

Appendix 1: Inventory Design and Methods

The Pacific Northwest Research Station's (PNW) Forest Inventory and Analysis (FIA) Program implemented the new annual inventory in California in 2001. The overall sampling design is a significant change from that of previous periodic inventories; the differences are discussed more fully below.

In the annual inventory system for the Pacific Northwest (coastal Alaska, Washington, Oregon, and California), the objective is to measure approximately 10 percent of the plots across an entire state each year. This annual subsample is referred to as a panel. The plots measured in a single panel are selected to ensure systematic coverage within each county, spanning both public and privately owned forests, and including lands reserved from industrial wood production such as national parks, wilderness areas, and natural areas.

Estimates of forest attributes can be derived from measurements of a single panel for areas as small as a survey unit or ecosection; however, such estimates are often imprecise because one panel represents only 10 percent of the full inventory sample. More-precise statistics are obtained by combining data from multiple panels. After at least 60 percent of plots have been sampled, change can be estimated through a comparison of average values across different sets of panels. Estimates from sampled plots in the five panels measured from 2001 to 2005 were combined to produce the statistics in this report. When all panels have been measured once (2010), each panel will be remeasured at 10-year intervals.

The FIA Program collects information in three phases. In phase 1, a sample of points is interpreted from remotely sensed imagery (either aerial photos or satellite data) and the landscape is stratified into meaningful groupings, such as forested and nonforested areas, ecologically similar regions, and forest types. In phase 2, field plots are measured for a variety of indicators that describe forest composition, structure, and the physical geography of the landscape. Phase 2 plots are spaced at approximate 3-mile intervals on a hexagonal grid throughout the forest. In phase 3, one of every 16 phase 2 field plots is visited and a variety of forest health measurements are taken.

Phase 1

The goal of phase 1 is to reduce the variance associated with estimates of forest land area and volume. Digital imagery collected by remote-sensing satellites is classed into a few similar strata (such as forest or nonforest) by means of standard techniques for image classification, and the total area of each of these strata is used to assign a representative acreage to each sample plot. Source data were derived from Landsat Thematic Mapper (98.4 feet resolution) imagery collected between 1990 and 1992. An image-filtering technique is used to classify individual plots through a summary of the 5- by 5-pixel region that surrounds the pixel containing a sample plot. The resulting 26 classes, or strata (ranging from entirely forested to entirely nonforested, for example), are combined with other geographic attributes likely to improve stratification effectiveness, such as owner class. The resulting strata are evaluated for each estimation unit (county, or combination of small counties), and collapsed as necessary to ensure that at least four plots are in each stratum. Stratified estimation is applied by assigning each plot to one of these collapsed strata and by calculating the area of each collapsed stratum in each estimation unit. The estimates of area and volume from stratified data are usually more precise than those from unstratified estimates.

Phase 2

The plot installed at each forested phase 2 location is a cluster of four subplots spaced 120 feet apart (fig. 89). Subplot 1 is in the center, with subplots 2 through 4 uniformly distributed radially around it. Each point serves as the center of a 1/24-acre circular subplot used to sample all trees at least 5.0 inches in diameter at breast height (d.b.h.). A 1/300-acre microplot, with its center located just east of each subplot center, is used to sample trees 1.0 to 4.9 inches d.b.h., as well as seedlings (trees less than 1.0 inch d.b.h.). On national forests in California, a hectare plot (a 185.1-foot fixed-radius plot centered on subplot 1) is also established to tally trees larger than 32 inches d.b.h. in the eastern part of the Northwest Forest Plan area and larger than 48 inches d.b.h. in the western part of the Northwest Forest Plan area.

All phase 2 plots identified by aerial photography as possibly being forested are established in the field without

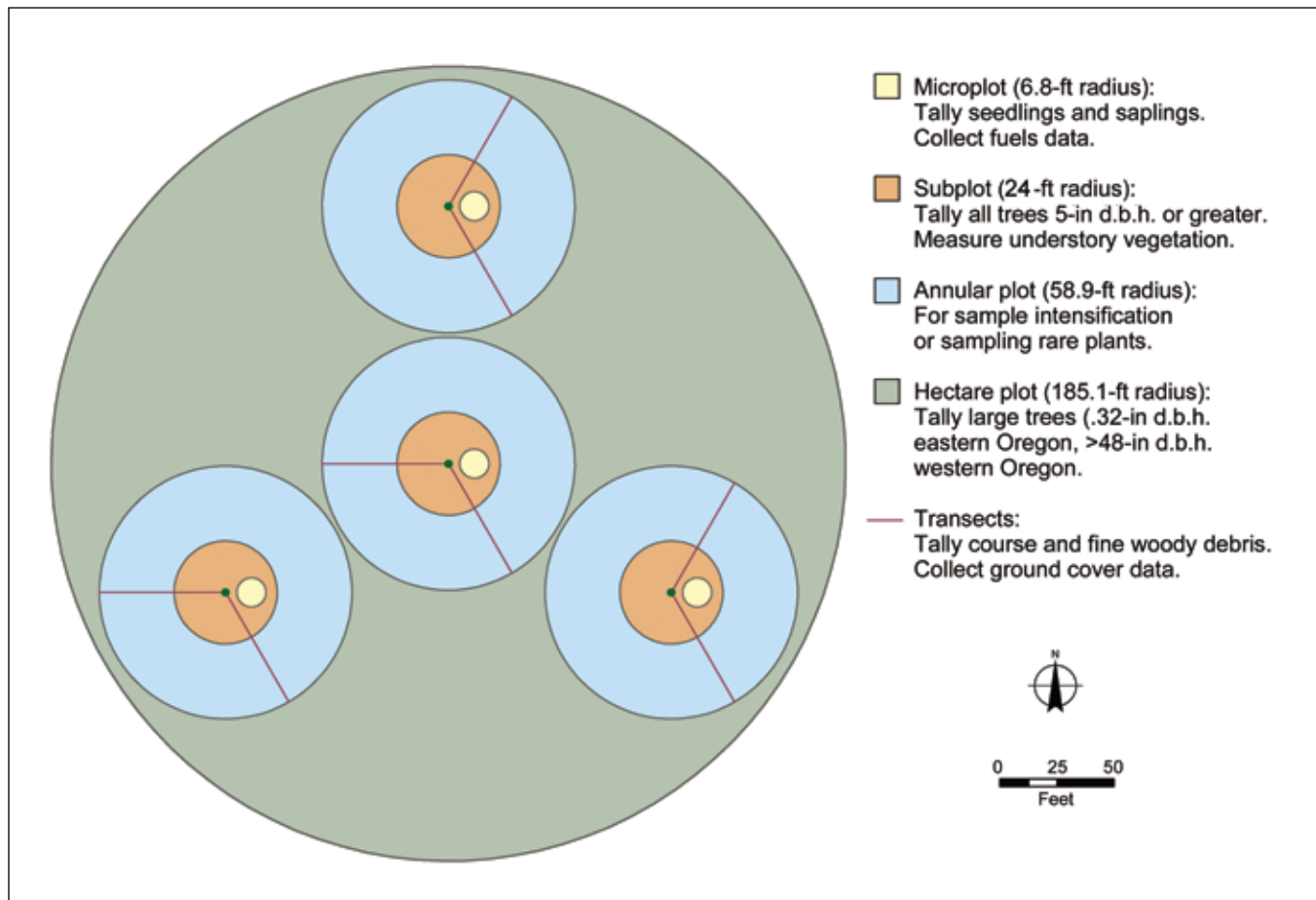


Figure 89—The Forest Inventory and Analysis plot design used in California, 2001–2005.

regard to land use or land cover. Field crews delineate areas that are comparatively less heterogeneous than the plot as a whole with regard to reserved status, owner group, forest type, stand size class, regeneration status, and tree density; these areas are described as condition classes. The process of delineating these condition classes on a fixed-radius plot is called mapping. All measured trees are assigned to the mapped condition class in which they are located.

On phase 2 plots, crews assess physical characteristics such as slope, aspect, and elevation; stand characteristics such as age, size class, forest type, disturbance, site productivity, and regeneration status; and tree characteristics such as tree species, diameter, height, damages, decay, and vertical crown dimensions. They also collect general descriptive information such as soil depth, proximity to water and roads, and the geographic position of the plot

in the larger landscape. In California, crews also assess height and cover of understory species, the structure of live and dead fuels, and the structure and composition of down wood as regional variables (see “Core, Core-Optional, and Regional Variables” section below).

The FIA Program sampled 3,542 forested phase 2 plots in California between 2001 and 2005. Estimates of timber volume and other forest attributes were derived from tree measurements and classifications made at each plot. Volumes for individual tally trees were computed with equations for each of the major species in California. Estimates of growth, removals, and mortality were determined from measurements taken at approximately 1,900 permanent sample plots established in the previous inventory and in conjunction with increment cores taken during the annual inventory.

Phase 3

More-extensive forest health measurements are collected in a 16-week period during the growing season (when most plants are in full leaf and many are flowering) on a subset (1/16) of phase 2 sample locations. At the phase 3 plots, measurements are taken on tree crowns, soils, lichens, downed woody material, and understory vegetation, in addition to the phase 2 variables. One forest health measurement, ozone injury, is conducted on a separate grid with all 65 ozone plots measured annually. The FIA Program sampled 351 forested phase 3 plots in California between 2001 and 2005. The relatively small number of phase 3 samples is intended to serve as a broad-scale detection monitoring system for forest health problems.

Core, Core-Optional, and Regional Variables

The majority of FIA variables collected in California are identical to those collected by FIA elsewhere in the United States—these are national “core” or “core optional” variables (as the name suggests, collection of core optional variables is optional but, if collected, they must be collected in the same way everywhere). A number of other variables are unique to PNW-FIA. These are “regional” variables and include such items as down woody material and understory vegetation on phase 2 plots (not to be confused with down woody and understory vegetation on phase 3 plots, which are measured using a slightly different protocol), as well as insect and disease damage, a record of previous disturbance on the plot, and measurements for special studies (such as nesting habitat assessment for the marbled murrelet (*Brachyramphus marmoratus*)).

Data Processing

The data used for this report are stored in the FIA National Information Management System (NIMS). It provides a means to input, edit, process, manage, and distribute FIA data. NIMS includes a process for data loading, a national set of edit checks to ensure data consistency, an error correction process, approved equations and algorithms, code to compile and compute calculated attributes, a table report generator, and routines to populate the presentation database. NIMS applies numerous algorithms and equa-

tions to calculate, for example, stocking, forest type, stand size, volume, and biomass. NIMS generates estimates and associated statistics based on county areas and stratum weights developed outside of NIMS. Additional FIA statistical design and estimation techniques are further reviewed in Bechtold and Patterson (2005).

Statistical Estimates

Throughout this report we have published standard errors (SE) for most of our estimates. These standard errors account for the fact that we measured only a small sample of the forest (thereby producing a sample-based estimate) and not the entire forest (which is the population parameter of interest). Because of small sample sizes or high variability within the population, some estimates can be very imprecise. The reader is encouraged to take the standard error into account when drawing any inference. One way to consider this type of uncertainty is to construct confidence intervals. Customarily, 66-percent or 95-percent confidence intervals are used. A 95-percent confidence interval means that one can be 95 percent confident that the interval contains the true population parameter of interest. For more details about confidence intervals, please consult Moore and McCabe (1989) or other statistical literature.

It is relatively easy to construct approximate 66-percent or 95-percent confidence intervals by multiplying the SE by 1.0 (for 66-percent confidence intervals) or 1.96 (for 95-percent confidence intervals) and subtracting and adding this to the estimate itself. For example, in table 2 of appendix 2, we estimated the total timberland in California to be 19,551 thousand acres, with a SE of 266. A 95-percent confidence interval for the total timberland area ranges from 19,030 to 20,072 thousand acres.

The reader may want to assess whether or not two estimates are significantly different from each other. The statistically correct way to address this is to estimate the SE of the difference of two estimates and either construct a confidence interval or use the equivalent z-test. However, this requires the original inventory data. It is often reasonable to assume that two estimates are nearly uncorrelated. For example, plots usually belong to one and only one owner. The correlation between estimates for different

owners will be very small. If both estimates are assumed to be nearly uncorrelated, the standard error of the difference can be estimated by

$$SE_{Difference} = \sqrt{SE_{Estimate\ 1}^2 + SE_{Estimate\ 2}^2}$$

Using the SE of the difference, a confidence of the difference can be constructed with this method.

If two estimates are based on data that occur on the same plot at the same time, the above equation should not be used. For example, table 17 in appendix 2 contains estimates of tree volume by diameter class. If one wants to compare the volume of trees in the diameter class 9.0 to 10.9 d.b.h. (9,676 million board feet) with that of trees in the diameter class 21.0 to 22.9 d.b.h. (21,484 million board feet), the covariance between the estimates is not zero, and this equation should not be used.

There are two other approaches the reader could consider, but we do not recommend them. The first is to construct a confidence interval for **one** estimate and evaluate whether the other estimates falls within the interval. The problem is that unless both estimates are **highly positively** correlated, this approach will lead to a too-small confidence interval. The second approach is to construct confidence intervals for **both** estimates and determine whether or not they overlap. The problem here is that unless both estimates are highly negatively correlated, this approach will be very conservative. For more complex and indepth analysis, the reader may contact the PNW-FIA Program.

All estimates—means, totals and their associated SE—are based on the poststratification methods described in detail by Bechtold and Patterson (2005).

Access Denied, Hazardous, or Inaccessible Plots

Although every effort was made to visit all field plots that were entirely or partially forested, some were not sampled for a variety of reasons. Field crews may have been unable to obtain permission from the landowner to access the plot (“denied access”), and some plots were impossible for crews to safely reach or access (“hazardous/inaccessible”). Some

private landowners deny access to their land. Although permission to visit public lands is almost always granted, some public land lies in higher elevation areas with extreme topography that can be very difficult or impossible to reach.

This kind of missing data can introduce bias into the estimates if the nonsampled plots tend to be different from the entire population. Plots that are obviously nonforested (based on aerial photos) are rarely visited and therefore the proportion of denied-access, hazardous, or inaccessible plots is significantly smaller for them than it is for forested plots.

The poststratification approach outlined in Bechtold and Patterson (2005) removes nonsampled plots from the sample. Estimates are adjusted for plots that are partially nonsampled by increasing the estimates by the nonsampled proportion within each stratum. To reduce the possible bias introduced by nonsampled plots, we delineated five broad strata groups: census water, forested public land, nonforested public land, forested private land, and nonforested private land. Some of these five broad strata groups were further divided into smaller strata to reduce the variance. The tabulation below shows the percentage of denied-access and hazardous/inaccessible plots for each of the five broad strata groups in California, 2001–2005:

Strata group	Total plots	Denied access	Hazardous/inaccessible
<i>Percent</i>			
Census water	460	0	0
Private forest	1,869	12.54	0.54
Private nonforest	2,204	3.33	0.13
Public forest	4,881	0.51	2.18
Public nonforest	324	0.77	1.86
Total	9,738	3.44	1.29

Timber Products Output Survey

The timber products information presented in this report was based on a census of California’s timber processors and out-of-state processors that use California timber.

The census was conducted by the University of Montana’s Bureau of Business and Economic Research in cooperation with PNW-FIA (Morgan et al. 2004). Through a written questionnaire or a phone interview, forest products

manufacturers provided the following information for each of their facilities: plant production capacity and employment; volume of raw material received, by county and ownership; species of timber received; finished product volumes, types, sales value, and market locations; and utilization and marketing of manufacturing residue. This survey is designed to determine the size and composition of California's timber harvest and forest products industry, the industry's use of forest resources, and the generation and disposition of wood residues.

National Woodland Owner Survey

This survey of private forest owners is conducted annually by the FIA Program to increase our understanding of private woodland owners. Questionnaires are mailed to individuals and private groups owning woodlands in which FIA has established forest inventory plots. Nationally, 20 percent of these owners (about 50,000) are contacted each year, with more-detailed questionnaires sent to coincide with national census, inventory, and assessment programs. For California, 269 private noncorporate woodland owners were sent questionnaires, and the 124 that were returned provide the data that were summarized and presented in this report.

Periodic Versus Annual Inventories

The PNW-FIA Program began fieldwork for the fifth inventory of California in 2001. This was the first inventory that used the annual inventory system, in which 1/10 of all forested plots (referred to as one panel) were visited each year. The first statewide panel of field plots was completed in 2001. By 2006, half of all field plots in the state had been measured, prompting production of this congressionally mandated 5-year analysis of California's forest resources.

Data from new inventories are often compared with those from earlier inventories to determine trends in forest resources. However, for the comparisons to be valid, the procedures used in the two inventories should ideally be identical. Previous inventories of California's forest resources were completed in 1974, 1983, and 1994. These were periodic inventories in which all timberland plots in the state (outside of national forests and reserved areas

such as national parks) were visited within a 2- or 3-year window. The last periodic inventory on national forests was completed in 1999.

As a result of our ongoing efforts to improve the efficiency and reliability of the inventory and to conform to the national annual inventory design adopted by all FIA units, several changes in procedures and definitions have been made since the last California inventory in 1994. These changes included an increase in plot density of about 18 percent, a new plot footprint (changing from a five-subplot configuration, in which about 2.5 acres were sampled, to a four-subplot configuration in which less than 1 acre is sampled) (fig. 90), a new set of nationally consistent measurement protocols, a plot visitation schedule that calls for sampling of 10 percent of all forested plots in the state each year, and changes in timberland classification protocols. Although these changes will have little impact on statewide estimates of forest area, timber volume, and tree biomass, they have significantly affected estimates of timberland area (see below) and may affect plot classification variables such as forest type and stand size class, especially for estimates at the county level.

Explanation of disparities in timberland area from periodic and annual inventories

Estimates of timberland area from the annual inventory are noticeably larger than timberland estimates from periodic inventories in California. One reason for this is a significant change in the procedures used to classify forest land as either productive timberland or unproductive forest land. In the periodic inventory of the mid 1990s, forest land was often classified using aerial photos or stratified map layers, before plots were assessed in the field. Classifications were based on a number of factors such as species present, density/cover of trees, and geographic location. Timberland is defined as forests capable of producing at least 20 cubic feet/acre/year of continuous crops of commercial trees, where "commercial" is defined in terms of size and quality of roundwood suitable for lumber or other manufactured products. All other forests (those not classified as timberland via aerial photos or field assessment) were assigned one the "unproductive" forest land labels (oak woodland

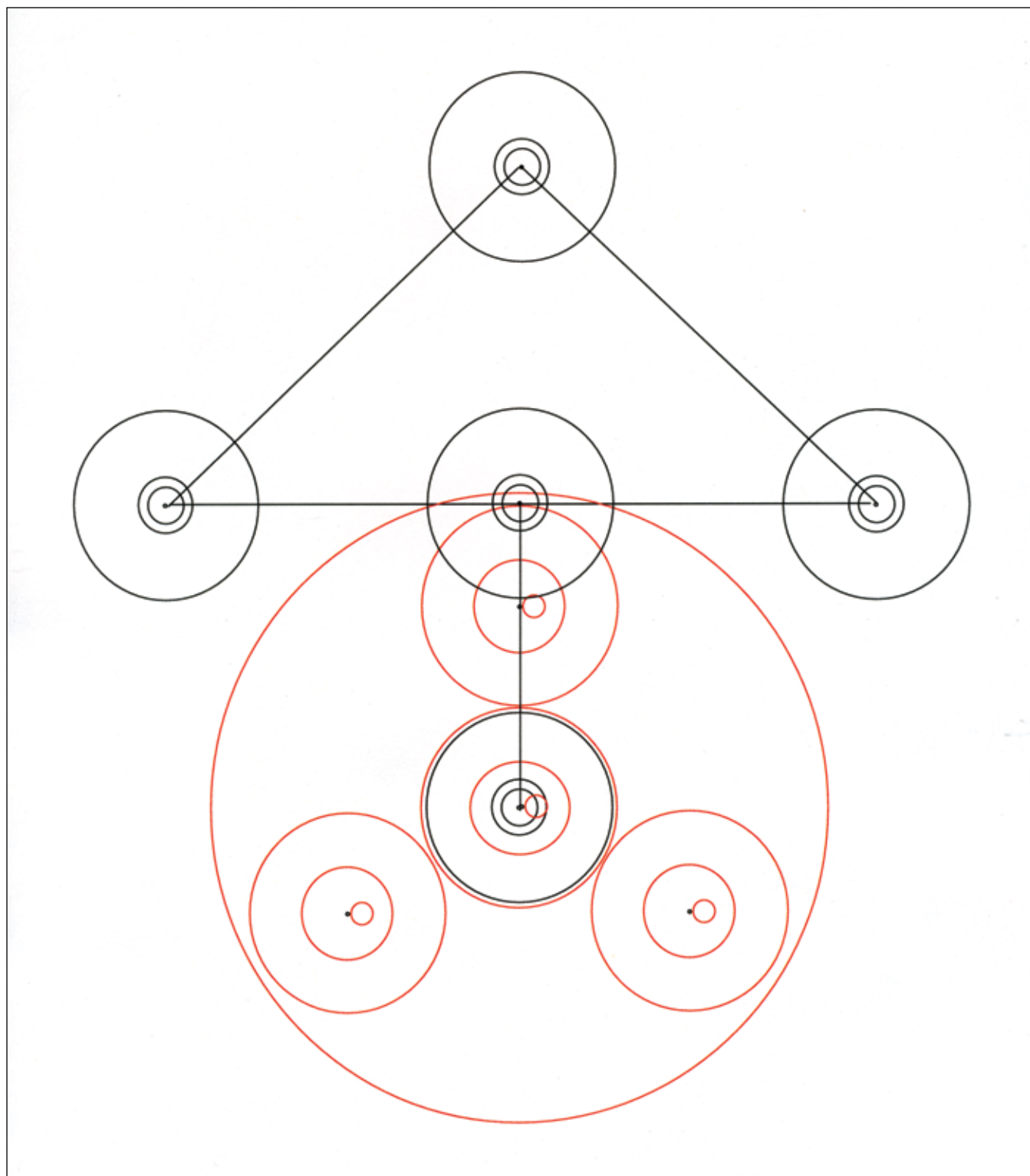


Figure 90—Relationship of periodic (upper, black figure) and annual (lower, red figure) inventory plot designs. Note that only one subplot center overlaps for both designs.

or pinyon-juniper, for example). Site trees were used to determine site index and the associated productivity index (mean annual increment, MAI) on all timberland plots. In some cases, the calculated MAI fell below the 20 cubic feet/acre/year threshold resulting in several plots being reclassified as unproductive forest.

With the intent of developing a more objective approach to classifying forest land, with the advent of annual inventory (which began implementation in California in 2001), FIA began collecting site trees on all forest land, including unproductive land. Instead of subjectively assigning forest land classes via visual inspection (of photos or plots on the ground) or based on the presence or absence of commercial species, site index equations are now used to estimate site index and calculate MAI to obtain an objective estimate of productivity. As before, MAI is the basis for assigning a site class to every forest condition on the plot, which, in turn, is used to determine whether forest land is timberland or unproductive forest. Because there are a limited number of site index equations available for each species, and there can be difficulty in locating a representative site tree on some poor sites, the calculated MAI is sometimes unrepresentative of actual productivity. In some cases, conditions previously classified as unproductive forest are now classified as timberland under the new approach, even though it is unlikely that there was any real change in productivity. This has caused a substantial increase in the area of timberland reported in this 5-year summary of the California inventory from 2001 to 2005.

To learn the extent of the various factors that contribute to this issue, a timberland accounting was developed using plots that had been assessed in both the periodic and annual inventories. Using these “paired plots,” the estimate of timberland area from annual inventory date is 2.7 million acres larger than the estimate from the periodic data. About 46 percent of this area was previously classified as oak woodland, 11 percent was pinyon-juniper, 26 percent was other types of forest land, and the rest was nonforests as represented in the periodic inventory data. Although some of these changes may be real and represent actual change, the majority are likely owing to changes in the approach to classifying forest land.

Estimates of growth, removals, and mortality (GRM) are particularly dependant on comparisons between inventories, and thus are most likely to be valid when based on remeasurements of the same plots and trees. Only half of the field plots (5 out of 10 panels) have been visited under the annual system to date, and the increase in plot density means about 18 percent of plots are new (they were not visited during a previous inventory). Unlike the five-subplot, variable-radius design used in the 1995 periodic inventory, the annual inventory uses fixed-radius sampling on four subplots, with only one subplot center coinciding with that of a periodic subplot. Thus, relatively few of the trees sampled at the periodic inventory were remeasured in the annual inventory. Estimates of GRM will eventually improve as the annual inventory becomes fully implemented, and several panels of plots are remeasured.

Appendix 2: Summary Data Tables

The following tables contain basic information about the forest resources of California as they relate to the discussions of current forest issues and basic resource information presented in this report. These tables aggregate data to a variety of levels, including county (fig. 5), ecosection (fig. 6), owner group (fig. 7), survey unit (fig. 8), and forest type, allowing Pacific Northwest Research Station Forest Inventory and Analysis (FIA) inventory results to be applied at various scales and used for various analyses. Many other tables could be generated from the California annual data, but space limits us to a few (60+) key ones. Data are also available for download in nonsummarized form at <http://www.fia.fs.fed.us>.

The national FIA Web site (<http://www.fia.fs.fed.us/tools-data/data/>) contains a tool for querying the California

annual data and generating custom tables or maps. Some of the tables in this appendix contain summaries of regional variables; data for regional variables currently are not included in the national FIA database (FIADB). Additional information on regional variables can be requested from our office by e-mailing Karen Waddell (kwaddell@fs.fed.us).

Please note that information in tables presented and in those generated from the FIADB may differ. As new data are added each year to FIADB, any tables generated from it will be based on the current full set of data in FIADB (e.g., 2001–2006, 2001–2007, etc.), whereas tables in this publication contain data from only 2001–2005. The user can take a snapshot of data from FIADB by selecting the desired years and generating tables that are similar, but probably not identical, to those presented here.

List of Tables

Table 1—Number of Forest Inventory and Analysis (FIA) plots measured from 2001 to 2005, by land class, sample status, ownership group, California.

Table 2—Estimated area of forest land, by owner class and forest land status, California, 2001–2005

Table 3—Estimated area of forest land, by forest type group and productivity class, California, 2001–2005

Table 4—Estimated area of forest land, by forest type group, ownership, and land status, California, 2001–2005

Table 5—Estimated area of forest land, by forest type group and stand size class, California, 2001–2005

Table 6—Estimated area of forest land, by forest type group and stand age class, California, 2001–2005

Table 7—Estimated area of timberland, by forest type group and stand size class, California, 2001–2005

Table 8—Estimated number of live trees on forest land, by species group and diameter class, California, 2001–2005

Table 9—Estimated number of growing-stock trees on timberland, by species group and diameter class, California, 2001–2005

Table 10—Estimated net volume of all live trees, by owner class and forest land status, California, 2001–2005

Table 11—Estimated net volume of all live trees on forest land, by forest type group and stand size class, California, 2001–2005

Table 12—Estimated net volume of all live trees on forest land, by species group and ownership group, California, 2001–2005

Table 13—Estimated net volume of all live trees on forest land, by species group and diameter class, California, 2001–2005

Table 14—Estimated net volume of growing-stock trees on timberland, by species group and diameter class, California, 2001–2005

Table 15—Estimated net volume of growing-stock trees on timberland, by species group and ownership group, California, 2001–2005

Table 16—Estimated net volume (International ¼-inch rule) of sawtimber trees on timberland, by species group and diameter class, California, 2001–2005

Table 17—Estimated net volume (Scribner rule) of saw-timber trees on timberland, by species group and diameter class, California, 2001–2005

Table 18—Estimated net volume (cubic feet) of sawtimber trees on timberland, by species group and ownership group, California, 2001–2005

Table 19—Estimated above-ground biomass of all live trees on forest land, by owner class and forest land status, California, 2001–2005

Table 20—Estimated above-ground biomass of all live trees on forest land, by diameter class and species group, California, 2001–2005

Table 21— Estimated biomass of live trees on forest land by softwood species group, for merchantable tree boles, tops, limbs, stumps, and small trees, California, 2001–2005

Table 22—Estimated mass of carbon of all live trees, by owner class and forest land status, California, 2001–2005

Table 23—Estimated biomass and carbon mass of live trees, snags, and down wood on forest land, by forest type group, California, 2001–2005

Table 24—Estimated average biomass and carbon mass of live trees, snags, and down wood on forest land, by forest type group, California, 2001–2005

Table 25—Estimated average biomass, volume, and density of down wood on forest land, by forest type group and diameter class, California, 2001–2005

Table 26—Estimated biomass and carbon mass of down wood on forest land, by forest type group and owner group, California, 2001–2005

Table 27—Estimated average biomass, volume, and density of snags on forest land, by forest type group and diameter class, California, 2001–2005

Table 28—Estimated biomass and carbon mass of snags on forest land, by forest type group and owner group, California, 2001–2005

Table 29—Mean cover of understory vegetation on forest land, by forest type group and lifeform, California, 2001–2005

Table 30—Mean cover of understory vegetation on forest land, by forest type class, age class, and life form, California, 2001–2005

Table 31—Estimated mean crown density and other statistics for live trees on forest land, by species group, California, 2001–2005

Table 32—Estimated mean foliage transparency and other statistics for live trees on forest land, by species group, California, 2001–2005

Table 33—Estimated mean crown dieback and other statistics for all live trees on forest land, by species group, California, 2001–2005

Table 34—Properties of the forest floor layer on forest land, by forest type, California, 2001, 2003–2005

Table 35—Properties of the mineral soil layer on forest land, by depth of layer and forest type, California, 2001, 2003–2005

Table 36—Chemical properties of mineral soil layers on forest land, by depth and forest type, California, 2001, 2003–2005

Table 37—Chemical properties (trace elements) of forest floor and mineral soils on forest land, by forest type, California, 2001, 2003–2005

Table 38—Compaction, bare soil, and slope properties of forest land, by forest type, California, 2001, 2003–2005

Table 39—Estimated number of live trees with damage on forest land, by species and type of damage, California, 2001–2005

Table 40—Estimated area of forest land with more than 25 percent of basal area damaged, by forest type and type of damage, California, 2001–2005

Table 41—Estimated gross volume of live trees with damage on forest land, by species and type of damage, California, 2001–2005

Table 42— Estimated number of live trees with damage, acres of forest land with greater than 25 percent of basal area damaged, and gross volume of live trees with damage, by survey unit and ownership group, California, 2001–2005

Table 43—Estimated area of forest land covered by selected nonnative vascular plant species, by life form and species, California, 2001–2005

Table 44—Summary of lichen community indicator species richness on forest land, by location, California, 1998–2001, 2003

Table 45—Summary of air quality on forest land in the greater Central Valley as indicated by the Lichen Community Indicator, California, 1998–2001, 2003

Table 46—Summary of air quality on forest land in the greater Sierra Nevada as indicated by the Lichen Community Indicator, California, 1998–2001, 2003

Table 47—Summary of climate on forest land as indicated by the Lichen Community Indicator, derived from the temperature gradient of Jovan and McCune's (2004) model, California, 1998–2001, 2003

Table 48—Summary of climate on forest land as indicated by the Lichen Community Indicator, derived from the moisture gradient of Jovan and McCune's (2004) model, California, 1998–2001, 2003

Table 49—Ozone injury summary information from ozone biomonitoring plots, by year, California, 2000–2005

Table 50 - Total acres of forest land with a forest fire incident, by year and ecosection group, California, 1995–2004

Table 51—Estimated gross growth, net change, removals, and mortality of growing stock for softwood species on timberland, by species group and owner, California, 2001–2005

Table 52—Total roundwood output by product, species group, and source of material, California, 2000

Table 53—Volume of timber removals by type of removal, source of material, species group, California, 2000

Table 54—Estimated area of forest land covered by vascular plant nontimber forest products, by plant group and species, California, 2001–2005

Table 55—Percentage of forested plots with selected lichen nontimber forest products present, by species, California, 2001–2005

Table 1—Number of Forest Inventory and Analysis (FIA) plots measured from 2001 to 2005, by land class, sample status, and ownership group, California

Land class and sample status	National forest	Other public	Private	Total
<i>Thousands</i>				
Forest land plots:				
Softwood types	1,582	224	437	2,212
Hardwood types	537	165	652	1,347
Nonstocked	76	8	19	103
Total	2,122	388	1,077	3,542
Nonforest land plots:	815	2,258	3,098	6,151
Unsampled plots:				
Denied access	1	1	330	363
Hazardous	166	43	25	206
Total	167	44	355	566
Total, all land plots	2,653	2,562	3,821	8,929

Table 2—Estimated area of forest land, by owner class and forest land status, California, 2001–2005

Owner class	Unreserved forests						Reserved forests						All forest land	
	Timberland ^a		Other forest ^b		Total		Productive ^a		Other forest ^b		Total			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
Thousand acres														
USDA Forest Service:														
National forest	9,784	167	2,424	126	12,208	174	2,626	128	923	80	3,558	144	15,766	145
Total	9,784	167	2,424	126	12,208	174	2,626	128	923	80	3,558	144	15,766	145
Other federal government:														
National Park Service	—	—	—	—	—	—	886	85	396	64	1,282	97	1,282	97
Bureau of Land Management	471	74	923	102	1,393	120	43	23	214	51	256	56	1,650	130
U.S. Fish and Wildlife Service	—	—	—	—	—	—	12	12	6	6	18	14	18	14
Departments of Defense and Energy	31	20	55	24	86	31	—	—	—	—	—	—	86	31
Other federal	12	12	8	7	20	14	52	25	47	24	99	34	119	37
Total	514	106	986	133	1,499	165	993	145	663	145	1,655	201	3,155	309
State and local government:														
State	160	43	67	28	227	52	341	63	152	41	492	74	719	88
Local	97	33	144	39	242	51	40	23	51	23	91	32	333	60
Other public	1	1	—	—	1	1	—	—	12	12	12	12	13	12
Total	258	77	211	67	470	104	381	86	215	76	595	118	1,065	160
Corporate private:	4,402	182	338	61	4,740	189	—	—	—	—	—	—	4,740	189
Noncorporate private:														
Nongovernmental conservation or natural resource organizations	230	53	88	33	319	62	—	—	—	—	—	—	319	62
Unincorporated partnerships, associations, or clubs	52	26	27	16	79	30	—	—	—	—	—	—	79	30
Native American	142	41	60	28	202	49	—	—	—	—	—	—	202	49
Individual	4,169	190	3,732	181	7,912	237	—	—	—	—	—	—	7,912	237
Total	4,593	310	3,907	258	8,512	378	—	—	—	—	—	—	8,512	378
All owners	19,551	266	7,866	252	27,428	299	3,999	168	1,802	124	5,810	194	33,238	284

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500 acres were estimated.

^a Forest land that is capable of producing in excess of 20 cubic feet/acre/year of wood at culmination of mean annual increment.

^b Forest land that is not capable of producing in excess of 20 cubic feet/acre/year of wood at culmination of mean annual increment

Table 3—Estimated area of forest land, by forest type group and productivity class, California, 2001–2005

Forest type group	Site productivity class ^a (cubic feet/acre/year)												All productivity classes			
	0–19		20–49		50–84		85–119		120–164		165–224				225+	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
Thousand acres																
Softwoods:																
California mixed conifer	114	32	1,172	99	1,802	123	1,827	124	1,413	109	372	57	1,179	104	7,879	210
Douglas-fir			112	31	153	37	279	53	317	57	150	41	58	26	1,070	97
Fir/spruce/mountain hemlock	52	21	94	25	191	39	384	58	379	57	107	33	854	85	2,069	128
Western hemlock/Sitka spruce	—	—	—	—	—	—	—	—	—	—	15	13	2	2	17	13
Lodgepole pine	184	41	551	70	140	35	17	11	104	31	15	11	—	—	1,012	91
Other western softwoods	1,444	113	354	55	128	32	38	19	34	18	13	13	9	8	2,020	130
Pinyon/juniper	1,761	127	95	32	27	16	—	—	13	12	—	—	—	—	1,896	131
Ponderosa pine	91	29	846	84	673	75	286	51	276	50	76	24	59	22	2,307	134
Redwood	2	2	—	—	11	11	55	26	229	51	222	52	125	38	643	85
Western white pine	84	25	48	19	15	11	—	—	39	19	8	8	—	—	194	39
Total	3,731	177	3,271	161	3,141	158	2,886	156	2,804	156	979	99	2,287	141	19,106	280
Hardwoods:																
Alder/maple	16	10	3	3	44	21	45	18	86	30	29	17	44	21	268	50
Aspen/birch	17	10	10	6	22	13	—	—	27	16	2	2	2	2	80	24
Elm/ash/cottonwood	20	14	—	—	1	1	—	—	25	18	—	—	1	1	48	23
Exotic hardwoods	—	—	—	—	—	—	—	—	4	4	—	—	—	—	4	4
Other hardwoods	203	46	15	11	93	31	94	30	166	44	21	15	18	12	610	79
Tanoak/laurel	133	36	78	28	326	57	616	82	689	84	148	42	121	38	2,112	137
Western oak	5,100	206	893	90	1,674	130	962	100	933	98	64	25	128	37	9,768	266
Woodland hardwoods	301	57	138	33	16	11	3	3	—	—	—	—	34	18	492	69
Total	5,790	218	1,138	100	2,176	145	1,721	132	1,931	140	264	54	348	61	13,381	293
Nonstocked	147	36	240	47	155	34	94	27	41	19	34	19	40	16	751	79
All forest types	9,668	273	4,649	191	5,473	211	4,701	202	4,776	204	1,277	114	2,675	154	33,238	284

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500 acres were estimated.

^a Site productivity class refers to the potential productivity of forest land expressed as the mean annual increment (in cubic feet/acre/year) at culmination in fully stocked stands.

Table 4—Estimated area of forest land, by forest type group, ownership, and land status, California, 2001–2005

Forest type group	USDA Forest Service						Other federal						State and local government						Corporate private						Noncorporate private					
	Timberland ^a			Other forest land			Timberland ^a			Other forest land			Timberland ^a			Other forest land			Timberland ^a			Other forest land			Timberland ^a			Other forest land		
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE		
	<i>Thousand acres</i>																													
Softwoods:																														
California mixed conifer	4,092	141	1,105	87	67	28	289	57	14	12	70	29	1,608	120	16	14	617	81	1	1	1	1	7,879	210						
Douglas-fir	324	45	63	22	12	12	36	21	38	22	12	12	22	16	—	—	281	55	—	—	—	—	1,070	97						
Fir/spruce/mountain hemlock	1,077	86	446	57	—	—	184	45	12	12	22	16	244	53	—	—	84	31	—	—	—	—	2,069	128						
Lodgepole pine	259	45	418	56	—	—	253	49	14	13	—	—	25	17	—	—	42	22	—	—	—	—	1,012	91						
Other western softwoods	257	42	914	78	76	30	391	68	—	—	12	12	23	15	9	7	93	32	244	54	2,020	130								
Pinyon/juniper	45	20	854	80	38	21	680	84	11	12	45	23	—	—	—	—	10	9	213	50	1,896	131								
Ponderosa pine	1,240	88	206	40	18	13	62	27	5	5	10	9	390	64	13	13	362	62	1	1	2,307	134								
Redwood	7	7	14	10	—	—	24	18	24	18	74	30	309	60	—	—	190	47	—	—	—	—	643	85						
Western hemlock/Sitka spruce	—	—	—	—	—	—	2	2	—	—	—	—	14	13	—	—	1	1	—	—	—	—	17	13						
Western white pine	46	19	134	32	—	—	—	—	—	—	—	—	14	13	—	—	—	—	—	—	—	194	39							
Total	7,348	161	4,153	157	211	49	1,921	125	119	38	246	53	2,931	156	37	20	1,681	131	459	73	19,106	280								
Hardwoods:																														
Alder/maple	53	19	21	11	8	8	20	15	3	3	12	12	90	32	—	—	48	22	12	9	268	50								
Aspen/birch	35	17	31	14	—	—	3	3	—	—	2	2	—	—	—	—	8	8	—	—	80	24								
Elm/ash/cottonwood	—	—	6	7	1	1	—	—	—	—	—	—	1	1	—	—	25	18	14	12	48	23								
Exotic hardwoods	—	—	—	—	—	—	—	—	—	—	—	—	4	4	—	—	0	0	—	—	4	4								
Other hardwoods	84	24	88	25	—	—	24	18	12	12	24	18	37	21	—	—	233	52	107	35	610	79								
Tanoak/laurel	414	54	102	27	31	18	64	28	36	19	103	36	633	84	—	—	694	87	36	21	2,112	137								
Western oak	1,361	95	1,255	89	217	50	471	71	88	32	419	67	668	89	301	57	1,804	138	3,183	167	9,768	266								
Woodland hardwoods	149	34	148	35	—	—	102	35	—	—	—	—	—	—	—	—	18	13	74	30	492	69								
Total	2,097	115	1,651	102	257	55	684	87	139	40	561	78	1,434	125	301	57	2,830	165	3,426	173	13,381	293								
Nonstocked	339	49	177	37	46	23	37	21	—	—	—	—	37	19	—	—	93	32	22	14	751	79								
All forest types	9,784	167	5,981	178	514	77	2,642	142	258	55	807	93	4,402	182	338	61	4,604	199	3,907	186	33,238	284								

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500 acres were estimated.

^aUnreserved forest land that is capable of producing in excess of 20 cubic feet/acre/year of wood at culmination of mean annual increment.

Table 5—Estimated area of forest land, by forest type group and stand size class, California, 2001–2005

Forest type group	Large-diameter stands ^a		Medium-diameter stands ^b		Small-diameter stands ^c		All size classes	
	Total	SE	Total	SE	Total	SE	Total	SE
<i>Thousand acres</i>								
Softwoods:								
California mixed conifer	7,277	204	219	44	383	60	7,879	210
Douglas-fir	914	89	77	30	79	28	1,070	97
Fir/spruce/mountain hemlock	1,952	125	6	3	111	29	2,069	128
Lodgepole pine	912	87	50	21	50	20	1,012	91
Other western softwoods	1,604	117	200	43	216	47	2,020	130
Pinyon/juniper	1,496	118	216	48	183	42	1,896	131
Ponderosa pine	1,964	125	205	40	138	34	2,307	134
Redwood	604	82	5	5	34	17	643	85
Western hemlock/Sitka spruce	17	13	—	—	—	—	17	13
Western white pine	132	31	9	8	52	22	194	39
Total	16,873	272	988	95	1,245	106	19,106	280
Hardwoods:								
Alder/maple	124	34	80	27	64	24	268	50
Aspen/birch	21	12	10	5	49	20	80	24
Elm/ash/cottonwood	32	20	2	1	14	12	48	23
Exotic hardwoods	4	4	—	—	—	—	4	4
Other hardwoods	224	48	146	40	240	49	610	79
Tanoak/laurel	1,339	113	456	70	317	55	2,112	137
Western oak	5,276	213	3,251	176	1,241	108	9,768	266
Woodland hardwoods	392	61	69	27	31	16	492	69
Total	7,412	244	4,013	194	1,956	134	13,381	293
Nonstocked	—	—	—	—	—	—	751	79
All forest types	24,285	304	5,001	213	3,201	167	33,238	284

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500 acres were estimated.

^a Stands with a majority of trees at least 11.0 inches diameter at breast height for hardwoods and 9.0 inches diameter at breast height for softwoods.

^b Stands with a majority of trees at least 5.0 inches diameter at breast height but not as large as large-diameter trees.

^c Stands with a majority of trees less than 5.0 inches diameter at breast height.

Table 6—Estimated area of forest land, by forest type group and stand age class, California, 2001–2005

Forest type group	Stand age class (years)														Unknown ^a				All forest land										
	1-20		21-40		41-60		61-80		81-100		101-120		121-140		141-160		161-180		181-200		201+		Total		Total		Total		
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	
Thousand acres																													
Softwoods:																													
California mixed conifer	250	46	271	50	788	88	1,667	121	1,619	116	748	80	431	62	404	56	282	49	410	59	1,009	87	—	—	—	—	7,879	210	
Douglas-fir	59	24	259	54	246	52	151	39	102	29	34	20	1	1	52	23	35	18	40	18	90	25	—	—	—	—	1,070	97	
Fir/spruce/mountain hemlock	41	19	42	17	196	41	341	57	413	59	169	36	152	36	221	43	97	28	212	44	175	38	9	8	—	—	2,069	128	
Lodgepole pine	21	15	19	11	80	28	104	30	184	42	90	29	96	32	137	36	38	17	87	28	157	36	—	—	—	—	1,012	91	
Other western softwoods	60	25	75	28	201	46	532	73	368	54	109	30	63	25	84	28	29	17	111	31	268	51	119	31	—	—	2,020	130	
Pinyon/juniper	37	19	55	26	172	43	318	55	436	66	68	26	143	38	162	41	35	17	41	17	151	38	278	55	—	—	1,896	131	
Ponderosa pine	211	40	237	43	212	45	574	72	642	74	147	34	53	20	90	27	8	8	66	25	56	22	11	12	—	—	2,307	134	
Redwood	39	19	100	35	131	39	105	35	91	32	40	22	—	—	18	16	—	—	14	14	92	32	12	12	—	—	643	85	
Western hemlock/Sitka spruce	—	—	16	13	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17	13	
Western white pine	14	13	—	—	17	11	17	11	8	8	8	8	8	8	8	8	18	12	23	14	74	23	—	—	—	—	194	39	
Total	732	80	1,074	101	2,043	140	3,809	181	3,863	175	1,414	109	946	92	1,177	100	543	67	1,005	92	2,072	127	430	66	—	—	19,106	280	
Hardwoods:																													
Alder/maple	44	17	85	31	65	27	17	10	28	17	9	9	—	—	6	7	—	—	6	6	—	—	7	5	—	—	268	50	
Aspen/birch	8	5	5	6	7	5	10	8	8	8	6	6	—	—	—	—	8	8	7	7	8	8	13	13	—	—	80	24	
Elm/ash/cottonwood	1	1	14	12	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	1	1	31	20	—	—	48	23	
Exotic hardwoods	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4	—	—	4	4	
Other hardwoods	88	30	100	32	92	32	102	34	120	36	15	12	—	—	16	13	—	—	—	—	34	16	44	20	—	—	610	79	
Tanoak/laurel	202	46	574	79	521	75	298	55	164	41	36	19	62	25	104	34	38	19	16	11	80	25	16	12	—	—	2,112	137	
Western oak	524	67	571	74	1,746	133	2,197	149	1,891	137	419	66	263	49	335	57	96	30	62	25	115	33	1,550	124	—	—	9,768	266	
Woodland hardwoods	—	—	26	15	74	25	153	37	88	31	36	20	8	8	9	9	—	—	19	14	17	10	62	25	—	—	492	69	
Total	867	87	1,375	117	2,504	158	2,776	165	2,300	151	522	73	333	56	471	68	142	36	110	32	254	46	1,727	131	—	—	13,381	293	
Nonstocked	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	751	79	
All forest types	1,724	118	2,498	151	4,574	204	6,674	237	6,206	226	1,958	131	1,305	108	1,662	121	684	76	1,115	97	2,326	134	2,194	147	—	—	33,238	284	

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500 acres were estimated.

^a The age of the stand is unknown on some plots because no trees were available for boring.

Table 7—Estimated area of timberland, by forest type group and stand size class, California, 2001–2005

Forest type group	Large-diameter stands ^a		Medium-diameter stands ^b		Small-diameter stands ^c		All size classes	
	Total	SE	Total	SE	Total	SE	Total	SE
<i>Thousand acres</i>								
Softwoods:								
California mixed conifer	5,816	187	219	44	363	58	6,399	194
Douglas-fir	815	85	65	27	79	28	958	93
Fir/spruce/mountain hemlock	1,343	104	4	3	70	24	1,417	106
Lodgepole pine	279	49	29	16	32	15	340	54
Other western softwoods	339	53	30	16	81	30	450	63
Pinyon/juniper	104	33	—	—	—	—	104	33
Ponderosa pine	1,695	115	189	38	132	33	2,015	125
Redwood	493	74	5	5	34	17	531	77
Western hemlock/Sitka spruce	15	13	—	—	—	—	15	13
Western white pine	23	14	8	8	29	17	60	23
Total	10,922	234	548	68	819	86	12,290	244
Hardwoods:								
Alder/maple	108	32	48	21	47	22	203	44
Aspen/birch	15	11	6	5	22	15	44	19
Elm/ash/cottonwood	25	18	1	1	1	1	27	18
Exotic hardwoods	4	4	—	—	—	—	4	4
Other hardwoods	186	44	47	23	133	37	366	62
Tanoak/laurel	1,146	104	418	67	243	49	1,808	127
Western oak	2,445	153	1,216	111	465	64	4,127	193
Woodland hardwoods	132	34	17	10	18	10	168	37
Total	4,063	188	1,754	131	929	92	6,746	228
Nonstocked	—	—	—	—	—	—	515	66
All forest types	14,985	259	2,302	147	1,749	123	19,551	266

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500 acres were estimated.

^a Stands with a majority of trees at least 11.0 inches diameter at breast height for hardwoods and 9.0 inches diameter at breast height for softwoods.

^b Stands with a majority of trees at least 5.0 inches diameter at breast height but not as large as large-diameter trees.

^c Stands with a majority of trees less than 5.0 inches diameter at breast height.

Table 8—Estimated number of live trees on forest land, by species group and diameter class, California, 2001–2005

Species group	Diameter class (inches)											
	1.0–2.9		3.0–4.9		5.0–6.9		7.0–8.9		9.0–10.9		11.0–12.9	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Thousand acres</i>												
Softwoods:												
Douglas-fir	540,741	41,419	230,294	18,759	144,833	7,057	98,972	4,910	71,985	3,791	49,616	2,785
Engelmann and other spruces	2,120	1,257	—	—	362	181	189	94	47	47	97	67
Incense-cedar	290,151	30,514	131,272	14,572	74,356	5,033	45,555	3,329	29,514	2,351	19,524	1,571
Lodgepole pine	95,775	18,495	51,999	10,818	33,162	4,605	19,434	2,370	16,949	2,343	12,543	1,550
Other western softwoods	159,226	21,919	62,785	9,480	49,776	4,012	36,481	2,790	24,565	1,867	18,397	1,474
Ponderosa and Jeffrey pines	248,740	25,472	135,225	12,753	113,551	6,525	88,115	5,231	68,639	4,023	47,640	2,865
Redwood	144,969	25,842	36,891	9,481	26,782	3,464	19,524	2,532	14,378	1,701	14,132	1,801
Sitka spruce	1,255	1,111	2,054	1,981	742	442	331	196	247	239	165	159
Sugar pine	50,882	8,534	20,426	4,960	12,897	1,418	10,719	1,099	7,109	910	5,412	647
True fir	589,989	49,556	257,329	20,679	164,640	7,953	119,343	5,651	83,851	4,163	61,437	3,213
Western hemlock	13,440	5,206	6,536	3,463	2,826	1,385	1,357	393	1,232	527	651	252
Western redcedar	—	—	—	—	73	75	220	225	46	47	—	—
Western white pine	23,813	5,849	8,673	2,894	6,596	1,020	4,418	667	3,084	514	1,914	364
Western woodland softwoods	53,143	20,971	33,124	5,969	21,255	2,433	16,123	1,793	15,563	1,725	12,660	1,483
Total	2,214,243	92,277	976,609	39,685	651,852	15,848	460,780	10,917	337,209	8,152	244,187	6,132
Hardwoods:												
Cottonwood and aspen	68,843	23,434	8,223	3,794	1,795	585	1,200	394	970	369	729	361
Oak	1,138,552	92,022	548,665	41,282	399,283	17,793	256,099	10,510	148,655	6,175	83,501	3,817
Other western hardwoods	1,157,168	83,263	383,113	31,809	233,351	12,369	133,945	7,398	79,595	4,894	53,049	3,653
Red alder	14,939	6,330	6,539	2,796	8,372	1,996	6,603	1,530	6,976	1,790	4,627	1,419
Western woodland hardwoods	48,278	12,436	29,339	10,222	22,834	3,025	16,694	2,552	10,693	1,725	6,817	1,107
Total	2,427,780	127,514	975,879	53,318	665,635	21,311	414,540	12,713	246,890	8,071	148,724	5,530
All species groups	4,642,023	158,831	1,952,488	66,578	1,317,487	25,923	875,320	16,163	584,099	11,012	392,911	8,087
											278,844	6,116
											200,584	4,707

Table 8—Estimated number of live trees on forest land, by species group and diameter class, California, 2001–2005 (continued)

Species group	Diameter class (inches)															
	17.0–18.9		19.0–20.9		21.0–24.9		25.0–28.9		29.0–32.9		33.0–36.9		37+		All classes	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
Softwoods:																
Douglas-fir	20,516	1,341	12,995	1,010	18,981	1,343	11,597	611	8,123	455	5,947	368	13,083	810	1,295,852	64,428
Engelmann and other spruces	—	—	50	48	174	103	63	31	40	21	7	8	—	—	3,241	1,567
Incense-cedar	7,993	861	5,290	666	7,257	898	4,325	322	2,376	202	1,910	196	2,788	265	646,868	46,460
Lodgepole pine	7,728	1,056	5,122	755	7,518	1,005	3,940	452	2,219	291	957	169	704	116	277,288	34,965
Other western softwoods	8,048	903	6,683	773	7,626	910	3,544	372	2,314	265	1,329	186	1,914	283	404,801	32,504
Ponderosa and Jeffrey pines	19,064	1,324	15,090	1,127	16,662	1,160	10,338	535	6,588	408	3,928	278	5,091	358	841,105	43,079
Redwood	6,433	1,211	5,965	1,119	7,517	1,087	4,685	625	2,815	406	2,026	314	4,054	694	308,717	41,406
Sitka spruce	330	318	—	—	73	75	53	43	55	32	14	13	96	69	5,826	2,764
Sugar pine	2,774	435	3,288	516	4,658	532	2,763	220	2,005	209	1,339	136	2,624	229	133,742	13,843
True fir	27,252	1,691	19,514	1,293	27,026	1,640	16,574	904	10,430	622	6,554	455	10,689	810	1,477,418	77,970
Western hemlock	303	152	220	168	7	7	67	35	15	11	24	18	24	25	27,604	9,237
Western redcedar	—	—	—	—	—	—	37	37	57	50	69	63	71	53	720	634
Western white pine	973	303	543	183	1,120	268	813	126	668	106	466	83	1,076	146	57,150	9,199
Western woodland softwoods	5,372	681	3,460	580	3,147	537	1,312	184	457	85	298	68	267	65	185,571	26,333
Total	106,785	3,288	78,220	2,693	101,768	3,150	60,111	1,515	38,162	1,089	24,866	818	42,483	1,526	5,665,903	142,105
Hardwoods:																
Cottonwood and aspen	373	250	696	333	495	181	243	120	120	50	7	8	21	15	84,951	25,745
Oak	21,933	1,441	12,619	1,007	14,244	1,111	5,421	331	2,686	221	1,088	128	1,025	138	2,721,396	131,193
Other western hardwoods	13,981	1,414	7,695	893	10,056	1,091	3,148	315	1,358	173	689	117	596	129	2,129,681	115,777
Red alder	535	188	157	110	162	103	30	17	49	25	15	15	—	—	51,569	11,539
Western woodland hardwoods	1,545	327	816	259	1,153	311	209	62	55	29	12	12	24	18	145,908	24,886
Total	38,367	2,086	21,982	1,438	26,110	1,615	9,051	484	4,269	287	1,812	176	1,665	189	5,133,505	177,176

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500 acres were estimated.

Table 10—Estimated net volume of all live trees, by owner class and forest land status, California, 2001–2005

Owner class	Unreserved forests						Reserved forests						All forest land	
	Timberland ^a		Other forest ^b		Total		Productive ^a		Other forest ^b		Total			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
Million cubic feet														
USDA Forest Service:														
National forest	38,479	1,050	1,665	169	40,144	1,045	11,816	784	858	117	12,688	786	52,832	1,074
Other federal government:														
National Park Service	—	—	—	—	—	—	5,234	735	338	108	5,572	733	5,572	733
Bureau of Land Management	986	236	299	53	1,285	240	82	60	82	27	164	66	1,449	248
U.S. Fish and Wildlife Service	—	—	—	—	—	—	19	20	—	—	20	20	20	20
Departments of Defense and Energy	15	12	54	34	69	36	—	—	—	—	—	—	69	36
Other federal	43	43	4	3	47	44	352	199	105	71	457	210	504	215
Total	1,044	291	357	90	1,401	320	5,687	1,014	525	206	6,213	1,029	7,614	1,252
State and local government:														
State	854	296	61	37	916	298	3,111	1,191	191	58	3,302	1,191	4,217	1,222
Local	326	160	150	51	476	167	143	101	91	59	234	117	710	203
Other public	—	—	—	—	—	—	—	—	3	3	3	3	3	3
Total	1,180	456	211	88	1,392	465	3,254	1,292	285	120	3,539	1,311	4,930	1,428
Corporate private:	12,891	742	342	73	13,232	743	—	—	—	—	—	—	13,232	743
Noncorporate private:														
“Nongovernmental conservation or natural resource organizations”	734	191	36	21	770	192	—	—	—	—	—	—	770	192
“Unincorporated partnerships, associations, or clubs”	175	112	25	16	201	114	—	—	—	—	—	—	201	114
Native American	763	285	42	27	805	286	—	—	—	—	—	—	805	286
Individual	12,221	848	2,925	215	15,165	859	—	—	—	—	—	—	15,165	859
Total	13,893	1,436	3,028	279	16,941	1,451	—	—	—	—	—	—	16,941	1,451
All owners	67,488	1,495	5,603	293	73,109	1,488	20,757	1,599	1,667	194	22,438	1,597	95,547	2,006

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500,000 cubic feet were estimated.

^a Forest land that is capable of producing in excess of 20 cubic feet/acre/year of wood at culmination of mean annual increment.

^b Forest land that is not capable of producing in excess of 20 cubic feet/acre/year of wood at culmination of mean annual increment

Table 11—Estimated net volume of all live trees on forest land, by forest type group and stand size class, California, 2001–2005

Forest type group	Large-diameter stands ^a		Medium-diameter stands ^b		Small-diameter stands ^c		All size classes	
	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million cubic feet</i>								
Softwoods:								
California mixed conifer	35,427	1,181	292	73	167	38	35,886	1,178
Douglas-fir	6,043	691	149	66	54	24	6,246	694
Fir/spruce/mountain hemlock	11,187	876	2	1	47	16	11,235	876
Lodgepole pine	3,431	395	77	46	5	3	3,512	397
Other western softwoods	1,258	146	55	22	17	6	1,330	148
Pinyon/juniper	648	76	18	6	10	3	676	76
Ponderosa pine	4,951	381	79	23	12	5	5,042	381
Redwood	6,427	1,416	9	8	14	8	6,449	1,416
Western hemlock/Sitka spruce	170	115	—	—	—	—	170	115
Western white pine	331	98	2	2	22	13	355	99
Total	69,872	2,000	683	113	347	51	70,901	1,995
Hardwoods:								
Alder/maple	657	206	228	85	38	22	924	224
Aspen/birch	60	37	7	4	9	5	76	38
Elm/ash/cottonwood	135	87	1	1	4	4	141	87
Exotic hardwoods	14	11	—	—	—	—	14	11
Other hardwoods	901	210	119	51	40	11	1,060	216
Tanoak/laurel	7,264	713	1,134	198	90	29	8,488	728
Western oak	10,088	541	3,281	231	265	34	13,634	571
Woodland hardwoods	223	40	21	10	3	2	248	41
Total	19,343	915	4,791	314	449	52	24,584	929
Nonstocked	—	—	—	—	—	—	62	13
All forest types	89,215	2,043	5,474	332	796	72	95,547	2,006

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500,000 cubic feet were estimated.

^a Stands with a majority of trees at least 11.0 inches diameter at breast height for hardwoods and 9.0 inches diameter at breast height for softwoods.

^b Stands with a majority of trees at least 5.0 inches diameter at breast height but not as large as large-diameter trees.

^c Stands with a majority of trees less than 5.0 inches diameter at breast height.

Table 12—Estimated net volume of all live trees on forest land, by species group and ownership group, California, 2001–2005

Species group	Forest Service		Other federal		State and local government		Corporate private		Noncorporate private		All owners	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million cubic feet</i>												
Softwoods:												
Douglas-fir	13,071	635	923	245	628	182	3,282	312	3,585	422	21,489	852
Engelmann and other spruces	29	13	—	—	—	—	11	10	—	—	40	16
Incense-cedar	2,607	179	194	59	71	38	699	92	504	102	4,075	234
Lodgepole pine	2,256	231	1,011	230	26	24	142	73	96	59	3,531	339
Other western softwoods	1,593	170	456	109	88	33	86	26	525	62	2,748	215
Ponderosa and Jeffrey pines	8,763	380	740	146	175	82	1,662	186	1,643	210	12,983	494
Redwood	276	191	515	356	2,169	1,083	1,851	300	2,120	425	6,931	1,255
Sitka spruce	—	—	16	15	7	7	67	49	43	40	133	65
Sugar pine	2,694	184	269	98	52	27	533	73	166	53	3,714	228
True fir	14,867	732	2,207	431	270	112	1,893	236	572	106	19,809	892
Western hemlock	7	5	22	12	58	57	60	28	24	16	172	67
Western redcedar	54	41	—	—	—	—	—	—	—	—	54	41
Western white pine	790	92	75	28	7	6	21	11	11	7	904	97
Western woodland softwoods	319	37	220	45	17	9	—	—	34	9	591	60
Total	47,327	1,039	6,650	735	3,568	1,189	10,305	645	9,323	738	77,173	1,906
Hardwoods:												
Cottonwood and aspen	76	29	4	4	30	28	7	6	103	64	220	76
Oak	3,574	188	636	116	572	95	1,197	129	4,830	243	10,810	351
Other western hardwoods	1,704	164	224	66	711	175	1,472	205	2,633	256	6,743	392
Red alder	40	12	65	38	47	48	248	75	35	16	435	99
Western woodland hardwoods	111	18	34	12	1	2	3	2	17	9	167	23
Total	5,505	255	963	148	1,362	213	2,927	259	7,618	378	18,374	539
All species groups	52,832	1,074	7,613	776	4,930	1,238	13,232	743	16,941	917	95,547	2,006

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500,000 cubic feet were estimated.

Table 13—Estimated net volume of all live trees on forest land, by species group and diameter class, California, 2001–2005

Species group	Diameter class (inches)													
	5.0–6.9		7.0–8.9		9.0–10.9		11.0–12.9		13.0–14.9		15.0–16.9		17.0–18.9	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million cubic feet</i>														
Softwoods:														
Douglas-fir	498	27	684	36	901	50	979	58	1,075	63	1,245	81	1,108	77
Engelmann and other spruces	—	—	—	—	—	—	1	1	—	—	3	3	—	—
Incense-cedar	153	11	177	13	205	17	213	17	235	25	250	26	259	29
Lodgepole pine	74	11	95	13	159	23	188	25	264	36	256	37	349	51
Other western softwoods	66	7	107	10	137	12	168	15	178	18	187	20	225	30
Ponderosa and Jeffrey pines	203	12	326	19	510	31	605	37	743	45	842	59	847	62
Redwood	40	5	80	11	114	14	181	23	228	35	230	33	273	55
Sitka spruce	2	1	2	1	4	4	4	4	7	7	13	12	20	20
Sugar pine	25	3	41	4	57	8	70	9	60	9	122	18	126	20
True fir	355	18	543	27	729	39	899	49	1,064	57	1,110	68	1,238	81
Western hemlock	8	5	10	3	18	8	15	6	16	10	23	10	19	10
Western redcedar	—	—	1	2	1	1	—	—	3	3	—	—	—	—
Western white pine	10	2	14	2	19	3	21	4	30	6	34	9	36	11
Western woodland softwoods	28	4	35	4	58	8	69	11	88	16	92	18	61	8
Total	1,464	40	2,116	55	2,913	79	3,413	95	3,991	114	4,408	134	4,560	154
Hardwoods:														
Cottonwood and aspen	2	1	4	1	8	3	9	5	12	5	23	11	11	7
Oak	885	41	1,219	52	1,278	55	1,203	58	1,156	60	997	59	851	57
Other western hardwoods	503	28	642	38	727	47	797	56	729	59	654	61	616	66
Red alder	26	7	51	12	104	28	103	32	56	22	32	10	27	9
Western woodland hardwoods	14	2	21	4	23	4	22	4	24	4	16	4	13	3
Total	1,430	49	1,938	63	2,139	76	2,134	86	1,978	87	1,721	88	1,518	89
All species groups	2,895	63	4,054	84	5,052	109	5,547	130	5,969	144	6,129	158	6,078	177
Species group	Diameter class (inches)													
	19.0–20.9		21.0–24.9		25.0–28.9		29.0–32.9		33.0–36.9		37.0+		All classes	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million cubic feet</i>														
Softwoods:														
Douglas-fir	923	76	1,924	148	1,738	98	1,684	103	1,645	111	7,084	511	21,489	852
Engelmann and other spruces	1	1	17	11	8	4	6	3	2	2	—	—	40	16
Incense-cedar	227	29	430	55	400	31	300	26	325	35	900	95	4,075	234
Lodgepole pine	319	54	614	83	455	54	350	49	200	37	207	38	3,531	339
Other western softwoods	261	35	394	57	269	34	224	32	196	34	337	59	2,748	215
Ponderosa and Jeffrey pines	923	73	1,485	107	1,474	83	1,363	93	1,131	87	2,532	192	12,983	494
Redwood	327	63	589	87	590	84	490	76	466	74	3,323	1,139	6,931	1,255
Sitka spruce	—	—	7	7	8	7	12	7	4	4	50	37	133	65
Sugar pine	201	32	392	44	369	31	402	44	354	37	1,496	148	3,714	228
True fir	1,159	80	2,274	145	2,177	127	1,933	122	1,630	118	4,699	394	19,809	892
Western hemlock	27	23	1	1	10	5	4	3	5	4	15	15	172	67
Western redcedar	—	—	—	—	4	4	9	8	14	13	21	16	54	41
Western white pine	26	9	72	18	84	13	93	15	91	16	375	58	904	97
Western woodland softwoods	50	9	51	10	30	5	14	3	9	2	7	2	591	60
Total	4,445	167	8,249	275	7,616	212	6,881	218	6,071	217	21,045	1,396	77,173	1,906
Hardwoods:														
Cottonwood and aspen	45	22	47	19	33	17	17	7	1	1	7	5	220	76
Oak	640	54	1,025	84	584	38	411	36	202	27	359	57	10,810	351
Other western hardwoods	413	49	764	86	350	38	209	28	145	29	195	47	6,743	392
Red alder	11	8	11	8	3	2	8	4	3	3	—	—	435	99
Western woodland hardwoods	8	3	17	5	5	2	2	1	1	1	1	1	167	23
Total	1,116	78	1,863	123	975	57	648	47	352	40	562	74	18,374	539
All species groups	5,561	185	10,113	301	8,591	220	7,529	223	6,423	223	21,607	1,399	95,547	2,006

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500,000 cubic feet

Table 14—Estimated net volume of growing-stock trees^a on timberland, by species group and diameter class, California, 2001–2005

Species group	Diameter class (inches)																						Million cubic feet
	5.0-6.9		7.0-8.9		9.0-10.9		11.0-12.9		13.0-14.9		15.0-16.9		17.0-18.9		19.0-20.9		21.0-28.9		29.0+		All classes		
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	
Softwoods:																							
Douglas-fir	453	24	625	34	811	48	879	54	982	60	1,135	78	1,008	74	807	70	3,171	202	8,591	587	18,462	815	
Engelmann and other spruces	0	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11	10	1	1	13	10	
Incense-cedar	135	10	159	12	184	16	188	16	211	24	227	25	235	27	195	28	700	70	1,190	112	3,423	215	
Lodgepole pine	43	10	49	10	72	16	85	18	99	21	86	20	109	27	76	17	243	48	164	49	1,027	160	
Other western softwoods	26	5	43	8	63	10	73	11	74	13	69	13	93	20	86	21	202	44	218	50	946	123	
Ponderosa and Jeffrey pines	184	12	292	18	460	29	545	36	667	43	755	57	766	59	808	69	2,492	148	3,540	230	10,509	442	
Redwood	39	5	77	11	106	14	169	23	211	34	221	33	256	55	308	62	1,028	143	1,966	319	4,380	526	
Sitka spruce	1	1	1	1	4	4	4	4	7	7	13	12	20	20	—	—	8	7	51	41	111	63	
Sugar pine	23	3	37	4	49	7	58	8	50	8	110	17	109	19	157	29	653	57	1,565	139	2,810	188	
True fir	294	17	437	24	593	34	720	43	856	53	855	61	945	70	838	65	3,057	199	4,563	372	13,157	673	
Western hemlock	8	5	6	2	16	8	15	6	14	10	16	8	4	4	—	—	8	5	1	1	88	33	
Western redcedar	—	—	1	2	—	—	—	—	3	3	—	—	—	—	—	—	4	4	27	27	36	36	
Western white pine	6	1	7	2	9	2	12	3	14	4	13	5	20	7	17	8	65	18	140	30	303	51	
Total	1,210	38	1,735	52	2,367	74	2,748	87	3,187	104	3,499	124	3,566	140	3,293	143	11,643	373	22,017	894	55,265	1,355	
Hardwoods:																							
Cottonwood and aspen	1	1	3	1	5	2	2	2	10	4	17	10	—	—	25	16	53	31	16	8	134	65	
Oak	506	31	698	41	715	42	688	47	628	46	567	46	444	41	342	39	968	79	586	61	6,142	276	
Other western hardwoods	405	26	528	34	616	43	690	51	608	51	532	56	483	57	335	43	869	86	448	80	5,512	346	
Red alder	20	5	37	9	78	24	70	24	31	13	23	9	25	9	6	6	14	8	7	4	311	78	
Total	933	40	1,266	52	1,414	64	1,450	74	1,276	71	1,139	75	951	71	710	62	1,904	125	1,056	101	12,100	461	
All species groups	2,143	56	3,002	77	3,781	99	4,198	116	4,463	129	4,638	144	4,517	157	4,003	158	13,547	396	23,073	910	67,364	1,494	

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500,000 cubic feet were estimated.

^a Growing-stock trees are trees of commercial species that meet certain merchantability standards; excludes trees that are entirely cull (rough or rotten tree classes).

Table 15—Estimated net volume of growing-stock trees^a on timberland, by species group and ownership group, California, 2001–2005

Species group	Forest Service		Other federal		State and local government		Corporate private		Noncorporate private		All owners	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million cubic feet</i>												
Softwoods:												
Douglas-fir	10,892	616	487	161	257	135	3,276	312	3,550	421	18,462	815
Engelmann and other spruces	2	1	—	—	—	—	11	10	—	—	13	10
Incense-cedar	2,192	167	32	27	—	—	696	92	504	102	3,423	215
Lodgepole pine	763	129	—	—	26	24	142	73	96	59	1,027	160
Other western softwoods	540	104	36	15	47	30	56	21	267	53	946	123
Ponderosa and Jeffrey pines	7,109	348	101	39	43	22	1,630	186	1,626	210	10,509	442
Redwood	24	24	—	—	386	167	1,851	300	2,120	425	4,380	526
Sitka spruce	—	—	—	—	—	—	67	49	43	40	111	63
Sugar pine	2,109	166	10	6	6	6	519	73	166	53	2,810	188
True fir	10,595	619	12	7	95	80	1,884	236	570	106	13,157	673
Western hemlock	1	1	—	—	3	3	60	28	24	16	88	33
Western redcedar	36	36	—	—	—	—	—	—	—	—	36	36
Western white pine	265	49	—	—	7	6	21	11	11	7	303	51
Total	34,527	993	679	176	869	281	10,213	645	8,977	738	55,265	1,355
Hardwoods:												
Cottonwood and aspen	25	11	4	4	—	—	7	6	98	64	134	65
Oak	2,378	155	241	65	120	47	953	117	2,449	192	6,142	276
Other western hardwoods	1,429	154	104	49	186	73	1,464	204	2,329	246	5,512	346
Red alder	34	11	—	—	—	—	248	75	29	16	311	78
Total	3,867	226	349	90	306	91	2,671	252	4,906	338	12,100	461
All species groups	38,394	1,050	1,028	240	1,175	335	12,884	742	13,883	907	67,364	1,494

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500,000 cubic feet were estimated.

^a Growing-stock trees are trees of commercial species that meet certain merchantability standards; excludes trees that are entirely cull (rough or rotten tree classes).

Table 16—Estimated net volume (International 1/4-inch rule) of sawtimber trees^a on timberland, by species group and diameter class, California, 2001–2005

Species group	Diameter class (inches)													
	9.0–10.9		11.0–12.9		13.0–14.9		15.0–16.9		17.0–18.9		19.0–20.9		21.0–22.9	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million board feet (International 1/4-inch rule)</i>														
Softwoods:														
Douglas-fir	3,595	215	4,500	280	5,421	336	6,557	457	6,047	450	4,966	435	5,515	596
Engelmann and other spruces	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Incense-cedar	679	60	810	70	1,003	115	1,143	127	1,236	146	1,070	153	1,083	183
Lodgepole pine	303	71	416	87	519	112	490	117	637	156	461	105	519	140
Other western softwoods	248	40	330	52	372	67	351	67	511	115	492	122	333	95
Ponderosa and Jeffrey pines	1,755	114	2,480	165	3,400	223	4,120	318	4,390	343	4,837	421	3,925	398
Redwood	410	54	775	107	1,072	173	1,195	181	1,446	316	1,801	364	1,914	351
Sitka spruce	20	19	25	24	41	39	78	75	126	121	—	—	—	—
Sugar pine	191	29	264	37	253	43	599	95	629	110	943	176	790	152
True fir	2,371	139	3,408	206	4,432	277	4,700	341	5,432	411	4,950	387	5,321	459
Western hemlock	71	36	78	33	80	54	99	52	25	24	—	—	—	—
Western larch	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Western redcedar	—	—	—	—	16	17	—	—	—	—	—	—	—	—
Western white pine	34	10	56	15	71	22	66	23	109	38	98	43	66	32
Total	9,676	315	13,141	430	16,679	558	19,399	704	20,587	826	19,620	868	19,466	971
Hardwoods:														
Ash	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cottonwood and aspen	—	—	9	7	50	22	96	54	—	—	153	97	126	83
Oak	—	—	689	47	662	50	620	52	536	56	414	49	435	57
Other western hardwoods	—	—	2,219	184	2,000	192	1,738	210	1,602	213	1,335	186	1,458	255
Red alder	—	—	332	115	166	69	128	47	146	54	40	39	—	—
Total	—	—	3,250	219	2,878	211	2,582	230	2,284	226	1,942	219	2,018	274
All species groups	9,676	315	16,391	502	19,557	610	21,981	740	22,870	860	21,562	900	21,484	1,009

Species group	Diameter class (inches)									
	23.0–24.9		25.0–26.9		27.0–28.9		29.0+		All classes	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million board feet (International 1/4-inch rule)</i>										
Softwoods:										
Douglas-fir	5,252	497	5,122	347	4,692	357	60,277	4,196	111,942	5,435
Engelmann and other spruces	72	64	—	—	—	—	9	9	81	65
Incense-cedar	930	157	1,011	94	1,050	107	7,636	735	17,651	1,202
Lodgepole pine	338	105	363	99	320	81	1,098	334	5,464	905
Other western softwoods	364	88	237	77	278	92	1,422	337	4,939	742
Ponderosa and Jeffrey pines	3,944	370	4,139	286	3,905	301	24,656	1,629	61,551	2,771
Redwood	1,291	236	1,589	251	1,599	262	13,274	2,177	26,365	3,322
Sitka spruce	—	—	37	29	19	19	361	290	707	405
Sugar pine	1,284	180	979	102	1,051	132	10,959	990	17,943	1,259
True fir	4,457	411	4,850	349	4,577	372	31,224	2,589	75,724	4,182
Western hemlock	—	—	23	16	28	27	10	10	414	157
Western larch	—	—	—	—	—	—	—	—	—	—
Western redcedar	—	—	9	9	17	17	173	177	215	219
Western white pine	122	47	79	27	124	40	929	205	1,754	311
Total	18,055	834	18,438	666	17,660	701	152,028	6,302	324,750	8,781
Hardwoods:										
Ash	—	—	—	—	—	—	—	—	—	—
Cottonwood and aspen	56	25	51	31	108	74	98	47	749	404
Oak	428	61	268	27	237	27	1,012	124	5,301	289
Other western hardwoods	738	131	640	85	457	79	1,848	427	14,035	1,158
Red alder	66	50	12	9	8	7	47	26	944	235
Total	1,288	155	972	95	810	112	3,005	447	21,028	1,288
All species groups	19,343	857	19,410	677	18,470	712	155,034	6,363	345,779	9,095

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500,000 board feet were estimated.

^a Sawtimber trees have merchantability limits that differ for softwood and hardwood species as follows: ≥9 inches diameter at breast height for softwoods and ≥11 inches diameter at breast height for hardwoods.

Table 17—Estimated net volume (Scribner rule) of sawtimber trees^a on timberland, by species group and diameter class, California, 2001–2005

Species group	Diameter class (inches)													
	9.0–10.9		11.0–12.9		13.0–14.9		15.0–16.9		17.0–18.9		19.0–20.9		21.0–22.9	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
Million board feet (Scribner rule)														
Softwoods:														
Douglas-fir	2,698	162	3,562	222	4,440	277	5,499	386	5,170	387	4,307	380	4,860	529
Engelmann and other spruces	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Incense-cedar	501	45	623	54	793	91	920	103	1,007	119	885	127	904	153
Lodgepole pine	226	53	326	68	420	91	408	98	539	133	397	91	453	122
Other western softwoods	185	30	257	41	299	55	285	55	424	98	415	104	282	81
Ponderosa and Jeffrey pines	1,301	84	1,923	128	2,728	180	3,394	263	3,690	290	4,145	363	3,410	348
Redwood	304	40	602	84	861	139	981	150	1,208	266	1,528	309	1,652	305
Sitka spruce	15	14	21	20	34	33	67	64	109	105	—	—	—	—
Sugar pine	141	21	205	29	202	34	493	78	528	93	809	151	680	131
True fir	1,760	103	2,659	161	3,570	224	3,878	283	4,570	348	4,219	331	4,595	399
Western hemlock	53	27	62	26	66	45	85	44	22	21	—	—	—	—
Western larch	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Western redcedar	—	—	—	—	13	13	—	—	—	—	—	—	—	—
Western white pine	25	7	43	12	57	18	53	18	90	31	82	36	55	27
Total	7,210	235	10,283	339	13,482	453	16,062	587	17,356	702	16,788	748	16,891	851
Hardwoods:														
Ash	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cottonwood and aspen	—	—	8	6	42	18	81	46	—	—	134	85	113	75
Oak	—	—	601	41	537	40	494	41	425	46	325	39	342	45
Other western hardwoods	—	—	1,954	163	1,654	160	1,429	174	1,330	178	1,121	157	1,242	222
Red alder	—	—	298	103	141	59	108	40	125	46	35	34	—	—
Total	—	—	2,861	194	2,374	176	2,111	191	1,881	189	1,615	186	1,697	238
All species groups	7,210	235	13,144	408	15,856	498	18,173	618	19,237	730	18,403	775	18,587	884

Species group	Diameter class (inches)									
	23.0–24.9		25.0–26.9		27.0–28.9		29.0+		All classes	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million board feet (Scribner rule)</i>										
Softwoods:										
Douglas-fir	4,672	447	4,601	314	4,254	327	56,171	3,950	100,234	5,005
Engelmann and other spruces	64	57	—	—	—	—	8	8	72	57
Incense-cedar	780	133	856	80	899	92	6,697	652	14,866	1,027
Lodgepole pine	299	92	323	88	287	73	997	307	4,675	785
Other western softwoods	310	76	208	68	245	82	1,270	306	4,181	651
Ponderosa and Jeffrey pines	3,472	326	3,697	257	3,528	274	22,929	1,529	54,217	2,489
Redwood	1,118	206	1,396	223	1,419	234	12,011	1,980	23,081	2,950
Sitka spruce	—	—	34	27	18	17	338	271	633	361
Sugar pine	1,122	158	867	90	941	119	10,199	927	16,187	1,152
True fir	3,901	362	4,291	311	4,091	336	28,719	2,407	66,254	3,745
Western hemlock	—	—	20	14	25	25	9	9	341	130
Western larch	—	—	—	—	—	—	—	—	—	—
Western redcedar	—	—	8	8	14	15	153	156	189	192
Western white pine	104	40	69	23	108	35	840	187	1,526	274
Total	15,843	739	16,370	596	15,829	635	140,342	5,881	286,456	7,970
Hardwoods:										
Ash	—	—	—	—	—	—	—	—	—	—
Cottonwood and aspen	49	22	46	28	99	68	87	42	659	359
Oak	337	48	211	22	187	21	808	101	4,267	232
Other western hardwoods	629	114	550	74	400	70	1,653	393	11,962	1,003
Red alder	59	45	11	8	7	6	42	23	825	205
Total	1,075	134	818	82	692	100	2,591	408	17,714	1,115
All species groups	16,917	758	17,188	606	16,521	644	142,932	5,936	304,169	8,241

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500,000 board feet were estimated.

^a Sawtimber trees have merchantability limits that differ for softwood and hardwood species as follows: ≥9 inches diameter at breast height for softwoods and ≥11 inches diameter at breast height for hardwoods.

Table 18—Estimated net volume (cubic feet) of sawtimber trees^a on timberland, by species group and ownership group, California, 2001–2005

Species group	Forest Service		Other federal		State and local government		Corporate private		Noncorporate private		All owners	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million cubic feet</i>												
Softwoods:												
Douglas-fir	10,275	600	457	154	242	131	2,844	287	3,230	405	17,048	788
Engelmann and other spruces	1	1	—	—	—	—	11	10	—	—	13	10
Incense-cedar	1,995	158	27	24	—	—	584	81	455	97	3,060	202
Lodgepole pine	674	120	—	—	24	23	128	65	83	53	908	147
Other western softwoods	487	101	30	13	46	29	46	18	245	50	854	119
Ponderosa and Jeffrey pines	6,701	337	94	36	41	21	1,477	176	1,521	200	9,834	426
Redwood	23	23	—	—	376	164	1,735	289	2,067	417	4,201	514
Sitka spruce	—	—	—	—	—	—	64	47	43	40	106	62
Sugar pine	2,052	164	9	6	6	6	493	71	158	52	2,717	185
True fir	9,930	596	10	6	89	75	1,659	219	484	92	12,172	645
Western hemlock	1	1	—	—	2	2	44	22	22	14	69	26
Western redcedar	34	35	—	—	—	—	—	—	—	—	34	35
Western white pine	250	48	—	—	7	6	20	11	10	7	286	50
Total	32,424	965	627	166	832	272	9,104	605	8,316	711	51,303	1,313
Hardwoods:												
Cottonwood and aspen	16	8	4	4	—	—	7	6	93	62	120	63
Oak	450	34	44	12	30	12	195	28	485	44	1,203	63
Other western hardwoods	602	78	40	24	93	40	652	104	1,112	149	2,499	196
Red alder	22	8	—	—	—	—	117	36	12	7	152	38
Total	1,091	88	88	30	123	42	970	116	1,702	172	3,973	220
All species groups	33,514	983	715	183	955	296	10,075	635	10,018	783	55,277	1,366

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 500,000 cubic feet were estimated.

^a Sawtimber trees have merchantability limits that differ for softwood and hardwood species as follows: ≥ 9 inches diameter at breast height for softwoods and ≥ 11 inches diameter at breast height for hardwoods.

Table 19—Estimated above-ground biomass of all live trees on forest land, by owner class and forest land status, California, 2001–2005

Owner class	Unreserved forests						Reserved forests						All forest land	
	Timberland ^a		Other forest ^b		Total		Productive ^a		Other forest ^b		Total			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	Million bone-dry tons													
USDA Forest Service:														
National forest	811.2	21.5	47.8	4.4	859.0	21.4	243.1	16.2	22.2	3.0	265.7	16.3	1,124.7	21.9
Other federal government:														
National Park Service	—	—	—	—	—	—	107.1	15.3	7.8	2.2	114.9	15.2	114.9	15.2
Bureau of Land Management	24.5	5.8	9.8	1.7	34.2	6.0	2.7	1.7	2.2	0.7	4.8	1.9	39.0	6.3
U.S. Fish and Wildlife Service	—	—	—	—	—	—	0.3	0.3	0.0	0.0	0.3	0.3	0.3	0.3
Departments of Defense and Energy	0.4	0.4	1.7	0.9	2.1	1.0	—	—	—	—	—	—	2.1	1.0
Other federal	1.1	1.2	0.1	0.1	1.3	1.2	7.1	4.1	2.0	1.3	9.1	4.3	10.4	4.5
Total	26.0	6.0	11.5	1.9	37.6	6.2	117.2	15.7	11.9	2.6	129.1	15.6	166.7	16.5
State and local government:														
State	21.3	7.1	2.6	1.5	23.9	7.2	68.6	23.5	5.5	1.8	74.1	23.5	98.0	24.4
Local	8.9	4.7	4.6	1.5	13.5	5.0	4.3	2.9	2.8	1.8	7.1	3.4	20.6	6.0
Other public	—	—	—	—	—	—	—	—	0.1	0.1	0.1	0.1	0.1	0.1
Total	30.2	8.5	7.2	2.1	37.5	8.7	72.9	23.6	8.4	2.5	81.3	23.7	118.8	25.1
Corporate private:	313.9	18.0	10.6	2.3	324.5	18.1	—	—	—	—	—	—	324.5	18.1
Noncorporate private:														
Nongovernmental conservation or natural resource organization	18.5	5.0	1.7	1.1	20.1	5.1	—	—	—	—	—	—	20.1	5.1
Unincorporated partnerships, associations, or clubs	4.3	2.7	0.9	0.6	5.2	2.8	—	—	—	—	—	—	5.2	2.8
Native American	17.2	6.2	1.4	0.9	18.6	6.3	—	—	—	—	—	—	18.6	6.3
Individual	308.8	20.5	96.8	7.0	406.1	21.1	—	—	—	—	—	—	406.1	21.1
Total	348.7	21.8	100.8	7.2	450.1	22.4	—	—	—	—	—	—	450.1	22.4
All owners	1,530.0	33.2	178.0	9.0	1,708.5	33.2	433.1	32.3	42.6	4.6	476.1	32.3	2,184.7	42.5

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 50,000 bone-dry tons were estimated; includes all live trees ≥ 1 inch diameter at breast height.

^a Forest land that is capable of producing in excess of 20 cubic feet/acre/year of wood at culmination of mean annual increment.

^b Forest land that is not capable of producing in excess of 20 cubic feet/acre/year of wood at culmination of mean annual increment.

Table 20—Estimated aboveground biomass of all live trees on forest land, by diameter class and species group, California, 2001–2005

Species group	Diameter class (inches)															
	1.0–2.9		3.0–4.9		5.0–6.9		7.0–8.9		9.0–10.9		11.0–12.9		13.0–14.9		15.0–16.9	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
Million bone-dry tons																
Softwoods:																
Douglas-fir	2.84	0.23	5.5	0.48	10.69	0.56	14.26	0.74	17.74	0.97	18.76	1.11	20.57	1.18	23.44	1.52
Engelmann and other spruces	0.05	0.03	—	—	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	—	—	0.04	0.04
Incense-cedar	1.15	0.12	1.61	0.18	2.55	0.18	3	0.22	3.38	0.28	3.48	0.28	3.85	0.41	4.13	0.43
Lodgepole pine	1.44	0.28	1.3	0.27	1.65	0.24	1.76	0.23	2.65	0.38	3.01	0.39	4.09	0.55	3.9	0.56
Other western softwoods	1.44	0.25	1.32	0.26	2.06	0.17	2.88	0.23	3.29	0.26	3.82	0.32	3.92	0.37	4.11	0.41
Ponderosa and Jeffrey pines	0.92	0.1	2.12	0.21	4.92	0.29	7.48	0.45	10.53	0.64	11.65	0.71	13.66	0.83	14.97	1.05
Redwood	2.59	0.47	2.33	0.61	3.75	0.48	4.76	0.62	5.44	0.65	7.68	0.99	8.33	1.26	7.75	1.1
Sitka spruce	0.02	0.01	0.06	0.06	0.05	0.03	0.04	0.02	0.07	0.07	0.08	0.08	0.11	0.1	0.2	0.2
Sugar pine	0.18	0.03	0.25	0.07	0.44	0.05	0.73	0.07	0.94	0.12	1.18	0.15	1.01	0.16	2.05	0.3
True fir	8.32	0.69	6.9	0.59	9.82	0.49	13.43	0.65	16.26	0.83	19.13	1.02	22.32	1.18	23.12	1.38
Western hemlock	0.07	0.03	0.2	0.11	0.2	0.11	0.18	0.05	0.3	0.13	0.25	0.1	0.27	0.16	0.37	0.16
Western redcedar	—	—	—	—	—	—	0.02	0.02	0.01	0.01	—	—	0.05	0.05	—	—
Western white pine	0.33	0.08	0.2	0.07	0.24	0.04	0.29	0.04	0.34	0.06	0.34	0.07	0.47	0.1	0.52	0.13
Western woodland softwoods	0.83	0.17	1.06	0.24	0.98	0.12	1.01	0.12	1.46	0.19	1.66	0.24	2.02	0.34	2.1	0.39
Total	20.19	0.98	22.86	1.11	37.38	1.03	49.84	1.32	62.42	1.69	71.07	2.06	80.67	2.42	86.68	2.66
Hardwoods:																
Cottonwood and aspen	0.33	0.11	0.13	0.06	0.06	0.02	0.09	0.03	0.14	0.05	0.17	0.08	0.21	0.09	0.39	0.18
Oaks	5.7	0.48	15.8	1.25	32.51	1.5	42.57	1.84	43.26	1.89	38.94	1.89	37.07	1.96	31.58	1.85
Other western hardwoods	4.56	0.35	9.69	0.91	17.75	1.02	20.75	1.23	21.96	1.44	23.08	1.65	20.13	1.62	17.7	1.65
Red alder	0.05	0.02	0.14	0.07	0.61	0.15	0.98	0.23	1.89	0.5	1.88	0.58	1.03	0.39	0.6	0.19
Western woodland hardwoods	0.09	0.02	0.12	0.04	0.27	0.04	0.4	0.07	0.44	0.07	0.42	0.07	0.44	0.08	0.31	0.07
Total	10.72	0.61	25.88	1.56	51.21	1.77	64.79	2.15	67.69	2.38	64.49	2.56	58.88	2.58	50.58	2.54
All species groups	30.92	1.15	48.73	1.93	88.59	2.04	114.63	2.49	130.11	2.85	135.56	3.27	139.55	3.52	137.26	3.6

Species group	Diameter class (inches)															
	17.0–18.9		19.0–20.9		21.0–24.9		25.0–28.9		29.0–32.9		33.0–36.9		37.0+		All classes	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
Million bone-dry tons																
Softwoods:																
Douglas-fir	21.01	1.42	17.4	1.41	36.15	2.72	32.88	1.83	32.5	1.96	32.08	2.12	142.1	10.2	427.91	16.69
Engelmann and other spruces	—	—	0.05	0.05	0.24	0.15	0.12	0.06	0.1	0.05	0.02	0.03	—	—	0.68	0.26
Incense-cedar	4.32	0.48	3.85	0.5	7.37	0.93	6.84	0.52	5.26	0.46	5.75	0.63	16.7	1.75	73.24	4.12
Lodgepole pine	5.3	0.75	4.78	0.8	9.15	1.25	6.98	0.83	5.37	0.73	3.02	0.56	3.22	0.58	57.63	5.38
Other western softwoods	4.72	0.6	5.21	0.66	8.03	1.1	5.42	0.64	4.77	0.62	4.01	0.67	7.71	1.29	62.71	4.41
Ponderosa and Jeffrey pines	14.76	1.08	15.75	1.24	24.6	1.78	23.91	1.34	21.71	1.47	17.84	1.35	39.28	2.97	224.1	8.27
Redwood	8.51	1.65	9.73	1.85	16.72	2.43	15.21	2.11	12.23	1.84	11.34	1.78	72.56	22.37	188.94	26.96
Sitka spruce	0.32	0.31	—	—	0.1	0.11	0.13	0.11	0.2	0.11	0.06	0.06	0.81	0.6	2.25	1.07
Sugar pine	2.12	0.34	3.46	0.55	7.04	0.78	6.77	0.55	7.54	0.8	6.95	0.71	33.76	3.39	74.45	4.67
True fir	25.28	1.61	23.64	1.59	46.55	2.89	44.71	2.53	40.14	2.45	34.35	2.42	103.77	8.42	437.73	18.74
Western hemlock	0.34	0.17	0.41	0.34	0.01	0.01	0.16	0.08	0.06	0.04	0.08	0.06	0.23	0.23	3.11	1.08
Western redcedar	—	—	—	—	—	—	0.06	0.07	0.14	0.12	0.25	0.21	0.4	0.31	0.93	0.69
Western white pine	0.54	0.16	0.39	0.13	1.09	0.27	1.27	0.2	1.43	0.23	1.38	0.25	6.1	0.96	14.93	1.57
Western woodland softwoods	1.4	0.18	1.13	0.19	1.29	0.22	0.79	0.12	0.35	0.07	0.31	0.07	0.36	0.09	16.76	1.51
Total	88.61	3.12	85.81	3.31	158.36	5.35	145.23	4.17	131.81	4.19	117.44	4.25	427	27.52	1,585.38	38.71
Hardwoods:																
Cottonwood and aspen	0.22	0.13	0.73	0.36	0.78	0.3	0.57	0.3	0.3	0.13	0.02	0.02	0.12	0.09	4.26	1.31
Oak	27.54	1.84	20.53	1.68	31.74	2.53	18.32	1.2	12.71	1.11	6.75	0.79	11.64	1.74	376.66	11.97
Other western hardwoods	16.14	1.71	10.96	1.28	20.46	2.22	9.16	0.95	5.39	0.68	3.76	0.69	4.93	1.14	206.42	11.37
Red alder	0.51	0.18	0.2	0.14	0.3	0.2	0.07	0.04	0.17	0.09	0.07	0.07	—	—	8.5	1.85
Western woodland hardwoods	0.25	0.05	0.2	0.07	0.3	0.08	0.11	0.04	0.05	0.04	0.02	0.02	0.03	0.02	3.45	0.47
Total	44.65	2.55	32.62	2.2	53.58	3.43	28.22	1.59	18.62	1.31	10.62	1.07	16.72	2.07	599.29	16.62
All species groups	133.25	3.99	118.44	3.96	211.95	6.33	173.46	4.48	150.43	4.39	128.07	4.43	443.72	27.63	2,184.67	42.46

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 5,000 bone-dry tons were estimated; includes all live trees ≥ 1 inch diameter at breast height.

Table 21—Estimated biomass of live trees on forest land by softwood species group, for merchantable tree boles, tops, limbs, stumps, and small trees, California, 2001–2005

Softwood species group	Trees ≥ 8 in d.b.h.				Trees < 8 in d.b.h.			
	Merchantable tree boles		Tops, limbs, and stumps		Whole tree		Total above-ground biomass	
	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million dry tons</i>								
Douglas-fir	308.2	12.7	94.0	3.6	25.7	1.3	427.9	16.7
Engelmann and other spruces	0.5	0.2	0.1	0.1	0.1	0.0	0.7	0.3
Incense-cedar	43.7	2.6	22.8	1.4	6.7	0.5	73.2	4.1
Lodgepole pine	42.1	4.1	10.4	1.0	5.2	0.8	57.6	5.4
Other western softwoods	38.6	3.0	17.9	1.4	6.1	0.6	62.7	4.4
Ponderosa and Jeffrey pines	152.1	5.8	60.7	2.3	11.4	0.7	224.1	8.3
Redwood	75.7	13.7	102.4	13.2	10.9	1.6	188.9	27.0
Sitka spruce	1.5	0.8	0.6	0.3	0.1	0.1	2.3	1.1
Sugar pine	40.1	2.5	33.1	2.2	1.3	0.1	74.4	4.7
True firs	224.3	10.2	182.0	8.0	31.4	1.7	437.7	18.7
Western hemlock	2.1	0.8	0.4	0.1	0.6	0.2	3.1	1.1
Western redcedar	0.6	0.4	0.4	0.3	0.0	0.0	0.9	0.7
Western white pine	10.4	1.1	3.7	0.4	0.9	0.2	14.9	1.6
Western woodland softwoods	9.0	0.9	4.4	0.4	3.3	0.4	16.8	1.5
Total	948.8	22.9	532.9	16.2	103.7	3.0	1,585.4	38.7

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 50,000 bone-dry tons were estimated; includes all live trees ≥ 1 inch diameter at breast height; the merchantable bole is from a 1-foot stump to a 4-inch top.

Table 22—Estimated mass of carbon of all live trees, by owner class and forest land status, California, 2001–2005

Owner class	Unreserved forests						Reserved forests						All forest land	
	Timberland ^a		Other forest ^b		Total		Productive ^a		Other forest ^b		Total			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
Million bone-dry tons														
USDA Forest Service:														
National forest	418.9	11.1	24.2	2.2	443.1	11.1	126.0	8.4	11.3	1.5	137.5	8.4	580.5	11.3
Other federal:														
National Park Service	—	—	—	—	—	—	55.5	7.9	4.0	1.1	59.5	7.9	59.5	7.9
Bureau of Land Management	12.4	3.0	5.0	0.8	17.4	3.0	1.3	0.9	1.1	0.4	2.5	0.9	19.8	3.2
U.S. Fish and Wildlife Service	—	—	—	—	—	—	0.2	0.2	—	—	0.2	0.2	0.2	0.2
Departments of Defense and Energy	0.2	0.2	0.8	0.5	1.0	0.5	—	—	—	—	—	—	1.0	0.5
Other federal	0.6	0.6	0.1	0.0	0.6	0.6	3.7	2.1	1.0	0.7	4.7	2.2	5.3	2.3
Total	13.2	3.0	5.8	1.0	19.0	3.1	60.6	8.1	6.2	1.3	66.8	8.1	85.8	8.5
State and local government:														
State	10.9	3.6	1.3	0.8	12.2	3.7	35.3	12.2	2.7	0.9	38.0	12.2	50.2	12.7
Local	4.6	2.4	2.3	0.7	6.8	2.5	2.2	1.5	1.4	0.9	3.6	1.7	10.4	3.0
Other public	—	—	—	—	—	—	—	—	0.1	0.1	0.1	0.1	0.1	0.1
Total	15.5	4.4	3.6	1.0	19.0	4.5	37.4	12.3	4.2	1.2	41.6	12.3	60.7	13.0
Corporate private:	161.0	9.2	5.3	1.1	166.2	9.3	—	—	—	—	—	—	166.2	9.3
Noncorporate private:														
“Nongovernmental conservation or natural resource organization”	9.4	2.6	0.8	0.5	10.3	2.6	—	—	—	—	—	—	10.3	2.6
“Unincorporated partnerships, associations, or clubs”	2.2	1.4	0.5	0.3	2.6	1.4	—	—	—	—	—	—	2.6	1.4
Native American	8.7	3.2	0.7	0.5	9.4	3.2	—	—	—	—	—	—	9.4	3.2
Individual	156.7	10.5	47.8	3.5	204.7	10.8	—	—	—	—	—	—	204.7	10.8
Total	177.0	11.1	49.7	3.5	227.0	11.4	—	—	—	—	—	—	227.0	11.4
All owners	785.5	17.1	88.6	4.4	874.4	17.1	224.0	16.7	21.7	2.4	245.9	16.7	1,120.2	21.9

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 50,000 bone-dry tons were estimated; includes all live trees ≥1 inch diameter at breast height.

^a Forest land that is capable of producing in excess of 20 cubic feet/acre/year of wood at culmination of mean annual increment.

^b Forest land that is not capable of producing in excess of 20 cubic feet/acre/year of wood at culmination of mean annual increment.

Table 23—Estimated biomass and carbon mass of live trees, snags, and down wood on forest land, by forest type group, California, 2001–2005

Forest type group	Biomass							Carbon						
	Live trees (≥1 in d.b.h.)		Snags (≥5 in d.b.h.)		Down wood ^a (≥3 in l.e.d.)		TOTAL	Live trees (≥1 in d.b.h.)		Snags (≥5 in d.b.h.)		Down wood ^a (≥3 in l.e.d.)		TOTAL
	Total	SE	Total	SE	Total	SE		Total	SE	Total	SE	Total	SE	
Million bone-dry tons														
Softwoods:														
California mixed conifer	724.1	23.3	72.1	3.9	82.8	3.9	879.0	375.6	12.1	37.4	2.0	42.8	2.0	455.8
Douglas-fir	140.0	15.3	10.0	1.6	14.2	2.4	164.2	72.3	7.9	5.2	0.8	7.3	1.2	84.7
Fir/spruce/mountain hemlock	240.7	18.2	34.7	3.6	22.8	2.1	298.2	125.4	9.5	18.1	1.9	11.8	1.1	155.3
Lodgepole pine	61.2	6.8	6.4	1.1	8.9	1.3	76.4	31.9	3.5	3.3	0.6	4.7	0.7	39.9
Other western softwoods	31.7	3.1	2.4	0.4	4.9	0.7	39.0	16.5	1.6	1.3	0.2	2.5	0.4	20.2
Pinyon/juniper	18.7	1.9	1.7	0.4	2.2	0.3	22.6	9.7	1.0	0.9	0.2	1.2	0.2	11.8
Ponderosa pine	92.1	6.9	3.5	0.5	9.3	0.9	104.8	47.8	3.6	1.8	0.3	4.8	0.5	54.4
Redwood	160.9	30.1	11.1	2.8	16.5	4.2	188.5	83.5	15.7	5.8	1.4	8.5	2.2	97.8
Western hemlock/Sitka spruce ^b	3.5	2.5	1.5	1.4	0.3	0.3	5.3	1.8	1.3	0.8	0.7	0.2	0.1	2.8
Western white pine	6.6	1.8	0.9	0.3	0.8	0.3	8.3	3.4	0.9	0.5	0.2	0.4	0.1	4.3
Total	1,479.4	41.2	144.2	6.1	162.7	6.3	1,786.3	767.8	21.4	74.9	3.2	84.2	3.3	927.0
Hardwoods:														
Alder/maple	20.9	5.0	2.7	0.9	4.9	1.5	28.5	10.6	2.5	1.4	0.5	2.6	0.8	14.6
Aspen/birch	1.7	0.7	0.6	0.5	0.2	0.1	2.5	0.8	0.4	0.3	0.3	0.1	0.1	1.3
Elm/ash/cottonwood	2.7	1.6	—	—	—	—	2.7	1.3	0.8	—	—	—	—	1.3
Exotic hardwoods ^b	0.4	0.3	—	—	—	—	0.4	0.2	0.2	—	—	—	—	0.2
Other hardwoods	27.8	5.5	1.9	0.6	2.2	0.5	31.9	13.9	2.8	1.0	0.3	1.1	0.3	16.0
Tanoak/laurel	230.9	18.8	10.5	1.4	25.6	2.8	267.0	116.2	9.5	5.3	0.7	13.2	1.5	134.7
Western oak	414.1	16.3	20.8	1.7	27.1	2.1	462.0	205.9	8.1	10.5	0.9	13.8	1.1	230.2
Woodland hardwoods	5.6	1.0	0.7	0.2	1.1	0.3	7.4	2.8	0.5	0.3	0.1	0.5	0.1	3.7
Total	704.0	24.5	37.3	2.5	61.1	3.8	802.4	351.7	12.3	18.9	1.3	31.3	2.0	401.9
Nonstocked	1.3	0.3	6.3	2.0	2.0	0.4	9.6	0.7	0.1	3.3	1.0	1.1	0.2	5.1
All forest types	2,184.7	42.5	187.8	6.6	225.8	7.0	2,598.3	1,120.2	21.9	97.1	3.4	116.6	3.6	1,333.9

Note: Totals may be off because of rounding; data subject to sampling error; SE = standard error; — = less than 50,000 bone-dry tons were estimated; d.b.h. = diameter at breast height; l.e.d. = large-end diameter of the log.

^a Down wood in this table includes coarse woody material (CWM) only; an additional 123 million tons of biomass and 62 million tons of carbon were estimated for fine woody material (FWM).

^b These forest type groups are represented by <5 plots.

Table 24—Estimated average biomass and carbon mass of live trees, snags, and down wood on forest land, by forest type group, California, 2001–2005

Forest type group	Biomass							Carbon						
	Live trees (≥1 in d.b.h.)		Snags (≥5 in d.b.h.)		Down wood ^a (≥3 in l.e.d.)		TOTAL	Live trees (≥1 in d.b.h.)		Snags (≥5 in d.b.h.)		Down wood ^a (≥3 in l.e.d.)		TOTAL
	Mean	SE	Mean	SE	Mean	SE		Mean	SE	Mean	SE	Mean	SE	
Bone-dry tons per acre														
Softwoods:														
California mixed conifer	91.9	2.0	9.2	0.5	10.5	0.4	111.6	47.7	1.0	4.7	0.2	5.4	0.2	57.8
Douglas-fir	130.9	8.6	9.3	1.3	13.2	1.7	153.4	67.6	4.5	4.8	0.7	6.8	0.9	79.2
Fir/spruce/mountain hemlock	116.4	5.2	16.8	1.4	11.0	0.8	144.2	60.6	2.7	8.7	0.7	5.7	0.4	75.0
Lodgepole pine	60.5	4.0	6.3	0.9	8.8	1.0	75.6	31.5	2.1	3.3	0.5	4.6	0.5	39.4
Other western softwoods	15.7	1.1	1.2	0.2	2.4	0.3	19.3	8.2	0.6	0.6	0.1	1.3	0.2	10.1
Pinyon/juniper	9.9	0.7	0.9	0.2	1.2	0.2	12.0	5.1	0.4	0.5	0.1	0.6	0.1	6.2
Ponderosa pine	39.9	1.9	1.5	0.2	4.0	0.3	45.4	20.7	1.0	0.8	0.1	2.1	0.2	23.6
Redwood	250.3	33.1	17.3	3.7	25.7	5.4	293.3	129.9	17.2	9.0	1.9	13.3	2.8	152.2
Western hemlock/Sitka spruce ^b	198.4	25.7	87.5	17.1	16.5	4.2	302.4	102.7	13.5	45.5	8.9	8.6	2.2	156.8
Western white pine	33.8	6.5	4.9	1.4	4.2	1.1	42.9	17.6	3.4	2.5	0.7	2.2	0.5	22.3
Total	77.4	1.9	7.5	0.3	8.5	0.3	93.4	40.2	1.0	3.9	0.2	4.4	0.2	48.5
Hardwoods:														
Alder/maple	78.1	10.6	10.1	2.8	18.4	4.2	106.6	39.6	5.4	5.2	1.5	9.5	2.2	54.3
Aspen/birch	20.7	6.8	7.5	6.0	2.3	1.4	30.5	10.4	3.4	3.9	3.1	1.1	0.7	15.4
Elm/ash/cottonwood	55.8	16.1	1.0	0.7	1.1	0.4	57.9	27.4	7.9	0.5	0.3	0.5	0.2	28.4
Exotic hardwoods ^b	82.0	19.1	—	—	2.7	0.1	84.7	40.3	9.4	—	—	1.3	0.1	41.6
Other hardwoods	45.6	6.8	3.1	0.8	3.5	0.7	52.2	22.8	3.4	1.6	0.4	1.8	0.3	26.2
Tanoak/laurel	109.3	5.4	5.0	0.6	12.2	1.1	126.5	55.0	2.7	2.5	0.3	6.2	0.5	63.7
Western oak	42.4	1.2	2.1	0.2	2.8	0.2	47.3	21.1	0.6	1.1	0.1	1.4	0.1	23.6
Woodland hardwoods	11.4	1.2	1.4	0.3	2.1	0.4	14.9	5.8	0.6	0.7	0.2	1.1	0.2	7.6
Total	52.6	1.5	2.8	0.2	4.6	0.3	60.0	26.3	0.7	1.4	0.1	2.3	0.1	30.0
Nonstocked	1.8	0.3	8.3	2.5	2.6	0.5	12.7	0.9	0.2	4.3	1.3	1.4	0.3	6.6
All forest types	65.7	1.2	5.6	0.2	6.8	0.2	78.1	33.7	0.6	2.9	0.1	3.5	0.1	40.1

Note: Means are calculated using a ratio of means formula across plots within forest type groups; data subject to sampling error; SE = standard error; — = less than 0.05 bone-dry tons per acre were estimated; d.b.h. = diameter at breast height; l.e.d. = large-end diameter of the log.

^a Down wood in this table includes coarse woody material only.

^b These forest type groups are represented by <5 plots.

Table 25—Estimated average biomass, volume, and density of down wood on forest land, by forest type group and diameter class, California, 2001–2005

Forest type group	Biomass						Volume						Density ^b																																								
	Diameter class (inches) ^a						Diameter class (inches) ^a						Diameter class (inches)																																								
	FWM			CWM			FWM			CWM			CWM			CWM																																					
	<3 in	3 to 19 in	≥20 in	Mean	SE	Total	<3 in	3 to 19 in	≥20 in	Mean	SE	Total	3 to 19 in	≥20 in	Mean	SE	Total																																				
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE																																			
----- Bone-dry tons per acre -----																		----- Cubic feet per acre -----																		----- Logs per acre -----																	
Softwoods:																																																					
California mixed conifer																																																					
Douglas-fir																																																					
Fir/spruce/mountain hemlock																																																					
Lodgepole pine																																																					
Other western softwoods																																																					
Pinyon/juniper																																																					
Ponderosa pine																																																					
Redwood																																																					
Western hemlock/Sitka spruce																																																					
Western white pine																																																					
Total																																																					
Hardwoods:																																																					
Alder/maple																																																					
Aspen/birch																																																					
Elm/ash/cottonwood																																																					
Other hardwoods																																																					
Tanoak/laurel																																																					
Western oak																																																					
Woodland hardwoods																																																					
Total																																																					
Nonstocked																																																					
All forest types																																																					

Note: Means are calculated using a ratio of means formula across plots within forest type groups; data subject to sampling error; SE = standard error; --- = less than 0.05 bone-dry tons per acre, 0.05 cubic feet per acre, and 0.05 logs per acre were estimated; CWM = coarse woody material; FWM = fine woody material.

^a The diameter at the large end is used to classify CWM with decay classes of 1–4; diameter at the point of intersection with the transect is used for heavily decomposed CWM (decay class 5) and for all FWM.

^b An estimate of pieces per acre is not possible for FWM.

Table 26—Estimated biomass and carbon mass of down wood^a on forest land, by forest type group and owner group, California, 2001–2005

Forest type group	USDA				Other federal				State and local governments				Corporate private				Noncorporate private				All owners			
	Forest Service								Biomass		Carbon		Biomass		Carbon		Biomass		Carbon		Biomass		Carbon	
	Biomass	Carbon	Biomass	Carbon	Biomass	Carbon	Biomass	Carbon	Biomass	Carbon	Biomass	Carbon	Biomass	Carbon	Biomass	Carbon	Biomass	Carbon	Biomass	Carbon	Biomass	Carbon		
Million bone-dry tons																								
Softwoods:																								
California mixed conifer	55.8	28.9			5.1	2.6			0.8	0.4			15.4	8			5.7	2.9			82.8	42.8		
Douglas-fir	4.5	2.3			0.7	0.4			0.5	0.2			6	3.1			2.5	1.3			14.2	7.3		
Fir/spruce/mountain hemlock	15.5	8			2.9	1.5			0.5	0.2			3	1.6			0.9	0.5			22.8	11.8		
Lodgepole pine	5.2	2.7			3	1.6			0.1	0			0.1	0.1			0.5	0.3			8.9	4.7		
Other western softwoods	3.3	1.7			0.7	0.4			—	—			0.2	0.1			0.7	0.3			4.9	2.5		
Pinyon/juniper	1.5	0.8			0.6	0.3			—	—			—	—			0.1	0.1			2.2	1.2		
Ponderosa pine	6.4	3.3			0.2	0.1			—	—			1.5	0.8			1.2	0.6			9.3	4.8		
Redwood	0.5	0.3			3.9	2			1.8	0.9			7	3.6			3.4	1.7			16.5	8.5		
Western hemlock/Sitka spruce	—	—			—	—			—	—			0.3	0.2			—	—			0.3	0.2		
Western white pine	0.8	0.4			—	—			—	—			—	—			—	—			0.8	0.4		
Total	93.5	48.4			17.1	8.9			3.7	1.7			33.5	17.5			15	7.7			162.7	84.2		
Hardwoods:																								
Alder/maple	0.9	0.5			0.1	0.1			0.2	0.1			3.2	1.6			0.6	0.3			4.9	2.6		
Aspen/birch	0.2	0.1			—	—			—	—			—	—			—	—			0.2	0.1		
Other hardwoods	0.9	0.5			—	—			—	—			0.4	0.2			0.9	0.4			2.2	1.1		
Tanoak/laurel	6	3.1			0.6	0.3			0.8	0.4			8.9	4.6			9.3	4.8			25.6	13.2		
Western oak	11.2	5.7			1.5	0.8			0.8	0.4			4.5	2.3			9.1	4.6			27.1	13.8		
Woodland hardwoods	0.8	0.4			0.1	—			—	—			—	—			0.2	0.1			1.1	0.5		
Total	20	10.3			2.3	1.2			1.7	0.9			17	8.7			20.1	10.2			61.1	31.3		
Nonstocked	1.7	0.9			0.2	0.1			—	—			0.1	0.1			—	—			2	1.1		
All forest types	115.2	59.6			19.6	10.2			5.4	2.6			50.6	26.3			35.1	17.9			225.8	116.6		

Note: Totals may be off because of rounding; data subject to sampling error; — = less than 50,000 bone-dry tons were estimated.

^a In this table, down wood includes logs ≥3 inches diameter at the large end (coarse woody material). An additional 123 million tons of biomass and 62 million tons of carbon were estimated for fine woody material in the state.

Table 27—Estimated average biomass, volume, and density of snags on forest land, by forest type group and diameter class, California, 2001–2005

Forest type group	Biomass						Volume						Density					
	Diameter class (inches at large end)						Diameter class (inches at large end)						Diameter class (inches at large end)					
	5 to 19		20 to 39		≥40		5 to 19		20 to 39		≥40		5 to 19		20 to 39		≥40	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
----- Bone-dry tons per acre ----- Cubic feet per acre ----- Trees per acre -----																		
Softwoods:																		
California mixed conifer	2.7	0.2	3.6	0.2	2.9	0.3	9.2	0.5	114.7	7	160.5	10.2	117.3	10.8	392.5	19.4	15.6	0.8
Douglas-fir	2.2	0.3	2.8	0.5	4.3	1.1	9.3	1.3	78.5	11.8	110.0	21	126.3	28.9	314.8	41.8	16.0	2.6
Fir/spruce/mountain hemlock	3.9	0.4	7.3	0.7	5.6	0.8	16.8	1.4	149.1	17.8	259.1	27.5	153.4	24.7	561.6	49.7	19.4	1.9
Lodgepole pine	2.0	0.3	3.1	0.5	1.2	0.4	6.3	0.9	114.5	18.6	173.3	28.7	54.5	20.4	342.3	50.3	9.6	1.5
Other western softwoods	0.6	0.1	0.5	0.1	0.1	0.1	1.2	0.2	29.7	6.8	29.9	5.8	7.3	3	67.0	11.1	5.7	1.1
Pinyon/juniper	0.7	0.1	0.2	0.2	—	—	0.9	0.2	27.8	6.4	11.1	2.5	0.2	0.2	39.0	7.7	7.2	1.6
Ponderosa pine	0.7	0.1	0.7	0.1	0.2	0.1	1.5	0.2	32.5	5.8	38.1	7.2	8.4	3.4	79.0	11.5	5.5	0.7
Redwood	2.5	0.7	4.9	1.6	9.9	2.4	17.3	3.7	42.7	12.7	116.5	58.6	166.6	44.3	325.8	94.2	9.0	1.7
Western hemlock/Sitka spruce	4.3	1.1	7.6	5.8	75.6	19.3	87.5	17.1	149.8	38.2	349.0	386.8	975.9	249.3	1,474.7	271	42.5	10.9
Western white pine	1.0	0.3	2.7	1.1	1.2	0.6	4.9	1.4	58.0	20.8	127.8	52.4	39.7	17.9	225.5	68.2	6.8	2.3
Total	2.0	0.1	3.0	0.1	2.5	0.2	7.6	0.3	85.9	3.9	124.0	6.1	83.7	5.9	293.5	11.2	12.3	0.5
Hardwoods:																		
Alder/maple	2.3	0.6	1.2	0.4	6.7	2.7	10.1	2.8	104.4	28.4	42.1	18	160.0	73.8	306.4	83.1	17.8	4.4
Aspen/birch	3.2	2.4	2.8	2.3	1.4	1.4	7.5	6.0	144.9	104.3	127.1	99.1	73.3	69.3	345.2	271.5	22.6	11.3
Elm/ash/cottonwood	0.9	0.6	0.1	0.1	—	—	1.0	0.7	30.0	18.2	2.5	2.6	—	—	32.4	19.2	6.1	4.6
Other hardwoods	2.3	0.7	0.3	0.2	0.5	0.3	3.1	0.8	85.2	26.4	11.7	6	25.8	14.8	122.7	33.8	12.0	2.6
Tanoak/laurel	1.8	0.3	1.3	0.3	1.9	0.3	5.0	0.6	61.0	10.7	46.4	10.7	60.2	12.4	167.7	21.1	11.1	1.1
Western oak	1.2	0.1	0.7	0.1	0.2	0.1	2.1	0.2	41.4	3.7	33.1	3.5	10.2	2.4	84.8	7	7.8	0.6
Woodland hardwoods	0.9	0.2	0.4	0.2	0.1	0.1	1.4	0.3	40.7	9.5	19.8	7.8	2.7	2.7	63.2	13.9	17.1	3.2
Total	1.4	0.1	0.8	0.1	0.6	0.1	2.8	0.2	48.3	3.6	34.4	3.2	21.9	3.2	104.6	6.8	9.2	0.5
Nonstocked	3.5	1.0	3.6	1.4	1.2	0.6	8.3	2.5	148.9	42.1	175.2	70	68.3	35.2	392.3	122	26.3	7
All forest types	1.8	0.1	2.1	0.1	1.7	0.1	5.7	0.2	72.2	2.8	89.1	4	58.4	3.7	219.7	7.5	11.3	0.4

Note: Means are calculated using a ratio of means formula across plots within forest type groups; data subject to sampling error; SE = standard error; — = less than 0.05 bone-dry tons per acre, 0.05 cubic feet per acre, and 0.05 trees per acre were estimated; includes snags ≥5 inches diameter at breast height.

Table 28—Estimated biomass and carbon mass of snags on forest land, by forest type group and owner group, California, 2001–2005

Forest type group	USDA Forest Service						Other federal						State and local governments						Corporate private						Noncorporate private						All owners					
	Biomass			Carbon			Biomass			Carbon			Biomass			Carbon			Biomass			Carbon			Biomass			Carbon			Biomass			Carbon		
	Total	SE		Total	SE		Total	SE		Total	SE		Total	SE		Total	SE		Total	SE		Total	SE		Total	SE		Total	SE		Total	SE				
Million bone-dry tons																																				
Softwoods:																																				
California mixed conifer	57.2	3.4	28.6	1.7	5.2	1.5	2.6	0.8	1.0	0.6	0.5	0.3	6.3	0.9	3.2	0.5	2.4	0.7	1.2	0.3	72.1	3.9	36.1	2.0												
Douglas-fir	4.9	0.9	2.5	0.5	0.2	0.1	0.1	0.0	0.2	0.1	0.1	0.1	2.6	1.1	1.3	0.5	2.0	0.7	1.0	0.3	10.0	1.6	5.0	0.8												
Fir/spruce/mountain hemlock	26.1	2.9	13.0	1.5	5.5	1.8	2.7	0.9	0.9	0.7	0.5	0.3	1.2	0.4	0.6	0.2	1.0	0.7	0.5	0.4	34.7	3.6	17.3	1.8												
Lodgepole pine	3.2	0.5	1.6	0.3	2.0	0.8	1.0	0.4	—	—	—	—	0.4	0.3	0.2	0.1	0.7	0.5	0.4	0.3	6.3	1.1	3.2	0.5												
Other western softwoods	1.9	0.4	0.9	0.2	0.3	0.1	0.2	0.1	—	—	—	—	—	—	—	—	0.2	0.1	0.1	0.0	2.4	0.4	1.2	0.2												
Pinyon/juniper	0.7	0.2	0.4	0.1	0.8	0.3	0.4	0.1	—	—	—	—	—	—	—	—	0.2	0.1	0.1	0.1	1.7	0.3	0.9	0.2												
Ponderosa pine	2.6	0.5	1.3	0.2	0.2	0.1	0.1	0.0	—	—	—	—	0.5	0.2	0.2	0.1	0.2	0.1	0.1	0.0	3.4	0.5	1.7	0.3												
Redwood	0.4	0.4	0.2	0.2	0.5	0.5	0.3	0.2	1.6	0.8	0.8	0.4	3.0	1.0	1.5	0.5	5.6	2.4	2.8	1.2	11.1	2.8	5.5	1.4												
Western hemlock/Sitka spruce	—	—	—	—	—	—	—	—	—	—	—	—	1.4	1.4	0.7	0.7	0.1	0.1	—	—	1.5	1.4	0.8	0.7												
Western white pine	0.9	0.3	0.5	0.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.9	0.3	0.5	0.2												
Total	97.9	4.3	49.0	2.1	14.7	2.3	7.3	1.2	3.7	1.2	1.8	0.6	15.5	2.3	7.7	1.1	12.4	2.7	6.2	1.4	144.2	6.1	72.1	3.0												
Hardwoods:																																				
Alder/maple	1.1	0.5	0.5	0.3	0.2	0.2	0.1	0.1	0.7	0.7	0.3	0.3	0.6	0.3	0.3	0.2	0.2	0.1	0.1	0.1	2.7	0.9	1.4	0.5												
Aspen/birch	0.6	0.5	0.3	0.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.6	0.5	0.3	0.3												
Elm/ash/cottonwood	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—												
Other hardwoods	0.9	0.4	0.5	0.2	—	—	—	—	—	—	—	—	0.1	0.11	—	—	0.9	0.4	0.4	0.2	1.9	0.6	1.0	0.3												
Tanoak/laurel	3.4	0.7	1.7	0.3	0.3	0.2	0.2	0.1	1.4	0.7	0.7	0.3	3.3	0.8	1.7	0.4	2.1	0.5	1.0	0.3	10.5	1.4	5.3	0.7												
Western oak	10.8	1.1	5.4	0.6	1.4	0.5	0.7	0.3	0.5	0.2	0.2	0.1	2.0	0.5	1.0	0.2	6.3	1.1	3.2	0.5	20.8	1.7	10.4	0.9												
Woodland hardwoods	0.5	0.2	0.3	0.1	0.1	0.1	—	—	—	—	—	—	—	—	—	—	0.1	0.0	—	—	0.7	0.2	0.3	0.1												
Total	17.3	1.6	8.6	0.8	2.0	0.6	1.0	0.3	2.6	1.0	1.3	0.5	5.9	1.0	3.0	0.5	9.5	1.2	4.8	0.6	37.3	2.5	18.6	1.2												
Nonstocked	6.0	2.0	3.0	1.0	0.2	0.2	0.1	0.1	—	—	—	—	—	—	—	—	—	—	—	—	6.3	2.0	3.1	1.0												
All forest types	121.2	4.7	60.6	2.4	16.9	2.4	8.5	1.2	6.2	1.5	3.1	0.8	21.4	2.4	10.7	1.2	22.0	3.0	11.0	1.5	187.8	6.6	93.9	3.3												

Note: Totals may be off because of rounding; data subject to sampling error; — = less than 50,000 bone-dry tons were estimated; includes snags ≥ 5 inches in diameter at breast height.

Table 29—Mean cover of understory vegetation on forest land, by forest type group and life form, California, 2001–2005

Forest type group	Seedlings and saplings		Shrubs		Forbs		Graminoids		All understory plants		Bare soil	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
<i>Percent</i>												
Softwoods:												
California mixed conifer	6.3	0.2	17.6	0.6	5.2	0.2	3.6	0.2	31.0	0.7	4.7	0.2
Douglas-fir	7.7	0.8	24.4	2.0	8.9	1.1	4.8	0.9	43.4	2.4	3.5	0.6
Fir/spruce/mountain hemlock	3.5	0.3	17.2	1.3	5.8	0.5	2.9	0.3	28.0	1.4	5.6	0.5
Lodgepole pine	3.7	0.5	10.9	1.3	8.9	0.9	11.0	1.4	31.6	2.1	5.9	0.8
Other western softwoods	1.7	0.2	14.9	1.0	7.6	0.6	14.1	0.9	35.9	1.4	14.1	0.9
Pinyon/juniper	1.0	0.2	17.6	0.9	4.9	0.4	6.9	0.6	29.4	1.3	16.5	1.2
Ponderosa pine	3.0	0.3	23.3	1.2	6.0	0.4	8.5	0.7	39.0	1.3	6.0	0.5
Redwood	7.9	0.9	21.7	2.4	12.5	1.7	3.5	0.7	43.3	2.8	3.4	0.8
Western hemlock/Sitka spruce	0.7	0.3	24.6	16.5	23.4	7.4	2.5	2.8	44.0	14.3	0.2	0.1
Western white pine	10.0	3.8	18.0	4.4	8.9	2.2	5.4	1.1	39.1	6.0	12.5	3.7
Total	4.6	0.1	18.1	0.4	6.3	0.2	6.0	0.2	33.2	0.5	7.2	0.2
Hardwoods:												
Alder/maple	7.5	1.7	35.4	4.6	18.1	2.8	3.6	1.2	58.7	4.4	1.8	0.8
Aspen/birch	14.9	3.1	26.6	5.6	12.6	3.3	8.7	1.7	57.1	6.7	5.1	2.2
Elm/ash/cottonwood	2.2	1.6	51.5	8.7	2.7	1.2	25.7	10.8	69.5	9.8	1.4	0.7
Exotic hardwoods	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0
Other western hardwoods	5.5	0.8	20.7	1.8	7.8	0.8	15.8	2.0	47.3	2.5	9.0	1.5
Tanoak/laurel	12.1	0.8	16.7	1.3	7.2	0.7	4.0	0.8	38.2	1.7	3.0	0.4
Western oak	4.0	0.2	18.2	0.7	11.7	0.5	28.7	0.9	57.5	0.9	4.0	0.2
Total	5.5	0.2	18.7	0.6	10.8	0.4	23.1	0.8	53.7	0.8	4.2	0.2
Nonstocked	1.6	0.6	28.9	2.8	10.7	1.4	16.0	2.3	53.9	2.9	16.0	2.1
All forest types	4.9	0.1	18.6	0.3	8.2	0.2	13.1	0.3	41.9	0.4	6.2	0.2
Chaparral on national forest	0.7	0.2	61.5	1.3	5.9	0.5	6.0	0.5	72.0	1.1	9.0	0.5

Note: Data subject to sampling error; SE = standard error.

Table 30—Mean cover of understory vegetation on forest land, by forest type class, age class, and life form, California, 2001–2005

Forest type class ^a and age class	Seedlings and saplings		Shrubs		Forbs		Graminoids		All understory plants		Bare soil	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
<i>Percent</i>												
Dry conifer:												
0–19	2.6	0.4	25.0	2.2	8.5	1.0	12.9	1.6	47.3	2.5	16.5	1.8
20–39	4.3	0.7	30.0	2.6	6.6	1.1	11.0	1.8	46.9	2.7	7.5	1.1
40–79	4.6	0.3	19.7	0.9	6.3	0.4	7.2	0.5	35.9	1.0	7.6	0.5
80–159	4.5	0.2	16.1	0.6	6.0	0.3	6.8	0.4	31.6	0.7	7.4	0.4
160+	3.9	0.3	16.7	0.8	5.5	0.4	5.2	0.5	29.8	1.0	8.3	0.6
All ages	4.3	0.2	18.2	0.4	6.1	0.2	7.1	0.3	33.8	0.5	8.2	0.3
Wet conifer:												
0–19	6.3	1.4	35.2	5.9	10.5	2.7	6.9	1.9	54.8	7.9	10.6	2.3
20–39	5.5	0.8	34.2	3.4	10.8	1.5	3.8	1.7	51.7	3.3	6.0	1.9
40–79	5.2	0.5	23.5	1.9	7.5	0.9	3.8	0.6	37.9	2.1	3.8	0.5
80–159	5.0	0.5	13.7	1.2	7.4	0.9	3.2	0.4	27.9	1.7	5.1	0.5
160+	6.4	0.8	18.5	2.3	7.5	1.0	3.2	0.6	33.9	2.4	3.8	0.7
All ages	5.4	0.3	20.0	1.0	7.9	0.5	3.5	0.3	35.0	1.2	4.6	0.3
Dry hardwood:												
0–19	13.1	1.3	32.9	3.0	10.1	1.3	14.3	2.4	65.4	2.6	9.2	1.4
20–39	10.0	1.1	24.5	2.0	7.4	0.9	8.6	1.7	47.2	2.3	3.0	0.6
40–79	4.8	0.3	18.4	0.9	9.9	0.6	21.6	1.2	50.6	1.3	3.6	0.3
80–159	4.8	0.4	16.3	1.0	10.5	0.6	25.4	1.3	52.7	1.4	4.4	0.4
160+	3.5	0.5	14.0	1.2	14.3	1.1	33.9	2.2	60.4	2.0	4.1	0.7
All ages	5.4	0.2	18.2	0.6	10.7	0.4	23.6	0.8	53.5	0.8	4.2	0.2
Wet hardwood:												
0–19	11.5	2.9	24.3	9.7	11.0	4.1	8.9	4.2	52.1	10.0	1.5	0.7
20–39	9.8	3.2	45.9	7.5	20.5	4.1	3.0	2.0	68.4	6.2	0.6	0.2
40–79	7.2	2.8	36.9	6.0	15.3	3.7	4.5	1.4	59.9	6.3	1.0	0.3
80–159	7.0	2.2	29.2	7.6	16.7	6.7	4.8	2.6	54.6	8.8	4.6	3.3
160+	8.0	3.7	27.1	7.6	7.4	3.3	18.4	7.0	52.8	9.2	5.7	3.0
All ages	8.4	1.4	35.4	3.5	15.2	2.1	7.2	1.7	59.6	3.4	2.4	0.8
All forest type classes:												
0–19	7.2	0.6	28.7	1.7	9.3	0.7	13.1	1.3	55.1	1.8	13.0	1.2
20–39	7.4	0.6	29.1	1.5	8.5	0.7	8.2	1.0	49.1	1.5	4.8	0.6
40–79	4.8	0.2	19.7	0.6	8.2	0.3	13.6	0.6	43.4	0.8	5.2	0.3
80–159	4.7	0.2	16.0	0.5	7.8	0.3	12.8	0.5	38.5	0.7	6.1	0.3
160+	4.1	0.3	16.2	0.7	8.7	0.5	14.7	0.9	40.8	1.0	6.3	0.4
All ages	4.9	0.1	18.6	0.3	8.2	0.2	13.1	0.3	41.9	1.1	6.2	0.5

Note: Data subject to sampling error; SE = standard error.

^a Dry conifer includes the pinyon/juniper, ponderosa, western white, and lodgepole pines; other softwoods; mixed conifer; and nonstocked forest types. Wet conifer includes the Douglas-fir, fir/spruce/mountain hemlock, hemlock/Sitka spruce, and redwood forest types. Dry hardwood includes the western oak, tanoak/laurel, other hardwoods, and exotic forest types. Wet hardwood includes the elm/ash/cottonwood, aspen/birch, and alder/maple forest types.

Table 31—Estimated mean crown density and other statistics^a for live trees on forest land, by species group, California, 2001–2005

Species group	Plots	Trees	Crown density				
			Mean	SE	Minimum	Median	Maximum
	-- Number --		----- Percent -----				
Softwoods:							
Douglas-fir	86	685	39.4	0.9	0	40	85
Incense-cedar	53	340	39.5	1.2	10	40	75
Lodgepole pine	20	262	38.4	2.2	5	40	85
Other western softwoods	63	292	41.8	1.3	0	40	80
Ponderosa and Jeffrey pines	103	781	40	1.1	5	40	95
Redwood	11	153	33.8	2.3	0	35	65
Sugar pine	42	150	41.9	1.8	0	40	80
True fir	97	1,159	43.9	0.9	0	40	99
Western white pine	15	68	36.5	1.7	15	35	55
Western woodland softwoods	16	77	47.9	4.8	10	45	90
Total	303	5,454	44.2	0.9	0	40	99
Hardwoods:							
Cottonwood and aspen	5	49	26.7	2.8	0	25	60
Oak	147	1,904	33.6	0.6	0	35	85
Other western hardwoods	66	906	34.6	1.2	0	35	85
Red alder	6	59	43	2.8	15	40	70
Western woodland hardwoods	19	181	38.1	2.8	5	35	85
Total	194	3,099	34.2	0.6	0	35	85
All species groups	327	7,077	38	0.5	0	35	99

Note: Data subject to sampling error; SE = standard error; includes live trees >4.9 inches diameter at breast height.

^a The mean, SE, and median calculations consider the clustering of trees on plots.

Table 32—Estimated mean foliage transparency and other statistics^a for live trees on forest land, by species group, California, 2001–2005

Species group	Plots	Trees	Foliage transparency				
			Mean	SE	Minimum	Median	Maximum
	-- Number --		----- Percent -----				
Softwoods:							
Douglas-fir	86	685	18.9	0.4	0	20	40
Incense-cedar	53	340	18.7	0.5	5	20	35
Lodgepole pine	20	262	17.2	0.8	10	15	40
Other western softwoods	63	292	18.7	0.9	5	15	40
Ponderosa and Jeffrey pines	103	781	20.3	0.5	5	20	65
Redwood	11	153	19.2	1.4	0	20	99
Sugar pine	42	150	19.3	0.5	10	20	65
True fir	97	1,159	16.8	0.4	0	15	99
Western white pine	15	68	18.2	1.4	15	15	30
Western woodland softwoods	16	77	17.7	1.3	5	20	30
Total	266	3,978	18.4	0.2	0	20	99
Hardwoods:							
Cottonwood and aspen	5	49	25.4	2.9	15	25	99
Oak	147	1,904	22.3	0.5	0	20	99
Other western hardwoods	66	906	21.2	0.9	5	20	99
Red alder	6	59	20.6	0.5	15	20	25
Western woodland hardwoods	19	181	26.1	2.0	15	25	60
Total	194	3,099	22.2	0.4	0	20	99
All species groups	327	7,077	20.1	0.3	0	20	99

Note: Data subject to sampling error; SE = standard error; includes live trees >4.9 inches diameter at breast height.

^a The mean, SE, and median calculations consider the clustering of trees on plots.

Table 33—Estimated mean crown dieback and other statistics^a for all live trees on forest land, by species group, California, 2001–2005

Species group	Plots	Trees	Crown density				
			Mean	SE	Minimum	Median	Maximum
	-- Number --		----- Percent -----				
Softwoods:							
Douglas-fir	86	686	0.8	0.2	0	0	90
Incense-cedar	53	340	2.0	0.4	0	0	90
Lodgepole pine	20	262	1.3	0.4	0	0	25
Other western softwoods	63	293	2.0	0.4	0	0	75
Ponderosa and Jeffrey pines	103	781	1.1	0.3	0	0	80
Redwood	11	153	2.5	1.9	0	0	99
Sugar pine	42	150	1.1	0.5	0	0	50
True fir	97	1,159	2.0	0.5	0	0	99
Western white pine	15	69	2.2	1.1	0	0	40
Western woodland softwoods	16	77	4.9	1.3	0	0	30
Total	266	3,981	1.6	0.2	0	0	99
Hardwoods:							
Cottonwood and aspen	5	49	6.0	4.5	0	0	99
Oak	148	1,924	4.6	0.6	0	0	99
Other western hardwoods	66	917	2.6	0.7	0	0	99
Red alder	6	59	3.7	1.4	0	5	15
Western woodland hardwoods	19	181	8.0	2.6	0	5	80
Total	195	3,130	4.2	0.5	0	0	99
All species groups	327	7,111	2.8	0.2	0	0	99

Note: Data subject to sampling error; SE = standard error; includes live trees >4.9 inches diameter at breast height.

^a The mean, SE, and median calculations consider the clustering of trees on plots.

Table 34—Properties of the forest floor layer on forest land, by forest type, California, 2001, 2003–2005

Forest type	Samples	Moisture content (oven-dry basis)		Organic carbon	Total nitrogen
		<i>Number</i>	<i>Percent</i>		
				----- Percent -----	
Bigleaf maple	1	6.35	19.33	0.56	
Blue oak	20	8.42	24.80	0.90	
California black oak	10	32.34	29.01	0.77	
California mixed conifer	61	21.41	33.81	0.73	
California white oak (valley oak)	2	10.91	28.21	0.74	
Canyon live oak	22	18.57	26.94	0.65	
Coast live oak	9	26.68	30.23	0.93	
Cottonwood	1	9.92	32.27	0.86	
Cottonwood/willow	1	15.12	26.00	0.84	
Douglas-fir	5	64.51	27.17	0.84	
Gray pine	7	15.67	28.30	0.79	
Interior live oak	10	9.56	29.77	0.82	
Jeffrey pine	7	11.07	37.71	0.83	
Juniper woodland	5	14.36	24.91	0.54	
Knobcone pine	1	9.39	28.57	0.66	
Lodgepole pine	11	15.32	33.51	0.79	
Miscellaneous western softwoods	2	12.37	41.84	0.62	
Mountain brush woodland	4	5.52	30.48	1.11	
Nonstocked	6	8.49	32.67	0.69	
Oregon white oak	4	16.92	35.66	0.94	
Other hardwoods	1	22.10	33.03	1.17	
Pacific madrone	3	16.27	40.15	0.87	
Pinyon/juniper woodland	5	13.27	31.42	0.71	
Ponderosa pine	11	27.38	36.74	0.80	
Port-Orford-cedar	1	20.68	41.06	1.21	
Red alder	1	46.61	31.33	0.83	
Red fir	6	18.76	29.47	0.64	
Redwood	2	15.67	33.98	0.38	
Tanoak	16	48.24	30.27	0.70	
Western juniper	9	22.00	32.31	0.71	
Western white pine	2	10.37	26.44	0.67	
White fir	14	44.52	32.42	0.93	
Whitebark pine	1	7.74	37.32	1.22	

Note: Data subject to sampling error.

Table 35—Properties of the mineral soil layer on forest land, by depth of layer and forest type, California, 2001, 2003–2005

Depth of layer and forest type	Samples	Soil properties			
		Texture	Moisture content (oven-dry basis)	Coarse fragments	Bulk density
	<i>Number</i>	<i>Most common</i>	-----Percent-----		<i>g/cm³</i>
Mineral layer 1 (0–10 cm):					
Bigleaf maple	1	Clayey	8.19	19.72	1.23
Blue oak	18	Loamy	5.46	31.90	1.28
California black oak	9	Loamy	59.37	40.12	0.96
California mixed conifer	52	Loamy	11.36	38.41	1.00
California white oak (valley oak)	2	Sandy	5.79	36.31	1.63
Canyon live oak	18	Loamy	11.09	43.73	1.12
Coast live oak	7	Clayey	10.88	46.25	1.15
Cottonwood	1	Loamy	33.57	65.29	1.23
Cottonwood/willow	1	Sandy	6.04	8.00	0.77
Douglas-fir	3	Loamy	21.26	53.11	0.84
Gray pine	7	Clayey	7.02	28.37	1.43
Interior live oak	8	Loamy	6.20	25.22	1.15
Jeffrey pine	6	Loamy	6.04	24.05	1.19
Juniper woodland	4	Sandy	2.00	19.88	1.57
Knobcone pine	1	Clayey	5.25	35.50	1.52
Lodgepole pine	10	Loamy	5.64	24.36	1.05
Misc. western softwoods	1	Loamy	29.04	18.54	—
Mountain brush woodland	2	Loamy	7.42	13.98	1.10
Nonstocked	5	Loamy	11.70	26.04	1.05
Oregon white oak	2	Clayey	9.79	38.00	0.99
Pacific madrone	3	Loamy	8.77	34.44	1.06
Pinyon/juniper woodland	4	Sandy	1.42	21.76	1.65
Ponderosa pine	6	Loamy	11.53	16.72	1.04
Red alder	1	Loamy	19.14	44.96	0.90
Red fir	5	Loamy	10.76	32.18	0.83
Redwood	1	Loamy	7.88	40.31	0.87
Tanoak	13	Loamy	17.28	42.49	0.95
Western juniper	7	Loamy	8.25	20.68	1.05
Western white pine	1	Loamy	5.52	43.59	—
White fir	13	Loamy	17.02	39.48	0.85
Mineral layer 2 (10–20 cm):					
Bigleaf maple	1	Clayey	9.92	19.03	1.37
Blue oak	17	Loamy	5.88	27.56	1.40
California black oak	7	Loamy	13.13	40.89	1.01
California mixed conifer	47	Loamy	12.01	37.39	1.20
California white oak (valley oak)	2	Sandy	7.38	43.95	1.77
Canyon live oak	14	Loamy	14.64	39.33	1.22
Coast live oak	5	Clayey	9.70	42.18	1.30
Cottonwood	1	Loamy	13.53	54.02	1.37
Cottonwood/willow	1	Sandy	11.51	19.85	1.13
Douglas-fir	3	Loamy	21.21	42.27	1.08
Gray pine	6	Clayey	8.32	37.38	1.47
Interior live oak	7	Loamy	6.87	28.40	1.33
Jeffrey pine	6	Loamy	7.18	27.23	1.22
Juniper woodland	2	Sandy	2.54	29.65	1.93
Knobcone pine	1	Clayey	6.28	34.31	1.08
Lodgepole pine	10	Loamy	6.70	26.28	1.28
Misc. western softwoods	1	Loamy	28.00	27.28	—
Mountain brush woodland	2	Loamy	9.91	40.16	1.54
Nonstocked	5	Loamy	11.59	30.36	1.27
Oregon white oak	2	Clayey	11.59	49.17	1.26
Pacific madrone	3	Loamy	11.31	20.55	1.19
Pinyon/juniper woodland	3	Sandy	2.05	28.04	1.58
Ponderosa pine	6	Loamy	11.69	26.42	1.39
Red alder	1	Clayey	16.17	53.25	0.67
Red fir	4	Loamy	12.59	34.74	0.96
Redwood	1	Loamy	9.44	69.92	1.01
Tanoak	13	Clayey	19.35	39.98	1.08
Western juniper	6	Clayey	11.24	34.43	1.02
Western white pine	1	Loamy	6.31	13.34	—
White fir	12	Loamy	17.91	38.47	0.89

Note: Data subject to sampling error; — = No data available for this sample.

Table 36—Chemical properties of mineral soil layers on forest land, by depth and forest type, California, 2001, 2003–2005

Depth of layer and forest type	Samples	pH		Organic carbon	Inorganic carbon	Total nitrogen	Extractable phosphorus	Exchangeable cations					ECEC ^a	Extractable sulfur
		H ₂ O	CaCl ₂					Na	K	Mg	Ca	Al		
Number														
Mineral layer 1 (0–10 cm):														
Bigleaf maple	1	5.95	5.20	3.82	0.22	0.19	15.29	22.64	357.80	594.50	2360.03	1.86	17.70	0
Blue oak	18	6.36	5.83	2.41	0.20	0.20	20.56	9.60	259.36	463.05	2125.87	3.07	15.16	7.18
California black oak	9	6.02	5.25	7.83	0.19	0.40	41.16	10.19	226.40	239.70	2377.54	20.77	14.69	4.07
California mixed conifer	52	5.88	5.24	4.27	0.17	0.17	57.49	14.78	247.81	255.03	1557.13	27.97	10.88	5.85
California white oak (valley oak)	2	6.33	5.74	1.73	0.16	0.12	27.82	0	169.86	123.24	1462.40	0	8.75	17.19
Canyon live oak	18	6.07	5.42	4.54	0.22	0.23	61.23	13.47	222.02	182.40	2061.75	26.04	12.70	5.08
Coast live oak	7	6.23	5.76	3.83	0.27	0.27	18.26	9.43	270.01	605.10	2268.31	2.09	17.05	7.94
Cottonwood	1	7.51	7.36	1.71	0.67	0.15	4.68	539.9	386.00	839.90	5881.00	0.76	39.60	956.30
Cottonwood/willow	1	7.05	6.65	0.78	0.18	0.07	16.66	0	157.70	600.50	3016.00	0	20.39	0.93
Douglas-fir	3	5.67	5.01	5.78	0.15	0.29	66.91	16.25	233.33	221.97	2030.98	44.01	13.12	5.48
Gray pine	7	6.42	5.72	1.89	0.20	0.12	15.32	16.04	228.65	596.60	1978.33	2.07	15.46	4.87
Interior live oak	8	6.06	5.44	2.92	0.20	0.17	28.37	13.51	188.67	198.39	1444.81	17.8	9.58	2.94
Jeffrey pine	6	6.18	5.34	2.63	0.18	0.18	105.67	17.35	208.46	75.72	1319.39	17.27	8.01	3.12
Juniper woodland	4	6.56	5.90	0.80	0.13	0.08	19.62	6.94	158.53	253.23	1486.24	0	9.93	0.37
Knobcone pine	1	5.95	5.24	1.43	0.23	0.09	12.20	0.10	160.50	145.30	670.00	3.92	4.99	0
Lodgepole pine	10	5.21	4.47	2.86	0.12	0.12	90.51	3.26	90.65	46.62	450.04	73.68	3.69	2.03
Misc. western softwoods	1	6.49	5.95	7.80	0.33	0.46	2.57	44.45	113.88	3925.00	174.60	0	33.63	4.72
Mountain brush woodland	2	6.36	5.81	3.30	0.20	0.29	35.83	11.00	537.78	274.70	3310.50	1.06	20.21	5.94
Nonstocked	5	6.27	5.73	3.26	0.31	0.19	16.33	5.67	263.39	238.54	2563.38	70.43	16.23	8.66
Oregon white oak	2	6.69	6.10	3.00	0.25	0.14	48.95	26.73	392.45	439.10	2424.00	0	16.83	9.61
Pacific madrone	3	5.54	4.90	3.07	0.18	0.15	100.71	0.64	198.68	146.51	1037.95	18.71	7.10	18.11
Pinyon/juniper woodland	4	6.80	6.22	0.59	0.19	0.04	26.39	3.59	95.67	69.95	1176.25	0.08	6.71	1.61
Ponderosa pine	6	6.08	5.36	3.92	0.28	0.20	32.39	11.40	449.95	265.89	2688.83	1.55	16.82	5.48
Red alder	1	5.40	4.68	4.86	0.12	0.26	86.82	17.66	273.90	153.70	1117.93	45.84	8.13	5.74
Red fir	4	5.41	4.67	4.98	0.13	0.17	77.84	14.35	109.42	25.49	467.58	93.77	3.93	2.65
Redwood	1	12.80	0.31	0.43	68.20	21.66	462.57	725.20	5454.00	3.17	34.49	5.48		
Tanoak	13	5.02	4.33	3.80	0.19	0.14	18.15	14.88	220.90	204.32	880.33	212.06	9.06	6.11
Western juniper	7	6.41	5.78	4.66	0.21	0.37	15.24	12.67	235.10	406.62	2222.44	16.67	15.28	3.76
Western white pine	1	4.91	4.30	4.73	0.20	0.09	40.70	0	54.23	38.03	588.90	81.46	4.30	3.75
White fir	13	5.94	5.34	6.81	0.22	0.32	37.86	17.13	255.54	149.49	2124.62	30.85	12.90	7.94

Table 36—Chemical properties of mineral soil layers on forest land, by depth and forest type, California, 2001, 2003–2005 (continued)

Depth of layer and forest type	Samples	pH		Organic carbon	Inorganic carbon	Total nitrogen	Extractable phosphorus	Exchangeable cations					Extractable sulfur	
		H ₂ O	CaCl ₂					Na	K	Mg	Ca	Al		ECEC ^a
Number														
Mineral layer 2 (10–20 cm):														
Bigleaf maple	1	6.18	4.98	1.14	0.20	0.12	8.30	0	173.6	530.7	1683	10.49	13.32	1.11
Blue oak	17	6.35	5.73	1.57	0.18	0.14	19.44	9.41	254.27	449.26	2066.02	6.06	14.76	3.29
California black oak	7	5.78	5.08	4.04	0.17	0.21	30.37	10.37	216.37	144.07	1375.31	44.49	9.14	10.03
California mixed conifer	47	5.90	5.19	2.56	0.13	0.10	29.91	8.32	225.73	208.45	1141.47	31.69	8.38	6.18
California white oak (valley oak)	2	6.06	5.18	1.21	0.14	0.09	57.44	3.95	153.95	118.28	1115.75	2.43	6.98	7.48
Canyon live oak	14	6.16	5.49	2.89	0.15	0.15	46.92	10.38	209.46	164.60	1838.23	20.83	11.34	6.32
Coast live oak	5	5.66	4.90	1.95	0.20	0.15	11.02	11.45	164.09	645.86	1197.04	37.98	12.18	3.49
Cottonwood	1	7.54	7.33	0.40	0.34	0.03	2.52	134.70	268.60	345.40	3549	0	21.82	442.10
Cottonwood/willow	1	7.12	6.66	1.67	0.21	0.11	13.98	1.13	170.30	630.20	3173	0	21.46	0.12
Douglas-fir	3	5.63	4.99	4.25	0.16	0.19	77.74	14.22	212.37	143.40	1286.40	27.55	8.51	1.76
Gray pine	6	6.34	5.49	0.93	0.14	0.08	11.06	12.10	210.22	805.02	1920.36	4.14	16.84	1.18
Interior live oak	7	6.08	5.21	1.17	0.17	0.12	38.24	13.51	172.13	151.57	1098.60	45.52	7.73	3.09
Jeffrey pine	6	5.99	5.39	2.07	0.14	0.10	67.85	10.01	162.11	55.79	1011.27	20.71	6.19	2.16
Juniper woodland	2	6.72	5.95	0.66	0.18	0.10	16.91	4.57	74.73	122.15	1624.5	1.10	9.33	0.41
Knobcone pine	1	5.58	4.90	1.58	0.20	0.07	9.57	0	126.50	122.40	558.30	7.53	4.20	0
Lodgepole pine	10	5.48	4.62	1.66	0.14	0.08	73.62	9.68	94.87	47.17	401.26	62.41	3.37	2.77
Misc. western softwoods	1	6.47	6.01	9.16	0.26	0.48	1.46	31.45	136.46	3741	195.70	0	32.23	14.63
Mountain brush woodland	2	6.71	6.02	1.22	0.11	0.11	5.39	19.5	226.31	177.15	2174.55	0.72	12.98	3.61
Nonstocked	5	6.56	5.96	1.26	0.37	0.08	8.65	8.34	191.16	227.21	2149.88	50.77	13.69	58.11
Oregon white oak	2	6.48	5.79	1.77	0.12	0.10	40.34	21.10	217.70	530.40	1975	0	14.87	4.13
Pacific madrone	3	5.62	4.93	2.60	0.17	0.14	65.12	3	166.94	102.68	749.57	23.16	5.28	3.74
Pinyon/juniper woodland	3	7.22	6.49	0.45	0.17	0.03	4.95	16.41	117.17	78.08	1537.73	0.70	8.69	18.85
Ponderosa pine	6	6.22	5.41	3.38	0.14	0.16	24.13	4.27	379.51	190.87	1687.60	4.33	11.03	3.12
Red alder	1	5.62	4.82	4.61	0.21	0.24	108.91	10.11	150.60	103.80	1242	23.52	7.74	5.61
Red fir	3	5.46	4.70	2.79	0.16	0.08	51.01	18.86	126.13	15.20	310.43	68.25	2.84	8.46
Redwood	1	6.02	5.38	4.99	0.20	0.17	59.60	0	393.81	425.90	3066	2.32	19.83	5.72
Tanoak	13	5.23	4.60	2.70	0.17	0.12	17.50	13.77	175.21	189.05	851.42	190.83	8.43	4.58
Western juniper	6	6.34	5.68	2.72	0.15	0.15	9.80	10.49	207.70	454.36	1982.75	28.66	14.53	3.05
Western white pine	1	5	4.39	2.01	0.20	0.05	253	0	54.36	5.49	151.70	84.19	1.88	0
White fir	12	6.07	5.35	4.17	0.17	0.24	27.51	7.04	230.58	109.92	1805.57	13.29	10.68	2.88

Note: Data subject to sampling error; — = less than 0.005 emole/kg were estimated; H₂O = water, CaCl₂ = calcium chloride, Na = sodium, K = potassium, Mg = magnesium, Ca = calcium, and Al = aluminum.

^a ECEC = effective cation exchange capacity.

Table 37—Chemical properties (trace elements) of forest floor and mineral soils on forest land, by forest type, California, 2001, 2003–2005

		Extractable						
Depth of layer and forest type	Samples	Manganese	Iron	Nickel	Copper	Zinc	Cadmium	Lead
	Number	----- mg/kg -----						
Mineral layer 1 (0–10 cm):								
Bigleaf maple	1	19.11	—	—	—	0.35	0.11	—
Blue oak	18	10.83	0.12	0.35	—	0.23	0.06	0.06
California black oak	9	30.26	0.07	0.39	—	0.10	0.06	0.18
California mixed conifer	52	35.40	0.95	0.80	0.01	0.26	0.05	0.07
California white oak (valley oak)	2	8.63	0.19	—	—	—	0.07	—
Canyon live oak	18	21.88	0.60	0.10	—	0.40	0.05	0.43
Coast live oak	7	30.19	0.10	0.26	0.03	0.34	0.05	0.09
Cottonwood	1	3.69	0.54	—	—	—	0.07	0.13
Cottonwood / willow	1	9.99	—	—	—	—	0.01	—
Douglas-fir	3	53.51	0.02	0.24	0.32	0.36	0.07	0.09
Gray pine	7	17.70	0.15	0.39	—	—	0.05	0.10
Interior live oak	8	8.05	1.26	0.10	0.02	0.21	0.05	0.02
Jeffrey pine	6	14.58	0.08	—	0.34	0.46	0.13	0.15
Juniper woodland	4	6.73	0.02	0.05	—	0.04	0.05	—
Knobcone pine	1	14.67	—	—	—	—	0.02	0.03
Lodgepole pine	10	25.89	0.01	0.12	—	0.55	0.03	0.15
Misc. western softwoods	1	8.83	—	10.74	—	—	0.06	1.18
Mountain brush woodland	2	16.26	0.35	0.12	—	—	0.01	—
Nonstocked	5	6.58	2.74	0.26	—	0.11	0.02	—
Oregon white oak	2	10.48	0.54	0.10	—	0.13	0.02	0.18
Pacific madrone	3	26.84	0.30	0.10	—	0.01	0.07	0.04
Pinyon/juniper woodland	4	5.93	—	0.02	—	0.04	0.05	—
Ponderosa pine	6	16.32	1.07	0.06	—	0.22	—	0.11
Red alder	1	36.22	—	0.49	—	0.61	0.04	—
Red fir	4	23.33	5.70	0.07	—	0.68	0.04	0.21
Redwood	1	28.42	—	—	—	0.03	0.06	—
Tanoak	13	39.40	5.76	0.65	—	0.46	0.04	0.17
Western juniper	7	17.32	0.74	0.10	—	0.11	0.02	0.02
Western white pine	1	102.70	3.56	0.05	—	1.80	0.05	0.07
White fir	13	37.57	1.58	0.30	0.06	0.53	0.03	0.03
Mineral layer 2 (10–20 cm):								
Bigleaf maple	1	7.20	—	0.25	—	0.10	0.05	—
Blue oak	17	9.40	0.06	0.35	0.01	0.01	0.04	0.10
California black oak	7	33.50	0.08	0.56	0.01	0.11	0.02	0.03
California mixed conifer	47	17.24	1.13	0.34	0.03	0.18	0.03	0.25
California white oak (valley oak)	2	6.69	0.22	0.01	—	—	0.05	0.07
Canyon live oak	14	12.81	0.13	0.03	0.02	0.09	0.02	0.17
Coast live oak	5	19.96	—	1.18	0.01	1.10	0.02	0.37
Cottonwood	1	3.65	—	0.01	—	—	0.06	—
Cottonwood / willow	1	6.87	—	—	—	—	0.01	—
Douglas-fir	3	25.16	0.01	0.15	—	0.31	0.03	0.60
Gray pine	6	6.75	0.23	0.67	—	0.10	0.01	0.28
Interior live oak	7	4.04	2.87	0.13	0.04	0.26	0.03	0.27
Jeffrey pine	6	8.40	0.51	0.04	0.09	0.31	0.10	0.16
Juniper woodland	2	6.18	—	—	—	0.04	0.02	0.41
Knobcone pine	1	20.35	0.27	0.06	—	—	0.04	0.13
Lodgepole pine	10	19.17	0.10	0.14	0.04	0.31	0.01	0.6
Misc. western softwoods	1	8.56	—	—	—	0.11	—	0.71
Mountain brush woodland	2	6.59	—	0.11	—	—	0.02	—
Nonstocked	5	3.11	0.28	0.15	0.04	0.05	0.01	0.21
Oregon white oak	2	8.23	—	0.11	0.19	0.01	0.02	0.07
Pacific madrone	3	21.24	—	—	—	0.03	0.01	0.07
Pinyon/juniper woodland	3	2.97	—	—	—	0.30	0.01	0.13
Ponderosa pine	6	11.57	—	—	—	0.08	0.01	0.17
Red alder	1	38.77	—	0.54	—	0.70	0.12	1.15
Red fir	3	8.17	3.65	—	—	—	0.01	0.01
Redwood	1	15.65	—	—	—	—	0.04	—
Tanoak	13	23.85	2.33	0.24	0.03	0.13	0.02	0.25
Western juniper	6	14.81	0.79	0.14	0.02	0.14	0.02	0.19
Western white pine	1	53.11	—	—	—	0.69	0.01	—
White fir	12	10.97	0.37	0.64	—	0.17	0.02	0.03

Note: Data subject to sampling error; — = less than 0.005 mg/kg were estimated.

Table 38—Compaction, bare soil, and slope properties of forest land, by forest type, California, 2001, 2003–2005

Forest type	Plots sampled	Plots reporting compaction	Compacted area per plot	Bare soil cover	Slope
	<i>Number</i>			<i>Percent</i>	
Bigleaf maple	1	0	0	2.33	65
Blue oak	22	14	24.99	6.85	21.86
California black oak	9	5	3.30	3.08	42.44
California mixed conifer	62	26	5.42	5.31	30.90
California white oak (valley oak)	2	0	0	3	27.50
Canyon live oak	21	7	2.23	6.06	54.38
Coast live oak	9	1	0.33	4.28	37.56
Cottonwood	1	1	6.25	17.5	0
Cottonwood / willow	2	2	18.25	1.50	7
Douglas-fir	3	0	0	1	36
Gray pine	7	4	1.89	5.07	14.17
Interior live oak	11	2	0.89	3.77	26.78
Jeffrey pine	7	1	0.36	5.60	23.71
Juniper woodland	5	2	2.75	28	30.8
Knobcone pine	1	1	2.50	12.75	28
Lodgepole pine	11	3	0.89	15.06	13.09
Misc. western softwoods	2	0	0	5.50	45
Mountain brush woodland	5	0	0	6.07	24.8
Nonstocked	6	0	0	4.07	19.83
Oregon white oak	4	0	0	2.17	28.33
Other hardwoods	1	0	0	0.75	63
Pacific madrone	2	0	0	2.13	47
Pinyon/juniper woodland	6	0	0	17.29	35
Ponderosa pine	11	3	3.07	10.41	17.82
Port-Orford-cedar	1	0	0	1	25
Red alder	1	1	25	5	37
Red fir	6	2	2.71	8.92	30.83
Redwood	3	0	0	3	44.67
Tanoak	17	9	4.42	4.75	39.63
Western juniper	9	4	1.83	9.68	15.63
Western white pine	2	0	0	1.50	30.50
White fir	12	6	9.06	7.15	22.50
Whitebark pine	1	0	0	5.50	38

Note: Data subject to sampling error.

Table 39—Estimated number of live trees^a with damage on forest land, by species and type of damage, California, 2001–2005

Species	Total number of live trees		Number of live trees with damage ^b		Type of damage											Weather	
	Total	SE	Total	SE	Animal	Bark beetles	Cankers	Defoliators	Dwarf mistletoe	Leafy mistletoe	Foliage diseases	Stem decay	Other insects	Physical damage or defect	Root disease		
Thousand trees																	
Softwoods:																	
Bigcone Douglas-fir	1,064	443	312	131	—	—	8	—	—	—	—	54	—	266	—	—	—
Bishop pine	1,979	1,314	413	328	—	—	—	—	82	—	—	—	—	331	—	—	—
Brewer spruce	2,991	1,558	919	747	—	—	55	—	—	—	—	8	—	174	—	—	736
Bristlecone pine	3,096	1,676	1,866	1,005	8	—	—	—	—	—	—	559	—	1,095	—	—	795
California juniper	44,081	21,500	4,962	1,443	64	8	—	—	2,180	—	8	—	3,175	—	82	—	—
California red fir	330,563	38,590	124,434	22,711	415	1,766	10,266	17	49,797	—	5,530	1,353	59	52,967	1,457	30,072	—
California torreya	15,283	5,429	1,260	626	—	—	—	—	—	—	—	297	—	1,094	—	—	—
Coulter pine	3,309	988	793	295	—	8	—	—	23	—	—	8	—	749	13	—	—
Cypress	608	523	47	47	—	—	—	—	—	—	—	—	—	47	—	—	—
Douglas-fir	1,295,852	64,428	139,100	9,707	4,709	412	23,182	748	5,793	—	1,117	15,109	294	95,713	1,345	684	—
Engelmann spruce	250	170	100	97	—	—	—	—	100	—	—	—	—	50	—	—	—
Foxtail pine	3,118	1,314	1,635	685	—	—	26	—	—	—	—	74	—	1,544	—	222	—
Giant sequoia	1,844	1,869	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grand fir	6,492	3,274	82	80	—	—	—	—	—	—	—	—	—	82	—	—	—
Gray pine	46,120	7,510	13,699	2,820	134	861	1,626	—	5,866	—	170	546	—	6,097	—	47	—
Incense-cedar	646,868	46,460	66,645	7,181	293	186	475	158	—	5,168	7,608	1,989	6	51,354	1,792	1,954	—
Jeffrey pine	237,458	21,331	50,045	5,835	1,027	1,685	1,897	53	12,422	—	905	727	188	31,877	1,591	2,424	—
Knobcone pine	44,600	15,343	8,095	2,671	156	297	1,768	—	2,425	—	582	140	—	4,808	47	—	—
Limber pine	4,316	1,806	1,630	649	8	—	—	—	—	55	—	1,404	—	328	—	—	—
Lodgepole pine	277,288	34,965	94,066	12,464	693	1,250	11,291	—	12,573	—	2,400	1,755	54	60,136	2,103	13,494	—
Monterey cypress	2,165	2,210	294	300	—	—	—	—	147	—	—	73	—	220	—	—	—
Monterey pine	124	96	96	81	—	—	—	—	—	—	—	82	—	96	—	—	—
Mountain hemlock	57,325	14,647	21,858	10,201	50	7	408	—	2,008	—	850	334	—	12,968	—	11,303	—
Noble fir	584	307	103	73	—	—	—	—	—	—	—	—	—	8	—	94	—
Pacific silver fir	7	8	7	8	—	—	—	—	—	—	—	—	—	7	—	—	—
Pacific yew	23,114	8,913	680	247	93	—	—	—	—	—	—	91	—	546	—	—	—
Ponderosa pine	603,647	38,572	105,753	9,229	800	3,679	9,299	503	18,031	—	1,095	1,620	1,145	67,482	9,063	511	—
Port-Orford-cedar	7,605	3,190	708	339	17	—	—	—	—	—	—	240	8	535	—	50	—
Redwood	308,717	41,406	37,854	5,780	3,197	—	2,386	—	102	—	143	2,568	—	32,046	31	215	—
Sargent's cypress	8,449	7,774	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Shasta red fir	29,492	12,553	9,913	6,893	622	—	—	—	3,924	—	634	257	8	4,805	—	3,971	—
Singleleaf pinyon	135,682	14,649	32,699	4,787	109	1,187	665	—	8,224	—	47	895	—	22,919	—	1,397	—
Sitka spruce	5,826	2,764	2,397	2,067	1,109	—	—	—	55	—	—	14	—	1,233	—	—	—
Subalpine fir	101	102	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sugar pine	133,742	13,843	24,693	3,473	171	386	6,529	39	1,174	—	247	698	—	18,255	394	1,200	—
Utah juniper	5,809	2,059	3,652	1,867	36	—	—	—	—	370	—	12	—	3,422	—	—	—
Washoe pine	3,614	3,760	1,183	1,230	—	—	—	—	—	—	—	—	—	88	—	1,095	—
Western hemlock	27,604	9,237	2,028	945	376	101	73	—	1,103	—	—	73	—	1,041	—	—	—
Western juniper	111,496	11,374	23,704	3,664	641	—	—	—	151	7,510	3,405	2,403	337	10,834	41	372	—
Western redcedar	720	634	262	219	—	—	—	—	—	—	—	39	—	254	—	—	—
Western white pine	57,150	9,199	20,053	4,909	168	106	5,298	7	420	—	273	357	—	13,635	39	2,655	—
White fir	1,110,177	61,449	217,543	21,749	1,382	5,917	21,570	2,658	42,755	7,144	767	3,881	219	114,401	33,555	11,884	—
Whitebark pine	65,574	15,106	25,188	7,016	153	—	—	—	—	—	—	759	—	21,138	—	5,938	—
Total	5,665,903	142,105	1,040,770	49,029	16,423	17,849	96,838	4,183	167,176	22,373	25,775	37,077	2,317	638,897	51,471	91,521	—

Table 39—Estimated number of live trees^a with damage on forest land, by species and type of damage, California, 2001–2005 (continued)

Species	Total number of live trees		Number of live trees with damage ^b		Type of damage											Physical Root disease	Weather
	Total	SE	Total	SE	Animal	Bark beetles	Cankers	Defoliators	Dwarf mistletoe	Leafy mistletoe	Foliage diseases	Stem decay	Other insects	damage or defect			
Thousand trees																	
Hardwoods:																	
Ash spp.	6,848	6,619	6,594	6,615	—	—	—	—	—	—	—	—	—	—	6,594	—	—
Bigleaf maple	126,583	18,861	18,869	3,465	—	—	—	—	—	—	—	3,268	—	—	16,389	—	—
Bitter cherry	16,329	8,591	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Black cottonwood	9,378	6,679	744	486	—	—	—	—	—	—	—	197	—	—	633	—	—
Blue oak	266,209	27,283	73,801	6,713	308	—	817	4,698	—	7,583	93	9,560	326	59,971	—	82	—
Boxelder	1,857	1,393	1,046	750	—	—	—	—	—	—	—	799	—	—	551	—	—
Buckeye spp.	1,981	1,768	582	584	—	—	—	—	—	—	—	—	—	—	582	—	—
California black oak	456,356	38,774	107,309	9,729	127	14	3,534	10,418	—	5,828	857	16,294	1,119	82,654	250	178	—
California buckeye	90,582	21,484	25,140	6,382	—	—	—	—	—	—	—	3,483	—	23,480	—	93	—
California live oak	120,265	14,458	54,186	7,356	258	—	709	1,148	—	426	163	11,865	—	48,282	—	154	—
California sycamore	1,529	727	419	194	—	—	—	—	—	—	—	221	—	419	—	—	—
California white oak	22,062	5,694	6,837	2,012	167	—	97	—	—	796	—	383	—	5,863	—	—	—
California-laurel	350,245	50,953	31,565	5,524	82	—	165	—	—	—	—	7,898	—	26,850	—	237	—
Canyon live oak	1,203,727	95,051	217,773	19,985	1,093	—	5,653	5,095	—	6,430	1,199	33,815	2,375	178,079	—	2,584	—
Cherry and plum spp.	2,736	1,878	1,072	793	—	—	555	—	—	—	—	—	—	517	—	—	—
Curl-leaf mountain mahogany	143,258	24,838	51,078	8,401	1,044	73	—	12	—	—	2,562	1,664	50	47,410	147	220	—
Engelmann oak	367	253	89	74	—	—	—	—	—	—	—	22	—	68	—	—	—
Eucalyptus spp.	813	824	222	225	—	—	—	—	—	—	—	—	—	222	—	—	—
Fremont cottonwood	1,137	836	1,062	780	—	—	177	—	—	—	25	354	—	658	—	—	—
Golden chinquapin	39,306	14,964	3,831	1,584	—	—	—	—	—	—	324	—	3,605	—	—	—	—
Interior live oak	501,735	66,790	97,443	13,674	280	—	2,109	781	—	8,149	162	20,742	1,027	76,354	—	—	—
Mesquite	1,261	1,255	306	305	—	—	—	—	—	—	—	—	—	306	—	—	—
Oregon ash	19,920	13,502	5,596	2,627	—	—	—	—	—	—	—	1,151	152	5,355	—	—	—
Oregon white oak	150,674	25,891	36,204	6,726	78	—	975	293	—	5,066	261	3,190	484	28,190	—	—	—
Pacific dogwood	82,450	16,657	3,300	1,505	—	—	—	—	—	—	120	722	—	2,719	—	—	—
Pacific madrone	220,502	29,665	40,672	4,520	127	—	253	—	—	—	—	11,531	14	32,558	89	98	—
Quaking aspen	74,436	24,881	15,847	10,253	208	—	203	50	—	—	—	2,030	—	5,248	—	9,300	—
Red alder	51,569	11,539	5,404	2,041	753	—	257	—	—	—	—	645	—	4,183	102	—	—
Tanoak	1,117,293	85,352	110,132	10,332	1,718	—	605	2,356	—	—	203	21,973	—	87,698	885	1,248	—
Tasmanian bluegum	949	933	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Walnut spp.	73	75	73	75	—	—	—	—	—	—	—	—	—	73	—	—	—
Western honey mesquite	1,390	883	1,014	760	—	—	—	—	—	—	—	—	—	1,014	—	—	—
White alder	29,145	12,747	4,073	1,497	259	—	14	—	—	—	—	156	—	3,729	—	228	—
Willow spp.	20,539	19,811	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	5,133,505	177,176	922,284	35,973	6,501	88	15,567	25,405	—	34,278	5,646	152,285	5,547	750,255	1,473	14,423	—
All species	10,799,408	224,623	1,963,054	59,500	22,923	17,936	112,404	29,588	167,176	56,651	31,421	189,363	7,864	1,389,151	52,945	105,944	—

Note: Data subject to sampling error; SE = Standard error; — = less than 500 trees were estimated.

^a Includes live trees ≥ 1 inch diameter at breast height.^b Number of live trees ≥ 1 inch diameter at breast height with one or more types of damage recorded.

Table 40—Estimated area of forest land with more than 25 percent of basal area damaged, by forest type and type of damage, California, 2001–2005

Species	Total forest land		Forest land with damage ^a		Type of damage										Physical damage or defect	Root disease	Weather
	Total	SE	Total	SE	Animal	Bark beetles	Cankers	Defoliators	Dwarf mistletoe	Leafy mistletoe	Foliage diseases	Stem decay	Other insects				
Thousand acres																	
Softwoods:																	
Bigcone Douglas-fir	7	7	7	7	—	—	—	—	—	—	—	—	—	—	7	—	—
Bishop pine	21	15	7	7	—	—	—	—	—	—	—	—	—	—	—	—	—
California mixed conifer	7,879	210	4,307	176	7	38	80	—	449	105	92	137	—	—	2,649	133	36
Coulter pine	31	15	4	4	—	—	—	—	—	—	—	—	—	—	4	—	—
Douglas-fir	1,024	96	420	65	26	—	2	—	—	2	—	61	—	—	228	—	—
Foxtail/bristlecone pine	99	31	99	31	—	—	—	—	—	—	—	15	—	—	99	—	21
Giant sequoia	7	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jeffrey pine	927	87	403	59	13	15	8	—	39	—	—	—	—	—	296	27	—
Juniper woodland	452	72	97	32	—	—	—	—	—	35	—	—	—	—	62	—	—
Knobcone pine	60	26	20	15	—	—	—	—	—	—	—	—	—	—	6	—	—
Limber pine	55	23	55	23	—	—	2	—	—	—	—	8	—	—	35	—	13
Lodgepole pine	1,012	91	828	84	7	13	57	—	81	—	27	1	—	—	660	7	56
Misc. western softwoods	49	22	12	12	—	—	—	—	—	—	—	—	—	—	—	—	—
Mountain hemlock	149	35	122	32	—	—	—	—	22	—	18	7	—	—	103	—	7
Pinyon/juniper woodland	1,444	113	728	82	12	—	20	—	134	29	—	34	—	—	554	—	26
Ponderosa pine	1,349	105	531	70	6	23	—	—	85	3	—	2	—	—	300	40	—
Port-Orford-cedar	39	17	32	16	—	—	—	—	—	—	—	8	—	—	24	—	—
Red fir	695	75	489	64	—	6	21	—	200	—	24	8	—	—	263	14	7
Redwood	636	84	272	56	—	—	11	—	—	—	—	12	—	—	206	—	—
Sitka spruce	17	13	4	3	—	—	—	—	1	—	—	—	—	—	2	—	—
Subalpine fir	2	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Western juniper	1,514	112	747	84	8	6	—	—	7	161	51	106	8	—	481	—	20
Western white pine	194	39	131	31	—	—	8	—	9	—	—	—	—	—	114	—	—
White fir	1,223	101	707	78	—	26	28	12	118	30	14	20	—	—	507	31	—
Whitebark pine	222	42	172	38	—	—	—	—	—	—	—	—	—	—	132	—	35
Total	19,106	280	10,194	251	79	127	237	12	1,145	366	227	418	8	—	6,732	252	221

Table 40—Estimated area of forest land with more than 25 percent of basal area damaged, by forest type and type of damage, California, 2001–2005 (continued)

Species	Total forest land		Forest land with damage ^a		Type of damage											Weather	
	Total	SE	Total	SE	Animal	Bark beetles	Cankers	Defoliators	Dwarf mistletoe	Leafy mistletoe	Foliage diseases	Stem decay	Other insects	Physical damage or defect	Root disease		
Thousand acres																	
Hardwoods:																	
Aspen	80	24	32	17	17	—	—	—	—	—	—	10	—	22	—	13	
Bigleaf maple	82	25	19	9	—	—	—	—	—	—	—	15	—	7	—	—	
Blue oak	2,419	146	1,566	124	10	25	34	54	43	236	—	264	—	1,108	—	—	
California black oak	1,513	120	838	92	—	—	38	—	12	55	3	141	—	554	—	—	
California laurel	381	62	143	38	—	—	—	—	—	—	—	14	—	74	—	—	
California white oak	278	54	161	43	—	—	—	—	3	25	—	24	—	114	—	—	
Canyon live oak	2,450	148	1,416	116	8	—	8	20	17	64	6	336	—	964	—	14	
Coast live oak	971	91	693	76	—	—	9	24	—	12	3	221	—	628	—	—	
Cottonwood	32	20	31	20	—	—	—	—	—	—	—	25	—	31	—	—	
Cottonwood/willow	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Eucalyptus	4	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Evergreen oak woodland	14	12	11	12	—	—	—	—	—	—	—	—	—	11	—	—	
Giant chinquapin	44	18	3	3	—	—	—	—	—	—	—	—	—	3	—	—	
Gray pine	520	73	362	62	7	14	—	—	96	—	—	39	—	212	—	—	
Interior live oak	1,004	103	666	85	—	—	6	—	7	53	—	148	—	452	—	—	
Mesquite woodland	56	25	31	18	—	—	—	—	—	—	—	—	—	31	—	—	
Mountain brush woodland	422	63	287	52	5	9	—	—	—	6	8	7	—	269	—	—	
Oregon ash	14	12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Oregon white oak	613	77	379	62	—	—	3	—	—	27	—	81	14	280	—	—	
Other hardwoods	293	54	194	46	—	—	7	—	—	11	11	30	—	153	—	11	
Pacific madrone	317	58	214	48	—	—	—	—	11	—	—	28	—	171	—	—	
Red alder	186	43	89	32	27	—	—	—	—	—	—	—	—	77	—	—	
Tanoak	1,687	125	781	90	—	—	—	—	—	—	—	122	—	460	—	—	
Total	13,381	293	7,916	253	74	48	105	98	189	489	31	1,504	14	5,621	—	38	
Nonstocked	751	79	183	42	7	—	—	—	6	25	—	14	17	128	—	—	
All forest types	33,238	284	18,293	325	160	175	342	110	1,341	881	258	1,936	38	12,480	252	259	

Note: Data subject to sampling error; SE = standard error; — = less than 500 acres were estimated.

^a Acres of forest land with >25 percent of tree basal area with one or more type of recorded damage.

Table 41—Estimated gross volume of live trees^a with damage on forest land, by species and type of damage, California, 2001–2005

Species	Total gross volume of live trees ^a		Gross volume of trees with damage ^b		Type of damage											Weather	
	Total	SE	Total	SE	Animal	Bark beetles	Cankers	Defoliators	Dwarf mistletoe	Leafy mistletoe	Foliage diseases	Stem decay	Other insects	Physical damage or defect	Root disease		
Thousand acres																	
Softwoods:																	
Bigcone Douglas-fir	54,432	19,166	23,411	8,926	—	—	473	—	—	—	—	7,581	—	16,939	—	—	—
Bishop pine	45,343	35,836	8,817	6,778	—	—	—	1,041	—	—	—	—	7,776	—	—	—	—
Brewer spruce	31,314	14,329	15,971	8,425	—	—	4,139	—	—	—	—	1,408	—	11,000	—	—	3,515
Bristlecone pine	76,296	38,320	60,976	32,046	810	—	—	—	—	—	—	23,028	—	41,701	—	—	21,138
California juniper	152,400	37,414	36,171	10,825	311	—	240	—	—	15,560	—	240	—	23,698	—	—	449
California nutmeg	14,162	6,187	5,590	2,822	—	—	—	—	—	—	—	4,311	—	3,822	—	—	—
California red fir	6,660,989	621,844	3,083,261	331,155	5,344	83,067	250,656	2,178	1,129,692	—	257,292	122,704	12,606	1,882,633	84,103	57,122	—
Coulter pine	117,876	34,463	45,859	17,039	—	3,428	—	—	3,776	—	—	743	—	30,027	11,313	—	—
Cypress	9,319	7,274	1,060	1,064	—	—	—	—	—	—	—	—	—	1,060	—	—	—
Douglas-fir	22,294,535	898,634	5,574,662	336,442	84,260	23,728	283,160	8,232	326,300	—	72,063	1,698,788	7,712	3,483,425	36,925	27,176	—
Engelmann spruce	12,242	10,029	908	883	—	—	—	—	908	—	—	—	—	83	—	—	—
Foxtail pine	196,897	76,074	119,219	48,196	—	—	3,759	—	—	—	—	8,024	—	113,093	—	17,347	—
Giant sequoia	3,586	3,580	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grand fir	70,836	27,730	5,792	5,587	—	—	—	—	—	—	—	—	—	5,792	—	—	—
Gray pine	657,617	68,311	280,859	44,132	12,451	40,708	5,148	—	85,498	—	11,759	32,162	—	132,231	—	347	—
Incense-cedar	4,237,392	241,895	1,518,218	115,719	13,545	3,350	10,697	366	—	257,455	115,487	180,869	700	1,159,563	21,569	12,241	—
Jeffrey pine	4,597,608	291,638	1,626,917	117,292	25,952	71,526	12,146	2,968	255,064	—	93,426	83,747	2,084	1,241,477	57,981	44,018	—
Knobcone pine	138,001	32,057	57,128	18,014	1,114	7,170	9,156	—	10,667	—	—	2,358	—	30,632	1,260	—	—
Limber pine	101,516	37,693	57,842	21,177	—	—	779	—	—	—	—	2,113	—	54,665	—	6,370	—
Lodgepole pine	3,669,155	350,158	1,601,808	180,994	22,163	50,832	148,820	—	101,767	—	92,713	119,889	258	1,266,116	5,959	36,125	—
Monterey cypress	3,130	3,196	960	980	—	—	—	—	476	—	—	128	—	718	—	—	—
Monterey pine	16,946	11,698	9,279	6,321	—	—	—	—	—	—	—	4,720	—	9,279	—	—	—
Mountain hemlock	656,077	163,383	267,868	80,215	3,666	983	17,660	—	28,058	—	53,955	15,718	—	175,010	—	7,890	—
Noble fir	31,525	22,846	3,775	3,614	—	—	—	—	—	—	—	—	—	1,107	—	2,668	—
Pacific silver fir	2,071	2,155	2,071	2,155	—	—	—	—	—	—	—	—	—	2,071	—	—	—
Pacific yew	9,211	2,733	1,743	680	390	—	—	—	—	—	—	371	—	1,230	—	—	—
Ponderosa pine	8,577,267	430,669	2,345,070	164,256	33,019	138,103	54,950	3,477	402,556	—	45,005	126,704	3,636	1,680,765	99,440	16,720	—
Port-Orford-cedar	178,268	81,039	81,294	38,883	4,614	—	—	—	—	—	—	31,065	872	72,170	—	18	—
Redwood	7,210,577	1,296,103	2,547,631	664,250	118,081	—	46,313	—	23,517	—	7,450	322,081	—	2,295,273	2,906	11,823	—
Sargent's cypress	968	890	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Shasta red fir	690,488	214,524	168,292	64,781	—	—	—	—	14,835	—	20,155	43,973	2,573	108,498	—	314	—
Singleleaf pinyon	455,929	48,253	160,461	23,505	319	5,058	3,535	—	33,586	—	68	8,380	—	123,161	—	1,694	—
Sitka spruce	134,418	66,101	50,415	30,832	129	—	—	—	29,377	—	—	3,599	—	20,909	—	—	—
Subalpine fir	2,566	2,574	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sugar pine	3,826,002	234,219	1,254,084	109,568	2,537	14,998	175,783	3,085	78,300	—	23,642	125,089	—	951,016	9,182	33,003	—
Utah juniper	35,264	9,447	20,047	7,500	1,037	—	—	—	—	3,525	—	394	—	16,894	—	—	—
Washoe pine	3,801	3,954	353	368	—	—	—	—	—	—	—	—	—	353	—	—	—
Western hemlock	174,651	67,051	53,276	21,705	6,068	4,223	5,476	—	17,180	—	—	6,839	—	37,256	—	—	—
Western juniper	563,502	47,720	213,306	24,316	8,295	—	—	—	1,790	49,053	18,011	30,237	2,407	125,689	95	5,689	—
Western redcedar	58,371	43,291	47,014	34,551	—	—	—	—	—	—	—	14,981	—	44,112	—	—	—
Western white pine	964,865	104,761	415,897	52,925	4,609	7,987	33,851	877	10,627	—	11,211	75,821	—	320,541	207	10,623	—
White fir	12,781,608	632,054	4,155,289	266,590	15,773	151,089	207,570	81,331	800,878	154,900	27,173	276,849	3,311	2,779,879	351,696	68,718	—
Whitebark pine	117,304	26,696	50,012	12,594	3,977	—	—	—	—	—	—	6,006	—	42,162	—	5,878	—
Total	79,636,327	1,965,533	25,972,608	932,317	368,466	606,250	1,274,310	102,515	3,355,892	480,493	849,411	3,380,922	36,157	18,313,827	682,635	390,885	—

Table 41—Estimated gross volume of live trees^a with damage on forest land, by species and type of damage, California, 2001–2005 (continued)

Species	Total gross volume of live trees ^a		Gross volume of trees with damage ^b		Type of damage											Physical damage or defect	Root disease	Weather
	Total	SE	Total	SE	Animal	Bark beetles	Cankers	Defoliators	Dwarf mistletoe	Leafy mistletoe	Foliage diseases	Stem decay	Other insects					
Thousand acres																		
Hardwoods:																		
Ash spp.	2,505	2,160	444	445	—	—	—	—	—	—	—	—	—	—	444	—	—	
Bigleaf maple	465,395	61,895	150,229	26,108	—	—	—	—	—	—	—	64,037	—	104,759	—	—	—	
Bitter cherry	236	241	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Black cottonwood	73,630	34,516	33,245	15,156	—	—	—	—	—	—	—	4,779	—	29,260	—	—	—	
Blue oak	1,599,438	112,636	722,761	62,355	6,695	—	11,438	35,626	—	104,686	2,393	207,167	2,757	498,045	—	2,525	—	
Boxelder	32,382	28,804	16,557	14,244	—	—	—	—	—	—	—	14,394	—	4,021	—	—	—	
Buckeye spp.	250	251	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
California black oak	3,595,773	202,214	1,467,227	98,494	10,595	2,126	45,399	27,867	—	186,735	6,037	515,962	2,991	936,510	12,885	3,585	—	
California buckeye	78,127	13,832	58,558	11,485	—	—	—	—	—	—	—	14,323	—	52,462	—	315	—	
California live oak	1,433,726	148,142	784,586	93,154	2,735	—	10,659	8,582	—	23,036	3,773	273,142	—	639,408	—	4,932	—	
California sycamore	68,145	25,978	25,976	10,027	—	—	—	—	—	—	—	20,769	—	25,976	—	—	—	
California white oak	365,511	70,288	120,362	29,911	5,818	—	103	—	—	22,441	—	21,255	—	80,786	—	—	—	
California-laurel	751,740	98,594	238,386	50,851	499	—	847	—	—	—	—	123,520	—	183,102	—	2,456	—	
Canyon live oak	3,442,586	217,938	1,374,558	109,664	10,439	—	26,912	8,062	—	56,310	3,229	488,157	9,650	935,318	—	10,398	—	
Curl-leaf mountain mahogany	163,575	23,166	114,097	19,661	5,162	368	—	556	—	—	7,322	3,671	236	103,823	58	296	—	
Engelmann oak	15,778	10,042	10,091	6,399	—	—	—	—	—	—	—	5,892	—	4,198	—	—	—	
Eucalyptus spp.	10,869	11,014	2,010	2,037	—	—	—	—	—	—	—	—	—	2,010	—	—	—	
Fremont cottonwood	89,914	66,071	78,581	57,743	—	—	11,153	—	—	—	5,592	29,272	—	39,834	—	—	—	
Golden chinquapin	140,615	50,759	48,506	16,764	—	—	—	—	—	—	—	11,179	—	39,137	—	—	—	
Interior live oak	747,510	91,772	350,543	43,343	1,167	—	1,823	384	—	23,729	3,736	139,887	—	239,541	—	—	—	
Oregon ash	34,111	20,475	16,550	9,183	—	—	—	—	—	—	—	6,085	991	13,461	—	—	—	
Oregon white oak	591,830	72,969	213,507	37,564	444	—	3,837	1,155	—	53,482	2,154	60,855	3,744	147,438	—	—	—	
Pacific dogwood	9,145	3,969	3,760	2,159	—	—	—	—	—	—	158	706	—	3,760	—	—	—	
Pacific madrone	1,867,729	162,072	899,310	94,988	1,752	—	6,665	—	—	—	—	383,863	7,949	607,672	821	4,225	—	
Quaking aspen	63,743	25,017	23,078	8,377	4,085	—	285	508	—	—	—	5,493	—	16,228	—	320	—	
Red alder	448,688	100,667	72,766	20,113	13,032	—	1,967	—	—	—	—	12,967	—	41,244	11,735	—	—	
Screwbean mesquite	615	612	615	612	—	—	—	—	—	—	—	—	—	615	—	—	—	
Tanoak	3,614,293	292,515	1,105,090	108,840	7,677	—	9,579	2,309	—	—	704	475,540	—	717,361	11,026	3,719	—	
Tasmanian bluegum	4,159	3,011	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Walnut spp.	306	313	306	313	—	—	—	—	—	—	—	—	—	306	—	—	—	
Western honey mesquite	8,681	5,946	7,180	5,538	—	—	—	—	—	—	—	—	—	7,180	—	—	—	
White alder	121,735	31,461	35,847	13,725	3,639	—	2,319	—	—	—	—	4,057	—	28,434	—	612	—	
Total	19,842,740	575,606	7,974,727	279,832	73,742	2,493	132,986	85,048	—	470,420	35,098	2,886,973	28,316	5,502,332	36,525	33,383	—	
All species	99,479,067	2,076,190	33,947,336	979,226	442,208	608,743	1,407,296	187,563	3,355,892	950,912	884,508	6,267,895	64,473	23,816,159	719,160	424,268	—	

Note: Data subject to sampling error; SE = Standard error; — = less than 500 cubic feet were estimated.

^a Includes the gross volume of live trees ≥ 5 inches diameter at breast height.^b Includes the gross volume of live trees ≥ 5 inches diameter at breast height with one or more types of damage recorded.

Table 42—Estimated number of live trees with damage, acres of forest land with greater than 25 percent of basal area damaged, and gross volume of live trees with damage, by survey unit and ownership group, California, 2001–2005

Survey unit and ownership group	Number of live trees with damage ^a		Acres of forest land with damage ^b		Gross volume of live trees with damage ^c	
	Total	SE	Total	SE	Total	SE
	<i>Thousand trees</i>		<i>Thousand acres</i>		<i>Thousand cubic feet</i>	
North Coast:						
Public	79,484	9,645	592	68	2,846,484	649,651
Private	215,107	15,308	1,598	116	3,430,270	277,886
Total	294,591	17,995	2,190	133	6,276,754	703,661
North Interior:						
Public	354,980	28,372	3,354	130	7,147,368	312,224
Private	185,249	17,157	1,577	116	1,767,519	142,744
Total	540,230	33,151	4,930	174	8,914,887	343,079
Sacramento:						
Public	257,945	21,483	1,929	102	5,025,768	276,211
Private	210,952	29,801	1,580	114	2,003,438	152,050
Total	468,897	36,690	3,509	151	7,029,206	314,956
Central Coast:						
Public	71,005	11,416	774	83	1,169,987	275,628
Private	74,842	9,869	827	87	1,201,676	219,181
Total	145,847	14,890	1,600	117	2,371,663	350,626
San Joaquin:						
Public	328,674	21,988	3,716	143	7,567,997	406,760
Private	94,678	11,252	1,397	114	1,132,089	131,527
Total	423,353	24,648	5,113	182	8,700,086	427,041
Southern:						
Public	66,658	10,383	819	82	575,917	93,181
Private	23,479	10,633	131	38	78,823	29,684
Total	90,137	14,860	951	91	654,740	97,785
Total, California:						
Public	1,158,748	44,289	11,184	236	24,333,521	895,930
Private	804,307	40,424	7,108	233	9,613,815	411,912
Total	1,963,054	59,500	18,293	325	33,947,336	979,226

Note: Data subject to sampling error; SE = standard error.

^a Number of live trees ≥ 1 inch diameter at breast height.^b Number of forest land acres with more than 25 percent of basal area damaged.^c Gross volume of live trees ≥ 5 inches diameter at breast height.

Table 43—Estimated area of forest land covered by selected nonnative vascular plant species, by life form and species, California, 2001–2005

Plant life form		Area covered	
Scientific name	Common name	Total	SE
<i>Acres</i>			
Shrubs:			
<i>Cytisus scoparius</i>	Scotch broom	3,000	1,400
<i>Hedera helix</i>	English ivy	300	300
<i>Ilex aquifolium</i>	English holly	200	200
<i>Rubus discolor</i>	Himalayan blackberry	34,400	9,100
<i>Rubus laciniatus</i>	cutleaf blackberry	1,400	1,000
Forbs:			
<i>Centaurea solstitialis</i>	yellow star-thistle	32,300	8,100
<i>Cirsium</i>	thistle spp.	21,800	3,600
<i>Cirsium arvense</i>	Canada thistle	1,000	800
<i>Cirsium vulgare</i>	bull thistle	2,000	800
<i>Digitalis purpurea</i>	purple foxglove	100	100
<i>Hypericum perforatum</i>	common St. John's wort	1,800	800
<i>Hypochaeris radicata</i>	hairy cat's ear	500	200
<i>Torilis arvensis</i>	spreading hedgeparsley	23,800	6,300
Grasses:			
<i>Aira caryophylla</i>	silver hairgrass	14,200	4,000
<i>Avena barbata</i>	slender oat	27,300	9,700
<i>Avena fatua</i>	wild oat	50,000	12,500
<i>Bromus diandrus</i>	ripgut brome	47,100	11,600
<i>Bromus hordeaceus</i>	soft brome	78,800	18,300
<i>Bromus madritensis</i>	compact brome	13,400	6,100
<i>Bromus tectorum</i>	cheatgrass	144,400	17,400
<i>Cynosurus echinatus</i>	bristly dogstail grass	96,000	21,200
<i>Dactylis glomerata</i>	orchardgrass	1,800	1,300
<i>Holcus lanatus</i>	common velvetgrass	100	100
<i>Taeniatherum caput-medusae</i>	medusahead	63,800	14,700

Note: Estimates are likely low for most grasses and some forbs because of short flowering seasons and difficulty of species identification. Data subject to sampling error; SE = standard error.

Table 44—Summary of lichen community indicator species richness on forest land, by location, California, 1998–2001, 2003

Parameter	Location			
	California	Greater Central Valley	Greater Sierra Nevada	Northwest Coast ^a
Number of plots ^b	288	76	133	68
Number of plots by lichen species richness category:				
0–6 species	61	7	43	3
7–15 species	141	41	67	31
16–25 species	62	19	18	24
>25 species	24	9	5	10
Median	12	13	9	16
Range of species richness per plot (low-high)	0–39	2–31	0–34	1–39
Average lichen species richness per plot (alpha diversity)	12.59	14.38	9.87	17.21
Standard deviation of lichen species richness per plot	7.97	6.82	7.06	8.05
Species turnover rate (beta diversity) ^c	16.52	9.11	16.92	9.36
Total number of species per area (gamma diversity)	208	131	167	161

^a Coastal area bordering the greater Central Valley and covering northwestern California.^b Plot totals do not include quality assurance surveys.^c Beta diversity is calculated as gamma diversity divided by alpha diversity.**Table 45—Summary of air quality on forest land in the greater Central Valley as indicated by the Lichen Community Indicator, California, 1998–2001, 2003**

Parameter	Greater Central Valley	On-frame ^a	Off-frame ^b
Number of plots surveyed ^c	108	76	32
Number of plots by air quality index category: ^d			
1 (Worst) : -0.99 to 0.13	45	19	26
2: 0.13 to 0.55	23	19	4
3: 0.55 to 0.85	22	20	2
4 (Best): 0.85 to 1.58	18	18	0
Air quality index extremes	-0.99 to 1.58	-0.86 to 1.58	-0.99 to 0.70
Average score	0.28	0.52	-0.27
Standard deviation	0.61	0.50	0.46

^a On-frame plots are on the Forest Inventory and Analysis sampling grid.^b Off-frame plots were located in cities, agricultural areas, and/or near air quality monitors.^c Plot totals do not include quality assurance surveys or plots without lichens present.^d Categories are based on the data quartiles for on-frame data.

Table 46—Summary of air quality on forest land in the greater Sierra Nevada as indicated by the Lichen Community Indicator, California, 1998–2001, 2003

Parameter	Greater Sierra Nevada	On-frame ^a	Off-frame ^b
Number of plots surveyed ^c	146	122	24
Number of plots by air quality index category: ^d			
1 (Best): -43.36 to -15.88	35	31	4
2: -15.88 to -8.22	31	30	1
3: -8.22 to 4.35	33	30	3
4 (Worst): 4.35 to 66.49	47	31	16
Air quality index extremes	-43.36 to 66.49	-43.36 to 66.49	-32.38 to 41.61
Average score	-2.77	-5.13	10.27
Standard deviation	19.28	18.32	19.60

^a On-frame plots are on the Forest Inventory and Analysis sampling grid.^b Off-frame plots were located in cities, agricultural areas, and/or near air quality monitors.^c Plot totals do not include quality assurance surveys or plots without lichens present.^d Categories are based on the data quartiles for on-frame data.**Table 47—Summary of climate on forest land as indicated by the Lichen Community Indicator, derived from the temperature gradient of Jovan and McCune's (2004) model, California, 1998–2001, 2003**

Parameter	Total	Greater Central Valley ^a	Greater Sierra Nevada ^a	Northwest Coast ^b
Number of plots surveyed ^c	264	76	121	67
Number of plots by climate index category: ^d				
Warmest (-2.59 to -1.04)	67	44	6	17
Warm (-1.04 to 0.01)	65	25	15	25
Cool (0.01 to 0.87)	66	5	43	18
Coolest (0.87 to 2.14)	66	2	57	7
Climate index extremes	-2.59 to 2.14	-2.59 to 2.10	-2.07 to 2.14	-2.46 to 1.27
Average score	-0.02	-0.96	0.73	-0.32
Standard deviation	1.13	0.79	0.88	0.92

^a The greater Central Valley (GCV) and greater Sierra Nevada are mapped in Volume 1, figures 57 and 58.^b The Northwest Coast borders the GCV and covers northwestern California.^c Plot totals do not include quality assurance surveys or plots without lichens present.^d Categories are based on data quartiles.

Table 48—Summary of climate on forest land as indicated by the Lichen Community Indicator, derived from the moisture gradient of Jovan and McCune's (2004) model, California, 1998–2001, 2003

Parameter	Total	Greater Central Valley^a	Greater Sierra Nevada^a	Northwest Coast^b
Number of plots surveyed ^c	264	76	121	67
Number of plots by climate index category: ^d				
Wettest (-2.28 to -0.71)	66	5	16	45
Wet (-0.71 to 0.13)	66	11	39	16
Dry (0.13 to 0.89)	68	25	40	3
Driest (0.89 to 2.22)	64	35	26	3
Climate index extremes	-2.28 to 2.22	-1.17 to 2.22	-2.20 to 2.13	-2.28 to 1.57
Average score	0.08	0.77	0.21	-0.92
Standard deviation	1.04	0.83	0.82	0.83

^a The greater Central Valley (GCV) and greater Sierra Nevada are mapped in Volume 1, figures 57 and 58.

^b The Northwest Coast borders the GCV and covers northwestern California.

^c Plot totals do not include quality assurance surveys or plots without lichens present.

^d Categories are based on data quartiles.

Table 49—Ozone injury summary information from ozone biomonitoring plots, by year, California, 2000–2005

Ozone biomonitoring plots	Year of monitoring						All years
	2000	2001	2002	2003	2004	2005	
Number of plots	22	29	61	65	65	65	307
Number of plots with injury	6	11	20	16	22	24	99
Number of plots by biosite index category ^a (percentage of plots):							
0 to 4.9 (least injured)	18 (81.8)	24 (82.8)	52 (85.2)	56 (86.2)	57 (87.7)	48 (73.8)	255 (83.1)
5.0 to 14.9	1 (4.5)	2 (6.9)	7 (11.5)	7 (10.8)	3 (4.6)	2 (3.1)	22 (7.2)
15 to 24.9	0 (0)	1 (3.4)	1 (1.6)	1 (1.5)	3 (4.6)	5 (7.7)	11 (3.6)
>25 (most injured)	3 (13.6)	2 (6.9)	1 (1.6)	1 (1.5)	2 (3.1)	10 (15.4)	19 (6.2)
Average biosite index score	6.7	3.4	2.2	2.1	2.5	9.3	4.4
Average number of species per plot	1.8	2.1	2.2	2.3	2.3	2.4	2.1
Number of plants evaluated	1,078	1,492	3,865	4,295	4,370	4,177	19,277
Number of plants injured	98	114	207	119	165	254	957
Number of plants evaluated by species:							
Blue elderberry	100	133	452	499	407	304	1,895
California black oak	43	13	0	0	0	0	56
Jeffrey pine	161	330	410	480	566	563	2,510
Mugwort	120	187	599	600	632	684	2,822
Pacific ninebark	0	0	30	30	22	30	112
Ponderosa pine	325	434	984	1,016	1,112	1,075	4,946
Quaking aspen	159	166	237	288	322	313	1,485
Red alder	0	0	112	120	120	90	442
Red elderberry	0	0	30	30	47	30	137
Scouler's willow	0	25	100	96	60	90	371
Skunkbush	0	0	254	270	328	262	1,114
Snowberry	170	204	627	776	724	706	3,207
Western wormwood	0	0	30	90	30	30	180
Percentage of forest land by biosite index category ^b							
0 to 4.9 (least injured)	—	—	—	—	—	—	75.7
5.0 to 14.9	—	—	—	—	—	—	22.1
15 to 24.9	—	—	—	—	—	—	2
>25 (most injured)	—	—	—	—	—	—	0.2

Note: — = no value calculated.

^a The biosite index is based on the average injury score (amount × severity) for each species averaged across all species on the plot.

Biosite categories represent a relative measure of tree-level response to ambient ozone exposure.

^b Percentage of forest land is estimated after interpolating the biosite values (2000–2005) to generate a biological response surface across the landscape.

Table 50—Total acres of forest land with a forest fire incident, by year and ecosection group, California, 1995–2004

Year	Ecosection group											
	Total		Northern Interior		West/Central		Sierra		North Coast		Southern California	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Acres</i>												
1995	212,069	44,344	72,832	26,426	7,807	7,807	110,023	31,667	12,604	12,604	8,803	7,036
1996	116,046	29,746	51,710	20,496	1,741	1,741	48,224	18,978	—	—	14,371	10,198
1997	105,732	30,625	19,998	14,476	32,181	16,674	49,688	20,893	—	—	3,866	3,866
1998	116,317	30,225	55,764	21,909	22,675	12,193	22,264	12,884	—	—	15,614	11,039
1999	278,900	48,628	103,211	27,987	26,013	14,150	107,678	31,894	12,604	12,604	29,394	14,741
2000	264,432	50,648	86,780	30,082	22,462	13,110	101,327	29,975	—	—	53,862	24,408
2001	263,680	53,974	131,070	37,058	—	—	122,123	37,926	—	—	10,487	10,487
2002	344,993	75,600	15,669	15,669	—	—	254,604	63,940	—	—	74,720	37,288
2003	284,307	91,618	125,234	62,614	—	—	80,452	47,138	31,916	31,916	46,705	35,174
2004	143,439	101,407	—	—	—	—	143,439	101,407	—	—	—	—
Average	212,992	19,010	66,227	9,473	11,288	2,934	103,982	14,732	5,712	3,655	25,782	6,192

Note: Data subject to sampling error; SE = standard error; — = less than 0.5 acre was estimated.

Table 51—Estimated gross growth, net change, removals, and mortality of growing stock for softwood species on timberland, by species group and owner, California, 2001–2005

Species group	All owners						National forest					
	Current gross annual growth		Average annual net change		Average annual removal and mortality		Current gross annual growth		Average annual net change		Average annual removal and mortality	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
Softwoods:												
Douglas-fir	410,507	34,656	322,719	97,031	87,787	92,083	192,351	19,966	197,764	77,366	-5,413	73,788
Incense-cedar	73,232	10,548	51,136	36,487	22,096	36,652	41,183	5,591	62,069	33,819	-20,886	34,152
Lodgepole pine	15,488	5,258	-25,690	27,879	41,177	26,498	11,098	4,186	-28,536	27,725	39,634	26,435
Other western softwoods	24,039	5,417	-6,374	22,521	30,413	23,355	6,742	2,393	-28,027	21,049	34,769	22,588
Ponderosa and Jeffrey pines	240,960	20,521	-39,834	90,770	280,794	91,405	140,881	13,920	-15,825	84,800	156,706	85,872
Redwood	207,415	55,206	19,545	47,202	187,870	66,176	—	—	—	—	—	—
Sugar pine	51,211	7,132	-52,219	41,406	103,430	41,905	37,605	6,171	-23,253	38,237	60,858	38,676
True fir	350,663	30,996	-116,643	110,361	467,306	108,317	270,873	27,774	-82,232	106,643	353,106	104,248
Western hemlock	8,504	5,600	684	4,144	7,820	3,861	—	—	—	—	—	—
Western white pine	8,445	5,303	36,470	17,512	-28,025	16,652	7,727	5,260	35,081	17,464	-27,354	16,640
Total	1,390,463	79,408	189,794	194,246	1,200,669	197,737	708,462	39,023	117,042	168,537	591,420	166,787
State and local government												
Corporate private												
Species group	Current gross annual growth		Average annual net change		Average annual removal and mortality		Current gross annual growth		Average annual net change		Average annual removal and mortality	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
Softwoods:												
Douglas-fir	3,883	1,745	7,905	5,132	-4,022	3,986	120,540	24,780	24,514	32,300	96,026	31,035
Incense-cedar	—	—	-5,076	4,856	5,076	4,856	25,093	8,630	2,197	9,348	22,897	9,158
Lodgepole pine	—	—	—	—	—	—	4,186	3,180	3,619	2,505	568	1,054
Other western softwoods	3,598	2,454	5,714	4,245	-2,116	2,348	1,661	1,373	-313	529	1,975	1,842
Ponderosa and Jeffrey pines	1,950	1,168	-13,389	15,159	15,339	15,570	45,245	9,811	-27,332	22,548	72,577	22,029
Redwood	30,804	17,096	4,110	8,562	26,694	12,931	81,717	24,126	24,281	36,259	57,436	32,398
Sugar pine	—	—	—	—	—	—	9,300	3,046	-16,451	10,755	25,751	10,289
True fir	3,078	2,249	-3,311	4,751	6,389	4,305	56,681	11,698	-20,074	24,719	76,755	25,719
Western hemlock	713	679	-2,769	2,262	3,482	2,473	5,304	5,046	3,632	3,456	1,672	1,590
Western white pine	701	670	1,358	1,299	-657	628	—	—	—	—	—	—
Total	44,728	19,567	-5,458	23,093	50,187	26,663	349,728	43,747	-5,929	65,842	355,657	63,774

Table 51—Estimated gross growth, net change, removals, and mortality of growing stock for softwood species on timberland, by species group and owner, California, 2001–2005 (continued)

Species group	Noncorporate private					
	Current gross annual growth		Average annual net change		Average annual removal and mortality	
	Total	SE	Total	SE	Total	SE
<i>Thousand cubic feet</i>						
Softwoods:						
Douglas-fir	93,732	15,275	92,536	48,713	1,195	45,222
Incense-cedar	6,956	2,389	-8,054	8,767	15,009	8,421
Lodgepole pine	203	130	-772	1,500	976	1,480
Other western softwoods	12,037	3,968	16,253	6,771	-4,215	5,130
Ponderosa and Jeffrey pines	52,884	11,651	16,713	17,639	36,171	16,195
Redwood	94,894	47,118	-8,845	28,974	103,740	56,558
Sugar pine	4,306	1,887	-12,516	11,701	16,822	12,439
True fir	20,030	7,142	-11,026	13,211	31,056	13,883
Western hemlock	2,486	2,366	-179	171	2,666	2,536
Western white pine	17	16	31	29	-14	13
Total	287,545	52,562	84,140	67,023	203,405	81,492

Note: Data subject to sampling error; SE = standard error; — = less than 500 cubic feet were estimated.

Table 52—Total roundwood output by product, species group, and source of material, California, 2000

Product and species group	Growing-stock trees			
	Sawtimber	Poletimber	Other sources	All sources
<i>Thousand cubic feet</i>				
Saw logs:				
Softwoods	364,162	1,350	21,331	386,843
Hardwoods	2	—	—	2
Total	364,164	1,350	21,331	386,845
Veneer logs:				
Softwoods	29,433	109	2,065	31,608
Hardwoods	377	1	4	382
Total	29,810	111	2,069	31,990
Pulpwood:				
Softwoods	—	—	—	—
Hardwoods	2,367	9	24	2,400
Total	2,367	9	24	2,400
Poles and posts:				
Softwoods	401	—	4	405
Hardwoods	0	—	—	—
Total	401	—	4	405
Other miscellaneous:				
Softwoods	123	—	1	124
Hardwoods	0	—	—	—
Total	123	—	1	124
Total industrial products:				
Softwoods	394,118	1,460	23,402	418,980
Hardwoods	2,746	10	28	2,784
Total	396,864	1,470	23,430	421,764
Fuelwood:				
Softwoods	45,953	170	115,086	161,209
Hardwoods	0	10	44,848	44,858
Total	45,953	180	159,934	206,067
All products:				
Softwoods	440,071	1,630	138,488	580,189
Hardwoods	2,746	20	44,877	47,643
Total	442,817	1,650	183,365	627,831

Note: Data subject to sampling error; excludes removals from precommercial thinnings; — = less than 500 cubic feet found.

Table 53—Volume of timber removals by type of removal, source of material, and species group, California, 2000

Removal type	Source of material						All sources		
	Growing stock			Other sources					
	Softwoods	Hardwoods	Total	Softwoods	Hardwoods	Total	Softwoods	Hardwoods	Total
Thousand cubic feet									
Roundwood products:									
Saw logs	365,512	2	365,514	21,331	—	21,331	386,843	2	386,845
Veneer logs	29,542	379	29,921	2,065	4	2,069	31,608	382	31,900
Pulpwood	—	2,376	2,376	—	24	24	—	2,400	2,400
Fuelwood	46,123	10	46,133	115,086	44,848	159,935	161,209	44,858	206,067
Posts, poles, and pilings	401	—	401	4	—	4	405	—	405
Miscellaneous products	123	—	123	1	—	1	124	—	124
Total	441,701	2,766	444,467	138,488	44,877	183,365	580,189	47,643	627,831
Logging residues	24,592	171	24,764	118,297	778	119,074	142,889	949	143,838
All removals	466,293	2,937	469,231	256,785	45,654	302,439	723,078	48,591	771,670

Note: Data subject to sampling error; excludes removals from precommercial thinnings; — = less than 500 cubic feet found.

Table 54—Estimated area of forest land covered by vascular plant nontimber forest products, by plant group and species, California, 2001–2005

Plant group and scientific name	Common name	Total	SE
<i>Acres</i>			
Tree seedlings and saplings:			
<i>Abies magnifica</i>	California red fir	46,700	4,600
<i>Abies procera</i>	noble fir	100	100
<i>Calocedrus decurrens</i>	incense-cedar	99,100	5,900
<i>Crataegus</i> spp.	hawthorn species	1,000	1,000
<i>Juniperus occidentalis</i>	western juniper	16,900	2,000
<i>Pseudotsuga menziesii</i>	Douglas-fir	128,100	6,500
<i>Taxus brevifolia</i>	Pacific yew	2,800	1,000
<i>Thuja plicata</i>	western redcedar	600	400
Shrubs:			
<i>Acer circinatum</i>	vine maple	19,200	5,900
<i>Arctostaphylos columbiana</i>	hairy manzanita	7,000	3,000
<i>Arctostaphylos nevadensis</i>	pinemat manzanita	118,100	15,900
<i>Arctostaphylos patula</i>	greenleaf manzanita	387,500	27,900
<i>Arctostaphylos</i> spp.	manzanita species	87,900	15,500
<i>Arctostaphylos uva-ursi</i>	kinnikinnick	7,000	3,200
<i>Arctostaphylos viscida</i>	sticky whiteleaf manzanita	226,800	31,100
<i>Ceanothus velutinus</i>	snowbrush ceanothus	116,300	18,600
<i>Chimaphila umbellata</i>	pipsissewa	30,500	3,700
<i>Cytisus scoparius</i>	Scotch broom	3,000	1,400
<i>Eriodictyon californicum</i>	California yerba santa	5,100	1,700
<i>Frangula purshiana</i>	Pursh's buckthorn	5,700	2,100
<i>Gaultheria shallon</i>	salal	83,600	12,400
<i>Mahonia aquifolium</i>	Oregon grape	6,700	2,200
<i>Mahonia nervosa</i>	dwarf Oregon grape	41,300	7,500
<i>Mahonia repens</i>	creeping barberry	500	300
<i>Paxistima myrsinites</i>	Oregon boxleaf	7,900	2,500
<i>Ribes</i> spp.	currant spp.	131,300	10,300
<i>Rosa</i> spp.	rose spp.	39,800	3,800
<i>Sambucus nigra</i>	European black elderberry	2,100	800
<i>Sambucus racemosa</i>	red elderberry	6,100	3,000
<i>Vaccinium membranaceum</i>	thinleaf huckleberry	3,200	1,800
<i>Vaccinium ovatum</i>	California huckleberry	265,000	31,800
Herbs:			
<i>Achillea millefolium</i>	common yarrow	19,100	2,400
<i>Anaphalis margaritacea</i>	western pearly everlasting	1,700	500
<i>Arnica cordifolia</i>	heartleaf arnica	1,300	700
<i>Asarum caudatum</i>	British Columbia wildginger	1,600	500
<i>Equisetum</i> spp.	horsetail spp.	10,300	3,000
<i>Hypericum perforatum</i>	common St. John's wort	1,800	800
<i>Polystichum munitum</i>	western swordfern	176,200	21,700
<i>Pteridium aquilinum</i>	western brackenfern	141,600	14,000
<i>Trillium ovatum</i>	Pacific trillium	400	100
<i>Urtica dioica</i>	stinging nettle	4,000	1,800
<i>Xerophyllum tenax</i>	common beargrass	18,600	5,700

Note: Data subject to sampling error; SE = standard error.

Table 55—Percentage of forested plots with selected lichen nontimber forest products present, by species, California, 2001–2005

Scientific name	Common name	Percent
<i>Alectoria sarmentosa</i>	Witch's hair lichen	13.5
<i>Bryoria fremontii</i>	Old man's beard	13.1
<i>Letharia vulpina</i>	Wolf lichen	53.8
<i>Lobaria pulmonaria</i>	Lungwort	6.9
<i>Parmelia saxatilis</i>	Crottle	1.5
<i>Ramalina menziesii</i>	Lace lichen	2.9
<i>Usnea</i>	Beard lichens	38.2
<i>Usnea hirta</i>	Beard lichen	1.1
<i>Vulpicida canadensis</i>	Brown-eyed sunshine lichen	8.4

Note: Data subject to sampling error; 275 forested plots were sampled.

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