60	43.4	4.3	3.0	1.7	5.4	41.9	57.8
15	103	47.9	9.3	3.7	4.0	6.1	41.9	71.0
20	144	54.2	9.6	3.7	7.5	6.2	41.9	81.2
25	179	59.5	11.2	3.7	9.0	6.4	41.9	89.8
30	206	63.1	13.7	3.7	10.3	6.6	41.9	97.5
35	223	65.4	16.2	3.7	11.8	6.9	41.9	103.9
40	240	68.4	15.6	3.7	13.5	7.1	41.9	108.2
45	253	71.0	15.5	3.7	13.7	7.3	41.9	111.2
50	266	73.8	16.4	3.7	13.6	7.5	41.9	115.0
55	279	77.0	15.9	3.7	13.9	7.7	41.9	118.3
60	289	79.8	15.8	3.7	13.8	7.9	41.9	121.0
65	301	83.2	14.9	3.7	13.3	8.2	41.9	123.3
70	311	85.9	15.4	3.7	12.4	8.4	41.9	125.9
75	319	88.6	15.6	3.7	12.2	8.6	41.9	128.7
80	327	91.7	16.1	3.7	12.1	8.8	41.9	132.4
85	334	94.5	16.4	3.7	12.3	9.0	41.9	135.9
90	342	97.8	15.9	3.7	12.5	9.3	41.9	139.2

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Table A49 (continued).—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands on forest land after clearcut harvest in the South Central States; volumes are for high-productivity sites (growth rate greater than 120 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.9	1.7	4.0	18.7	6.7
5	0	5.7	0.0	1.1	1.1	2.3	18.7	10.1
10	863	19.3	1.9	1.3	0.7	2.4	18.7	25.8
15	1,471	21.4	4.1	1.7	1.8	2.7	18.7	31.7
20	2,053	24.2	4.3	1.7	3.3	2.8	18.7	36.2
25	2,559	26.5	5.0	1.7	4.0	2.9	18.7	40.1
30	2,937	28.2	6.1	1.7	4.6	3.0	18.7	43.5
35	3,189	29.2	7.2	1.7	5.2	3.1	18.7	46.4
40	3,426	30.5	7.0	1.7	6.0	3.1	18.7	48.3
45	3,613	31.7	6.9	1.7	6.1	3.2	18.7	49.6
50	3,795	32.9	7.3	1.7	6.1	3.3	18.7	51.3
55	3,985	34.3	7.1	1.7	6.2	3.4	18.7	52.8
60	4,135	35.6	7.1	1.7	6.1	3.5	18.7	54.0
65	4,308	37.1	6.7	1.7	6.0	3.6	18.7	55.0
70	4,440	38.3	6.9	1.7	5.5	3.7	18.7	56.2
75	4,555	39.5	7.0	1.7	5.4	3.8	18.7	57.4
80	4,674	40.9	7.2	1.7	5.4	3.9	18.7	59.1
85	4,771	42.1	7.3	1.7	5.5	4.0	18.7	60.6
90	4,889	43.6	7.1	1.7	5.6	4.1	18.7	62.1

Table A50.—Regional estimates of timber volume and carbon stocks for oak-pine stands on forest land after clearcut harvest in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	5.7	8.5	41.7	14.2
5	0	10.2	0.0	0.4	3.6	5.2	41.7	19.4
10	0	29.9	2.6	0.4	2.4	5.5	41.7	40.9
15	2	32.0	13.1	0.4	4.1	5.9	41.7	55.5
20	51	39.2	9.3	0.4	10.2	6.0	41.7	65.1
25	78	46.5	10.2	0.4	10.9	6.2	41.7	74.2
30	87	46.0	15.8	6.7	11.2	6.5	41.7	86.2
35	118	54.5	8.9	6.7	13.6	6.6	41.7	90.3
40	117	51.3	17.2	6.7	11.1	6.8	41.7	93.1
45	154	63.1	5.6	6.7	13.8	6.9	41.7	96.1
50	147	60.6	16.9	6.7	9.3	7.2	41.7	100.8
55	171	69.7	9.9	6.7	12.0	7.3	41.7	105.7
60	175	71.7	15.1	6.7	11.1	7.6	41.7	112.1
65	185	76.8	15.2	6.7	12.3	7.7	41.7	118.7
70	192	79.9	15.9	6.7	14.0	7.9	41.7	124.5
75	200	83.4	16.0	6.7	15.2	8.1	41.7	129.4
80	206	87.1	15.8	6.7	16.1	8.3	41.7	134.0
85	212	89.4	16.7	6.7	16.4	8.5	41.7	137.8
90	219	92.4	16.7	6.7	17.0	8.7	41.7	141.5

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Table A50 (continued).—Regional estimates of timber volume and carbon stocks for oak-pine stands on forest land after clearcut harvest in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	2.5	3.8	18.6	6.3
5	0	4.6	0.0	0.2	1.6	2.3	18.6	8.6
10	0	13.4	1.2	0.2	1.1	2.4	18.6	18.2
15	30	14.3	5.8	0.2	1.8	2.6	18.6	24.8
20	733	17.5	4.1	0.2	4.5	2.7	18.6	29.0
25	1,119	20.7	4.5	0.2	4.9	2.8	18.6	33.1
30	1,249	20.5	7.1	3.0	5.0	2.9	18.6	38.5
35	1,691	24.3	4.0	3.0	6.1	2.9	18.6	40.3
40	1,668	22.9	7.7	3.0	4.9	3.0	18.6	41.5
45	2,198	28.1	2.5	3.0	6.2	3.1	18.6	42.9
50	2,098	27.0	7.6	3.0	4.2	3.2	18.6	45.0
55	2,439	31.1	4.4	3.0	5.3	3.3	18.6	47.1
60	2,497	32.0	6.7	3.0	4.9	3.4	18.6	50.0
65	2,643	34.2	6.8	3.0	5.5	3.4	18.6	53.0
70	2,745	35.6	7.1	3.0	6.3	3.5	18.6	55.5
75	2,857	37.2	7.1	3.0	6.8	3.6	18.6	57.7
80	2,942	38.8	7.0	3.0	7.2	3.7	18.6	59.8
85	3,032	39.9	7.4	3.0	7.3	3.8	18.6	61.4
90	3,129	41.2	7.5	3.0	7.6	3.9	18.6	63.1

Table A51.—Regional estimates of timber volume and carbon stocks for oak-hickory stands on forest land after clearcut harvest in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	0.0	5.8	8.5	38.6	14.3
5	0	1.9	0.0	0.0	3.7	5.0	38.6	10.6
10	0	30.5	0.0	0.0	2.4	5.2	38.6	38.2
15	4	45.1	4.2	0.0	2.7	6.0	38.6	58.1
20	18	51.0	7.8	0.0	6.6	6.4	38.6	71.9
25	35	55.3	8.4	0.0	10.8	6.6	38.6	81.1
30	66	59.1	10.8	0.0	13.3	6.8	38.6	90.0
35	93	62.8	12.6	0.0	15.8	7.0	38.6	98.1
40	110	65.5	14.6	0.0	18.0	7.2	38.6	105.3
45	128	71.7	12.7	0.0	20.4	7.4	38.6	112.1
50	146	77.6	12.7	0.0	21.0	7.7	38.6	119.0
55	165	83.1	13.3	0.0	21.2	7.9	38.6	125.5
60	182	87.8	14.8	0.0	21.6	8.2	38.6	132.5
65	193	89.6	17.1	0.0	22.3	8.5	38.6	137.6
70	204	91.5	17.9	0.0	23.5	8.8	38.6	141.7
75	214	93.3	18.0	0.0	24.5	9.0	38.6	144.8
80	224	95.6	18.0	0.0	24.8	9.2	38.6	147.7
85	233	97.7	18.0	0.0	24.8	9.5	38.6	150.1
90	243	99.9	18.0	0.0	24.6	9.7	38.6	152.3

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Table A51 (continued).—Regional estimates of timber volume and carbon stocks for oak-hickory stands on forest land after clearcut harvest in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	2.6	3.8	17.2	6.4
5	0	0.8	0.0	0.0	1.7	2.2	17.2	4.7
10	0	13.6	0.0	0.0	1.1	2.3	17.2	17.0
15	54	20.1	1.9	0.0	1.2	2.7	17.2	25.9
20	255	22.8	3.5	0.0	2.9	2.9	17.2	32.1
25	496	24.7	3.8	0.0	4.8	2.9	17.2	36.2
30	948	26.4	4.8	0.0	5.9	3.0	17.2	40.2
35	1,331	28.0	5.6	0.0	7.0	3.1	17.2	43.8
40	1,572	29.2	6.5	0.0	8.0	3.2	17.2	47.0
45	1,827	32.0	5.6	0.0	9.1	3.3	17.2	50.0
50	2,092	34.6	5.6	0.0	9.4	3.4	17.2	53.1
55	2,354	37.1	5.9	0.0	9.5	3.5	17.2	56.0
60	2,600	39.2	6.6	0.0	9.6	3.7	17.2	59.1
65	2,754	40.0	7.6	0.0	10.0	3.8	17.2	61.4
70	2,913	40.8	8.0	0.0	10.5	3.9	17.2	63.2
75	3,059	41.6	8.0	0.0	10.9	4.0	17.2	64.6
80	3,204	42.6	8.0	0.0	11.1	4.1	17.2	65.9
85	3,332	43.6	8.0	0.0	11.1	4.2	17.2	66.9
90	3,470	44.5	8.0	0.0	11.0	4.3	17.2	67.9

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table A52.—Regional estimates of timber volume and carbon stocks for oak-gum-cypress stands on forest land after clearcut harvest in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	4.7	6.8	52.8	11.5
5	0	2.9	0.0	0.0	2.9	4.7	52.8	10.6
10	0	12.4	0.1	0.0	1.9	5.1	52.8	19.5
15	0	30.0	0.2	0.0	1.7	5.5	52.8	37.5
20	22	44.3	1.1	0.0	2.8	6.2	52.8	54.4
25	51	49.2	4.4	0.0	5.0	6.7	52.8	65.2
30	84	53.2	6.7	0.0	8.3	6.9	52.8	75.1
35	119	57.0	8.6	0.0	11.1	7.1	52.8	84.0
40	148	60.4	10.4	0.0	13.6	7.4	52.8	91.8
45	174	63.1	11.8	0.0	15.6	7.7	52.8	98.3
50	202	68.3	10.0	0.0	17.4	8.0	52.8	103.7
55	228	73.3	10.0	0.0	17.4	8.4	52.8	109.2
60	246	76.6	11.9	0.0	17.3	8.8	52.8	114.6
65	260	77.5	14.1	0.0	17.7	9.1	52.8	118.5
70	271	78.1	14.7	0.0	18.8	9.5	52.8	121.1
75	281	78.2	15.3	0.0	19.5	9.8	52.8	122.9
80	286	79.5	15.2	0.0	20.1	10.1	52.8	125.1
85	290	79.8	16.2	0.0	20.0	10.3	52.8	126.4
90	293	80.1	16.1	0.0	20.5	10.6	52.8	127.4

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Table A52 (continued).—Regional estimates of timber volume and carbon stocks for oak-gum-cypress stands on forest land after clearcut harvest in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	2.1	3.0	23.5	5.1
5	0	1.3	0.0	0.0	1.3	2.1	23.5	4.7
10	0	5.5	0.0	0.0	0.8	2.3	23.5	8.7
15	0	13.4	0.1	0.0	0.8	2.5	23.5	16.7
20	312	19.7	0.5	0.0	1.2	2.8	23.5	24.3
25	734	21.9	2.0	0.0	2.2	3.0	23.5	29.1
30	1,202	23.7	3.0	0.0	3.7	3.1	23.5	33.5
35	1,695	25.4	3.8	0.0	5.0	3.2	23.5	37.5
40	2,119	26.9	4.6	0.0	6.1	3.3	23.5	41.0
45	2,483	28.2	5.3	0.0	7.0	3.4	23.5	43.9
50	2,880	30.5	4.5	0.0	7.8	3.6	23.5	46.3
55	3,261	32.7	4.5	0.0	7.8	3.7	23.5	48.7
60	3,522	34.2	5.3	0.0	7.7	3.9	23.5	51.1
65	3,711	34.6	6.3	0.0	7.9	4.1	23.5	52.8
70	3,866	34.8	6.6	0.0	8.4	4.2	23.5	54.0
75	4,011	34.9	6.8	0.0	8.7	4.4	23.5	54.8
80	4,083	35.5	6.8	0.0	9.0	4.5	23.5	55.8
85	4,150	35.6	7.2	0.0	8.9	4.6	23.5	56.4
90	4,181	35.7	7.2	0.0	9.2	4.7	23.5	56.8

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table A53.—Regional estimates of timber volume and carbon stocks for elm-ash-cottonwood stands on forest land after clearcut harvest in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	6.1	3.3	49.9	9.4
5	0	2.5	0.0	0.0	3.8	1.4	49.9	7.7
10	6	16.8	0.1	0.0	2.4	1.6	49.9	21.0
15	18	29.9	1.6	0.0	2.2	2.0	49.9	35.7
20	27	34.5	8.7	0.0	3.6	2.4	49.9	49.2
25	50	38.3	4.9	0.0	8.8	2.5	49.9	54.6
30	81	42.4	5.5	0.0	9.9	2.7	49.9	60.6
35	100	45.6	6.8	0.0	10.8	2.9	49.9	66.2
40	110	48.2	7.6	0.0	12.0	3.1	49.9	71.0
45	121	50.8	8.2	0.0	13.0	3.3	49.9	75.3
50	141	56.7	5.7	0.0	13.7	3.5	49.9	79.6
55	154	60.0	7.4	0.0	12.7	3.7	49.9	83.8
60	166	63.4	8.5	0.0	13.0	3.9	49.9	88.8
65	176	66.6	9.0	0.0	13.7	4.1	49.9	93.5
70	186	69.8	9.4	0.0	14.1	4.3	49.9	97.7
75	193	72.4	10.0	0.0	14.4	4.6	49.9	101.3
80	198	74.6	10.5	0.0	14.8	4.8	49.9	104.6
85	201	75.8	11.0	0.0	15.2	5.0	49.9	107.0
90	203	77.0	11.5	0.0	15.5	5.2	49.9	109.1

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Table A53 (continued).—Regional estimates of timber volume and carbon stocks for elm-ash-cottonwood stands on forest land after clearcut harvest in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	2.7	1.5	22.2	4.2
5	0	1.1	0.0	0.0	1.7	0.6	22.2	3.5
10	83	7.5	0.1	0.0	1.0	0.7	22.2	9.3
15	260	13.3	0.7	0.0	1.0	0.9	22.2	15.9
20	382	15.4	3.9	0.0	1.6	1.1	22.2	21.9
25	708	17.1	2.2	0.0	3.9	1.1	22.2	24.3
30	1,163	18.9	2.5	0.0	4.4	1.2	22.2	27.0
35	1,427	20.3	3.0	0.0	4.8	1.3	22.2	29.5
40	1,574	21.5	3.4	0.0	5.4	1.4	22.2	31.6
45	1,727	22.6	3.7	0.0	5.8	1.5	22.2	33.6
50	2,014	25.3	2.5	0.0	6.1	1.5	22.2	35.5
55	2,201	26.8	3.3	0.0	5.7	1.7	22.2	37.4
60	2,370	28.3	3.8	0.0	5.8	1.7	22.2	39.6
65	2,518	29.7	4.0	0.0	6.1	1.8	22.2	41.7
70	2,658	31.1	4.2	0.0	6.3	1.9	22.2	43.6
75	2,755	32.3	4.4	0.0	6.4	2.0	22.2	45.2
80	2,830	33.3	4.7	0.0	6.6	2.1	22.2	46.7
85	2,873	33.8	4.9	0.0	6.8	2.2	22.2	47.7
90	2,907	34.3	5.1	0.0	6.9	2.3	22.2	48.7

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Appendix B: Estimates of Forest Ecosystem Yield and Carbon Stocks for Afforestation (Establishment on Nonforest Land)

Tables B1 through B53 present estimates of timber volume and carbon stocks on forest land after stand establishment on nonforest land, by forest type group and region. Please see Figure 1 for a map of the regions. Table numbers and content are as follows:

B1. White-red-jack pine, Northeast

B2. Maple-beech-birch, Northeast

B3. Oak-hickory, Northeast

B4. Spruce-fir, Northeast

B5. White-red-jack pine, Northern Lake States

B6. Aspen-birch, Northern Lake States

B7. Maple-beech-birch, Northern Lake States

B8. Elm-ash-cottonwood, Northern Lake States

B9. Oak-hickory, Northern Lake States

B10. Spruce-fir, Northern Lake States

B11. Elm-ash-cottonwood, Great Plains

B12. Oak-hickory, Great Plains

B13. Elm-ash-cottonwood, Central States

B14. Oak-hickory, Central States

B15. Douglas-fir, Pacific Northwest, East

B16. Fir-spruce-mountain hemlock, Pacific Northwest, East

B17. Lodgepole pine, Pacific Northwest, East

B18. Ponderosa pine, Pacific Northwest, East

B19. Alder-maple, Pacific Northwest, West

B20. Douglas-fir, Pacific Northwest, West

B21. Douglas-fir, high productivity, Pacific Northwest, West

B22. Fir-spruce-mountain hemlock, Pacific Northwest, West

B23. Hemlock-Sitka spruce, Pacific Northwest, West

B24. Hemlock-Sitka spruce, high productivity, Pacific Northwest, West

B25. Ponderosa pine, Pacific Southwest

B26. Fir-spruce-mountain hemlock, Pacific Southwest

B27. Western oak, Pacific Southwest

B28. Redwood, Pacific Southwest

B29. California mixed conifer, Pacific Southwest

B30. Tanoak-laurel, Pacific Southwest

B31. Other western softwoods, Pacific Southwest

B32. Douglas-fir, Rocky Mountain, North

B33. Ponderosa pine, Rocky Mountain, North

B34. Fir-spruce-mountain hemlock, Rocky Mountain, North

B35. Lodgepole pine, Rocky Mountain, North

B36. Douglas-fir, Rocky Mountain, South

B37. Ponderosa pine, Rocky Mountain, South

B38. Fir-spruce-mountain hemlock, Rocky Mountain, South

B39. Lodgepole pine, Rocky Mountain, South

B40. Aspen-birch, Rocky Mountain, South

B41. Longleaf-slash pine, Southeast

B42. Longleaf-slash pine, high productivity, Southeast

B43. Loblolly-shortleaf pine, Southeast

B44. Loblolly-shortleaf pine, high productivity, Southeast

B45. Oak-pine, Southeast

B46. Oak-hickory, Southeast

B47. Oak-gum-cypress, Southeast

B48. Loblolly-shortleaf pine, South Central

B49. Loblolly-shortleaf pine, high productivity, South Central

B50. Oak-pine, South Central

B51. Oak-hickory, South Central

B52. Oak-gum-cypress, South Central

B53. Elm-ash-cottonwood, South Central

Notes: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

For common and scientific names of species, refer to Appendix F in the FIA Database user guide (Burrill et al. 2021), available at: https://www.fia.fs.fed.us/library/database-documentation/current/ver90/FIADB%20User%20Guide%20P2_9-0-1_final.pdf.

Table B1.—Regional estimates of timber volume and carbon stocks for white-red-jack pine stands with afforestation of land in the Northeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.7	0.0	0.0	58.6	0.7
10	0	3.7	0.0	0.7	0.0	0.0	59.4	4.4
20	8	36.9	0.4	0.7	0.6	1.1	61.5	39.8
30	99	46.1	6.2	0.7	5.2	2.4	64.5	60.5
40	135	53.6	7.6	0.7	6.4	2.9	67.8	71.3
50	163	59.5	8.9	0.7	7.7	3.3	70.9	80.1
60	187	65.1	9.2	0.7	8.7	3.8	73.5	87.6
70	209	70.6	9.5	0.7	9.1	4.3	75.4	94.2
80	230	75.9	9.6	0.7	9.4	4.7	76.6	100.3
90	248	81.0	9.6	0.7	9.9	5.2	77.4	106.4
100	266	86.0	9.6	0.7	10.3	5.7	77.8	112.3
110	282	90.8	9.6	0.7	10.7	6.1	78.0	117.9
120	297	95.5	9.5	0.7	11.1	6.6	78.1	123.3

continued on next page

Table B1 (continued).—Regional estimates of timber volume and carbon stocks for white-red-jack pine stands with afforestation of land in the Northeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.3	0.0	0.0	26.1	0.3
10	0	1.6	0.0	0.3	0.0	0.0	26.5	2.0
20	115	16.5	0.2	0.3	0.3	0.5	27.4	17.7
30	1,420	20.6	2.8	0.3	2.3	1.1	28.8	27.0
40	1,930	23.9	3.4	0.3	2.9	1.3	30.3	31.8
50	2,323	26.5	4.0	0.3	3.4	1.5	31.6	35.7
60	2,674	29.1	4.1	0.3	3.9	1.7	32.8	39.1
70	2,992	31.5	4.2	0.3	4.1	1.9	33.6	42.0
80	3,282	33.9	4.3	0.3	4.2	2.1	34.2	44.8
90	3,551	36.1	4.3	0.3	4.4	2.3	34.5	47.5
100	3,799	38.4	4.3	0.3	4.6	2.5	34.7	50.1
110	4,031	40.5	4.3	0.3	4.8	2.7	34.8	52.6
120	4,245	42.6	4.2	0.3	4.9	2.9	34.8	55.0

Table B2.—Regional estimates of timber volume and carbon stocks for maple-beech-birch stands with afforestation of land in the Northeast

Age	Mean Volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.7	0.0	0.0	52.2	0.7
10	0	5.5	0.0	0.7	0.0	0.1	52.8	6.3
20	0	39.0	0.6	0.7	1.0	1.4	54.7	42.7
30	11	58.6	6.7	0.7	5.5	2.7	57.4	74.2
40	77	69.2	8.5	0.7	10.0	3.4	60.4	91.7
50	131	80.1	9.5	0.7	11.6	4.0	63.2	105.9
60	168	91.6	11.7	0.7	12.3	4.7	65.4	121.0
70	185	95.3	17.2	0.7	14.3	5.3	67.1	132.9
80	200	99.3	17.9	0.7	16.5	5.8	68.2	140.1
90	214	104.1	17.1	0.7	18.0	6.4	68.9	146.2
100	228	109.0	16.5	0.7	18.9	6.9	69.2	152.0
110	240	113.9	16.0	0.7	19.6	7.4	69.4	157.6
120	251	118.8	15.5	0.7	20.2	7.9	69.5	163.1
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.3	0.0	0.0	23.3	0.3
10	0	2.5	0.0	0.3	0.0	0.0	23.6	2.8
20	0	17.4	0.3	0.3	0.5	0.6	24.4	19.1
30	159	26.2	3.0	0.3	2.4	1.2	25.6	33.1
40	1,103	30.9	3.8	0.3	4.5	1.5	26.9	40.9
50	1,865	35.7	4.2	0.3	5.2	1.8	28.2	47.2
60	2,407	40.9	5.2	0.3	5.5	2.1	29.2	54.0
70	2,645	42.5	7.7	0.3	6.4	2.4	29.9	59.3
80	2,853	44.3	8.0	0.3	7.3	2.6	30.4	62.5
90	3,060	46.4	7.6	0.3	8.0	2.8	30.7	65.2
100	3,252	48.6	7.4	0.3	8.4	3.1	30.9	67.8
110	3,430	50.8	7.1	0.3	8.7	3.3	31.0	70.3
120	3,594	53.0	6.9	0.3	9.0	3.5	31.0	72.8

Table B3.—Regional estimates of timber volume and carbon stocks for oak-hickory stands with afforestation of land in the Northeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.7	0.0	0.0	39.8	0.7
10	0	5.3	0.0	0.7	0.0	0.1	40.3	6.2
20	0	38.1	0.4	0.7	1.2	1.3	41.8	41.7
30	0	58.9	6.3	0.7	7.5	2.6	43.8	75.9
40	107	72.1	8.5	0.7	12.8	3.4	46.1	97.5
50	148	81.9	13.0	0.7	13.4	4.1	48.2	113.0
60	176	88.7	15.8	0.7	15.7	4.8	49.9	125.7
70	205	96.8	15.4	0.7	17.3	5.4	51.2	135.5
80	227	101.7	17.6	0.7	17.9	6.0	52.1	143.8
90	245	105.0	18.7	0.7	19.4	6.5	52.6	150.3
100	259	108.6	17.4	0.7	20.9	7.0	52.8	154.6
110	267	110.4	17.8	0.7	22.1	7.5	53.0	158.4
120	268	109.7	19.6	0.7	22.7	7.9	53.0	160.6
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.3	0.0	0.0	17.8	0.3
10	0	2.4	0.0	0.3	0.0	0.0	18.0	2.7
20	0	17.0	0.2	0.3	0.5	0.6	18.6	18.6
30	0	26.3	2.8	0.3	3.3	1.1	19.5	33.9
40	1,528	32.2	3.8	0.3	5.7	1.5	20.6	43.5
50	2,115	36.5	5.8	0.3	6.0	1.8	21.5	50.4
60	2,522	39.6	7.0	0.3	7.0	2.1	22.3	56.1
70	2,936	43.2	6.9	0.3	7.7	2.4	22.8	60.4
80	3,246	45.3	7.8	0.3	8.0	2.7	23.2	64.2
90	3,496	46.8	8.3	0.3	8.7	2.9	23.4	67.0
100	3,696	48.4	7.8	0.3	9.3	3.1	23.6	69.0
110	3,816	49.2	7.9	0.3	9.8	3.3	23.6	70.7
120	3,837	48.9	8.7	0.3	10.1	3.5	23.7	71.6

Table B4.—Regional estimates of timber volume and carbon stocks for spruce-fir stands with afforestation of land in the Northeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.7	0.0	0.0	73.5	0.7
10	0	3.5	0.0	0.7	0.0	0.0	74.5	4.3
20	0	29.4	4.7	0.7	0.4	0.8	77.1	36.0
30	32	36.7	5.3	0.7	3.5	1.5	80.9	47.6
40	63	41.6	5.4	0.7	4.4	2.0	85.1	54.0
50	84	46.3	4.9	0.7	5.1	2.5	89.0	59.5
60	104	50.4	4.5	0.7	5.5	3.0	92.2	64.1
70	115	51.6	5.6	0.7	5.4	3.5	94.5	66.8
80	123	51.8	6.0	0.7	5.1	4.0	96.1	67.5
90	131	52.6	5.4	0.7	5.0	4.4	97.0	68.1
100	139	54.0	5.0	0.7	4.7	4.8	97.5	69.2
110	155	58.4	3.0	0.7	4.2	5.1	97.8	71.4
120	169	62.5	2.8	0.7	3.2	5.6	97.9	74.9
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.3	0.0	0.0	32.8	0.3
10	0	1.6	0.0	0.3	0.0	0.0	33.2	1.9
20	0	13.1	2.1	0.3	0.2	0.4	34.4	16.1
30	458	16.4	2.4	0.3	1.5	0.7	36.1	21.2
40	904	18.6	2.4	0.3	2.0	0.9	37.9	24.1
50	1,204	20.6	2.2	0.3	2.3	1.1	39.7	26.5
60	1,481	22.5	2.0	0.3	2.4	1.3	41.1	28.6
70	1,637	23.0	2.5	0.3	2.4	1.6	42.2	29.8
80	1,755	23.1	2.7	0.3	2.3	1.8	42.9	30.1
90	1,866	23.4	2.4	0.3	2.2	2.0	43.3	30.4
100	1,984	24.1	2.2	0.3	2.1	2.1	43.5	30.8
110	2,208	26.1	1.3	0.3	1.9	2.3	43.6	31.9
120	2,409	27.9	1.3	0.3	1.4	2.5	43.7	33.4

Table B5.—Regional estimates of timber volume and carbon stocks for white-red-jack pine stands with afforestation of land in the Northern Lake States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.0	0.0	90.6	0.0
10	0	1.1	0.0	0.1	0.0	0.0	91.8	1.2
20	0	9.9	0.1	0.1	0.1	0.3	95.1	10.5
30	41	27.2	0.6	0.1	1.0	0.9	99.7	29.8
40	105	45.0	2.0	0.1	2.6	1.7	104.9	51.4
50	157	55.0	3.5	0.1	4.9	2.4	109.7	65.9
60	208	64.6	2.5	0.1	7.0	3.0	113.7	77.2
70	230	66.6	6.7	0.1	8.9	3.6	116.6	86.0
80	251	69.2	6.8	0.1	11.0	4.1	118.5	91.3
90	270	71.7	7.6	0.1	11.6	4.5	119.6	95.5
100	289	74.2	7.5	0.3	12.2	5.0	120.3	99.3
110	304	76.6	7.4	0.3	11.6	5.4	120.6	101.4
120	317	78.8	7.3	0.3	11.0	5.9	120.7	103.3
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.0	0.0	40.4	0.0
10	0	0.5	0.0	0.0	0.0	0.0	41.0	0.6
20	0	4.4	0.1	0.0	0.1	0.1	42.4	4.7
30	588	12.1	0.3	0.0	0.4	0.4	44.5	13.3
40	1,506	20.1	0.9	0.0	1.2	0.8	46.8	22.9
50	2,249	24.5	1.6	0.0	2.2	1.1	48.9	29.4
60	2,976	28.8	1.1	0.0	3.1	1.4	50.7	34.4
70	3,280	29.7	3.0	0.0	4.0	1.6	52.0	38.3
80	3,586	30.9	3.0	0.0	4.9	1.8	52.9	40.7
90	3,856	32.0	3.4	0.0	5.2	2.0	53.4	42.6
100	4,123	33.1	3.3	0.1	5.4	2.2	53.7	44.3
110	4,341	34.2	3.3	0.1	5.2	2.4	53.8	45.2
120	4,527	35.1	3.3	0.1	4.9	2.6	53.9	46.1

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table B6.—Regional estimates of timber volume and carbon stocks for aspen-birch stands with afforestation of land in the Northern Lake States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.0	0.0	109.6	0.0
10	0	4.4	0.1	0.0	0.0	0.1	111.0	4.6
20	17	30.8	3.3	0.0	1.3	1.6	115.0	37.0
30	73	34.2	3.5	0.0	12.6	2.0	120.6	52.3
40	114	49.8	3.6	0.0	7.5	2.8	126.8	63.8
50	129	54.6	6.8	0.0	6.8	3.6	132.7	71.8
60	140	57.7	6.6	0.0	8.2	4.0	137.4	76.5
70	149	60.4	7.1	0.0	8.2	4.4	140.9	80.0
80	157	62.7	4.4	0.0	9.7	4.6	143.3	81.3
90	161	63.9	4.5	0.0	9.0	4.9	144.7	82.3
100	163	64.4	4.7	0.0	8.2	5.2	145.4	82.5
110	107	44.4	13.0	0.0	13.2	5.1	145.8	75.6
120	82	33.7	10.3	0.0	15.4	4.7	146.0	64.1
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.0	0.0	48.9	0.0
10	0	2.0	0.0	0.0	0.0	0.0	49.5	2.0
20	249	13.7	1.5	0.0	0.6	0.7	51.3	16.5
30	1,045	15.3	1.6	0.0	5.6	0.9	53.8	23.3
40	1,627	22.2	1.6	0.0	3.4	1.3	56.6	28.4
50	1,845	24.4	3.0	0.0	3.0	1.6	59.2	32.0
60	2,002	25.7	3.0	0.0	3.6	1.8	61.3	34.1
70	2,134	26.9	3.2	0.0	3.7	1.9	62.9	35.7
80	2,243	28.0	2.0	0.0	4.3	2.1	63.9	36.3
90	2,297	28.5	2.0	0.0	4.0	2.2	64.5	36.7
100	2,324	28.7	2.1	0.0	3.7	2.3	64.9	36.8
110	1,535	19.8	5.8	0.0	5.9	2.3	65.0	33.7
120	1,172	15.0	4.6	0.0	6.9	2.1	65.1	28.6

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table B7.—Regional estimates of timber volume and carbon stocks for maple-beech-birch stands with afforestation of land in the Northern Lake States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.0	0.0	100.7	0.0
10	0	2.8	0.0	0.0	0.0	0.1	102.0	3.0
20	0	21.8	0.4	0.0	0.7	1.1	105.7	24.0
30	89	51.1	5.7	0.0	3.9	2.6	110.8	63.4
40	125	62.8	8.6	0.0	10.2	3.7	116.6	85.3
50	140	67.1	9.0	0.0	14.7	4.3	121.9	95.1
60	161	74.3	6.3	0.0	16.5	4.7	126.3	101.8
70	178	80.1	7.4	0.0	14.3	5.4	129.5	107.1
80	187	82.1	9.2	0.0	13.6	5.9	131.7	110.8
90	193	83.6	9.3	0.0	14.3	6.3	132.9	113.4
100	202	86.2	9.2	0.0	14.3	6.7	133.6	116.4
110	210	88.9	9.7	0.0	14.0	7.1	134.0	119.8
120	219	92.3	9.4	0.0	14.5	7.5	134.1	123.8
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.0	0.0	44.9	0.0
10	0	1.3	0.0	0.0	0.0	0.1	45.5	1.3
20	0	9.7	0.2	0.0	0.3	0.5	47.1	10.7
30	1,271	22.8	2.5	0.0	1.8	1.2	49.4	28.3
40	1,782	28.0	3.8	0.0	4.5	1.6	52.0	38.1
50	2,002	29.9	4.0	0.0	6.6	1.9	54.4	42.4
60	2,298	33.1	2.8	0.0	7.4	2.1	56.3	45.4
70	2,545	35.7	3.3	0.0	6.4	2.4	57.8	47.8
80	2,667	36.6	4.1	0.0	6.1	2.6	58.7	49.4
90	2,764	37.3	4.1	0.0	6.4	2.8	59.3	50.6
100	2,889	38.4	4.1	0.0	6.4	3.0	59.6	51.9
110	3,005	39.7	4.3	0.0	6.3	3.2	59.8	53.4
120	3,127	41.2	4.2	0.0	6.5	3.4	59.8	55.2

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table B8.—Regional estimates of timber volume and carbon stocks for elm-ash-cottonwood stands with afforestation of land in the Northern Lake States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.0	0.0	134.9	0.0
10	0	4.4	0.0	0.0	0.0	0.0	136.7	4.5
20	58	38.6	1.1	0.0	1.2	1.3	141.6	42.2
30	95	48.7	4.5	0.0	5.8	2.6	148.5	61.6
40	107	51.3	7.5	0.0	8.9	3.1	156.2	70.8
50	119	55.5	5.3	0.0	11.5	3.4	163.4	75.6
60	133	61.6	5.8	0.0	10.0	3.9	169.3	81.3
70	139	63.8	7.1	0.0	10.8	4.3	173.6	86.1
80	141	65.0	7.2	0.0	11.4	4.6	176.5	88.3
90	141	65.3	7.9	0.0	11.5	4.9	178.2	89.6
100	144	67.0	7.3	0.0	10.9	5.2	179.1	90.4
110	146	68.5	7.0	0.0	10.1	5.5	179.5	91.1
120	148	70.4	7.2	0.0	9.8	5.8	179.8	93.1
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.0	0.0	60.2	0.0
10	0	2.0	0.0	0.0	0.0	0.0	61.0	2.0
20	822	17.2	0.5	0.0	0.5	0.6	63.2	18.8
30	1,360	21.7	2.0	0.0	2.6	1.2	66.3	27.5
40	1,529	22.9	3.4	0.0	4.0	1.4	69.7	31.6
50	1,703	24.7	2.4	0.0	5.1	1.5	72.9	33.7
60	1,904	27.5	2.6	0.0	4.4	1.7	75.5	36.3
70	1,980	28.5	3.2	0.0	4.8	1.9	77.4	38.4
80	2,015	29.0	3.2	0.0	5.1	2.1	78.7	39.4
90	2,017	29.1	3.5	0.0	5.1	2.2	79.5	40.0
100	2,055	29.9	3.2	0.0	4.8	2.3	79.9	40.3
110	2,080	30.6	3.1	0.0	4.5	2.5	80.1	40.6
120	2,110	31.4	3.2	0.0	4.4	2.6	80.2	41.5

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table B9.—Regional estimates of timber volume and carbon stocks for oak-hickory stands with afforestation of land in the Northern Lake States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.0	0.0	72.8	0.0
10	0	2.7	0.0	0.0	0.0	0.1	73.8	2.8
20	0	19.6	0.4	0.0	0.9	1.0	76.4	22.0
30	96	52.5	2.4	0.0	5.2	2.4	80.2	62.5
40	103	62.0	8.5	0.0	11.5	3.4	84.3	85.3
50	107	66.1	12.6	0.0	16.5	4.1	88.2	99.2
60	115	71.4	13.1	0.0	18.6	4.6	91.3	107.8
70	126	77.0	12.8	0.0	18.9	5.2	93.7	113.8
80	135	81.1	12.3	0.0	18.0	5.7	95.2	117.2
90	146	86.3	11.2	0.0	16.3	6.2	96.1	120.0
100	157	92.2	10.4	0.0	15.6	6.7	96.7	124.8
110	168	97.2	9.4	0.0	15.4	7.2	96.9	129.1
120	168	96.7	13.2	0.0	15.5	7.6	97.0	133.0
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.0	0.0	32.5	0.0
10	0	1.2	0.0	0.0	0.0	0.0	32.9	1.3
20	7	8.7	0.2	0.0	0.4	0.4	34.1	9.8
30	1,369	23.4	1.1	0.0	2.3	1.1	35.8	27.9
40	1,479	27.7	3.8	0.0	5.1	1.5	37.6	38.1
50	1,533	29.5	5.6	0.0	7.3	1.8	39.3	44.2
60	1,648	31.9	5.9	0.0	8.3	2.1	40.8	48.1
70	1,795	34.3	5.7	0.0	8.4	2.3	41.8	50.8
80	1,936	36.2	5.5	0.0	8.0	2.6	42.5	52.3
90	2,082	38.5	5.0	0.0	7.3	2.8	42.9	53.5
100	2,237	41.1	4.6	0.0	7.0	3.0	43.1	55.7
110	2,394	43.4	4.2	0.0	6.8	3.2	43.2	57.6
120	2,396	43.1	5.9	0.0	6.9	3.4	43.3	59.3

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table B10.—Regional estimates of timber volume and carbon stocks for spruce-balsam fir stands with afforestation of land in the Northern Lake States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.0	0.0	196.4	0.0
10	0	1.4	0.0	0.1	0.0	0.1	198.9	1.6
20	0	8.2	0.4	0.1	0.2	0.7	206.0	9.6
30	7	17.5	0.9	0.1	1.0	1.2	216.1	20.6
40	33	26.6	1.6	0.1	1.8	1.6	227.3	31.7
50	51	32.4	2.6	0.1	3.1	2.2	237.7	40.4
60	63	34.8	3.2	0.1	4.3	2.6	246.3	45.0
70	73	36.8	3.3	0.1	4.8	3.0	252.6	48.0
80	83	39.3	3.6	0.1	4.4	3.3	256.7	50.7
90	90	40.8	3.7	0.1	4.5	3.7	259.2	52.8
100	95	41.9	4.1	0.1	4.5	4.0	260.6	54.5
110	100	43.1	4.2	0.1	4.3	4.3	261.2	55.9
120	105	44.3	4.5	0.1	4.3	4.5	261.6	57.6
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.0	0.0	87.6	0.0
10	0	0.6	0.0	0.0	0.0	0.0	88.7	0.7
20	0	3.7	0.2	0.0	0.1	0.3	91.9	4.3
30	100	7.8	0.4	0.0	0.4	0.5	96.4	9.2
40	476	11.9	0.7	0.0	0.8	0.7	101.4	14.1
50	725	14.4	1.2	0.0	1.4	1.0	106.0	18.0
60	899	15.5	1.4	0.0	1.9	1.2	109.9	20.1
70	1,048	16.4	1.5	0.0	2.1	1.4	112.7	21.4
80	1,187	17.5	1.6	0.0	2.0	1.5	114.5	22.6
90	1,289	18.2	1.7	0.0	2.0	1.6	115.6	23.6
100	1,364	18.7	1.8	0.0	2.0	1.8	116.3	24.3
110	1,433	19.2	1.9	0.0	1.9	1.9	116.5	24.9
120	1,495	19.8	2.0	0.0	1.9	2.0	116.7	25.7

Table B11.—Regional estimates of timber volume and carbon stocks for elm-ash-cottonwood stands with afforestation of land in the Great Plains

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.0	0.0	43.8	0.0
10	0	4.5	0.0	0.0	0.0	0.1	44.4	4.6
20	26	17.8	0.2	0.0	0.8	0.3	45.9	19.2
30	92	56.0	0.9	0.0	2.0	1.0	48.2	59.9
40	86	55.1	7.8	0.0	13.0	1.4	50.7	77.4
50	86	39.9	20.0	0.0	16.9	1.8	53.0	78.7
60	121	48.6	12.1	0.0	18.7	2.1	54.9	81.5
70	161	59.6	11.2	0.0	15.8	2.7	56.3	89.4
80	195	70.4	11.5	0.0	14.1	3.2	57.3	99.3
90	229	81.3	12.7	0.0	14.3	3.7	57.8	112.2
100	264	93.3	13.4	0.0	15.8	4.3	58.1	126.8
110	298	105.7	15.1	0.0	17.3	5.0	58.3	143.1
120	320	114.3	20.4	0.0	19.0	5.6	58.3	159.3
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.0	0.0	19.5	0.0
10	0	2.0	0.0	0.0	0.0	0.0	19.8	2.1
20	372	7.9	0.1	0.0	0.3	0.2	20.5	8.6
30	1,318	25.0	0.4	0.0	0.9	0.4	21.5	26.7
40	1,236	24.6	3.5	0.0	5.8	0.6	22.6	34.5
50	1,222	17.8	8.9	0.0	7.5	0.8	23.6	35.1
60	1,732	21.7	5.4	0.0	8.3	0.9	24.5	36.4
70	2,294	26.6	5.0	0.0	7.1	1.2	25.1	39.9
80	2,793	31.4	5.1	0.0	6.3	1.4	25.5	44.3
90	3,267	36.3	5.7	0.0	6.4	1.7	25.8	50.0
100	3,769	41.6	6.0	0.0	7.1	1.9	25.9	56.6
110	4,260	47.1	6.8	0.0	7.7	2.2	26.0	63.8
120	4,567	51.0	9.1	0.0	8.5	2.5	26.0	71.1

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table B12.—Regional estimates of timber volume and carbon stocks for oak-hickory stands with afforestation of land in the Great Plains

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	0.0	0.0	0.0	33.2	0.0
10	0	1.5	0.0	0.0	0.0	0.0	33.6	1.6
20	1	12.8	0.3	0.0	0.4	0.3	34.8	13.9
30	34	31.0	1.2	0.0	2.4	0.9	36.5	35.5
40	56	40.6	2.1	0.0	4.2	1.3	38.4	48.2
50	59	41.5	4.9	0.0	7.8	1.5	40.2	55.8
60	63	43.9	8.2	0.0	7.6	1.9	41.6	61.6
70	73	50.9	5.1	0.0	8.6	2.1	42.7	66.8
80	80	56.7	5.6	0.0	8.9	2.4	43.4	73.6
90	82	59.7	7.6	0.0	10.1	2.7	43.8	80.2
100	84	63.5	11.2	0.0	8.8	3.2	44.1	86.8
110	96	74.2	6.7	0.0	10.0	3.5	44.2	94.5
120	101	78.8	8.1	0.0	9.7	3.9	44.2	100.6
years	*ft^3/acre*	---------- *tons carbon/acre* ----------						
0	0	0.0	0.0	0.0	0.0	0.0	14.8	0.0
10	0	0.7	0.0	0.0	0.0	0.0	15.0	0.7
20	14	5.7	0.1	0.0	0.2	0.2	15.5	6.2
30	489	13.8	0.5	0.0	1.1	0.4	16.3	15.8
40	794	18.1	0.9	0.0	1.9	0.6	17.1	21.5
50	850	18.5	2.2	0.0	3.5	0.7	17.9	24.9
60	905	19.6	3.7	0.0	3.4	0.8	18.6	27.5
70	1,049	22.7	2.3	0.0	3.8	1.0	19.0	29.8
80	1,145	25.3	2.5	0.0	4.0	1.1	19.4	32.8
90	1,170	26.6	3.4	0.0	4.5	1.2	19.5	35.8
100	1,205	28.3	5.0	0.0	3.9	1.4	19.6	38.7
110	1,379	33.1	3.0	0.0	4.4	1.6	19.7	42.1
120	1,437	35.2	3.6	0.0	4.3	1.7	19.7	44.9

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table B13.—Regional estimates of timber volume and carbon stocks for elm-ash-cottonwood stands with afforestation of land in the Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.0	0.0	66.8	0.0
10	22	24.7	0.5	0.0	0.2	0.4	67.6	25.9
20	64	28.0	15.0	0.0	10.5	1.0	70.0	54.6
30	115	42.4	12.1	0.0	15.3	1.5	73.5	71.3
40	154	54.0	10.2	0.0	15.6	2.0	77.3	81.9
50	187	63.6	14.6	0.0	15.8	2.6	80.8	96.6
60	204	68.7	15.5	0.0	20.3	3.0	83.7	107.6
70	225	74.9	14.7	0.0	21.2	3.6	85.9	114.5
80	242	80.9	16.6	0.0	20.0	4.1	87.3	121.6
90	264	88.9	16.9	0.0	20.3	4.6	88.1	130.8
100	287	96.9	16.5	0.0	19.8	5.2	88.6	138.3
110	309	105.9	18.3	0.0	19.4	5.7	88.8	149.4
120	335	117.0	20.1	0.0	21.3	6.3	88.9	164.7
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.0	0.0	29.8	0.0
10	319	11.0	0.2	0.0	0.1	0.2	30.2	11.5
20	913	12.5	6.7	0.0	4.7	0.5	31.2	24.3
30	1,644	18.9	5.4	0.0	6.8	0.7	32.8	31.8
40	2,200	24.1	4.6	0.0	7.0	0.9	34.5	36.5
50	2,666	28.4	6.5	0.0	7.0	1.1	36.0	43.1
60	2,919	30.6	6.9	0.0	9.1	1.4	37.3	48.0
70	3,221	33.4	6.6	0.0	9.4	1.6	38.3	51.1
80	3,454	36.1	7.4	0.0	8.9	1.8	38.9	54.3
90	3,776	39.7	7.5	0.0	9.1	2.1	39.3	58.3
100	4,107	43.2	7.3	0.0	8.8	2.3	39.5	61.7
110	4,421	47.2	8.2	0.0	8.7	2.6	39.6	66.6
120	4,787	52.2	9.0	0.0	9.5	2.8	39.7	73.5

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table B14.—Regional estimates of timber volume and carbon stocks for oak-hickory stands with afforestation of land in the Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.0	0.0	35.5	0.0
10	0	4.5	0.0	0.0	0.0	0.1	35.9	4.7
20	1	37.7	0.6	0.0	1.5	0.8	37.2	40.7
30	91	48.9	12.4	0.0	14.1	1.6	39.0	77.1
40	115	58.1	10.6	0.0	16.1	2.1	41.1	86.9
50	128	63.2	13.4	0.0	17.3	2.6	42.9	96.5
60	141	68.8	13.3	0.0	18.5	3.1	44.5	103.8
70	154	74.1	14.0	0.0	17.3	3.5	45.6	109.0
80	166	79.4	14.5	0.0	17.1	4.0	46.4	115.1
90	175	84.8	13.0	0.0	17.2	4.5	46.8	119.5
100	183	89.0	14.3	0.0	16.1	4.9	47.1	124.3
110	193	94.4	14.9	0.0	17.1	5.4	47.2	131.8
120	203	99.7	13.8	0.0	17.1	5.8	47.2	136.5
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.0	0.0	15.8	0.0
10	0	2.0	0.0	0.0	0.0	0.0	16.0	2.1
20	17	16.8	0.3	0.0	0.7	0.3	16.6	18.1
30	1,295	21.8	5.5	0.0	6.3	0.7	17.4	34.4
40	1,639	25.9	4.7	0.0	7.2	0.9	18.3	38.8
50	1,823	28.2	6.0	0.0	7.7	1.1	19.2	43.1
60	2,018	30.7	5.9	0.0	8.2	1.4	19.9	46.3
70	2,202	33.1	6.2	0.0	7.7	1.6	20.4	48.6
80	2,374	35.4	6.5	0.0	7.6	1.8	20.7	51.3
90	2,506	37.8	5.8	0.0	7.7	2.0	20.9	53.3
100	2,613	39.7	6.4	0.0	7.2	2.2	21.0	55.5
110	2,752	42.1	6.6	0.0	7.6	2.4	21.1	58.8
120	2,896	44.5	6.2	0.0	7.6	2.6	21.1	60.9

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table B15.—Regional estimates of timber volume and carbon stocks for Douglas-fir stands with afforestation of land in the Pacific Northwest, East

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.1	0.0	0.0	71.1	1.1
10	0	5.8	0.0	1.1	0.0	0.2	72.0	7.1
20	0	38.3	2.6	1.1	0.6	0.9	74.6	43.6
30	0	56.9	12.6	1.1	5.5	1.6	78.2	77.7
40	60	71.9	13.7	1.1	9.5	1.9	82.3	98.1
50	93	77.1	17.4	1.1	12.9	2.1	86.0	110.7
60	118	81.0	18.0	1.1	16.6	2.3	89.1	119.0
70	140	86.2	17.2	1.1	18.4	2.5	91.4	125.3
80	160	91.4	17.6	1.1	17.7	2.7	92.9	130.5
90	177	96.1	19.5	1.1	16.4	2.9	93.8	136.0
100	191	100.7	20.6	1.1	15.6	3.1	94.3	141.1
110	203	105.0	21.1	1.1	15.6	3.2	94.6	146.0
120	214	109.7	20.6	1.1	16.3	3.4	94.7	151.1
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.5	0.0	0.0	31.7	0.5
10	0	2.6	0.0	0.5	0.0	0.1	32.1	3.2
20	0	17.1	1.2	0.5	0.3	0.4	33.3	19.4
30	0	25.4	5.6	0.5	2.4	0.7	34.9	34.7
40	854	32.1	6.1	0.5	4.2	0.8	36.7	43.7
50	1,332	34.4	7.7	0.5	5.8	0.9	38.4	49.4
60	1,692	36.1	8.0	0.5	7.4	1.0	39.8	53.1
70	1,995	38.4	7.7	0.5	8.2	1.1	40.8	55.9
80	2,292	40.8	7.8	0.5	7.9	1.2	41.5	58.2
90	2,530	42.9	8.7	0.5	7.3	1.3	41.9	60.7
100	2,723	44.9	9.2	0.5	7.0	1.4	42.1	62.9
110	2,903	46.8	9.4	0.5	7.0	1.4	42.2	65.1
120	3,060	48.9	9.2	0.5	7.3	1.5	42.2	67.4

Table B16.—Regional estimates of timber volume and carbon stocks for fir-spruce-mountain hemlock stands with afforestation of land in the Pacific Northwest, East

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.1	0.0	0.0	46.6	1.1
10	0	2.9	0.0	1.1	0.0	0.1	47.2	4.2
20	0	16.8	0.6	1.1	0.5	0.9	48.9	19.9
30	0	41.3	1.2	1.1	1.8	1.9	51.3	47.3
40	0	69.4	7.3	1.1	4.0	3.1	53.9	84.9
50	0	81.6	14.6	1.1	10.4	3.7	56.4	111.4
60	39	91.4	17.7	1.1	16.5	4.1	58.5	130.8
70	170	99.5	19.3	1.1	21.0	4.4	60.0	145.4
80	198	105.5	22.5	1.1	23.1	4.7	60.9	157.0
90	210	110.5	27.1	1.1	23.7	5.0	61.5	167.5
100	218	115.6	26.9	1.1	27.1	5.3	61.9	176.1
110	224	121.2	27.2	1.1	28.5	5.6	62.0	183.7
120	259	126.3	28.4	1.1	28.4	6.0	62.1	190.2
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.5	0.0	0.0	20.8	0.5
10	0	1.3	0.0	0.5	0.0	0.1	21.1	1.9
20	0	7.5	0.3	0.5	0.2	0.4	21.8	8.9
30	0	18.4	0.5	0.5	0.8	0.8	22.9	21.1
40	0	31.0	3.3	0.5	1.8	1.4	24.1	37.9
50	0	36.4	6.5	0.5	4.7	1.7	25.2	49.7
60	552	40.8	7.9	0.5	7.3	1.8	26.1	58.3
70	2,433	44.4	8.6	0.5	9.4	2.0	26.7	64.8
80	2,831	47.1	10.0	0.5	10.3	2.1	27.2	70.0
90	3,004	49.3	12.1	0.5	10.6	2.2	27.4	74.7
100	3,115	51.5	12.0	0.5	12.1	2.4	27.6	78.5
110	3,200	54.1	12.1	0.5	12.7	2.5	27.7	81.9
120	3,707	56.4	12.7	0.5	12.7	2.7	27.7	84.9

Table B17.—Regional estimates of timber volume and carbon stocks for lodgepole pine stands with afforestation of land in the Pacific Northwest, East

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.1	0.0	0.0	46.6	1.1
10	0	3.5	0.0	0.8	0.0	0.1	39.5	4.5
20	0	22.4	2.6	0.8	0.3	0.7	40.9	26.7
30	0	27.7	7.0	0.8	2.9	1.0	42.9	39.4
40	71	33.4	7.8	1.1	5.5	1.2	45.2	49.1
50	110	40.3	8.1	1.1	7.2	1.4	47.2	58.2
60	129	46.4	8.0	1.1	8.6	1.6	48.9	65.8
70	148	50.0	9.8	1.1	9.6	1.9	50.2	72.4
80	167	52.4	10.6	1.1	11.2	2.1	51.5	81.7
90	177	54.9	11.0	1.1	12.4	2.3	51.5	81.7
100	189	57.2	11.0	1.1	13.3	2.5	51.8	85.2
110	197	59.7	10.8	1.1	13.9	2.7	51.9	88.2
120	203	62.0	10.3	1.1	14.3	2.9	52.0	90.7
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.5	0.0	0.0	17.4	0.5
10	0	1.6	0.0	0.4	0.0	0.1	17.6	2.0
20	0	10.0	1.1	0.4	0.1	0.3	18.3	11.9
30	0	12.3	3.1	0.4	1.3	0.5	19.2	17.6
40	1,011	14.9	3.5	0.5	2.4	0.5	20.2	21.9
50	1,565	18.0	3.6	0.5	3.2	0.6	21.1	25.9
60	1,837	20.7	3.6	0.5	3.8	0.7	21.8	29.4
70	2,119	22.3	4.4	0.5	43	0.8	22.4	32.3
80	2,387	23.4	4.7	0.5	5.0	0.9	22.8	34.5
90	2,525	24.5	4.9	0.5	5.5	1.0	23.0	36.4
100	2,700	25.5	4.9	0.5	5.9	1.1	23.1	38.0
110	2,816	26.6	4.8	0.5	6.2	1.2	23.2	39.3
120	2,903	27.7	4.6	0.5	6.4	1.3	23.2	40.5

Table B18.—Regional estimates of timber volume and carbon stocks for ponderosa pine stands with afforestation of land in the Pacific Northwest, East

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.4	0.0	5.0	38.0	5.4
10	0	1.7	0.0	0.4	0.0	4.9	38.5	7.0
20	0	14.0	0.1	0.4	0.2	5.1	39.9	19.8
30	0	26.2	1.9	0.5	0.8	5.4	41.8	34.8
40	27	36.9	3.1	0.5	2.8	5.5	44.0	48.7
50	100	46.6	3.8	0.5	4.7	5.5	46.0	61.1
60	116	51.4	6.4	0.5	6.9	5.5	47.7	70.6
70	124	55.5	7.2	0.5	8.7	5.5	48.9	77.4
80	129	57.7	8.8	0.5	9.8	5.4	49.7	82.2
90	132	59.6	9.4	0.5	10.7	5.4	50.2	85.6
100	132	61.3	9.1	0.5	11.6	5.4	50.5	87.9
110	134	63.0	8.9	0.5	11.9	5.3	50.6	89.7
120	135	64.6	8.6	0.5	12.0	5.3	50.6	91.0
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.2	0.0	2.2	17.0	2.4
10	0	0.7	0.0	0.2	0.0	2.2	17.2	3.1
20	0	6.2	0.0	0.2	0.1	2.3	17.8	8.8
30	0	11.7	0.8	0.2	0.4	2.4	18.7	15.5
40	381	16.4	1.4	0.2	1.2	2.4	19.6	21.7
50	1,426	20.8	1.7	0.2	2.1	2.5	20.5	27.3
60	1,654	22.9	2.8	0.2	3.1	2.5	21.3	31.5
70	1,777	24.7	3.2	0.2	3.9	2.4	21.8	34.5
80	1,845	25.7	3.9	0.2	4.4	2.4	22.2	36.7
90	1,893	26.6	4.2	0.2	4.8	2.4	22.4	38.2
100	1,888	27.4	4.1	0.2	5.2	2.4	22.5	39.2
110	1,921	28.1	4.0	0.2	5.3	2.4	22.6	40.0
120	1,927	28.8	3.8	0.2	5.4	2.4	22.6	40.6

Table B19.—Regional estimates of timber volume and carbon stocks for alder-maple stands with afforestation of land in the Pacific Northwest, West

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	0.0	0.0	86.4	2.7
10	0	5.7	0.2	0.4	0.0	0.1	87.6	6.3
20	0	34.1	1.0	0.4	0.4	1.0	90.7	36.9
30	78	70.1	3.2	0.4	1.6	2.5	95.1	77.8
40	387	98.4	10.9	0.4	4.4	3.9	100.0	118.1
50	495	120.9	19.3	0.4	6.4	5.1	104.6	152.1
60	562	135.6	27.4	0.4	9.2	6.1	108.4	178.7
70	600	144.6	28.2	0.4	13.3	6.9	111.2	193.4
80	629	149.3	34.7	0.4	13.2	7.6	113.0	205.2
90	657	152.4	35.3	0.4	15.9	8.2	114.1	212.3
100	669	159.0	31.1	0.4	16.6	8.8	114.7	216.0
110	702	169.8	26.5	0.4	15.1	9.6	115.0	221.3
120	720	177.2	24.0	0.4	15.2	10.2	115.1	227.1
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	0.0	0.0	38.6	1.2
10	0	2.5	0.1	0.2	0.0	0.0	39.1	2.8
20	0	15.2	0.4	0.2	0.2	0.4	40.5	16.4
30	1,109	31.3	1.4	0.2	0.7	1.1	42.4	34.7
40	5,536	43.9	4.9	0.2	1.9	1.8	44.6	52.7
50	7,068	53.9	8.6	0.2	2.9	2.3	46.7	67.9
60	8,031	60.5	12.2	0.2	4.1	2.7	48.4	79.7
70	8,576	64.5	12.6	0.2	5.9	3.1	49.6	86.3
80	8,992	66.6	15.5	0.2	5.9	3.4	50.4	91.5
90	9,385	68.0	15.8	0.2	7.1	3.7	50.9	94.7
100	9,557	70.9	13.9	0.2	7.4	3.9	51.2	96.3
110	10,035	75.7	11.8	0.2	6.7	4.3	51.3	98.7
120	10,290	79.0	10.7	0.2	6.8	4.6	51.4	101.3

Table B20.—Regional estimates of timber volume and carbon stocks for Douglas-fir stands with afforestation of land in the Pacific Northwest, West

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	0.0	0.0	71.1	2.7
10	0	3.8	0.2	1.3	0.0	0.3	72.0	5.7
20	0	56.8	0.5	0.4	0.7	0.6	74.6	59.1
30	194	114.1	19.8	0.4	4.8	1.8	78.2	140.9
40	328	169.9	17.7	0.4	11.1	2.5	82.3	201.7
50	413	188.3	26.0	0.4	16.9	2.9	86.0	234.5
60	481	205.6	33.3	0.4	20.1	3.3	89.1	262.7
70	542	221.0	33.5	0.4	26.3	3.7	91.4	284.9
80	585	229.8	41.5	0.4	28.2	4.1	92.9	304.0
90	627	242.4	44.7	0.4	30.8	4.4	93.8	322.8
100	663	252.5	46.8	0.4	34.7	4.8	94.3	339.3
110	692	261.5	51.1	0.4	36.3	5.1	94.6	354.6
120	722	273.2	50.9	0.4	39.3	5.5	94.7	369.3
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	0.0	0.0	31.7	1.2
10	0	1.7	0.1	0.6	0.0	0.1	32.1	2.5
20	0	25.3	0.2	0.2	0.3	0.3	33.3	26.4
30	2,768	50.9	8.8	0.2	2.1	0.8	34.9	62.8
40	4,684	75.8	7.9	0.2	4.9	1.1	36.7	89.9
50	5,902	84.0	11.6	0.2	7.5	1.3	38.4	104.6
60	6,871	91.7	14.8	0.2	9.0	1.5	39.8	117.2
70	7,748	98.6	15.0	0.2	11.7	1.7	40.8	127.1
80	8,356	102.5	18.5	0.2	12.6	1.8	41.5	135.6
90	8,965	108.1	19.9	0.2	13.7	2.0	41.9	144.0
100	9,468	112.6	20.9	0.2	15.5	2.1	42.1	151.3
110	9,884	116.6	22.8	0.2	16.2	2.3	42.2	158.2
120	10,318	121.8	22.7	0.2	17.5	2.5	42.2	164.7

Table B21.—Regional estimates of timber volume and carbon stocks for Douglas-fir stands with afforestation of land in the Pacific Northwest, West; volumes are for high-productivity sites (growth rate greater than 165 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	0.0	0.0	71.1	2.7
10	0	5.0	0.1	1.1	0.1	0.4	72.0	6.7
20	40	81.2	1.1	0.4	0.8	0.7	74.6	84.2
30	281	149.4	33.8	0.4	7.4	2.3	78.2	193.2
40	430	203.4	29.8	0.4	16.5	2.9	82.3	252.9
50	532	227.1	40.1	0.4	24.2	3.4	86.0	295.3
60	622	248.3	47.7	0.4	30.3	3.9	89.1	330.6
70	694	263.4	58.1	0.4	33.7	4.3	91.4	359.9
80	759	281.5	58.7	0.4	40.2	4.7	92.9	385.6
90	818	296.4	63.3	0.4	43.5	5.1	93.8	408.8
100	863	309.3	68.0	0.4	47.7	5.6	94.3	431.0
110	896	319.6	68.8	0.4	54.6	6.0	94.6	449.5
120	930	331.5	72.0	0.4	57.1	6.5	94.7	467.4
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	0.0	0.0	31.7	1.2
10	0	2.2	0.1	0.5	0.0	0.2	32.1	3.0
20	570	36.2	0.5	0.2	0.3	0.3	33.3	37.6
30	4,012	66.6	15.1	0.2	3.3	1.0	34.9	86.2
40	6,138	90.7	13.3	0.2	7.4	1.3	36.7	112.8
50	7,606	101.3	17.9	0.2	10.8	1.5	38.4	131.7
60	8,892	110.7	21.3	0.2	13.5	1.7	39.8	147.4
70	9,912	117.5	25.9	0.2	15.0	1.9	40.8	160.5
80	10,842	125.6	26.2	0.2	17.9	2.1	41.5	172.0
90	11,684	132.2	28.2	0.2	19.4	2.3	41.9	182.3
100	12,333	137.9	30.3	0.2	21.3	2.5	42.1	192.2
110	12,801	142.5	30.7	0.2	24.4	2.7	42.2	200.5
120	13,292	147.8	32.1	0.2	25.5	2.9	42.2	208.5

Table B22.—Regional estimates of timber volume and carbon stocks for fir-spruce-mountain hemlock with afforestation of land in the Pacific Northwest, West

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.6	0.0	0.0	46.6	2.6
10	0	0.7	0.0	2.3	0.0	0.1	47.2	3.0
20	0	4.7	0.5	1.3	0.2	0.3	48.9	6.9
30	0	10.6	0.9	0.9	0.9	0.7	51.3	13.9
40	21	42.7	0.4	0.3	1.4	1.3	53.9	46.1
50	209	91.3	0.4	0.3	2.8	2.5	56.4	97.3
60	334	122.7	18.7	0.3	5.4	3.6	58.5	150.6
70	417	144.5	33.8	0.3	11.5	4.2	60.0	194.3
80	476	159.4	39.2	0.3	20.4	4.6	60.9	223.8
90	509	170.8	45.4	0.3	26.6	5.1	61.5	248.0
100	564	186.3	47.4	0.3	29.8	5.6	61.9	269.4
110	599	200.8	48.5	0.3	33.7	6.0	62.0	289.3
120	638	216.3	48.2	0.3	35.7	6.5	62.1	306.9
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.1	0.0	0.0	20.8	1.1
10	0	0.3	0.0	1.0	0.0	0.0	21.1	1.4
20	0	2.1	0.2	0.6	0.1	0.1	21.8	3.1
30	0	4.7	0.4	0.4	0.4	0.3	22.9	6.2
40	303	19.1	0.2	0.1	0.6	0.6	24.1	20.6
50	2,985	40.7	0.2	0.1	1.3	1.1	25.2	43.4
60	4,767	54.7	8.4	0.1	2.4	1.6	26.1	67.2
70	5,966	64.5	15.1	0.1	5.1	1.9	26.7	86.6
80	6,801	71.1	17.5	0.1	9.1	2.0	27.2	99.8
90	7,273	76.2	20.2	0.1	11.9	2.3	27.4	110.6
100	8,062	83.1	21.1	0.1	13.3	2.5	27.6	120.1
110	8,562	89.5	21.6	0.1	15.0	2.7	27.7	129.0
120	9,111	96.5	21.5	0.1	15.9	2.9	27.7	136.9

Table B23.—Regional estimates of timber volume and carbon stocks for hemlock-Sitka spruce stands with afforestation of land in the Pacific Northwest, West

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	0.0	0.0	87.3	2.7
10	0	4.3	0.0	0.6	0.0	0.1	88.4	5.1
20	0	66.3	0.7	0.4	0.8	1.8	91.6	70.1
30	277	107.1	29.9	0.4	9.4	4.0	96.1	150.9
40	414	140.8	42.2	0.4	26.7	4.3	101.0	214.5
50	525	166.4	49.8	0.4	39.9	4.6	105.6	261.2
60	615	189.2	62.7	0.4	44.4	4.9	109.5	301.7
70	702	208.2	68.5	0.4	51.7	5.3	112.3	334.1
80	788	230.0	62.4	0.4	63.5	5.7	114.1	362.1
90	889	257.8	62.7	0.4	64.2	6.1	115.2	391.2
100	996	287.5	53.3	0.4	70.9	6.5	115.8	418.6
110	1,102	319.0	52.0	0.4	70.2	6.9	116.1	448.5
120	1,211	350.4	47.3	0.4	71.4	7.2	116.2	476.8
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	0.0	0.0	38.9	1.2
10	0	1.9	0.0	0.3	0.0	0.0	39.4	2.3
20	0	29.6	0.3	0.2	0.4	0.8	40.8	31.3
30	3,958	47.8	13.3	0.2	4.2	1.8	42.8	67.3
40	5,910	62.8	18.8	0.2	11.9	1.9	45.1	95.7
50	7,509	74.2	22.2	0.2	17.8	2.1	47.1	116.5
60	8,792	84.4	28.0	0.2	19.8	2.2	48.8	134.6
70	10,036	92.8	30.6	0.2	23.1	2.4	50.1	149.0
80	11,259	102.6	27.8	0.2	28.3	2.5	50.9	161.5
90	12,706	115.0	28.0	0.2	28.6	2.7	51.4	174.5
100	14,227	128.2	23.8	0.2	31.6	2.9	51.7	186.7
110	15,742	142.3	23.2	0.2	31.3	3.1	51.8	200.0
120	17,312	156.3	21.1	0.2	31.8	3.2	51.9	212.7

Table B24.—Regional estimates of timber volume and carbon stocks for hemlock-Sitka spruce stands with afforestation of land in the Pacific Northwest, West; volumes are for high-productivity sites (growth rate greater than 225 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	0.0	0.0	87.3	2.7
10	0	7.6	0.0	0.4	0.0	0.1	88.4	8.2
20	0	76.5	9.4	0.4	1.4	3.2	91.6	91.0
30	194	120.9	39.9	0.4	13.8	5.7	96.1	180.8
40	472	157.4	52.6	0.4	32.4	6.3	101.0	249.2
50	626	186.1	58.6	0.4	49.4	6.8	105.6	301.4
60	755	213.4	60.8	0.4	60.4	7.3	109.5	342.3
70	854	236.5	63.3	0.4	66.9	7.7	112.3	374.9
80	933	255.3	72.0	0.4	69.5	8.2	114.1	405.3
90	1,000	272.5	81.7	0.4	69.3	8.6	115.2	432.6
100	1,061	290.1	83.9	0.4	73.3	9.0	115.8	456.8
110	1,104	302.3	86.3	0.4	78.7	9.4	116.1	477.2
120	1,153	317.5	86.7	0.4	83.5	9.9	116.2	498.0
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	0.0	0.0	38.9	1.2
10	0	3.4	0.0	0.2	0.0	0.0	39.4	3.7
20	0	34.1	4.2	0.2	0.6	1.4	40.8	40.6
30	2,768	53.9	17.8	0.2	6.2	2.6	42.8	80.6
40	6,745	70.2	23.5	0.2	14.5	2.8	45.1	111.2
50	8,942	83.0	26.1	0.2	22.0	3.0	47.1	134.4
60	10,784	95.2	27.1	0.2	26.9	3.2	48.8	152.7
70	12,210	105.5	28.2	0.2	29.8	3.4	50.1	167.2
80	13,330	113.9	32.1	0.2	31.0	3.6	50.9	180.8
90	14,287	121.5	36.5	0.2	30.9	3.8	51.4	192.9
100	15,159	129.4	37.4	0.2	32.7	4.0	51.7	203.7
110	15,774	134.8	38.5	0.2	35.1	4.2	51.8	212.8
120	16,478	141.6	38.7	0.2	37.2	4.4	51.9	222.1

Table B25.—Regional estimates of timber volume and carbon stocks for ponderosa pine stands with afforestation of land in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.4	0.0	0.0	31.0	1.4
10	0	1.0	0.0	1.3	0.0	0.1	31.4	2.4
20	0	7.9	0.1	1.2	0.1	0.4	32.5	9.7
30	0	23.7	0.5	1.0	0.6	1.3	34.1	27.0
40	34	44.8	0.6	0.8	2.0	2.4	35.9	50.6
50	52	47.6	9.1	0.8	6.4	2.8	37.5	66.8
60	83	51.9	11.3	0.8	13.6	3.1	38.9	80.7
70	104	56.4	13.0	0.8	20.0	3.2	39.9	93.4
80	129	61.4	14.7	0.8	26.0	3.3	40.5	106.2
90	152	67.3	15.0	0.8	31.5	3.2	40.9	117.9
100	181	73.3	16.0	0.8	35.8	3.3	41.1	129.2
110	207	79.1	16.5	0.8	39.6	3.4	41.2	139.4
120	230	84.8	15.5	0.8	42.9	3.5	41.3	147.6
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.6	0.0	0.0	13.8	0.6
10	0	0.4	0.0	0.6	0.0	0.0	14.0	1.1
20	0	3.5	0.0	0.5	0.1	0.2	14.5	4.3
30	0	10.6	0.2	0.5	0.3	0.6	15.2	12.0
40	485	20.0	0.3	0.4	0.9	1.1	16.0	22.6
50	749	21.2	4.0	0.4	2.9	1.3	16.7	29.8
60	1,182	23.1	5.1	0.4	6.0	1.4	17.3	36.0
70	1,488	25.1	5.8	0.4	8.9	1.4	17.8	41.7
80	1,843	27.4	6.6	0.4	11.6	1.5	18.1	47.4
90	2,178	30.0	6.7	0.4	14.1	1.4	18.2	52.6
100	2,592	32.7	7.2	0.4	16.0	1.5	18.3	57.6
110	2,959	35.3	7.3	0.4	17.7	1.5	18.4	62.2
120	3,294	37.8	6.9	0.3	19.2	1.6	18.4	65.8

Table B26.—Regional estimates of timber volume and carbon stocks for fir-spruce-mountain hemlock stands with afforestation of land in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.6	0.0	0.0	38.9	1.6
10	0	1.1	0.0	1.9	0.0	0.1	39.4	3.1
20	0	11.8	0.3	1.1	0.3	0.6	40.8	14.1
30	0	36.6	1.1	0.3	1.7	1.6	42.8	41.4
40	0	69.5	3.0	0.3	5.1	2.8	45.1	80.7
50	93	89.1	14.8	0.3	10.9	3.7	47.1	118.8
60	215	107.0	24.1	0.3	21.0	4.3	48.8	156.6
70	279	118.0	34.5	0.4	34.0	4.6	50.1	191.6
80	336	126.7	37.5	0.6	48.8	4.8	50.9	218.3
90	390	135.5	33.9	0.7	61.5	5.1	51.4	236.6
100	446	144.3	33.4	0.7	70.1	5.4	51.7	253.9
110	504	153.6	34.2	0.8	76.8	5.7	51.8	271.2
120	553	162.1	34.9	0.9	82.4	6.0	51.9	286.3
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.7	0.0	0.0	17.4	0.7
10	0	0.5	0.0	0.8	0.0	0.0	17.6	1.4
20	0	5.3	0.1	0.5	0.1	0.2	18.2	6.3
30	0	16.3	0.5	0.1	0.8	0.7	19.1	18.5
40	0	31.0	1.4	0.1	2.3	1.2	20.1	36.0
50	1,326	39.8	6.6	0.1	4.8	1.7	21.0	53.0
60	3,068	47.7	10.7	0.1	9.4	1.9	21.8	69.9
70	3,985	52.7	15.4	0.2	15.2	2.1	22.3	85.5
80	4,802	56.5	16.7	0.3	21.8	2.2	22.7	97.4
90	5,579	60.4	15.1	0.3	27.4	2.3	22.9	105.5
100	6,378	64.3	14.9	0.3	31.3	2.4	23.0	113.3
110	7,204	68.5	15.3	0.4	34.3	2.5	23.1	121.0
120	7,905	72.3	15.6	0.4	36.8	2.7	23.1	127.7

Table B27.—Regional estimates of timber volume and carbon stocks for western oak stands with afforestation of land in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.0	0.0	0.0	20.7	1.0
10	0	21.2	0.0	0.5	0.0	0.2	21.0	21.8
20	0	32.9	1.1	0.5	0.9	4.1	21.7	39.5
30	0	45.3	2.8	0.5	3.1	6.0	22.8	57.6
40	23	53.3	6.8	0.5	7.4	7.5	23.9	75.5
50	67	63.4	6.7	0.5	14.0	8.6	25.0	93.1
60	99	74.4	8.1	0.5	19.3	9.9	25.9	112.3
70	113	81.2	11.9	0.5	26.0	11.1	26.6	130.7
80	126	87.3	14.0	0.5	34.5	11.9	27.0	148.2
90	137	91.7	15.6	0.5	43.7	12.6	27.3	164.1
100	146	95.6	17.6	0.5	53.4	13.1	27.5	180.2
110	163	104.0	14.6	0.5	62.4	13.8	27.5	195.3
120	171	107.7	18.3	0.5	69.3	14.5	27.6	210.3
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.4	0.0	0.0	9.2	0.4
10	0	9.4	0.0	0.2	0.0	0.1	9.4	9.7
20	0	14.7	0.5	0.2	0.4	1.8	9.7	17.6
30	0	20.2	1.2	0.2	1.4	2.7	10.2	25.7
40	325	23.8	3.0	0.2	3.3	3.3	10.7	33.7
50	952	28.3	3.0	0.2	6.2	3.8	11.2	41.5
60	1,408	33.2	3.6	0.2	8.6	4.4	11.6	50.1
70	1,608	36.2	5.3	0.2	11.6	4.9	11.9	58.3
80	1,801	38.9	6.2	0.2	15.4	5.3	12.1	66.1
90	1,951	40.9	7.0	0.2	19.5	5.6	12.2	73.2
100	2,089	42.6	7.9	0.2	23.8	5.8	12.3	80.4
110	2,328	46.4	6.5	0.2	27.8	6.1	12.3	87.1
120	2,450	48.0	8.2	0.2	30.9	6.5	12.3	93.8

Table B28.—Regional estimates of timber volume and carbon stocks for redwood stands with afforestation of land in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	0.0	0.0	40.3	2.7
10	0	22.7	0.0	0.4	0.0	0.0	40.9	23.2
20	13	63.3	0.0	0.4	1.3	1.4	42.3	66.4
30	128	107.5	0.0	0.4	3.8	2.0	44.4	113.8
40	279	152.5	0.0	0.4	6.5	2.5	46.7	161.9
50	454	197.4	0.0	0.4	9.0	2.8	48.8	209.7
60	621	228.7	7.8	0.4	11.7	3.0	50.6	251.7
70	792	257.4	13.0	0.4	15.5	3.2	51.9	289.6
80	975	285.7	15.7	0.4	20.4	3.4	52.7	325.7
90	1167	313.7	17.0	0.4	25.5	3.6	53.3	360.3
100	1336	335.2	23.7	0.4	30.0	3.8	53.5	393.2
110	1429	341.3	38.3	0.4	35.6	4.1	53.7	419.7
120	1513	347.7	48.3	0.4	43.8	4.4	53.7	444.6
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	0.0	0.0	18.0	1.2
10	0	10.1	0.0	0.2	0.0	0.0	18.2	10.4
20	182	28.2	0.0	0.2	0.6	0.6	18.9	29.6
30	1,830	47.9	0.0	0.2	1.7	0.9	19.8	50.8
40	3,988	68.0	0.0	0.2	2.9	1.1	20.8	72.2
50	6,495	88.0	0.0	0.2	4.0	1.2	21.8	93.5
60	8,878	102.0	3.5	0.2	5.2	1.3	22.6	112.3
70	11,314	114.8	5.8	0.2	6.9	1.4	23.1	129.2
80	13,938	127.4	7.0	0.2	9.1	1.5	23.5	145.3
90	16,680	139.9	7.6	0.2	11.4	1.6	23.8	160.7
100	19,091	149.5	10.6	0.2	13.4	1.7	23.9	175.4
110	20,421	152.2	17.1	0.2	15.9	1.8	23.9	187.2
120	21,618	155.1	21.5	0.2	19.6	1.9	24.0	198.3

Table B29.—Regional estimates of timber volume and carbon stocks for California mixed conifer stands with afforestation of land in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.4	0.0	0.0	37.4	1.4
10	0	2.7	0.0	2.1	0.0	0.0	37.8	4.8
20	0	24.1	0.2	0.9	0.4	0.8	39.2	26.4
30	13	55.9	0.9	0.4	1.9	1.6	41.1	60.6
40	79	79.0	8.6	0.4	4.9	2.2	43.2	95.1
50	170	98.9	16.5	0.4	10.9	2.7	45.2	129.4
60	245	111.1	24.2	0.6	20.0	3.0	46.9	159.0
70	322	122.3	24.0	0.7	30.5	3.3	48.0	180.8
80	384	131.2	25.8	0.8	38.9	3.7	48.8	200.4
90	438	138.7	30.6	0.9	45.9	4.0	49.3	220.0
100	481	143.5	35.8	1.0	53.6	4.2	49.6	238.1
110	525	147.5	37.5	1.1	62.2	4.5	49.7	252.9
120	552	147.6	42.8	1.2	70.7	4.7	49.8	266.9
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.6	0.0	0.0	16.7	0.6
10	0	1.2	0.0	0.9	0.0	0.0	16.9	2.1
20	0	10.8	0.1	0.4	0.2	0.4	17.5	11.8
30	180	24.9	0.4	0.2	0.8	0.7	18.3	27.0
40	1,128	35.2	3.8	0.2	2.2	1.0	19.3	42.4
50	2,436	44.1	7.3	0.2	4.9	1.2	20.2	57.7
60	3,506	49.5	10.8	0.3	8.9	1.3	20.9	70.9
70	4,600	54.6	10.7	0.3	13.6	1.5	21.4	80.6
80	5,493	58.5	11.5	0.4	17.4	1.6	21.8	89.4
90	6,262	61.9	13.6	0.4	20.5	1.8	22.0	98.1
100	6,878	64.0	16.0	0.4	23.9	1.9	22.1	106.2
110	7,503	65.8	16.7	0.5	27.8	2.0	22.2	112.8
120	7,886	65.8	19.1	0.5	31.5	2.1	22.2	119.1

Table B30.—Regional estimates of timber volume and carbon stocks for tanoak-laurel stands with afforestation of land in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.4	0.0	0.0	20.7	2.4
10	0	36.2	0.2	0.5	0.1	0.9	21.0	37.7
20	49	51.2	18.5	0.5	3.4	5.0	21.7	78.6
30	94	69.4	25.3	0.5	21.8	6.0	22.8	122.9
40	140	92.5	31.7	0.5	42.3	7.5	23.9	174.3
50	179	108.6	42.1	0.5	63.8	8.7	25.0	223.7
60	230	128.0	43.3	0.5	88.2	9.6	25.9	269.5
70	279	142.8	48.5	0.5	109.3	10.7	26.6	311.7
80	337	159.7	49.8	0.5	128.7	11.6	27.0	350.4
90	387	170.6	50.7	0.5	145.9	12.5	27.3	380.2
100	412	173.1	56.0	0.5	162.8	12.9	27.5	405.2
110	476	189.9	45.7	0.5	174.7	14.1	27.5	424.9
120	496	187.5	62.4	0.5	178.5	15.1	27.6	444.0
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.1	0.0	0.0	9.2	1.1
10	0	16.1	0.1	0.2	0.0	0.4	9.4	16.8
20	699	22.8	8.3	0.2	1.5	2.2	9.7	35.1
30	1,342	31.0	11.3	0.2	9.7	2.7	10.2	54.8
40	1,994	41.2	14.1	0.2	18.8	3.4	10.7	77.8
50	2,565	48.4	18.8	0.2	28.5	3.9	11.2	99.8
60	3,285	57.1	19.3	0.2	39.3	4.3	11.6	120.2
70	3,987	63.7	21.6	0.2	48.7	4.8	11.9	139.0
80	4,811	71.2	22.2	0.2	57.4	5.2	12.1	156.3
90	5,533	76.1	22.6	0.2	65.1	5.6	12.2	169.6
100	5,885	77.2	25.0	0.2	72.6	5.8	12.3	180.7
110	6,797	84.7	20.4	0.2	77.9	6.3	12.3	189.5
120	7,085	83.6	27.8	0.2	79.6	6.7	12.3	198.0

Table B31.—Regional estimates of timber volume and carbon stocks for other western softwood stands with afforestation of land in the Pacific Southwest

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.6	0.0	0.0	37.4	2.6
10	0	1.1	0.0	2.2	0.0	0.0	37.8	3.3
20	0	5.1	0.2	1.8	0.1	0.1	39.2	7.1
30	0	8.6	0.9	1.5	0.3	0.1	41.1	11.4
40	0	12.1	2.1	1.3	0.9	0.2	43.2	16.6
50	19	15.4	3.4	1.2	2.0	0.3	45.2	22.5
60	26	18.5	4.8	1.2	3.8	0.5	46.9	28.9
70	37	21.5	6.0	1.2	6.1	0.7	48.0	35.5
80	47	24.4	7.0	1.2	8.7	1.0	48.8	42.2
90	55	27.4	7.7	1.2	11.6	1.2	49.3	49.1
100	62	30.9	8.2	1.2	14.5	1.6	49.6	56.4
110	66	34.5	8.6	1.2	17.4	1.9	49.7	63.6
120	71	38.9	8.7	1.2	20.1	2.4	49.8	71.2
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.1	0.0	0.0	16.7	1.1
10	0	0.5	0.0	1.0	0.0	0.0	16.9	1.5
20	0	2.3	0.1	0.8	0.0	0.0	17.5	3.2
30	0	3.8	0.4	0.7	0.1	0.1	18.3	5.1
40	0	5.4	0.9	0.6	0.4	0.1	19.3	7.4
50	268	6.9	1.5	0.5	0.9	0.2	20.2	10.0
60	372	8.3	2.2	0.5	1.7	0.2	20.9	12.9
70	530	9.6	2.7	0.5	2.7	0.3	21.4	15.8
80	674	10.9	3.1	0.5	3.9	0.4	21.8	18.8
90	782	12.2	3.4	0.5	5.2	0.6	22.0	21.9
100	881	13.8	3.7	0.5	6.5	0.7	22.1	25.2
110	947	15.4	3.8	0.5	7.7	0.9	22.2	28.4
120	1,019	17.4	3.9	0.5	9.0	1.1	22.2	31.8

Table B32.—Regional estimates of timber volume and carbon stocks for Douglas-fir stands with afforestation of land in the Rocky Mountain, North

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	0.0	0.0	29.1	2.7
10	0	0.1	0.0	2.7	0.0	0.0	29.5	2.8
20	0	1.0	0.2	2.3	0.0	0.1	30.6	3.6
30	0	11.4	0.2	0.9	0.2	0.3	32.1	13.0
40	0	25.6	0.9	0.4	0.4	0.7	33.7	28.1
50	0	37.0	2.8	0.4	1.1	1.1	35.3	42.5
60	9	47.2	4.7	0.4	2.5	1.3	36.5	56.2
70	61	56.7	6.5	0.4	4.3	1.6	37.5	69.5
80	96	64.0	8.6	0.4	6.6	1.8	38.1	81.4
90	132	69.8	10.0	0.4	9.2	2.0	38.5	91.4
100	149	74.3	11.7	0.4	12.1	2.2	38.7	100.6
110	169	78.8	12.3	0.4	15.0	2.3	38.8	108.9
120	179	82.8	12.8	0.4	17.8	2.5	38.8	116.2
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	0.0	0.0	13.0	1.2
10	0	0.1	0.0	1.2	0.0	0.0	13.2	1.3
20	0	0.4	0.1	1.0	0.0	0.1	13.6	1.6
30	0	5.1	0.1	0.4	0.1	0.2	14.3	5.8
40	0	11.4	0.4	0.2	0.2	0.3	15.0	12.6
50	0	16.5	1.3	0.2	0.5	0.5	15.7	18.9
60	125	21.0	2.1	0.2	1.1	0.6	16.3	25.1
70	870	25.3	2.9	0.2	1.9	0.7	16.7	31.0
80	1,367	28.5	3.8	0.2	2.9	0.8	17.0	36.3
90	1,881	31.1	4.5	0.2	4.1	0.9	17.2	40.8
100	2,127	33.1	5.2	0.2	5.4	1.0	17.3	44.9
110	2,417	35.1	5.5	0.2	6.7	1.0	17.3	48.6
120	2,553	36.9	5.7	0.2	7.9	1.1	17.3	51.8

Table B33.—Regional estimates of timber volume and carbon stocks for ponderosa pine stands with afforestation of land in the Rocky Mountain, North

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.4	0.0	0.0	25.7	0.4
10	0	0.1	0.0	0.4	0.0	0.0	26.1	0.6
20	0	2.0	0.1	0.4	0.0	0.1	27.0	2.6
30	0	16.0	0.3	0.5	0.2	0.5	28.3	17.4
40	16	29.2	2.1	0.5	0.8	1.0	29.8	33.6
50	42	36.7	4.9	0.5	2.3	1.4	31.1	45.7
60	59	41.1	7.7	0.5	4.5	1.6	32.3	55.4
70	73	44.3	8.1	0.5	7.1	1.8	33.1	61.7
80	84	46.5	8.8	0.5	9.2	2.0	33.6	67.0
90	93	49.1	9.5	0.5	11.5	2.1	34.0	72.6
100	100	50.9	10.4	0.5	13.5	2.3	34.1	77.6
110	108	52.3	10.2	0.5	15.1	2.4	34.2	80.5
120	115	53.6	10.9	0.5	16.4	2.6	34.3	84.0
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.2	0.0	0.0	11.5	0.2
10	0	0.1	0.0	0.2	0.0	0.0	11.6	0.2
20	0	0.9	0.0	0.2	0.0	0.0	12.0	1.2
30	0	7.1	0.1	0.2	0.1	0.2	12.6	7.8
40	234	13.0	0.9	0.2	0.4	0.5	13.3	15.0
50	605	16.4	2.2	0.2	1.0	0.6	13.9	20.4
60	850	18.3	3.4	0.2	2.0	0.7	14.4	24.7
70	1,041	19.8	3.6	0.2	3.2	0.8	14.8	27.5
80	1,194	20.7	3.9	0.2	4.1	0.9	15.0	29.9
90	1,324	21.9	4.2	0.2	5.1	0.9	15.2	32.4
100	1,429	22.7	4.7	0.2	6.0	1.0	15.2	34.6
110	1,546	23.3	4.6	0.2	6.7	1.1	15.3	35.9
120	1,637	23.9	4.9	0.2	7.3	1.2	15.3	37.5

Table B34.—Regional estimates of timber volume and carbon stocks for fir-spruce-mountain hemlock stands with afforestation of land in the Rocky Mountain, North

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.6	0.0	0.0	33.1	2.6
10	0	0.1	0.0	2.6	0.0	0.0	33.5	2.8
20	0	1.5	0.3	2.0	0.1	0.2	34.7	4.1
30	0	18.3	0.2	0.6	0.3	0.6	36.4	19.9
40	2	43.5	2.6	0.3	0.8	1.5	38.3	48.7
50	56	64.2	8.5	0.3	2.9	2.3	40.1	78.2
60	128	76.9	14.2	0.3	7.0	2.9	41.5	101.2
70	170	85.6	18.6	0.3	12.4	3.2	42.6	120.1
80	205	91.6	20.7	0.3	18.1	3.5	43.3	134.1
90	227	96.7	22.2	0.3	23.2	3.7	43.7	146.2
100	248	101.5	22.5	0.3	28.4	3.9	43.9	156.5
110	274	106.3	22.6	0.3	32.3	4.1	44.0	165.5
120	293	110.5	22.7	0.3	35.5	4.3	44.1	173.3
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.1	0.0	0.0	14.8	1.1
10	0	0.1	0.0	1.1	0.0	0.0	15.0	1.2
20	0	0.7	0.1	0.9	0.0	0.1	15.5	1.8
30	0	8.1	0.1	0.3	0.1	0.3	16.2	8.9
40	25	19.4	1.2	0.1	0.4	0.7	17.1	21.7
50	805	28.6	3.8	0.1	1.3	1.0	17.9	34.9
60	1,835	34.3	6.3	0.1	3.1	1.3	18.5	45.2
70	2,435	38.2	8.3	0.1	5.5	1.4	19.0	53.6
80	2,935	40.8	9.2	0.1	8.1	1.5	19.3	59.8
90	3,243	43.1	9.9	0.1	10.4	1.6	19.5	65.2
100	3,550	45.3	10.0	0.1	12.6	1.7	19.6	69.8
110	3,913	47.4	10.1	0.1	14.4	1.8	19.6	73.8
120	4,189	49.3	10.1	0.1	15.8	1.9	19.7	77.3

Table B35.—Regional estimates of timber volume and carbon stocks for lodgepole pine stands with afforestation of land in the Rocky Mountain, North

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	2.6	0.0	0.0	27.9	2.6
10	0	0.4	0.1	1.6	0.0	0.0	28.2	2.1
20	0	13.1	0.3	0.4	0.2	0.3	29.3	14.3
30	0	32.8	2.6	0.3	0.5	1.3	30.7	37.5
40	8	43.9	7.9	0.3	2.5	1.9	32.3	56.6
50	81	53.5	11.1	0.3	6.7	2.5	33.8	74.1
60	141	61.1	14.1	0.3	11.7	3.0	35.0	90.2
70	171	66.2	16.2	0.3	17.1	3.5	35.9	103.3
80	192	70.1	17.7	0.3	22.5	3.9	36.5	114.6
90	208	73.1	17.7	0.3	27.3	4.3	36.8	122.7
100	225	75.9	17.8	0.3	31.3	4.6	37.0	129.9
110	235	78.2	18.2	0.3	34.5	4.9	37.1	136.2
120	248	80.6	17.5	0.3	37.3	5.2	37.1	141.0
years	*ft^3/acre*	---------- *tons carbon/acre* ----------						
0	0	0.0	0.0	1.1	0.0	0.0	12.4	1.1
10	0	0.2	0.0	0.7	0.0	0.0	12.6	0.9
20	0	5.8	0.1	0.2	0.1	0.2	13.0	6.4
30	0	14.6	1.2	0.2	0.2	0.6	13.7	16.7
40	111	19.6	3.5	0.2	1.1	0.9	14.4	25.3
50	1,160	23.9	4.9	0.2	3.0	1.1	15.1	33.1
60	2,015	27.2	6.3	0.2	5.2	1.3	15.6	40.2
70	2,441	29.5	7.2	0.2	7.6	1.5	16.0	46.1
80	2,742	31.3	7.9	0.2	10.0	1.7	16.3	51.1
90	2,969	32.6	7.9	0.2	12.2	1.9	16.4	54.7
100	3,215	33.8	7.9	0.2	13.9	2.1	16.5	57.9
110	3,365	34.9	8.1	0.2	15.4	2.2	16.5	60.8
120	3,551	35.9	7.8	0.2	16.7	2.3	16.6	62.9

Table B36.—Regional estimates of timber volume and carbon stocks for Douglas-fir stands with afforestation of land in the Rocky Mountain, South

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.7	0.0	0.0	23.2	2.7
10	0	2.9	0.0	1.8	0.0	0.0	23.5	4.7
20	0	9.1	0.0	1.1	0.1	0.6	24.3	11.0
30	0	19.6	0.1	0.7	0.4	1.2	25.5	22.0
40	0	34.8	0.2	0.4	0.9	2.0	26.8	38.4
50	31	42.9	5.3	0.5	2.3	2.8	28.1	53.7
60	49	48.0	8.7	0.6	5.3	3.1	29.1	65.7
70	69	53.7	10.0	0.8	8.8	3.2	29.8	76.5
80	93	60.7	10.4	0.9	12.1	3.4	30.3	87.5
90	98	65.9	9.8	1.0	15.2	3.6	30.6	95.4
100	124	69.4	8.6	1.0	17.7	3.6	30.8	100.3
110	127	72.8	8.3	1.1	19.2	3.8	30.8	105.1
120	147	76.4	8.3	1.1	20.7	3.9	30.9	110.4
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.2	0.0	0.0	10.3	1.2
10	0	1.3	0.0	0.8	0.0	0.0	10.5	2.1
20	0	4.0	0.0	0.5	0.0	0.3	10.9	4.9
30	0	8.7	0.1	0.3	0.2	0.5	11.4	9.8
40	0	15.5	0.1	0.2	0.4	0.9	12.0	17.1
50	442	19.1	2.4	0.2	1.0	1.2	12.5	24.0
60	704	21.4	3.9	0.3	2.3	1.4	13.0	29.3
70	983	23.9	4.4	0.4	3.9	1.4	13.3	34.1
80	1,324	27.1	4.7	0.4	5.4	1.5	13.5	39.0
90	1,403	29.4	4.4	0.4	6.8	1.6	13.7	42.5
100	1,776	30.9	3.8	0.5	7.9	1.6	13.7	44.7
110	1,809	32.5	3.7	0.5	8.6	1.7	13.8	46.9
120	2,105	34.1	3.7	0.5	9.2	1.7	13.8	49.2

Table B37.—Regional estimates of timber volume and carbon stocks for ponderosa pine stands with afforestation of land in the Rocky Mountain, South

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.4	0.0	0.0	18.1	0.4
10	0	0.6	0.0	0.4	0.0	0.2	18.3	1.2
20	0	13.7	0.1	0.5	0.1	0.4	19.0	14.8
30	0	21.1	6.0	0.5	1.0	1.8	19.9	30.3
40	21	28.0	8.0	0.5	4.2	2.1	20.9	42.8
50	42	35.1	7.4	0.5	7.8	2.1	21.9	52.9
60	58	39.3	8.4	0.4	10.7	2.1	22.7	61.1
70	74	43.2	8.7	0.4	13.6	2.1	23.3	68.0
80	92	47.8	7.9	0.4	16.2	2.0	23.6	74.3
90	107	50.5	8.7	0.4	18.3	2.0	23.9	79.9
100	119	53.4	9.0	0.4	20.5	2.0	24.0	85.3
110	131	56.1	8.8	0.4	22.4	2.0	24.1	89.8
120	144	58.7	8.5	0.4	24.1	2.1	24.1	93.8
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.2	0.0	0.0	8.1	0.2
10	0	0.2	0.0	0.2	0.0	0.1	8.2	0.5
20	0	6.1	0.0	0.2	0.1	0.2	8.5	6.6
30	0	9.4	2.7	0.2	0.5	0.8	8.9	13.5
40	306	12.5	3.6	0.2	1.9	0.9	9.3	19.1
50	596	15.7	3.3	0.2	3.5	1.0	9.8	23.6
60	822	17.5	3.8	0.2	4.8	1.0	10.1	27.2
70	1,064	19.3	3.9	0.2	6.1	0.9	10.4	30.3
80	1,321	21.3	3.5	0.2	7.2	0.9	10.6	33.2
90	1,524	22.5	3.9	0.2	8.2	0.9	10.7	35.6
100	1,694	23.8	4.0	0.2	9.1	0.9	10.7	38.1
110	1,873	25.0	3.9	0.2	10.0	0.9	10.7	40.1
120	2,055	26.2	3.8	0.2	10.8	0.9	10.8	41.8

Table B38.—Regional estimates of timber volume and carbon stocks for fir-spruce-mountain hemlock stands with afforestation of land in the Rocky Mountain, South

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	---------- *tonnes carbon/hectare* ----------						
0	0	0.0	0.0	2.6	0.0	0.0	23.6	2.6
10	0	1.0	0.0	2.4	0.0	0.0	23.9	3.4
20	0	14.0	0.2	1.0	0.2	0.8	24.8	16.1
30	24	38.7	0.9	0.4	1.2	2.7	26.0	43.9
40	37	45.9	8.5	0.7	4.0	4.3	27.3	63.3
50	64	49.3	11.1	0.9	8.9	4.5	28.6	74.8
60	76	51.1	12.3	1.2	13.2	4.5	29.6	82.3
70	89	54.1	13.2	1.4	16.8	4.5	30.4	90.1
80	112	62.6	7.9	1.4	20.0	4.5	30.9	96.5
90	143	71.1	3.7	1.4	20.9	4.7	31.2	101.8
100	160	77.7	4.8	1.4	19.4	5.1	31.3	108.3
110	182	84.7	4.1	1.4	19.7	5.4	31.4	115.4
120	192	86.6	6.6	1.5	20.8	5.7	31.4	121.2
years	*ft^3/acre*	---------- *tons carbon/acre* ----------						
0	0	0.0	0.0	1.1	0.0	0.0	10.5	1.1
10	0	0.4	0.0	1.1	0.0	0.0	10.7	1.5
20	0	6.2	0.1	0.4	0.1	0.3	11.0	7.2
30	346	17.3	0.4	0.2	0.5	1.2	11.6	19.6
40	531	20.5	3.8	0.3	1.8	1.9	12.2	28.2
50	921	22.0	5.0	0.4	4.0	2.0	12.7	33.4
60	1,089	22.8	5.5	0.5	5.9	2.0	13.2	36.7
70	1,268	24.1	5.9	0.6	7.5	2.0	13.5	40.2
80	1,595	27.9	3.5	0.6	8.9	2.0	13.8	43.1
90	2,040	31.7	1.6	0.6	9.3	2.1	13.9	45.4
100	2,288	34.6	2.1	0.6	8.6	2.3	14.0	48.3
110	2,599	37.8	1.9	0.6	8.8	2.4	14.0	51.5
120	2,745	38.6	2.9	0.7	9.3	2.5	14.0	54.0

Table B39.—Regional estimates of timber volume and carbon stocks for lodgepole pine stands with afforestation of land in the Rocky Mountain, South

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.6	0.0	0.0	20.2	1.6
10	0	2.9	0.0	1.5	0.0	0.1	20.5	4.5
20	0	12.3	0.1	1.2	0.2	1.1	21.2	14.9
30	0	24.1	0.3	1.0	0.7	2.1	22.3	28.2
40	0	31.0	3.8	1.0	1.4	2.2	23.4	39.3
50	0	37.7	5.5	1.0	3.5	2.5	24.5	50.3
60	0	45.6	5.3	1.0	6.0	2.8	25.4	60.7
70	82	53.1	6.1	1.0	8.1	3.1	26.0	71.4
80	150	59.7	6.7	1.0	10.4	3.4	26.5	81.2
90	203	66.0	7.7	1.0	12.9	3.6	26.7	91.2
100	214	69.9	9.6	1.1	15.8	3.7	26.9	100.1
110	255	73.9	10.5	1.1	19.6	3.8	26.9	108.8
120	259	77.6	10.3	1.1	23.4	3.8	27.0	116.2
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.7	0.0	0.0	9.0	0.7
10	0	1.3	0.0	0.6	0.0	0.1	9.1	2.0
20	0	5.5	0.0	0.5	0.1	0.5	9.5	6.6
30	0	10.7	0.1	0.5	0.3	1.0	9.9	12.6
40	0	13.8	1.7	0.4	0.6	1.0	10.5	17.5
50	0	16.8	2.5	0.4	1.6	1.1	10.9	22.4
60	0	20.4	2.4	0.4	2.7	1.3	11.3	27.1
70	1,175	23.7	2.7	0.4	3.6	1.4	11.6	31.8
80	2,146	26.6	3.0	0.4	4.6	1.5	11.8	36.2
90	2,896	29.4	3.4	0.5	5.8	1.6	11.9	40.7
100	3,062	31.2	4.3	0.5	7.1	1.7	12.0	44.7
110	3,640	33.0	4.7	0.5	8.7	1.7	12.0	48.5
120	3,707	34.6	4.6	0.5	10.4	1.7	12.0	51.8

Table B40.—Regional estimates of timber volume and carbon stocks for aspen-birch stands with afforestation of land in the Rocky Mountain, South

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.7	0.0	0.0	44.1	1.7
10	0	2.9	0.0	1.0	0.0	0.2	44.7	4.2
20	0	9.4	0.1	0.6	0.5	0.9	46.3	11.4
30	0	17.9	0.3	0.6	1.6	1.5	48.5	21.8
40	0	27.6	0.5	0.6	2.9	2.2	51.0	33.7
50	0	38.5	0.8	0.6	4.7	2.9	53.4	47.5
60	1	50.3	1.0	0.6	7.3	3.8	55.3	63.0
70	102	60.1	3.1	0.6	11.4	4.6	56.7	79.7
80	143	69.6	3.7	0.6	16.9	5.4	57.7	96.1
90	168	79.7	4.1	0.6	21.8	6.2	58.2	112.2
100	191	85.2	7.2	0.6	27.0	6.9	58.5	126.8
110	220	89.7	8.3	0.6	32.4	7.5	58.7	138.4
120	220	93.2	9.5	0.6	38.1	8.0	58.7	149.3
years	*ft^3/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.8	0.0	0.0	19.7	0.8
10	0	1.3	0.0	0.4	0.0	0.1	19.9	1.9
20	0	4.2	0.1	0.3	0.2	0.4	20.6	5.1
30	0	8.0	0.1	0.3	0.7	0.7	21.7	9.7
40	0	12.3	0.2	0.3	1.3	1.0	22.8	15.0
50	0	17.2	0.3	0.3	2.1	1.3	23.8	21.2
60	14	22.4	0.5	0.3	3.3	1.7	24.7	28.1
70	1,457	26.8	1.4	0.3	5.1	2.1	25.3	35.6
80	2,050	31.0	1.6	0.3	7.5	2.4	25.7	42.8
90	2,395	35.5	1.8	0.3	9.7	2.7	26.0	50.1
100	2,728	38.0	3.2	0.3	12.0	3.1	26.1	56.5
110	3,137	40.0	3.7	0.3	14.5	3.3	26.2	61.7
120	3,149	41.6	4.2	0.3	17.0	3.5	26.2	66.6

Table B41.—Regional estimates of timber volume and carbon stocks for longleaf-slash pine stands with afforestation of land in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.7	0.0	0.0	82.5	1.7
5	0	2.1	0.0	2.5	0.0	0.0	82.8	4.6
10	39	30.6	0.1	3.8	0.1	0.2	83.6	34.7
15	56	34.1	3.3	5.7	1.1	1.1	84.9	45.3
20	73	37.4	4.0	5.7	3.6	1.3	86.6	52.0
25	100	42.3	3.3	5.7	5.0	1.5	88.6	57.9
30	122	47.1	3.7	5.7	5.2	1.8	90.9	63.5
35	137	49.8	5.9	5.7	5.3	2.1	93.2	68.9
40	152	52.5	6.5	5.7	6.4	2.3	95.5	73.5
45	166	54.8	7.1	5.7	7.1	2.6	97.8	77.2
50	178	56.7	7.6	5.7	7.6	2.8	99.9	80.4
55	188	58.5	7.4	5.7	8.0	3.0	101.8	82.6
60	196	59.9	8.1	5.7	8.0	3.2	103.5	85.0
65	203	61.2	8.3	5.7	8.2	3.5	105.0	86.9
70	209	62.0	8.9	5.7	8.3	3.7	106.2	88.6
75	212	62.6	9.2	5.7	8.5	3.9	107.2	89.9
80	214	63.0	9.2	5.7	8.6	4.1	107.9	90.6
85	214	62.8	9.5	5.7	8.6	4.3	108.5	91.0
90	212	62.3	9.8	5.7	8.7	4.5	109.0	91.1

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Table B41 (continued).—Regional estimates of timber volume and carbon stocks for longleaf-slash pine stands with afforestation of land in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.8	0.0	0.0	36.8	0.8
5	0	0.9	0.0	1.1	0.0	0.0	36.9	2.0
10	555	13.6	0.1	1.7	0.0	0.1	37.3	15.5
15	807	15.2	1.4	2.5	0.5	0.5	37.9	20.2
20	1,046	16.7	1.8	2.5	1.6	0.6	38.6	23.2
25	1,423	18.9	1.5	2.5	2.2	0.7	39.5	25.8
30	1,739	21.0	1.6	2.5	2.3	0.8	40.5	28.3
35	1,951	22.2	2.7	2.5	2.4	0.9	41.6	30.7
40	2,175	23.4	2.9	2.5	2.9	1.0	42.6	32.8
45	2,372	24.4	3.1	2.5	3.2	1.1	43.6	34.4
50	2,538	25.3	3.4	2.5	3.4	1.2	44.6	35.8
55	2,685	26.1	3.3	2.5	3.6	1.3	45.4	36.8
60	2,807	26.7	3.6	2.5	3.6	1.4	46.2	37.9
65	2,908	27.3	3.7	2.5	3.7	1.5	46.8	38.8
70	2,981	27.7	4.0	2.5	3.7	1.6	47.4	39.5
75	3,034	27.9	4.1	2.5	3.8	1.7	47.8	40.1
80	3,054	28.1	4.1	2.5	3.9	1.8	48.1	40.4
85	3,056	28.0	4.2	2.5	3.9	1.9	48.4	40.6
90	3,035	27.8	4.4	2.5	3.9	2.0	48.6	40.6

Table B42.—Regional estimates of timber volume and carbon stocks for longleaf-slash pine stands with afforestation of land in the Southeast; volumes are for high-productivity sites (growth rate greater than 85 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	3.1	0.0	0.0	82.5	3.1
5	0	2.8	0.0	3.9	0.0	0.0	82.8	6.8
10	0	15.4	0.0	5.3	0.0	0.2	83.6	21.0
15	24	26.1	0.2	7.2	0.6	0.7	84.9	34.7
20	70	39.9	0.7	7.2	1.7	1.0	86.6	50.4
25	104	45.9	7.0	7.2	3.1	1.6	88.6	64.7
30	137	52.5	7.7	7.2	6.8	1.9	90.9	76.1
35	171	59.4	8.9	7.2	8.4	2.2	93.2	86.1
40	195	63.4	12.2	7.2	9.5	2.6	95.5	94.9
45	213	66.0	14.0	7.2	11.4	2.9	97.8	101.5
50	228	68.7	14.1	7.2	12.9	3.3	99.9	106.2
55	238	70.8	15.6	7.2	13.5	3.6	101.8	110.6
60	242	71.0	16.2	7.2	14.3	3.9	103.5	112.5
65	248	72.4	15.6	7.2	14.6	4.2	105.0	113.9
70	256	74.6	15.1	7.2	14.2	4.5	106.2	115.6
75	263	76.5	14.5	7.2	13.7	4.8	107.2	116.6
80	270	78.7	13.9	7.2	13.0	5.1	107.9	117.9
85	277	80.9	13.8	7.2	12.3	5.4	108.5	119.6
90	284	83.0	13.1	7.2	11.9	5.7	109.0	120.8

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Table B42 (continued).—Regional estimates of timber volume and carbon stocks for longleaf-slash pine stands with afforestation of land in the Southeast; volumes are for high-productivity sites (growth rate greater than 85 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.4	0.0	0.0	36.8	1.4
5	0	1.3	0.0	1.8	0.0	0.0	36.9	3.0
10	0	6.9	0.0	2.3	0.0	0.1	37.3	9.3
15	350	11.6	0.1	3.2	0.3	0.3	37.9	15.5
20	1,001	17.8	0.3	3.2	0.8	0.5	38.6	22.5
25	1,480	20.5	3.1	3.2	1.4	0.7	39.5	28.9
30	1,964	23.4	3.4	3.2	3.0	0.8	40.5	33.9
35	2,440	26.5	4.0	3.2	3.7	1.0	41.6	38.4
40	2,782	28.3	5.5	3.2	4.2	1.2	42.6	42.3
45	3,037	29.5	6.2	3.2	5.1	1.3	43.6	45.3
50	3,259	30.6	6.3	3.2	5.8	1.5	44.6	47.4
55	3,404	31.6	6.9	3.2	6.0	1.6	45.4	49.3
60	3,456	31.7	7.2	3.2	6.4	1.7	46.2	50.2
65	3,547	32.3	6.9	3.2	6.5	1.9	46.8	50.8
70	3,661	33.3	6.8	3.2	6.3	2.0	47.4	51.6
75	3,759	34.1	6.5	3.2	6.1	2.1	47.8	52.0
80	3,862	35.1	6.2	3.2	5.8	2.3	48.1	52.6
85	3,962	36.1	6.2	3.2	5.5	2.4	48.4	53.4
90	4,063	37.0	5.8	3.2	5.3	2.5	48.6	53.9

Table B43.—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands with afforestation of land in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.3	0.0	0.0	54.7	1.3
5	0	15.0	0.0	1.6	0.0	0.0	54.9	16.6
10	32	36.9	5.5	2.1	0.4	0.5	55.4	45.5
15	43	42.9	2.8	2.9	4.5	1.0	56.3	54.1
20	79	48.8	3.3	2.9	5.4	1.3	57.4	61.6
25	122	52.1	6.1	2.9	6.3	1.5	58.7	68.8
30	150	55.5	6.6	2.9	7.6	1.7	60.2	74.2
35	169	58.6	7.0	2.9	8.0	1.9	61.8	78.4
40	191	61.7	7.3	2.9	8.2	2.1	63.3	82.2
45	210	64.7	7.1	2.9	8.3	2.3	64.8	85.4
50	225	67.6	7.2	2.9	8.1	2.5	66.2	88.3
55	240	70.4	7.2	2.9	8.0	2.7	67.5	91.2
60	252	73.0	7.0	2.9	8.0	2.9	68.6	93.8
65	262	75.6	7.3	2.9	7.7	3.1	69.6	96.7
70	272	78.1	6.9	2.9	7.7	3.4	70.4	98.9
75	280	80.6	7.0	2.9	7.4	3.6	71.0	101.5
80	288	83.2	7.6	2.9	7.4	3.8	71.5	104.8
85	296	85.4	6.8	2.9	7.6	4.0	71.9	107.1
90	296	86.4	8.5	2.9	7.4	4.2	72.2	109.3

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Table B43 (continued).—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands with afforestation of land in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.6	0.0	0.0	24.4	0.6
5	0	6.7	0.0	0.7	0.0	0.0	24.5	7.4
10	457	16.5	2.5	0.9	0.2	0.2	24.7	20.3
15	611	19.1	1.3	1.3	2.0	0.5	25.1	24.1
20	1,129	21.8	1.5	1.3	2.4	0.6	25.6	27.5
25	1,743	23.3	2.7	1.3	2.8	0.7	26.2	30.7
30	2,139	24.7	2.9	1.3	3.4	0.8	26.9	33.1
35	2,421	26.2	3.1	1.3	3.6	0.8	27.6	35.0
40	2,724	27.5	3.3	1.3	3.7	0.9	28.3	36.7
45	2,996	28.9	3.2	1.3	3.7	1.0	28.9	38.1
50	3,221	30.1	3.2	1.3	3.6	1.1	29.5	39.4
55	3,424	31.4	3.2	1.3	3.6	1.2	30.1	40.7
60	3,595	32.6	3.1	1.3	3.6	1.3	30.6	41.8
65	3,747	33.7	3.2	1.3	3.5	1.4	31.0	43.1
70	3,882	34.8	3.1	1.3	3.4	1.5	31.4	44.1
75	4,002	35.9	3.1	1.3	3.3	1.6	31.7	45.3
80	4,115	37.1	3.4	1.3	3.3	1.7	31.9	46.7
85	4,226	38.3	3.0	1.3	3.4	1.8	32.1	47.7
90	4,233	38.5	3.8	1.3	3.3	1.9	32.2	48.8

Table B44.—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands with afforestation of land in the Southeast; volumes are for high-productivity sites (growth rate greater than 85 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.1	0.0	0.0	54.7	2.1
5	0	13.5	0.0	2.5	0.0	0.0	54.9	16.0
10	34	42.0	3.6	3.0	0.2	0.5	55.4	49.3
15	85	50.4	4.4	3.7	3.1	1.1	56.3	62.7
20	142	56.6	6.6	3.7	5.5	1.4	57.4	73.8
25	170	59.5	10.6	3.7	7.3	1.6	58.7	82.8
30	205	64.0	10.5	3.7	9.9	1.8	60.2	89.9
35	232	67.4	12.4	3.7	10.7	2.1	61.8	96.3
40	258	71.3	12.1	3.7	11.8	2.4	63.3	101.3
45	278	74.3	13.4	3.7	12.0	2.6	64.8	106.1
50	298	78.0	12.3	3.7	12.6	2.9	66.2	109.6
55	314	81.0	12.9	3.7	12.2	3.2	67.5	113.0
60	327	83.8	12.9	3.7	12.3	3.5	68.6	116.2
65	338	86.5	13.6	3.7	12.2	3.7	69.6	119.7
70	345	88.0	14.1	3.7	12.4	4.0	70.4	122.2
75	350	89.4	14.4	3.7	12.7	4.2	71.0	124.5
80	359	91.7	13.7	3.7	12.9	4.5	71.5	126.5
85	354	90.9	17.6	3.7	12.6	4.7	71.9	129.6
90	360	92.8	14.2	3.7	14.3	5.0	72.2	130.0

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Table B44 (continued).—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands with afforestation of land in the Southeast; volumes are for high-productivity sites (growth rate greater than 85 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.9	0.0	0.0	24.4	0.9
5	0	6.0	0.0	1.1	0.0	0.0	24.5	7.1
10	491	18.8	1.6	1.3	0.1	0.2	24.7	22.0
15	1,220	22.5	2.0	1.7	1.4	0.5	25.1	28.0
20	2,024	25.2	2.9	1.7	2.5	0.6	25.6	32.9
25	2,426	26.5	4.7	1.7	3.3	0.7	26.2	36.9
30	2,924	28.5	4.7	1.7	4.4	0.8	26.9	40.1
35	3,319	30.1	5.6	1.7	4.8	0.9	27.6	43.0
40	3,681	31.8	5.4	1.7	5.3	1.1	28.3	45.2
45	3,971	33.2	6.0	1.7	5.3	1.2	28.9	47.3
50	4,261	34.8	5.5	1.7	5.6	1.3	29.5	48.9
55	4,485	36.1	5.7	1.7	5.5	1.4	30.1	50.4
60	4,671	37.4	5.7	1.7	5.5	1.5	30.6	51.8
65	4,833	38.6	6.1	1.7	5.4	1.7	31.0	53.4
70	4,926	39.2	6.3	1.7	5.5	1.8	31.4	54.5
75	5,006	39.9	6.4	1.7	5.7	1.9	31.7	55.5
80	5,128	40.9	6.1	1.7	5.8	2.0	31.9	56.4
85	5,066	40.6	7.9	1.7	5.6	2.1	32.1	57.8
90	5,141	41.4	6.3	1.7	6.4	2.2	32.2	58.0

Table B45.—Regional estimates of timber volume and carbon stocks for oak-pine stands with afforestation of land in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.3	0.0	0.0	46.1	1.3
5	0	11.5	0.0	1.6	0.0	0.0	46.2	13.0
10	0	30.8	1.3	2.1	0.2	0.5	46.7	34.9
15	17	37.4	6.1	2.9	1.8	1.0	47.4	49.1
20	31	42.3	6.4	2.9	5.4	1.3	48.3	58.3
25	54	45.8	7.0	2.9	7.7	1.6	49.5	65.0
30	85	49.1	7.9	2.9	9.4	1.8	50.7	71.1
35	114	52.2	8.7	2.9	10.3	2.1	52.0	76.1
40	137	56.9	7.4	2.9	10.8	2.3	53.3	80.4
45	159	61.8	7.7	2.9	10.3	2.6	54.6	85.4
50	179	66.6	8.1	2.9	10.1	2.9	55.8	90.6
55	197	71.5	8.2	2.9	10.2	3.3	56.8	96.0
60	207	73.7	10.7	2.9	10.2	3.6	57.8	101.1
65	215	75.7	11.4	2.9	11.4	3.8	58.6	105.3
70	221	77.8	11.1	2.9	12.1	4.1	59.2	107.9
75	227	79.9	10.9	2.9	12.1	4.4	59.8	110.2
80	232	82.5	11.3	2.9	11.9	4.6	60.2	113.2
85	238	85.3	11.0	2.9	11.8	4.9	60.6	115.9
90	243	87.9	10.7	2.9	11.6	5.2	60.8	118.2

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Table B45 (continued).—Regional estimates of timber volume and carbon stocks for oak-pine stands with afforestation of land in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	1.3	0.0	0.0	46.1	1.3
5	0	11.5	0.0	1.6	0.0	0.0	46.2	13.0
10	0	30.8	1.3	2.1	0.2	0.5	46.7	34.9
15	17	37.4	6.1	2.9	1.8	1.0	47.4	49.1
20	31	42.3	6.4	2.9	5.4	1.3	48.3	58.3
25	54	45.8	7.0	2.9	7.7	1.6	49.5	65.0
30	85	49.1	7.9	2.9	9.4	1.8	50.7	71.1
35	114	52.2	8.7	2.9	10.3	2.1	52.0	76.1
40	137	56.9	7.4	2.9	10.8	2.3	53.3	80.4
45	159	61.8	7.7	2.9	10.3	2.6	54.6	85.4
50	179	66.6	8.1	2.9	10.1	2.9	55.8	90.6
55	197	71.5	8.2	2.9	10.2	3.3	56.8	96.0
60	207	73.7	10.7	2.9	10.2	3.6	57.8	101.1
65	215	75.7	11.4	2.9	11.4	3.8	58.6	105.3
70	221	77.8	11.1	2.9	12.1	4.1	59.2	107.9
75	227	79.9	10.9	2.9	12.1	4.4	59.8	110.2
80	232	82.5	11.3	2.9	11.9	4.6	60.2	113.2
85	238	85.3	11.0	2.9	11.8	4.9	60.6	115.9
90	243	87.9	10.7	2.9	11.6	5.2	60.8	118.2

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table B46.—Regional estimates of timber volume and carbon stocks for oak-hickory stands with afforestation of land in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.3	0.0	0.0	33.9	1.3
5	0	1.9	0.0	1.6	0.0	0.0	34.1	3.5
10	0	16.2	0.0	2.1	0.1	0.3	34.4	18.7
15	25	40.9	0.7	2.9	1.0	0.8	34.9	46.3
20	38	48.5	7.4	2.9	3.5	1.5	35.6	63.8
25	40	53.8	4.3	2.9	8.6	1.7	36.4	71.4
30	56	59.4	4.3	2.9	9.9	2.0	37.4	78.5
35	77	65.1	4.7	2.9	11.0	2.2	38.3	85.9
40	100	70.0	6.0	2.9	12.3	2.5	39.3	93.7
45	124	74.5	6.9	2.9	14.0	2.8	40.2	101.0
50	145	79.1	8.1	2.9	15.6	3.1	41.1	108.7
55	163	83.8	9.2	2.9	17.2	3.4	41.9	116.4
60	178	88.3	10.2	2.9	18.7	3.7	42.6	123.7
65	194	93.7	9.2	2.9	19.8	4.0	43.2	129.6
70	210	99.5	8.9	2.9	19.5	4.3	43.7	135.0
75	224	105.2	9.1	2.9	18.8	4.6	44.1	140.5
80	237	110.0	9.7	2.9	18.1	5.0	44.4	145.7
85	248	115.0	9.8	2.9	17.7	5.3	44.6	150.6
90	258	119.5	10.2	2.9	17.3	5.6	44.8	155.5

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Table B46 (continued).—Regional estimates of timber volume and carbon stocks for oak-hickory stands with afforestation of land in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.6	0.0	0.0	15.1	0.6
5	0	0.9	0.0	0.7	0.0	0.0	15.2	1.6
10	0	7.2	0.0	0.9	0.0	0.1	15.3	8.3
15	357	18.3	0.3	1.3	0.4	0.4	15.6	20.7
20	544	21.6	3.3	1.3	1.6	0.7	15.9	28.5
25	574	24.0	1.9	1.3	3.9	0.8	16.3	31.8
30	803	26.5	1.9	1.3	4.4	0.9	16.7	35.0
35	1,106	29.0	2.1	1.3	4.9	1.0	17.1	38.3
40	1,432	31.2	2.7	1.3	5.5	1.1	17.5	41.8
45	1,775	33.2	3.1	1.3	6.2	1.2	17.9	45.0
50	2,071	35.3	3.6	1.3	6.9	1.4	18.3	48.5
55	2,326	37.4	4.1	1.3	7.7	1.5	18.7	51.9
60	2,540	39.4	4.5	1.3	8.3	1.6	19.0	55.2
65	2,770	41.8	4.1	1.3	8.8	1.8	19.3	57.8
70	2,996	44.4	4.0	1.3	8.7	1.9	19.5	60.2
75	3,208	46.9	4.1	1.3	8.4	2.1	19.7	62.7
80	3,381	49.1	4.3	1.3	8.1	2.2	19.8	65.0
85	3,549	51.3	4.4	1.3	7.9	2.4	19.9	67.2
90	3,691	53.3	4.6	1.3	7.7	2.5	20.0	69.3

Table B47.—Regional estimates of timber volume and carbon stocks for oak-gum-cypress stands with afforestation of land in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.7	0.0	0.0	118.5	0.7
5	0	3.0	0.0	1.0	0.0	0.0	118.9	4.0
10	0	12.5	0.0	1.5	0.1	0.4	120.1	14.6
15	0	27.0	0.1	2.3	0.7	0.8	121.9	31.0
20	41	42.3	3.4	2.3	2.1	1.4	124.3	51.4
25	42	52.0	3.3	2.3	5.2	1.8	127.2	64.4
30	51	61.1	3.9	2.3	7.1	2.1	130.5	76.6
35	85	70.1	5.1	2.3	9.0	2.5	133.8	88.9
40	131	77.7	7.5	2.3	11.0	2.9	137.2	101.3
45	162	80.8	11.8	2.3	13.4	3.2	140.4	111.5
50	187	85.4	12.3	2.3	16.7	3.5	143.5	120.2
55	205	89.2	13.7	2.3	18.9	3.8	146.2	127.9
60	222	94.1	13.4	2.3	20.5	4.1	148.7	134.4
65	236	98.4	13.9	2.3	20.9	4.3	150.7	139.8
70	249	102.4	14.2	2.3	21.0	4.6	152.4	144.6
75	262	106.2	14.1	2.3	21.4	4.9	153.8	149.0
80	273	109.9	14.3	2.3	21.6	5.2	155.0	153.3
85	285	113.9	14.0	2.3	21.6	5.5	155.8	157.4
90	295	117.4	13.9	2.3	21.4	5.9	156.5	160.9

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Table B47 (continued).—Regional estimates of timber volume and carbon stocks for oak-gum-cypress stands with afforestation of land in the Southeast

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.3	0.0	0.0	52.9	0.3
5	0	1.3	0.0	0.4	0.0	0.0	53.0	1.8
10	0	5.6	0.0	0.7	0.0	0.2	53.6	6.5
15	0	12.1	0.1	1.0	0.3	0.4	54.4	13.8
20	590	18.8	1.5	1.0	0.9	0.6	55.5	22.9
25	594	23.2	1.5	1.0	2.3	0.8	56.8	28.7
30	726	27.3	1.8	1.0	3.2	1.0	58.2	34.2
35	1,214	31.3	2.3	1.0	4.0	1.1	59.7	39.7
40	1,877	34.7	3.3	1.0	4.9	1.3	61.2	45.2
45	2,314	36.0	5.2	1.0	6.0	1.4	62.7	49.7
50	2,667	38.1	5.5	1.0	7.5	1.5	64.0	53.6
55	2,931	39.8	6.1	1.0	8.4	1.7	65.2	57.0
60	3,177	42.0	6.0	1.0	9.1	1.8	66.3	59.9
65	3,374	43.9	6.2	1.0	9.3	1.9	67.2	62.4
70	3,559	45.7	6.3	1.0	9.4	2.1	68.0	64.5
75	3,739	47.4	6.3	1.0	9.6	2.2	68.6	66.5
80	3,898	49.0	6.4	1.0	9.7	2.3	69.1	68.4
85	4,070	50.8	6.3	1.0	9.7	2.5	69.5	70.2
90	4,210	52.4	6.2	1.0	9.5	2.6	69.8	71.8

Table B48.—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands with afforestation of land in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	1.3	0.0	0.0	31.4	1.3
5	0	12.7	0.0	1.6	0.0	0.0	31.5	14.3
10	36	46.0	2.8	2.1	0.2	0.4	31.8	51.6
15	80	51.3	6.2	2.9	2.8	1.2	32.3	64.3
20	123	54.7	6.6	2.9	6.2	1.4	33.0	71.8
25	155	56.7	9.4	2.9	7.7	1.6	33.7	78.2
30	189	62.1	7.2	2.9	9.5	1.7	34.6	83.4
35	223	67.4	7.1	2.9	9.0	2.0	35.5	88.4
40	245	69.4	10.4	2.9	8.7	2.3	36.4	93.6
45	262	70.8	11.1	2.9	10.1	2.5	37.2	97.4
50	276	72.2	11.7	2.9	11.0	2.7	38.0	100.5
55	285	72.7	12.9	2.9	11.6	2.9	38.8	103.0
60	295	73.8	12.1	2.9	12.3	3.1	39.4	104.2
65	305	75.2	11.5	2.9	12.1	3.3	40.0	105.0
70	314	76.4	11.6	2.9	11.5	3.5	40.4	105.8
75	323	77.9	11.0	2.9	11.1	3.7	40.8	106.6
80	330	79.3	10.8	2.9	10.6	3.9	41.1	107.5
85	338	80.9	11.0	2.9	10.3	4.1	41.3	109.2
90	345	82.3	10.5	2.9	10.3	4.3	41.5	110.2

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Table B48 (continued).—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands with afforestation of land in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.6	0.0	0.0	12.7	0.6
5	0	5.7	0.0	0.7	0.0	0.0	12.7	6.4
10	513	20.5	1.3	0.9	0.1	0.2	12.8	23.0
15	1,147	22.9	2.8	1.3	1.2	0.5	13.0	28.7
20	1,758	24.4	3.0	1.3	2.8	0.6	13.3	32.0
25	2,210	25.3	4.2	1.3	3.4	0.7	13.6	34.9
30	2,696	27.7	3.2	1.3	4.3	0.8	13.9	37.2
35	3,192	30.1	3.2	1.3	4.0	0.9	14.3	39.4
40	3,497	30.9	4.7	1.3	3.9	1.0	14.7	41.8
45	3,739	31.6	5.0	1.3	4.5	1.1	15.0	43.5
50	3,943	32.2	5.2	1.3	4.9	1.2	15.3	44.8
55	4,074	32.4	5.8	1.3	5.2	1.3	15.6	45.9
60	4,222	32.9	5.4	1.3	5.5	1.4	15.9	46.5
65	4,363	33.5	5.1	1.3	5.4	1.5	16.1	46.8
70	4,484	34.1	5.2	1.3	5.1	1.6	16.3	47.2
75	4,611	34.8	4.9	1.3	5.0	1.7	16.4	47.6
80	4,716	35.4	4.8	1.3	4.7	1.8	16.6	48.0
85	4,826	36.1	4.9	1.3	4.6	1.8	16.7	48.7
90	4,925	36.7	4.7	1.3	4.6	1.9	16.7	49.2

Table B49.—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands with afforestation of land in the South Central States; volumes are for high-productivity sites (growth rate greater than 120 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	2.1	0.0	0.0	31.4	2.1
5	0	12.8	0.0	2.5	0.0	0.0	31.5	15.3
10	60	43.4	4.3	3.0	0.2	0.4	31.8	51.3
15	103	47.9	9.3	3.7	3.1	1.1	32.3	65.1
20	144	54.2	9.6	3.7	6.9	1.3	33.0	75.7
25	179	59.5	11.2	3.7	8.7	1.5	33.7	84.6
30	206	63.1	13.7	3.7	10.0	1.8	34.6	92.4
35	223	65.4	16.2	3.7	11.6	2.1	35.5	99.0
40	240	68.4	15.6	3.7	13.4	2.3	36.4	103.4
45	253	71.0	15.5	3.7	13.7	2.6	37.2	106.4
50	266	73.8	16.4	3.7	13.6	2.8	38.0	110.3
55	279	77.0	15.9	3.7	13.9	3.1	38.8	113.7
60	289	79.8	15.8	3.7	13.7	3.4	39.4	116.4
65	301	83.2	14.9	3.7	13.3	3.7	40.0	118.8
70	311	85.9	15.4	3.7	12.4	3.9	40.4	121.4
75	319	88.6	15.6	3.7	12.2	4.2	40.8	124.3
80	327	91.7	16.1	3.7	12.1	4.4	41.1	128.0
85	334	94.5	16.4	3.7	12.3	4.7	41.3	131.6
90	342	97.8	15.9	3.7	12.5	5.0	41.5	134.9

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Table B49 (continued).—Regional estimates of timber volume and carbon stocks for loblolly-shortleaf pine stands with afforestation of land in the South Central States; volumes are for high-productivity sites (growth rate greater than 120 cubic feet wood/acre/year)

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.9	0.0	0.0	12.7	0.9
5	0	5.7	0.0	1.1	0.0	0.0	12.7	6.8
10	863	19.3	1.9	1.3	0.1	0.2	12.8	22.9
15	1,471	21.4	4.1	1.7	1.4	0.5	13.0	29.0
20	2,053	24.2	4.3	1.7	3.1	0.6	13.3	33.8
25	2,559	26.5	5.0	1.7	3.9	0.7	13.6	37.7
30	2,937	28.2	6.1	1.7	4.5	0.8	13.9	41.2
35	3,189	29.2	7.2	1.7	5.2	0.9	14.3	44.2
40	3,426	30.5	7.0	1.7	6.0	1.0	14.7	46.1
45	3,613	31.7	6.9	1.7	6.1	1.1	15.0	47.5
50	3,795	32.9	7.3	1.7	6.1	1.3	15.3	49.2
55	3,985	34.3	7.1	1.7	6.2	1.4	15.6	50.7
60	4,135	35.6	7.1	1.7	6.1	1.5	15.9	51.9
65	4,308	37.1	6.7	1.7	5.9	1.6	16.1	53.0
70	4,440	38.3	6.9	1.7	5.5	1.8	16.3	54.2
75	4,555	39.5	7.0	1.7	5.4	1.9	16.4	55.4
80	4,674	40.9	7.2	1.7	5.4	2.0	16.6	57.1
85	4,771	42.1	7.3	1.7	5.5	2.1	16.7	58.7
90	4,889	43.6	7.1	1.7	5.6	2.2	16.7	60.2

Table B50.—Regional estimates of timber volume and carbon stocks for oak-pine stands with afforestation of land in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.0	0.0	31.3	0.0
5	0	10.2	0.0	0.4	0.0	0.0	31.4	10.6
10	0	29.9	2.6	0.4	0.2	0.4	31.7	33.5
15	2	32.0	13.1	0.4	2.7	0.8	32.2	49.1
20	51	39.2	9.3	0.4	9.3	1.0	32.8	59.2
25	78	46.5	10.2	0.4	10.4	1.2	33.6	68.7
30	87	46.0	15.8	6.7	10.8	1.5	34.4	81.0
35	118	54.5	8.9	6.7	13.4	1.7	35.3	85.1
40	117	51.3	17.2	6.7	11.0	2.0	36.2	88.1
45	154	63.1	5.6	6.7	13.8	2.1	37.1	91.2
50	147	60.6	16.9	6.7	9.3	2.4	37.9	96.0
55	171	69.7	9.9	6.7	11.9	2.6	38.6	100.9
60	175	71.7	15.1	6.7	11.0	2.9	39.2	107.4
65	185	76.8	15.2	6.7	12.3	3.1	39.8	114.1
70	192	79.9	15.9	6.7	14.0	3.4	40.2	119.9
75	200	83.4	16.0	6.7	15.2	3.6	40.6	124.9
80	206	87.1	15.8	6.7	16.1	3.8	40.9	129.5
85	212	89.4	16.7	6.7	16.4	4.1	41.1	133.3
90	219	92.4	16.7	6.7	17.0	4.3	41.3	137.1

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Table B50 (continued).—Regional estimates of timber volume and carbon stocks for oak-pine stands with afforestation of land in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.0	0.0	14.0	0.0
5	0	4.6	0.0	0.2	0.0	0.0	14.0	4.7
10	0	13.4	1.2	0.2	0.1	0.2	14.1	15.0
15	30	14.3	5.8	0.2	1.2	0.4	14.4	21.9
20	733	17.5	4.1	0.2	4.2	0.4	14.6	26.4
25	1,119	20.7	4.5	0.2	4.6	0.5	15.0	30.6
30	1,249	20.5	7.1	3.0	4.8	0.7	15.4	36.1
35	1,691	24.3	4.0	3.0	6.0	0.7	15.8	38.0
40	1,668	22.9	7.7	3.0	4.9	0.9	16.1	39.3
45	2,198	28.1	2.5	3.0	6.1	0.9	16.5	40.7
50	2,098	27.0	7.6	3.0	4.1	1.1	16.9	42.8
55	2,439	31.1	4.4	3.0	5.3	1.2	17.2	45.0
60	2,497	32.0	6.7	3.0	4.9	1.3	17.5	47.9
65	2,643	34.2	6.8	3.0	5.5	1.4	17.7	50.9
70	2,745	35.6	7.1	3.0	6.2	1.5	17.9	53.5
75	2,857	37.2	7.1	3.0	6.8	1.6	18.1	55.7
80	2,942	38.8	7.0	3.0	7.2	1.7	18.2	57.8
85	3,032	39.9	7.4	3.0	7.3	1.8	18.3	59.5
90	3,129	41.2	7.5	3.0	7.6	1.9	18.4	61.2

Table B51.—Regional estimates of timber volume and carbon stocks for oak-hickory stands with afforestation of land in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.0	0.0	29.0	0.0
5	0	1.9	0.0	0.0	0.0	0.0	29.1	1.9
10	0	30.5	0.0	0.0	0.0	0.3	29.4	30.9
15	4	45.1	4.2	0.0	1.2	1.1	29.8	51.7
20	18	51.0	7.8	0.0	5.7	1.6	30.4	66.1
25	35	55.3	8.4	0.0	10.2	1.8	31.1	75.7
30	66	59.1	10.8	0.0	12.9	2.0	31.9	84.9
35	93	62.8	12.6	0.0	15.6	2.2	32.7	93.2
40	110	65.5	14.6	0.0	17.8	2.5	33.5	100.5
45	128	71.7	12.7	0.0	20.3	2.7	34.3	107.4
50	146	77.6	12.7	0.0	20.9	3.1	35.1	114.3
55	165	83.1	13.3	0.0	21.2	3.4	35.8	121.0
60	182	87.8	14.8	0.0	21.6	3.7	36.4	128.0
65	193	89.6	17.1	0.0	22.3	4.1	36.9	133.1
70	204	91.5	17.9	0.0	23.5	4.4	37.3	137.3
75	214	93.3	18.0	0.0	24.5	4.6	37.6	140.5
80	224	95.6	18.0	0.0	24.8	4.9	37.9	143.4
85	233	97.7	18.0	0.0	24.8	5.2	38.1	145.8
90	243	99.9	18.0	0.0	24.6	5.5	38.3	148.0

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Table B51 (continued).—Regional estimates of timber volume and carbon stocks for oak-hickory stands with afforestation of land in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.0	0.0	12.9	0.0
5	0	0.8	0.0	0.0	0.0	0.0	13.0	0.9
10	0	13.6	0.0	0.0	0.0	0.1	13.1	13.8
15	54	20.1	1.9	0.0	0.5	0.5	13.3	23.1
20	255	22.8	3.5	0.0	2.5	0.7	13.6	29.5
25	496	24.7	3.8	0.0	4.5	0.8	13.9	33.8
30	948	26.4	4.8	0.0	5.8	0.9	14.2	37.9
35	1,331	28.0	5.6	0.0	6.9	1.0	14.6	41.6
40	1,572	29.2	6.5	0.0	8.0	1.1	15.0	44.8
45	1,827	32.0	5.6	0.0	9.0	1.2	15.3	47.9
50	2,092	34.6	5.6	0.0	9.3	1.4	15.7	51.0
55	2,354	37.1	5.9	0.0	9.4	1.5	16.0	54.0
60	2,600	39.2	6.6	0.0	9.6	1.7	16.2	57.1
65	2,754	40.0	7.6	0.0	9.9	1.8	16.4	59.4
70	2,913	40.8	8.0	0.0	10.5	1.9	16.6	61.2
75	3,059	41.6	8.0	0.0	10.9	2.1	16.8	62.6
80	3,204	42.6	8.0	0.0	11.1	2.2	16.9	64.0
85	3,332	43.6	8.0	0.0	11.1	2.3	17.0	65.0
90	3,470	44.5	8.0	0.0	11.0	2.5	17.1	66.0

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table B52.—Regional estimates of timber volume and carbon stocks for oak-gum-cypress stands with afforestation of land in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.0	0.0	39.6	0.0
5	0	2.9	0.0	0.0	0.0	0.0	39.7	2.9
10	0	12.4	0.1	0.0	0.1	0.4	40.1	13.0
15	0	30.0	0.2	0.0	0.6	0.9	40.7	31.7
20	22	44.3	1.1	0.0	2.1	1.6	41.5	49.1
25	51	49.2	4.4	0.0	4.5	2.1	42.5	60.2
30	84	53.2	6.7	0.0	8.0	2.3	43.6	70.3
35	119	57.0	8.6	0.0	11.0	2.6	44.7	79.3
40	148	60.4	10.4	0.0	13.5	3.0	45.8	87.3
45	174	63.1	11.8	0.0	15.6	3.3	46.9	93.9
50	202	68.3	10.0	0.0	17.4	3.6	47.9	99.3
55	228	73.3	10.0	0.0	17.4	4.1	48.8	104.8
60	246	76.6	11.9	0.0	17.3	4.5	49.7	110.3
65	260	77.5	14.1	0.0	17.7	4.9	50.3	114.2
70	271	78.1	14.7	0.0	18.8	5.3	50.9	116.9
75	281	78.2	15.3	0.0	19.5	5.6	51.4	118.7
80	286	79.5	15.2	0.0	20.1	6.0	51.8	120.9
85	290	79.8	16.2	0.0	20.0	6.3	52.0	122.4
90	293	80.1	16.1	0.0	20.5	6.6	52.3	123.3

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Table B52 (continued).—Regional estimates of timber volume and carbon stocks for oak-gum-cypress stands with afforestation of land in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.0	0.0	17.7	0.0
5	0	1.3	0.0	0.0	0.0	0.0	17.7	1.3
10	0	5.5	0.0	0.0	0.0	0.2	17.9	5.8
15	0	13.4	0.1	0.0	0.3	0.4	18.2	14.1
20	312	19.7	0.5	0.0	0.9	0.7	18.5	21.9
25	734	21.9	2.0	0.0	2.0	0.9	19.0	26.9
30	1,202	23.7	3.0	0.0	3.6	1.0	19.4	31.3
35	1,695	25.4	3.8	0.0	4.9	1.2	19.9	35.4
40	2,119	26.9	4.6	0.0	6.0	1.3	20.4	38.9
45	2,483	28.2	5.3	0.0	6.9	1.5	20.9	41.9
50	2,880	30.5	4.5	0.0	7.7	1.6	21.4	44.3
55	3,261	32.7	4.5	0.0	7.8	1.8	21.8	46.8
60	3,522	34.2	5.3	0.0	7.7	2.0	22.1	49.2
65	3,711	34.6	6.3	0.0	7.9	2.2	22.5	50.9
70	3,866	34.8	6.6	0.0	8.4	2.3	22.7	52.2
75	4,011	34.9	6.8	0.0	8.7	2.5	22.9	52.9
80	4,083	35.5	6.8	0.0	9.0	2.7	23.1	53.9
85	4,150	35.6	7.2	0.0	8.9	2.8	23.2	54.6
90	4,181	35.7	7.2	0.0	9.2	2.9	23.3	55.0

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Table B53.—Regional estimates of timber volume and carbon stocks for elm-ash-cottonwood stands with afforestation of land in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*m^3/hectare*	*tonnes carbon/hectare*						
0	0	0.0	0.0	0.0	0.0	0.0	37.4	0.0
5	0	2.5	0.0	0.0	0.0	0.0	37.5	2.6
10	6	16.8	0.1	0.0	0.1	0.2	37.9	17.3
15	18	29.9	1.6	0.0	0.8	0.6	38.5	32.9
20	27	34.5	8.7	0.0	2.7	1.0	39.2	47.0
25	50	38.3	4.9	0.0	8.3	1.2	40.2	52.7
30	81	42.4	5.5	0.0	9.5	1.4	41.2	58.9
35	100	45.6	6.8	0.0	10.6	1.6	42.2	64.6
40	110	48.2	7.6	0.0	11.9	1.8	43.3	69.5
45	121	50.8	8.2	0.0	12.9	1.9	44.3	73.9
50	141	56.7	5.7	0.0	13.7	2.1	45.3	78.2
55	154	60.0	7.4	0.0	12.7	2.4	46.2	82.5
60	166	63.4	8.5	0.0	13.0	2.6	46.9	87.5
65	176	66.6	9.0	0.0	13.6	2.8	47.6	92.2
70	186	69.8	9.4	0.0	14.1	3.1	48.1	96.4
75	193	72.4	10.0	0.0	14.4	3.3	48.6	100.1
80	198	74.6	10.5	0.0	14.7	3.5	48.9	103.4
85	201	75.8	11.0	0.0	15.2	3.7	49.2	105.7
90	203	77.0	11.5	0.0	15.5	3.9	49.4	107.9

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Table B53 (continued).—Regional estimates of timber volume and carbon stocks for elm-ash-cottonwood stands with afforestation of land in the South Central States

Age	Mean volume	Mean carbon density						
		Live tree	Standing dead tree	Under-story	Down dead wood	Forest floor	Soil organic	Total nonsoil
years	*ft³/acre*	*tons carbon/acre*						
0	0	0.0	0.0	0.0	0.0	0.0	16.7	0.0
5	0	1.1	0.0	0.0	0.0	0.0	16.7	1.1
10	83	7.5	0.1	0.0	0.0	0.1	16.9	7.7
15	260	13.3	0.7	0.0	0.3	0.3	17.2	14.7
20	382	15.4	3.9	0.0	1.2	0.4	17.5	20.9
25	708	17.1	2.2	0.0	3.7	0.5	17.9	23.5
30	1,163	18.9	2.5	0.0	4.2	0.6	18.4	26.3
35	1,427	20.3	3.0	0.0	4.7	0.7	18.8	28.8
40	1,574	21.5	3.4	0.0	5.3	0.8	19.3	31.0
45	1,727	22.6	3.7	0.0	5.8	0.9	19.8	32.9
50	2,014	25.3	2.5	0.0	6.1	1.0	20.2	34.9
55	2,201	26.8	3.3	0.0	5.6	1.1	20.6	36.8
60	2,370	28.3	3.8	0.0	5.8	1.2	20.9	39.0
65	2,518	29.7	4.0	0.0	6.1	1.3	21.2	41.1
70	2,658	31.1	4.2	0.0	6.3	1.4	21.5	43.0
75	2,755	32.3	4.4	0.0	6.4	1.5	21.7	44.6
80	2,830	33.3	4.7	0.0	6.6	1.6	21.8	46.1
85	2,873	33.8	4.9	0.0	6.8	1.7	21.9	47.2
90	2,907	34.3	5.1	0.0	6.9	1.8	22.0	48.1

Note: Very small values for understory carbon may appear as zero because results are reported to a single decimal place.

Appendix C: Fit Statistics for Live Tree Carbon and Volume Estimates

Table C1.—Fit statistics for live tree carbon estimates. Observed values are benchmark data from the Forest Service's Forest Inventory and Analysis program. Expected values are current estimates reported in Appendixes A and B.

Region	Forest type group	Fraction of predictions within a factor of two (FAC2)[a]	Mean bias[b]	Coefficient of efficiency (COE)[a]	Index of agreement (IOA)[a]
Northeast	White-red-jack pine	1.0	-1.42	0.6	0.8
Northeast	Spruce-fir	0.9	-0.38	0.8	0.9
Northeast	Oak-hickory	0.9	3.49	0.6	0.8
Northeast	Maple-beech-birch	0.9	4.46	0.4	0.7
Northern Lake States	White-red-jack pine	0.8	-0.96	0.7	0.8
Northern Lake States	Spruce-fir	0.8	0.28	0.6	0.8
Northern Lake States	Oak-hickory	0.8	4.22	0.3	0.7
Northern Lake States	Elm-ash-cottonwood	0.8	4.33	0.2	0.6
Northern Lake States	Maple-beech-birch	0.8	2.59	0.4	0.7
Northern Lake States	Aspen-birch	0.9	1.98	0.4	0.7
South Central	Loblolly-shortleaf pine	1.0	-3.71	0.4	0.7
South Central	Loblolly-shortleaf pine, high productivity	0.9	-1.18	0.3	0.6
South Central	Oak-pine	1.0	2.07	0.7	0.8
South Central	Oak-hickory	0.9	5.97	0.3	0.7
South Central	Oak-gum-cypress	0.9	-4.18	0.6	0.8
South Central	Elm-ash-cottonwood	0.9	0.77	0.8	0.9
Southeast	Longleaf-slash pine	0.9	-1.47	0.5	0.7
Southeast	Longleaf-slash pine, high productivity	0.9	-1.27	0.0	0.5
Southeast	Loblolly-shortleaf pine	1.0	-4.67	0.4	0.7
Southeast	Loblolly-shortleaf pine, high productivity	0.9	-10.64	0.2	0.6
Southeast	Oak-pine	1.0	-0.58	0.8	0.9
Southeast	Oak-hickory	0.9	3.27	0.6	0.8
Southeast	Oak-gum-cypress	0.9	1.92	0.7	0.9
Central States	Oak-hickory	0.9	4.06	0.3	0.6
Central States	Elm-ash-cottonwood	0.9	1.98	0.7	0.8
Great Plains	Oak-hickory	0.8	4.45	0.1	0.6
Great Plains	Elm-ash-cottonwood	0.9	3.01	0.6	0.8

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Table C1 (continued).—Fit statistics for live tree carbon estimates. Observed values are benchmark data from the Forest Service's Forest Inventory and Analysis program. Expected values are current estimates reported in Appendixes A and B.

Region	Forest type group	Fraction of predictions within a factor of two (FAC2)[a]	Mean bias[b]	Coefficient of efficiency (COE)[a]	Index of agreement (IOA)[a]
Pacific Northwest, West	Douglas-fir	0.8	-1.03	0.8	0.9
Pacific Northwest, West	Douglas-fir, high productivity	0.8	19.89	0.1	0.5
Pacific Northwest, West	Fir-spruce-mountain hemlock	0.7	2.64	0.6	0.8
Pacific Northwest, West	Hemlock-Sitka spruce	0.8	-2.28	0.6	0.8
Pacific Northwest, West	Hemlock-Sitka spruce, high productivity	0.9	-0.78	0.8	0.9
Pacific Northwest, West	Alder-maple	0.8	-2.13	0.5	0.7
Pacific Northwest, East	Douglas-fir	0.9	6.25	0.3	0.6
Pacific Northwest, East	Ponderosa pine	0.9	1.32	0.6	0.8
Pacific Northwest, East	Fir-spruce-mountain hemlock	0.9	6.15	0.3	0.6
Pacific Northwest, East	Lodgepole pine	0.9	-1.05	0.7	0.9
Pacific Southwest	Ponderosa pine	0.8	1.02	0.0	0.5
Pacific Southwest	Fir-spruce-mountain hemlock	1.0	6.71	0.3	0.7
Pacific Southwest	Redwood	0.9	3.97	0.6	0.8
Pacific Southwest	Other western softwoods	0.4	3.42	-0.6	0.2
Pacific Southwest	California mixed conifer	0.9	5.28	0.5	0.8
Pacific Southwest	Western oak	0.7	6.36	0.3	0.7
Pacific Southwest	Tanoak-laurel	0.9	-1.28	0.5	0.7
Rocky Mountain, North	Douglas-fir	0.8	-0.18	0.5	0.8
Rocky Mountain, North	Ponderosa pine	0.8	3.28	0.2	0.6
Rocky Mountain, North	Fir-spruce-mountain hemlock	0.8	3.11	0.3	0.7
Rocky Mountain, North	Lodgepole pine	0.8	1.13	0.5	0.8
Rocky Mountain, South	Douglas-fir	0.8	2.72	0.2	0.6
Rocky Mountain, South	Ponderosa pine	0.8	2.74	0.3	0.6
Rocky Mountain, South	Fir-spruce-mountain hemlock	0.8	1.15	0.1	0.6
Rocky Mountain, South	Lodgepole pine	0.8	-2.17	0.3	0.7
Rocky Mountain, South	Aspen-birch	0.8	2.99	0.3	0.7

[a]Evaluation thresholds are as follows: FAC2 > 0.5; COE > 0, preferably >0.3; IOA > 0.5.

[b]Mean bias is in units of variable under consideration.

Table C2.—Fit statistics for volume estimates. Observed values are benchmark data from the Forest Service's Forest Inventory and Analysis program. Expected values are current estimates reported in Appendixes A and B.

Region	Forest type group	Fraction of predictions within a factor of two (FAC2)[a]	Mean bias[b]	Coefficient of efficiency (COE)[a]	Index of agreement (IOA)[a]
Northeast	White-red-jack pine	0.9	2.75	0.6	0.8
Northeast	Spruce-fir	0.8	-23.15	0.5	0.8
Northeast	Oak-hickory	0.7	21.38	0.2	0.6
Northeast	Maple-beech-birch	0.8	-0.77	0.6	0.8
Northern Lake States	White-red-jack pine	0.8	21.62	0.2	0.6
Northern Lake States	Spruce-fir	0.7	-16.15	0.5	0.7
Northern Lake States	Oak-hickory	0.8	-1.77	0.6	0.8
Northern Lake States	Elm-ash-cottonwood	0.8	8.00	0.5	0.8
Northern Lake States	Maple-beech-birch	0.8	13.31	0.4	0.7
Northern Lake States	Aspen-birch	0.8	5.85	0.6	0.8
South Central	Loblolly-shortleaf pine	0.9	43.11	0.0	0.5
South Central	Loblolly-shortleaf pine, high productivity	0.8	46.59	0.2	0.6
South Central	Oak-pine	0.8	6.72	0.5	0.7
South Central	Oak-hickory	0.8	11.28	0.4	0.7
South Central	Oak-gum-cypress	0.8	10.28	0.5	0.8
South Central	Elm-ash-cottonwood	0.8	0.61	0.7	0.8
Southeast	Longleaf-slash pine	0.9	27.67	-0.3	0.3
Southeast	Longleaf-slash pine, high productivity	0.6	32.63	-0.5	0.3
Southeast	Loblolly-shortleaf pine	0.9	6.39	0.3	0.7
Southeast	Loblolly-shortleaf pine, high productivity	0.9	-4.44	0.6	0.8
Southeast	Oak-pine	0.8	1.39	0.5	0.7
Southeast	Oak-hickory	0.8	-12.50	0.5	0.7
Southeast	Oak-gum-cypress	0.7	-9.72	0.6	0.8
Central States	Oak-hickory	0.8	-21.82	0.6	0.8
Central States	Elm-ash-cottonwood	0.7	89.46	-1.5	-0.2
Great Plains	Oak-hickory	0.8	-9.69	0.3	0.7
Great Plains	Elm-ash-cottonwood	0.8	10.33	0.5	0.8

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Table C2 (continued).—Fit statistics for volume estimates. Observed values are benchmark data from the Forest Service's Forest Inventory and Analysis program. Expected values are current estimates reported in Appendixes A and B.

Region	Forest type group	Fraction of predictions within a factor of two (FAC2)[a]	Mean bias[b]	Coefficient of efficiency (COE)[a]	Index of agreement (IOA)[a]
Pacific Northwest, West	Douglas-fir	0.8	-89.77	0.6	0.8
Pacific Northwest, West	Douglas-fir, high productivity	0.8	62.17	0.3	0.6
Pacific Northwest, West	Fir-spruce-mountain hemlock	0.6	-24.38	0.6	0.8
Pacific Northwest, West	Hemlock-Sitka spruce	0.8	17.46	0.5	0.8
Pacific Northwest, West	Hemlock-Sitka spruce, high productivity	0.6	-2.50	0.5	0.8
Pacific Northwest, West	Alder-maple	0.7	83.08	-0.2	0.4
Pacific Northwest, East	Douglas-fir	0.7	-62.92	0.1	0.5
Pacific Northwest, East	Ponderosa pine	0.7	-40.62	0.2	0.6
Pacific Northwest, East	Fir-spruce-mountain hemlock	0.5	-107.15	-0.2	0.4
Pacific Northwest, East	Lodgepole pine	0.7	-21.08	0.5	0.7
Pacific Southwest	Ponderosa pine	0.5	-44.62	-0.2	0.4
Pacific Southwest	Fir-spruce-mountain hemlock	0.9	-43.89	0.4	0.7
Pacific Southwest	Redwood	0.7	35.70	0.3	0.6
Pacific Southwest	Other western softwoods	0.5	-2.08	0.0	0.5
Pacific Southwest	California mixed conifer	0.7	6.54	0.5	0.7
Pacific Southwest	Western oak	0.7	-32.62	0.5	0.7
Pacific Southwest	Tanoak-laurel	0.9	-53.42	0.2	0.6
Rocky Mountain, North	Douglas-fir	0.5	-62.31	-0.1	0.5
Rocky Mountain, North	Ponderosa pine	0.6	-25.23	0.4	0.7
Rocky Mountain, North	Fir-spruce-mountain hemlock	0.6	-60.85	0.3	0.6
Rocky Mountain, North	Lodgepole pine	0.6	-28.77	0.5	0.8
Rocky Mountain, South	Douglas-fir	0.6	-50.22	0.0	0.5
Rocky Mountain, South	Ponderosa pine	0.7	-23.69	0.5	0.7
Rocky Mountain, South	Fir-spruce-mountain hemlock	0.6	-83.77	-0.4	0.3
Rocky Mountain, South	Lodgepole pine	0.5	-56.46	-0.4	0.3
Rocky Mountain, South	Aspen-birch	0.5	-48.31	0.3	0.7

[a]Evaluation thresholds are as follows: FAC2 > 0.5; COE > 0, preferably >0.3; IOA > 0.5.

[b]Mean bias is in units of variable under consideration.

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