

AB 1504 California Forest Ecosystem and Harvested Wood Product Carbon Inventory: 2006 – 2015

FINAL REPORT

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Acronym List

AB – Assembly Bill

AGL – aboveground live

ALCI – attributional life-cycle inventory

Board; BOF – California Board of Forestry and Fire Protection

C – carbon

CALFIRE – California Department of Forestry and Fire Protection

CALGREEN – California Green Building Standards Code

CARB – California Air Resources Board

CALRECYCLE – California Department of Resources, Recycling, and Recovery

CBM – Canadian Carbon Budget Model

CFPP – California Forest Project Protocol

CH₄ - methane

CI – confidence interval

CLCI – consequential life-cycle inventory

CMAI – culmination of mean annual increment

CO - carbon monoxide

CO₂e – carbon dioxide equivalent

DBH – diameter at breast height

EPA – Environmental Protection Agency

FCAT – California Forest Climate Action Team

FCP – California Forest Carbon Plan

FF – Forest Land Remaining Forest (IPCC terminology)

FIA – Forest Inventory and Analysis

FIADB – FIA database

FMRL – Forest Management Reference Level

FS – Forest Service

GHG – greenhouse gas

GRM – Growth, Removals and Mortality

HWP – harvested wood product

HWP-use – harvested wood products in use

HWP-SWDS – harvested wood products at a solid waste disposal site

HWP-energy – harvested wood products burned for energy production

HWP-burned – harvested wood products burned without energy production

ICE – Image-based Change Estimation

InTEC – USFS Integrated Terrestrial Ecosystem Carbon Model

IPCC – Intergovernmental Panel on Climate Change

LCA – life-cycle analysis

LCI – life-cycle inventory

LF – Forest Land Conversions (IPCC terminology)

LULCF – Land-use, Land-use Change and Forestry (IPCC terminology)

mm - millimeter

MMT – million metric tons

MT – metric tons

NFS – National Forest System

NGHGI – National Greenhouse Gas Inventory

NMVOC – non-methane volatile organic compounds

N₂O – nitrous oxide

NO_x - nitrogen oxides

NPV – net present value

NRCS – Natural Resources Conservation Service

NRI – Natural Resources Inventory

PNW – Pacific Northwest Research Station

RPA – Resources Planning Act

RS – remote sensing

SOC – soil organic carbon

SWDS – solid waste disposal site

TBD – to be determined

TPO – Timber Products Output

μm – micrometer i.e., one millionth of a meter

UC – University of California

UNFCCC – United Nations Framework Convention on Climate Change

USDA – United States Department of Agriculture

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1 Executive summary and key findings

The state of California has enacted a variety of legislation establishing greenhouse gas (GHG) emissions reduction targets. Currently, the state has a net carbon sequestration target for the forest sector of 5 million metric tons (MMT) of carbon dioxide equivalent (CO₂e) annually until 2020, establishing a critical role for California's forests in meeting the state's targets. This report was written to inform several elements of the state's effort to meet GHG emissions reduction targets by compiling best-available data on GHG emissions, stock and flux from California's forest sector, identifying critical gaps in data, and suggesting strategies to reduce uncertainty in estimating the magnitude of stocks and flux within the forest sector.

This is the first in a series of annual Assembly Bill (AB) 1504 Forest Ecosystem and Harvested Wood Product (HWP) Carbon Inventory reports to the California Board of Forestry and Fire Protection (also referred to as the Board). The report establishes forest sector carbon accounting methods that comply with the Intergovernmental Panel on Climate Change Tier 3 good practice guidelines for carbon accounting (IPCC 2006, 2014) and is intended to assist the Board in evaluating and monitoring progress on meeting California's forest sector carbon sequestration target. This report can inform policy decision-making, but is not intended to be a complex policy assessment framework. Forest ecosystem carbon stocks and flux are established using direct measurements on forested plots throughout the state of California as part of the United States Department of Agriculture (USDA) Forest Service Forest Inventory and Analysis (FIA) program. Harvested wood product carbon stocks will be based on an IPCC Tier 3 production accounting approach and will be completed for the upcoming inventory in 2018.

As of 2015, California's forests remain net sinks, sequestering 33.6 MMT CO₂e per year, excluding net flux from soils, forest land conversions, non-CO₂ emissions from wildfires, or harvested wood products. After accounting for these other sources (except HWP), the rate of carbon sequestration is 32.8 MMT CO₂e per year. Carbon stocks are just over 2 billion metric tons. However, in many forest types current stocking levels reflect over a century of fire suppression and may not represent stand densities that are resilient to disturbances common to California forests such as fire or pest outbreaks. Additionally, as the forests age in unharvested stands, growth rates slow. Older forests tend to store more carbon, but they might not accumulate new carbon as quickly as younger, fast-growing stands. Consequently, the stocks and flux represented in this report may not be sustainable into the future without forest management given the uncertainty in potential effects from climate change, the current level of forest disturbances from wildfire and pests, and aging of forests on federal lands.

Key Findings:

The data presented in this report are based on the 2006-2015 FIA inventory years. Carbon stocks physically present in the forest are based on a 10-year average for this time-period and given in metric tons (MT) of carbon (C). The estimates of average annual carbon sequestration (i.e., net flux) is based on plots and trees initially measured between 2001 and 2005 then re-measured 10 years later between 2011 and 2015. Calculating flux based on actual growth, removals and mortality (i.e., the GRM approach) allows for annual reporting and is more robust than a simple stock-change approach. Results of carbon flux are given in metric tons (MT) of carbon dioxide equivalent (CO₂e). Carbon can be converted to CO₂e by multiplying by 3.667. Ranges in the text (i.e., \pm) represent a 95% confidence interval (CI), while values in the tables report the sampling error (SE; CI = 1.96*SE).

Forest land area:

- As of 2015 there are approximately 32 million acres of forest land across all ownerships.
- 16.9 million acres are classified as timberland with an additional 4.1 million acres of productive forest land in reserves.
- The federal government manages 58% of California's forest lands, with the remaining areas under state and local government (3.4%) or private management (39%) (Figure 2.4).
- Overall there was a net loss of forest land at the rate of 14.6 ± 10.6 thousand acres per year, primarily to developed land-uses (Table 4.8). The confidence interval is high compared to the estimate because it is a relatively rare event at the scale of the inventory.
- Most of the forest land loss occurred on non-productive "other forest" (68%), followed by timberland (28%), with little change occurring on reserved lands (4%).
- Western oak woodlands cover the greatest area of all forest types at approximately 8.9 ± 0.38 million acres, followed by California mixed conifer at approximately 8 ± 0.34 million acres (Table 4.11).

Average net annual forest carbon dioxide sequestration - overview:

- Overall California forests are exceeding the 5 MMT CO₂e target rate of annual sequestration established by AB 1504.
- The 2015 statewide rate of forest carbon sequestration is 33.6 ± 5.3 MMT CO₂e per year, excluding net CO₂e contributions from other sources such as forest soils, harvested wood products, forest land conversions and non-CO₂ GHG emissions from wildfire (Table 4.1, 4.3).

- Soil organic carbon is estimated to sequester 0.8 ± 1.0 MMT CO₂e per year (Table 4.1-4.3).
- Combined annual net emissions of non-CO₂ GHGs (methane and nitrous oxide) from wildfire is estimated to be 0.4 ± 0.1 MMT CO₂e per year (Table 4.2, 4.7).
- Changes in land-use between forest and non-forest land condition is estimated to have a net effect of emitting 1.2 ± 1.2 MMT CO₂e per year (Table 4.2, 4.9).
- After accounting for these other CO₂ and greenhouse gas sources the 2015 statewide rate of carbon sequestration on all forest land is 32.8 ± 5.5 MMT CO₂e per year (95% CI, table 4.2). This value currently excludes contributions from HWP pools.

Average net annual forest carbon dioxide sequestration – by pool:

- Growth on live trees, including foliage and live roots, makes up 89% of the annual aboveground CO₂e flux on all forest land at a net rate of about 30 ± 4.7 MMT CO₂e per year (Table 4.3).
- Standing dead trees, fallen down wood, and understory vegetation make up the remaining 11% of aboveground CO₂e flux (Table 4.3).
- Some portion of the 13.6 ± 2.8 MMT CO₂e flux (Table 4.3) associated with harvested wood is not immediately emitted as CO₂, but is stored as sequestered C. Information for these HWP pools will be provided in the 2018 inventory.

Average net annual forest carbon dioxide sequestration – by owner:

- The national forests provide the largest contribution, accounting for 39% of the statewide annual flux at a rate of 13.2 ± 3 MMT CO₂e per year (figure 4.1).
- Individual noncorporate forest land owners account for 33% of the statewide annual flux at a rate of 10.9 ± 1.9 MMT CO₂e per year (figure 4.1).
- Corporate forest land accounts for 13% of the statewide annual flux at a rate of 4.3 ± 3.8 MMT CO₂e per year (figure 4.1).
- State and local governments contribute 2.6% of the statewide annual flux at a rate of 2.6 ± 0.96 MMT CO₂e per year (figure 4.1).
- Other federal lands contribute 7% of the statewide annual flux at a rate of 2.5 ± 1.2 MMT CO₂e per year (figure 4.1).
- Only on reserved forest lands managed by the Forest Service is live tree growth not currently estimated to exceed carbon losses from the live tree pool due to tree mortality (Figure 4.4, Table 4.4).
- Annual gross growth per acre on live trees is currently exceeding all other carbon losses from the live tree pool due to mortality or harvest on unreserved timberland for all ownerships including lands managed by the Forest Service.

- The annual net rate of carbon sequestration per acre is greatest on timberland owned by private individuals at 1.33 ± 0.22 metric tons of CO₂e per acre per year (Figure 4.4, Table 4.4).
- Trees growing on all ownerships across all of California's forests are sequestering carbon at a net rate of 0.79 ± 0.15 metric tons CO₂e per acre per year (Table 4.4).

Average net annual forest carbon dioxide sequestration – by region:

- The Sierra/Cascades region has the greatest net live tree CO₂e flux due to higher total annual growth in its forests relative to growth from other regions. This region also has the greatest rate of mortality but after accounting for harvest, live trees in the Sierra/Cascades region are still sequestering 8.7 ± 3 MMT CO₂e per year, more than any other region (figure 4.6).
- The Southern Coastal Mountains and Deserts region is currently the only region where tree mortality is exceeding tree growth, resulting in a net carbon reduction of the live tree pool of 1.1 ± 0.7 MMT CO₂e per year (figure 4.6). Further analysis is needed to determine why this may be the case.

Carbon stocks for forest land remaining forest land (FF) by pool

- Currently there are just over 2 billion metric tons of carbon stocks stored on forest land including forest soils across all ownerships in California (Table 4.12, figure 4.9, 4.10).
- Just over half of this stored carbon is found above ground in the live tree pool, which now includes foliage biomass and is different from previous FIA-based C estimates ($1,062 \pm 27$ MMT C, Table 4.12, figure 4.9).
- Forest soils store about a quarter of the stored carbon (506 ± 6.7 MMT C, Table 4.12, figure 4.9).
- Approximately 10% of the stored carbon is found aboveground in dead wood pools (203 ± 6.3 MMT C, Table 4.12, figure 4.9). Equations for dead wood pools use decay factors for hardwood/softwoods, which is different from previous FIA-based C estimates which use species-level values. Differences in these decay factors are discussed in section 3.2.3.
- These estimates exclude forest floor C as data was limited for this pool at this time. Initial estimates of forest floor C based on FIA measurements compiled in Gray et al. (2016) for National Forests in Oregon and Washington suggested that the forest floor made up 10% of non-soil forest C, which would translate to 7% of total C (150 MMT C) in Table 4.12 if the same ratio held. We suspect this number is too high and will go down with a better estimation approach.

Carbon stocks for forest land remaining forest land (FF) by owner

- Approximately two-thirds of the carbon stocks in the state are found on public forest land (1,346 MMT C), with approximately 80% of that on National Forest land (1,074 MMT C) (Table 4.12, figure 4.8).
- Private corporate forest land contains approximately 16% of the state's carbon stocks (324 MMT C, Table 4.12, figure 4.8).
- Private noncorporate forest land contains approximately 18% of the state's carbon stocks (368 MMT C, Table 4.12, figure 4.8).
- Approximately 62% of the forest carbon stores are found on unreserved timberland (273 MMT C, Figure 4.10).

Carbon stocks for forest land remaining forest land (FF) by region

- Nearly half of California's carbon stocks in all carbon pools are found in a single region, the Sierra and Cascade Mountain Ranges. This region represents 47% of the forest land area and contains 953 MMT C (Table 4.19, figure 4.11).
- The next largest carbon store, the Klamath Interior and Coast Ranges region has about half the carbon stocks as found in the Sierra and Cascades and just over a quarter of those found in the state at 568 MMT C (Table 4.17, figure 4.11).
- For each of these regions the dead tree and down woody material pools are each about 10% of the live tree carbon pool.

Carbon stocks for forest land remaining forest land (FF) by forest type

- The California mixed conifer forest type contains the largest carbon stock compared to all other forest types, storing approximately 664 ± 22 MMT C (95% CI; Table 4.21, Figure 4.12).
- Western oak forests follow with 333 ± 12 MMT C (Table 4.20, figure 4.12).
- For most forest types the majority of carbon stores are found in live trees (Table 4.20, Figure 4.12).
- Most carbon stocks are found on unreserved timberland for most softwood forest types (Table 4.22, figure 4.13).
- The redwood forest type has the highest carbon density per acre (figure 4.14).
- Regional data by forest type is included in Appendix 1.

Comparison to the Forest Management Reference Level (FMRL)

- FIA's initial 10-year forest inventory in California installed from 2001 - 2010 is the FMRL basis (i.e., baseline) to evaluate relative changes in California forest carbon stocks between measurement periods.
- Stock-change comparisons to the FMRL cannot determine net flux until the entire 10-year re-measurement period is complete in 2020. The GRM method is used to estimate annual net flux.
- Comparison to the FMRL show that overall California's forest carbon stocks are increasing over time with minor annual variations (table 4.31, figure 4.15).

Harvested Wood Product (HWP) carbon

- Current data are through an agreement between CALFIRE, the USDA Forest Service Pacific Northwest Research Station (PNW), and the University of Montana, a detailed IPCC Tier 3 inventory of the harvested wood product carbon pools will be conducted for the AB 1504 Forest Ecosystem and Harvested Wood Products carbon inventory expected to be released in 2018.

Comparison of this inventory to other reports

- In 2013, the U.S. NGHGI estimates live tree net stock change at 36.2 MMT CO₂e per year for California (table 6.1). For this 2015 inventory we use similar methods to the U.S. NGHGI and estimate the rate to be 29.9 MMT CO₂e per year. Differences are likely due to use of national rather than regional biomass equations for the U.S. NGHGI. For non-soil stock changes with the aboveground live pools excluded, the U.S NGHGI reports slightly lower estimates, probably due to the use of models to determine down wood C based on forest type and stand age rather than direct measurements.
- In 2010, estimates from Gonzalez et al. 2015 adjusted for undetected growth show aboveground live tree stocks of 888 MMT C and an annual gain of 7.3 MMT CO₂e per year (Table 6.2). Later refinements by CARB put the stock at 892 MMT C and net flux at 7.1 MMT CO₂e per year. Errors with the initial Gonzalez et al. 2015 estimate prior to adjustment were approximately 25% for stock and 35% for flux and are likely similar for the adjusted estimates. In 2010, we estimate aboveground live tree stocks of 1,025 MMT C. Using 2015 data we show an annual AGL gain of 23.9 MMT CO₂e per year. Errors for our estimate were approximately 3% for stock and 19% for flux. Differences are likely due to the different time periods of analysis and a variety of differences in the methods discussed further in section 6.2.

Strategies to leverage forests for emissions reductions

The following strategies have been identified to reduce carbon emissions or increase sequestration from the atmosphere by forests including contributions from harvested wood products and by-product utilization:

- Promote afforestation/avoid deforestation associated with land-use change.
- Increase C stores in forests through sustainable forest management practices, considering the age of the stand and other forest management objectives.
- Manage forest densities and fuels where appropriate.
- Increase C in HWP pools including wood used for energy.
- Consider wood energy and material substitution effects.

Organization of the 1504 Forest Ecosystem and Harvested Wood Products Carbon Inventory

The California forest carbon policy background, carbon cycle overview, and overview of California's forests are provided in section 2. A description of inventory methods for forest ecosystem carbon pools is provided in section 3. Forest ecosystem carbon inventory results are provided in section 4. An overview of harvested wood product carbon is described in section 5. Differences between this inventory and other reports are described in section 6. Strategies to leverage forests for emissions reductions are described in section 7. Strategies to improve the 1504 Forest Ecosystem and Harvested Wood Product Carbon Inventory are described in section 8. Appendix 1 contains regional forest carbon stock data by forest type. Extensive inventory tables are provided in appendix 2 and summarized below.

Appendix 2:

Area

Sampled Area

- Sampled area by land status and ownership group for all of California (Table A1) and by region, 2006-2015 (Tables A2-A8)

Forest Area for Forest Land Remaining Forest (FF): by owner

- Forest land area by forest land status and ownership group for all of California (Table A9) and by region, 2006-2015 (Tables A10-A16)

Forest Area for Forest Land Remaining Forest (FF): by forest type

- Forest land area by forest type, forest land status and ownership group for all of California, 2006-2015 (Table A17) (regional tables will be included in future report)

Net forest carbon flux for forest land remaining forest (FF)

Net carbon flux for all pools by owner

- Annual net change for all forest carbon pools by owner for all of California (Table B1) and by region, 2001-2005 and 2011-2015 (Tables B2-B8)

Disturbance effects on net forest carbon flux

- Annual net change for aboveground pools by disturbance, forest land status and owner, 2001-2005 and 2011-2015 – total (Table B9) and per acre (Table B10)

Forest carbon stock for forest land remaining forest (FF): by owner and forest land status

Aboveground live tree pool

- All of California (Table C1) and by region, 2006-2015 (Tables C2-C8)
- All of California by 10-year averages (Tables C9-C14)

Aboveground dead tree pool

- All of California (Table C15) and by region, 2006-2015 (Tables C16-C22)
- All of California by 10-year averages (Tables C23-C28)

Aboveground live understory vegetation pool

- All of California (Table C29) and by region, 2006-2015 (Tables C30-C36)

Aboveground and belowground live understory vegetation pools, 10-year averages

- All of California by 10-year averages (Tables C37-C42)

Belowground live understory vegetation pool

- All of California (Table C43) and by region, 2006-2015 (Tables C44-C50)

Belowground live tree pool

- All of California (Table C51) and by region, 2006-2015 (Tables C52-C58)

Belowground live and dead tree pools, 10-year averages

- All of California by 10-year averages (Tables C59-C64)

Belowground dead tree pool

- All of California (Table C65) and by region, 2006-2015 (Tables C66-C72)

Soil organic carbon pool

- All of California (Table C73) and by region, 2006-2015 (Tables C74-C80)
- All of California by 10-year averages (Tables C81-C86)

Aboveground down dead wood pool

- All of California (Table C87) and by region, 2006-2015 (Tables C88-C94)
- All of California by 10-year averages (Tables C95-C100)

Forest carbon stock for forest land remaining forest (FF): by forest type and forest land status**Aboveground live tree pool**

- All of California (Table D1) and regions (Tables D2-D8), 2006-2015

Aboveground dead tree pool

- All of California (Table D9) and regions (Tables D10-D16), 2006-2015

Aboveground live understory vegetation pool

- All of California (Table D17) and regions (Tables D18-D24), 2006-2015

Belowground live understory vegetation pool

- All of California (Table D25) and regions (Tables D26-D32), 2006-2015

Belowground live tree pool

- All of California (Table D33) and regions (Tables D34-D40), 2006-2015

Belowground dead tree pool

- All of California (Table D41) and regions (Tables D42-D48), 2006-2015

Soil organic carbon pool

- All of California (Table D49) and regions (Tables D50-D56), 2006-2015

Aboveground down dead wood pool

- All California (Table D57) and regions (Tables D58-D64), 2006-2015

Forest land conversions (LF)**Changes in area from forest land-use conversions**

- Annual change in forest land area to and from other IPCC land-use classes in California by forest land status for all of California, 2001-2005 to 2011-2015 (Table E1)

Net forest carbon flux from forest land-use conversions

- Annual change in carbon pools due to change in land-use between forest and non-forest in California, 2001-2005 to 2011-2015 (Table E2)

Net flux from other GHG emissions

- Annual net emissions of non-CO₂ greenhouse gasses from fire by owner group and class for all of California, 2001-2005 to 2011-2015 (Table F1)

2 Introduction

2.1 California forest carbon policy background

The Global Warming Solutions Act (Assembly Bill 32, Chapter 488, Statutes of 2006) requires California to reduce greenhouse gas (GHG) emissions to 1990 levels by 2020, which is approximately 15% below a business-as-usual scenario. It tasks the California Air Resources Board (CARB) with determining the statewide greenhouse gas emissions level in 1990, and the statewide greenhouse gas emissions limit that is equivalent to that level, to be achieved by 2020. To achieve this target, CARB was also required to develop a Scoping Plan that identifies direct emission reduction measures, alternative compliance mechanisms, market-based compliance mechanisms, and potential monetary and nonmonetary incentives to achieve the maximum technologically feasible and cost-effective emissions reductions. The Scoping Plan lays out the state's strategy for meeting the goals of the law by 2020 and must be updated at least every five years. The first Scoping Plan was finalized in 2008, with an initial update in 2014.

The initial AB 32 Scoping Plan (CARB 2008) included a forest sector target with a goal of maintaining the forest carbon sink with a net annual sequestration rate of 5 million metric tons of carbon dioxide equivalent (MMT CO₂e). This target was based on a 2004 GHG inventory by Winrock International (Brown et al. 2004). The 2014 update to the Scoping Plan carried forward the forest net sink goal and called for the development of a Forest Carbon Plan to set mid-term and long-term quantitative planning targets while ensuring forest resilience, health, and continued ecosystem services; identify actions to meet those targets; and provide recommendations on funding those actions.

The responsibility for setting forest carbon policy to ensure the AB 32 forest sector goals are met lies with the California Board of Forestry and Fire Protection (also referred to as the Board). The California Board of Forestry and Fire Protection is the entity responsible for promulgating the state's Forest Practice Rules, which regulate timber harvest on privately owned lands. In 2008, the Board developed "The 2008 Strategic Plan and Report to the California Air Resources Board on Meeting the AB 32 Forestry Sector Targets" (CA BOF 2008). The 2008 Strategic Plan recognized the following guiding principal related to the AB 32 mandate.

"The Board of Forestry and Fire Protection is mandated to maintain a vigorous, resilient and healthy forest land base in California, which supports the ecological needs of the forest ecosystem and its human dependencies. The Board recognizes the importance of the carbon sequestration potential for forests, and their benefits in achieving GHG emission reduction targets established by the Global Warming Solutions Act (AB 32). At

the same time the Board acknowledges that these needs must be considered in conjunction with many other ecological and human benefits that forests provide and for which the Board has responsibility” (CA BOF 2008).

The 2008 Strategic Plan identified the following approaches to meet the Board’s responsibility in achieving the AB 32 forest sector targets:

- Improvement of forest inventory and monitoring to ensure changes will be detected.
- Consideration of additional statutory and regulatory needs, including a review of the effects of existing regulations on carbon sequestration.
- Working with Federal agencies to maintain and increase sequestration levels by: 1) preventing losses of inventory and growth rates; 2) continuing reforestation efforts; and 3) fuels management treatments on federal lands to reduce the risk of catastrophic wildfire.
- Reducing barriers and providing additional incentives to encourage voluntary action by private landowners to increase inventory and growth rates while decreasing risk of losses.
- Developing sound policies and regulations for CALFIRE that will contribute to reduction of the risk of catastrophic wildfire.
- Encouraging research related to climate change impacts for the forest sector.
- Working with other agencies and legislative authorities to ensure development of policies, infrastructure and funding to support fuels reduction and biomass utilization.

The 2008 Strategic Plan also noted that the 2004 Winrock estimate of forest carbon sequestration in California had a high uncertainty of roughly +/- 38%, and is a major reason that continued work on refining the forest sector portion of the statewide GHG inventory is a high priority.

The Board of Forestry and Fire Protection’s responsibility in meeting or exceeding the AB 32 forest sector targets was formalized in Assembly Bill 1504 (AB 1504, Chapter 534, Statutes of 2010). AB 1504 emphasizes the critical and unique role California’s forests play in the state’s carbon balance by sequestering carbon dioxide from the atmosphere and storing it long-term as carbon. It also emphasizes the goal of maximum sustained production of high-quality timber products in serving the public while also providing other benefits and ecosystem services such as sequestration of carbon dioxide, recreation, watershed, wildlife, range and forage, fisheries, regional economic vitality, employment, and aesthetic enjoyment. The bill requires the Board

to ensure the rules and regulations governing the harvest of commercial tree species consider the capacity of forests to sequester 5 Million Metric Tons (MMT) of CO₂e annually by 2020.

To assess whether the AB 32/AB 1504 goals are being met and to carry out the Board's 2008 Strategic Plan, this report is the first in a series of annual Forest Ecosystem and Harvested Wood Product Carbon Inventory reports to the Board (i.e., the AB 1504 inventory). Although the California Forest Practice Rules only apply to privately owned lands, because the Board represents the state's interest in federal matters pertaining to forestry (CA PRC § 740), and because the federal government manages more than half of the forest land within the state's forest sector, all ownerships are included in the AB 1504 inventory.

2.2 Relationship of this report to other inventory efforts

In addition to the 2006 Assembly Bill 32 and the 2010 Assembly Bill 1504, Governor Edmund G. Brown has provided additional leadership and guidance to implement the state's climate change policy. In 2014, under his direction, the CA Forest Climate Action Team (FCAT) was formed to develop a statewide plan to identify actions needed to reduce GHG emissions and enhance carbon sequestration on California forest land. In 2015, the Governor issued Executive Order B-30-15 establishing a GHG reduction target for California of 40 percent below 1990 levels by 2030 and 80 percent by 2050 to help limit global warming to 2 degrees Celsius or less as identified by the IPCC to avoid potentially catastrophic climate change impacts. In 2016, the California Legislature passed Senate Bill 32 (Chapter 249, Statutes of 2016), which codifies the Governor's Executive Order. CARB is currently updating the AB 32 Scoping Plan to reflect the 2030 target. While neither forest sector emissions nor emissions reductions count towards the 2030 and 2050 SB 32 emissions reduction targets, this new legislation signifies an ongoing role for California forests to play in carbon sequestration beyond the original 2020 deadlines associated with AB 32 and AB 1504. The FCAT is also finalizing the state's Forest Carbon Plan, which is intended to outline a framework for how California forests will contribute to meeting the State's long term objective of maintaining California's Natural and Working Lands, including forests, as a carbon net sink. Lastly, in 2016 Senate Bill 859 was also passed (SB 859, Chapter 368, Statutes of 2016), requiring CARB to complete a statewide GHG inventory by the end of 2018.

In addition to this AB 1504 Forest Ecosystem and Harvested Wood Product Carbon Inventory, there are several efforts within the state to address forest carbon sequestration, which are described in this section. Comparisons of results from this report to other inventories can be found in section 6.

2.2.1 FCAT/FCP

As stated above, the CA Forest Carbon Action Team's Forest Carbon Plan (FCAT 2017) is designed to outline a framework for how forests can contribute to meeting the State's objectives and goals for Natural and Working Lands in the AB 32 2030 Scoping Plan Update and forthcoming Natural and Working Lands Implementation Plan. The Forest Carbon Plan (FCP) reports on forest ecosystem and harvested wood product carbon using USDA Forest Service Forest Inventory and Analysis program (FIA) data, USFS Timber Products Output (TPO) data (McIver et al. 2015) and CA Board of Equalization timber harvest data (CA BOE 2016). FCAT will use the information from the AB 1504 Forest Ecosystem and Harvested Wood Products Carbon Inventory or the CARB's Natural and Working Lands GHG inventory to inform whether the goals identified within the FCP are being met.

2.2.2 CARB Natural and Working Lands Inventory

As stated above, through Assembly Bill 32 and Senate Bill 859, CARB is obligated to provide a statewide greenhouse gas (GHG) inventory. The Forest Carbon Plan summarizes information about CARB inventory efforts, stating that the inventory will represent sectors such as energy production, industry, waste and recycling, transportation and communities, water resources, and natural and working lands (FCAT 2017). The CARB's Natural and Working Lands GHG Inventory ("CARB Inventory") reports both carbon stock and GHG flux associated with stock-change on forests and other lands. The initial analysis period for the CARB inventory is 2001-2010. Satellite imagery modeled on FIA standing stock measurements and other data informs CARB's estimates of carbon stock in wildland forests and other lands. Chaparral is included in the forest land category for the purposes of the CARB inventory. The inventory models carbon stocks, stock-change, and GHG flux between discrete points in time, estimating natural processes such as growth and mortality, disturbance events such as wildfire, timber harvests and other activities, land conversion to other uses, and fluxes associated with wood processing and the disposition of discarded wood products. Unlike the AB 1504 inventory which takes the **production** accounting approach for wood products, the **atmospheric flow** approach of carbon accounting in the CARB inventory includes imported harvested wood products. The CARB Inventory serves as an important source of information to assess net GHG flux associated with forests and other lands, and interactions with other sectors. CARB is currently developing methods to estimate carbon stocks and stock-change associated with urban forests and croplands, neither of which are addressed in the AB 1504 inventory. CARB plans to update the Natural and Working Lands Inventory on a bi-annual basis.

2.2.3 U.S. National Greenhouse Gas Inventory

The U.S. Environmental Protection Agency coordinates and compiles summaries and analyses by multiple agencies to produce the National Greenhouse Gas Inventory (NGHGI). The most recent published report provides national estimates of stocks and flux of greenhouse gases for

1990-2015 (US EPA 2017). The core dataset for forest carbon used in the NGHGI is the USDA Forest Service's Forest Inventory and Analysis (FIA) inventory. The inventory is based on empirical field measurements of carbon pools and on models that complement the field measurements for pools and/or time periods with few data. The NGHGI follows IPCC guidance as closely as possible with available datasets.

This report differs from the NGHGI analysis in that some of the fluxes can be estimated from measurements available in California, rather than models designed for national estimation, and in not attempting to model results back to 1990 for all lands. Instead, we summarize available empirical data for that time-period and identify alternatives for improving estimates. We refer to the methods of the NGHGI extensively, however, for estimating flux in pools and processes for which empirical data are limited (e.g., soils). Other differences include the use of regional biomass equations instead of national ones, and adjustments for decay and fragmentation of snags. We detail differences in section 3.2 and 6.1.

2.3 Forest carbon cycle overview

The global carbon cycle includes movement of carbon (C) among vegetation, soil, ocean, rock, and atmosphere (Ryan et al. 2010). Although the amount of C in vegetation and soils (i.e., **stores**) is much smaller than that in the ocean, the movement of C to and from the atmosphere (i.e., **flux**) is comparable. Vegetation absorbs C from the atmosphere through photosynthesis and fixation of C in living material, and vegetation and soils emit C to the atmosphere through respiration and microbial decay of dead plant matter (Figure 2.1). Forests are particularly important to the carbon cycle because they can store large amounts of C and can be dynamic over relatively short time periods (e.g., decades). It is thought that forests in the Northern Hemisphere in particular are absorbing more C from the atmosphere than they are emitting (Pacala et al. 2001). C removed from the atmosphere by forest growth or stored in harvested wood products for the U.S. in 2015 were estimated to offset 11.8% of U.S. emissions from industry and agriculture (US EPA 2017).

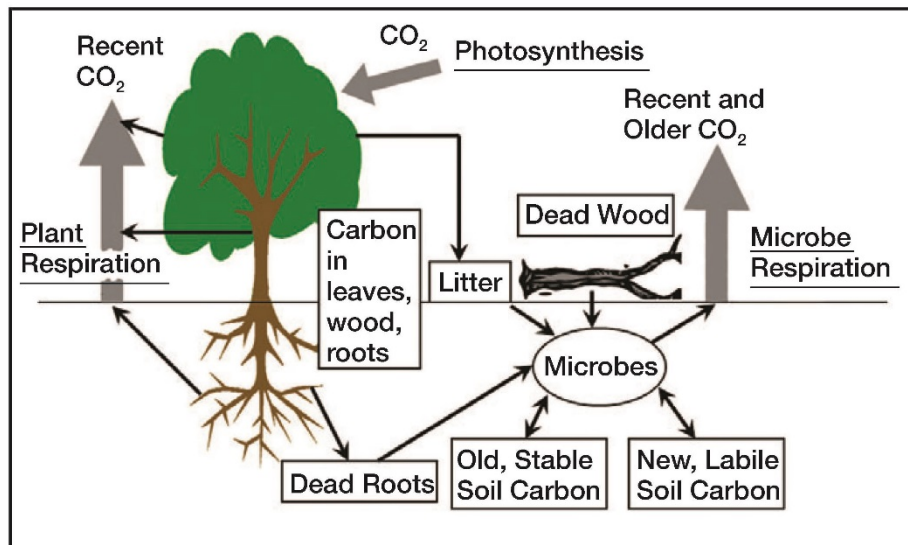


Figure 2.1: Flows of carbon in a forest from the atmosphere to the forest and back. Carbon is stored mostly in live and dead wood as forests grow (extracted from Ryan et al. 2010 Figure 2). Does not include C removed from harvest, or soil C removed in groundwater or erosion.

Live forest vegetation absorbs C from the atmosphere through photosynthesis of carbon dioxide (CO₂). A large proportion of that carbon is respired by living plant cells, but a portion of it goes into the production of tissues like leaves; twigs; fine roots; flowers and fruits; and wood and bark in boles, branches, and coarse roots. Depending on their longevity (a matter of weeks for fine roots, or centuries for tree boles), these tissues die and begin to decompose due to microbial action, whereby C is emitted to the atmosphere, primarily as CO₂. Some of the partially-decomposed tissue stays in the soil mineral and organic layers, where C may accumulate over time. When the net effect of the many C fluxes in a forest results in increased storage of C it is referred to as **sequestration**.

In addition to CO₂, other greenhouse gases emitted by forests and/or forest products include methane (CH₄), and nitrous oxide (N₂O). In this report carbon stocks are reported in metric tons of carbon mass. Changes in carbon stocks that involve transfers to/from the atmosphere are reported in units of metric tons of carbon dioxide equivalent (CO₂e), which puts the various greenhouse gases on the same footing in terms of their absorption of infrared radiation. One metric ton of carbon mass in live and dead biomass or soil is equal to 3.67 metric tons CO₂e.

While tree mortality occurs naturally in all forests, natural disturbance events such as wildfire, pest outbreaks, windthrow, and drought can result in high mortality rates, potentially killing all aboveground live vegetation over large areas. In the case of wildfire, some C (as well as other greenhouse gases such as nitrogen oxides) can be emitted directly to the atmosphere through combustion, or lost from the area as soot. Fine particulate matter in soot ($\leq 2.5 \mu\text{m}$ in diameter) is referred to as “black carbon” and although it only remains in the atmosphere for a few

weeks, it contributes to the greenhouse effect by absorbing solar radiation and heating the atmosphere. In some cases, black carbon can take on the form of charcoal, which can be a stable, long-lived form of C in the forest. Dead tissue left after the disturbance then decays, emitting C to the atmosphere over weeks in the case of scorched needles or over decades in the case of large dead trees. In severely disturbed forests, C emissions to the atmosphere will initially exceed absorption, and total C will decrease (Figure 2.2). As vegetation becomes established and the amount of growing tissue increases, at some point absorption will exceed emissions, and total C will increase. This net flux from the atmosphere (accumulation) tends to decrease as forests age and appears to come close to zero, or equilibrium, in older forests (Gray et al. 2016). At this point when annual emissions equal annual uptake, forests have reached the **carbon sink saturation point**.

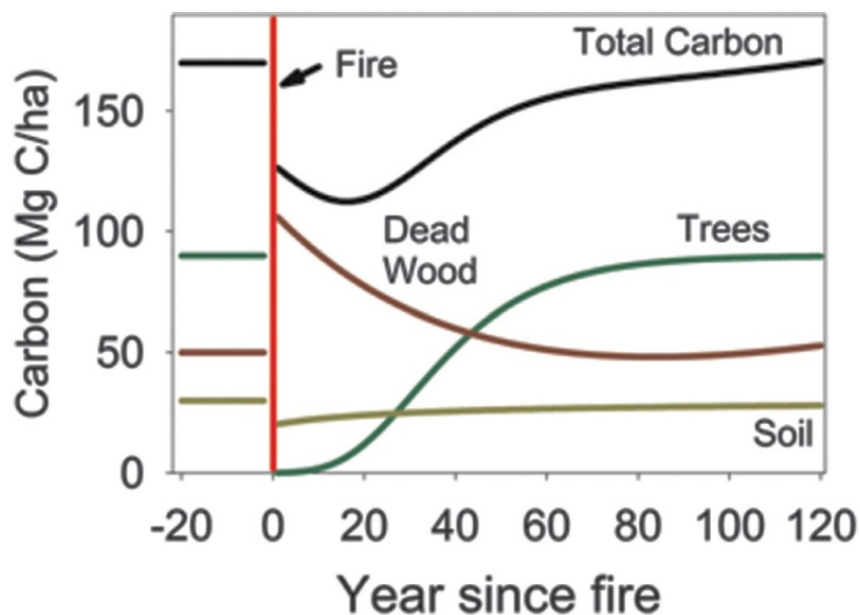


Figure 2.2: Idealized cartoon of carbon trajectories in live trees, dead wood, and soil in a forest where all trees are killed by severe wildfire and vegetation subsequently regenerates (extracted from Ryan et al. 2010 Figure 3). With sufficient time, the forest will recover the carbon lost in the fire and the decomposition of trees killed by the fire as long as there were no conversion to lower carbon vegetation types such as shrub lands or grasslands.

In addition to growth and mortality, the C stored in forests can change through increases in forest area (**afforestation**) or decreases in forest land (**deforestation**). While vegetation on afforested sites may accumulate at rates comparable to regenerating forest, levels of soil C tend to take longer (e.g., several decades) to accumulate to levels typically found in forests. Consequently, recently deforested areas may not reflect a significant loss in soil C for many years. Similarly, deforested lands lose soil C over decades until they reach levels typical of non-

forest land-uses. While trees are often found in non-forest land-uses (e.g., urban areas, windbreaks or stream buffers in agricultural lands), their C stores are typically included in the carbon assessments of those other land-uses identified as sectors of national assessments.

Tree harvest removes C from forests in the form of logs. However, much of the C is not immediately emitted to the atmosphere, so the tracking of the fate of forest C in various harvested wood products (HWP) becomes an important part of forest C accounting. Slash and bark are considered by-products of harvest, but may also be utilized and should be tracked in forest C accounting. Some portions of harvested trees remain in the forest as litter and decay along with other dead tissue (e.g., branches and foliage) or are disposed of through in-forest burning. Other parts become stored in short-lived or long-lived products (e.g., paper and house frames, respectively), and other parts are burned to supply industrial or residential energy and/or heat. Some portion of wood products accumulate in landfills, where the C can be stored over long time periods (decades to centuries); however, some of the C in landfills may be emitted as methane (CH₄), a more potent greenhouse gas than CO₂. Newer landfill technologies are being implemented in parts of the country to reduce methane emissions. At the end of product use-life, products can remain in use through recycling, burned for energy, or burned as waste (Stockmann et al. 2012). Fossil fuel and other emissions not derived directly from forest ecosystems that are generated in the forest management and manufacturing process are typically not included in forest sector C analyses but are included in the industrial sector (e.g., US EPA 2017).

Accumulating C in standing forests is one clear way to increase absorption from the atmosphere. Accumulating C in forests could be accomplished by reducing the amount of C removed during harvest. However, to the extent that the demand for wood products remains, you could see **leakage** where storing more carbon in forests in one region (or country) is offset by reduced storage of carbon in other regions, with no net gain in global carbon storage (McKinley et al. 2011). Conversely, intensive commercial timber production may decrease demand for wood from other lands, thereby increasing the in-forest carbon stocks on those other lands (Heath et al. 2010).

Another concern with increasing carbon stores in forests is the notion of **permanence**; areas that are fire-prone are at higher risk that live trees will be killed and C lost to fire and decay, especially in forest types where denser (higher C) forests are likely to burn at higher severity. Many forests in California are fire-prone; see the Forest Carbon Plan for a more detailed discussion of issues and management options.

The use of harvested wood and wood products may reduce overall C emissions through their use as **biomass energy** in situations where the use of wood as biomass for fuel results in fewer C emissions from the use of fossil fuels. Another effect of using wood products could be

through **substitution** of wood instead of steel or concrete, which result in more C and other greenhouse gas emissions to produce.

While tracking the changes in C stocks (and therefore C flux) can be relatively straight-forward, quantifying leakage, permanence, and substitution can be more difficult and is discussed in more detail in section 8. One analysis that incorporated biomass energy as a reduction in fossil fuel emissions compared overall emissions from open pile burning of logging residues to processing and burning in a biomass energy plant, and found a net reduction in emissions of 0.54 tons CO₂e per dry ton of biomass (Figure 2.3; Springsteen et al. 2015).

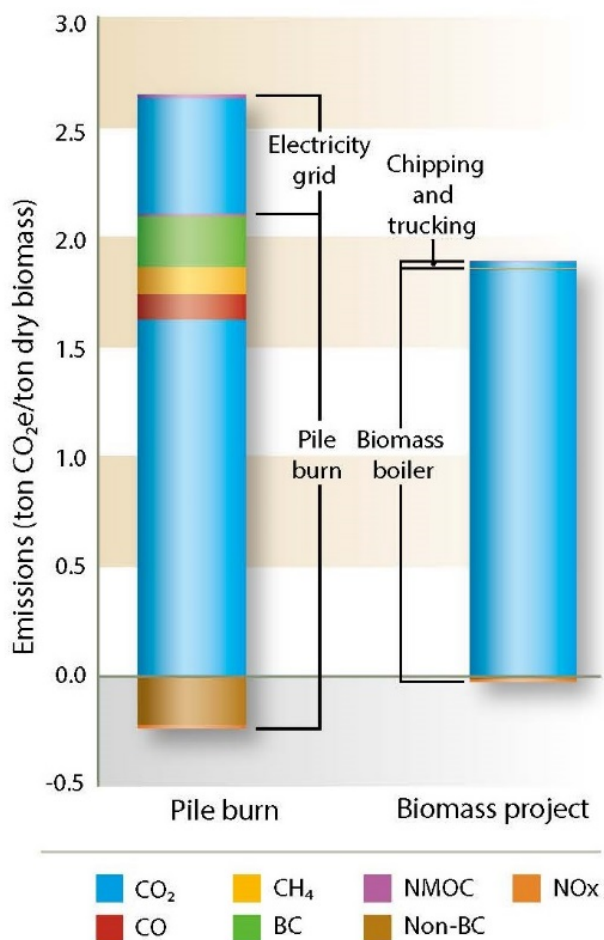


Figure 2.3: Comparison of greenhouse gas emissions between a pile burn of logging residue versus chipping, hauling, and burning it in a biomass energy plant. Analysis estimates CO₂-equivalent effects of different gases and particulates, as well as the additional emissions needed in the case of the pile burn to generate the same amount of electricity from natural gas. (Extracted from Springsteen et al. 2015).

2.4 Overview of California forests

California hosts a wide variety of tree species, including many species of conifers as well as oaks and other hardwoods. Assemblages of tree species are often grouped into forest types to support inventory and reporting. The Forest Inventory and Analysis (FIA) program defines a variety of coniferous forest types in California including redwood, Douglas-fir, California mixed conifer, lodgepole pine, ponderosa pine, pinyon/juniper, fir/spruce/mountain hemlock and others. Hardwood forest types include tanoak/laurel, western oak, woodland hardwoods, elm/ash/cottonwood, and alder/maple among others.

FIA **land status** distinguishes **forest land** from non-forest (i.e., crops, improved pasture, residential areas, city parks, etc.) and other area (i.e., water), and also distinguishes differences in **forest land status**. For example, forest land in California is also categorized into timberland and other forest land based on its ability to grow commercial tree species (**productive capacity**) and its availability for timber extraction. Lands that can produce 20 cubic feet of wood volume per acre per year of commercial tree species are termed **Productive Forest land**. Productive forest land that is available for management for timber production (i.e., not in a **reserve status**) is called **Timberland**. Forest land that is not capable of producing 20 cubic feet of wood volume per acre per year of commercial tree species is called **Other forest land**. Forests in reserve status (i.e., wilderness designation, National Monuments, National Parks, etc.) can include both productive and other forest land. Although management for production of wood products in reserved forests is precluded, in some cases timber harvest can still occur for various objectives (i.e., restoration, salvage, etc.). Approximately half (16.6 million acres) of the 31.9 million acres of forest land in California are classified as timberland, with an estimated 4.1 million acres of productive forest land in reserves. There are approximately 8.9 million acres of non-reserve other forest land and 2.4 million acres of reserved other forest land.

Management and use of forest land is often a function of ownership and land status in California. California's forest land is divided between private and public ownership (see Figures 2.4 and 2.5). The federal government manages 58% of these lands, with the remaining areas under state and local government (3.4%) or private management (39%). Approximately 9.2 million of the 16.6 million acres of timberland are owned by the federal government, 7.3 million are in private ownership, with the remainder in other public ownership. Approximately 5.1 million of the 8.9 million acres of other forest land in non-reserved status is privately owned, 3.6 million acres in federal ownership, with the remainder in public ownership. Of the 6.5 million acres of forest land in California in reserved status (wilderness designations, etc.), 5.7 million acres are owned by the federal government, with the remainder in other public ownership.

To better understand the carbon dynamics in California's forests, information in this report and appendices is provided for different forest types, ownerships, forest reserve classes, and on a regional basis (see figure 4.5).

The way in which forests are used and managed impact both forest health and resilience as well as carbon storage and sequestration. California's forested landscape consists of a mosaic of land-uses including working forests, conservation reserves, and those associated with human-dominated uses. Forests in which trees are harvested regularly are often referred to as **working forests**. Whether a forest is considered a working forest or not, forested landscapes provide several important ecosystem services, including carbon sequestration as well as wildlife habitat, water, recreational opportunities and other cultural values. A variety of recent studies exhibit concern that current forest conditions resulting from management activities centered on fire suppression have negatively impacted the resiliency of forest ecosystems and carbon stocks. For example, some studies suggest certain forest types, such as mixed conifer forests of the Sierra Nevada, have changed when compared to historic conditions, with more of the current carbon stock in higher densities of small, fire-prone trees (Collins et al. 2011, North et al. 2009, Lydersen et al. 2013, Earles et al. 2014). These forests are thought to be vulnerable to fire, pest outbreaks, and other disturbance, especially as changes in climate continue to affect the timing, frequency, intensity and extent of disturbances such as wildfire and pest outbreaks. In the short-term, management strategies to improve forest health and resiliency and reduce hazardous fuels may decrease in-forest carbon stocks and result in other greenhouse gas emissions through tree removal or prescribed fire. However, in the long-term forest carbon stocks may benefit from these treatments through continued growth and decreased mortality from wildfire, pests and drought (North and Hurteau 2011). While the actual occurrence of wildfire on a given acre is subject to many factors, opting instead to minimize tree removal to maintain current carbon stocks can come with risk of loss in California's fire prone forests (discussed further in section 8.4). Similarly, debate continues around the long-term storage of carbon in harvested wood products when compared to not harvesting trees and instead increasing carbon stocks on forest land (discussed further in section 8.5). Also, competing uses for forest land and the potential for economic gain can create pressure to convert forest land to other uses which can have severe impacts on forest carbon outcomes (discussed further in section 8.3).

For a more detailed discussion on California forest carbon dynamics and potential forest management strategies, refer to the California Forest Carbon Plan (FCAT 2017) and Sapsis et al. (2016).

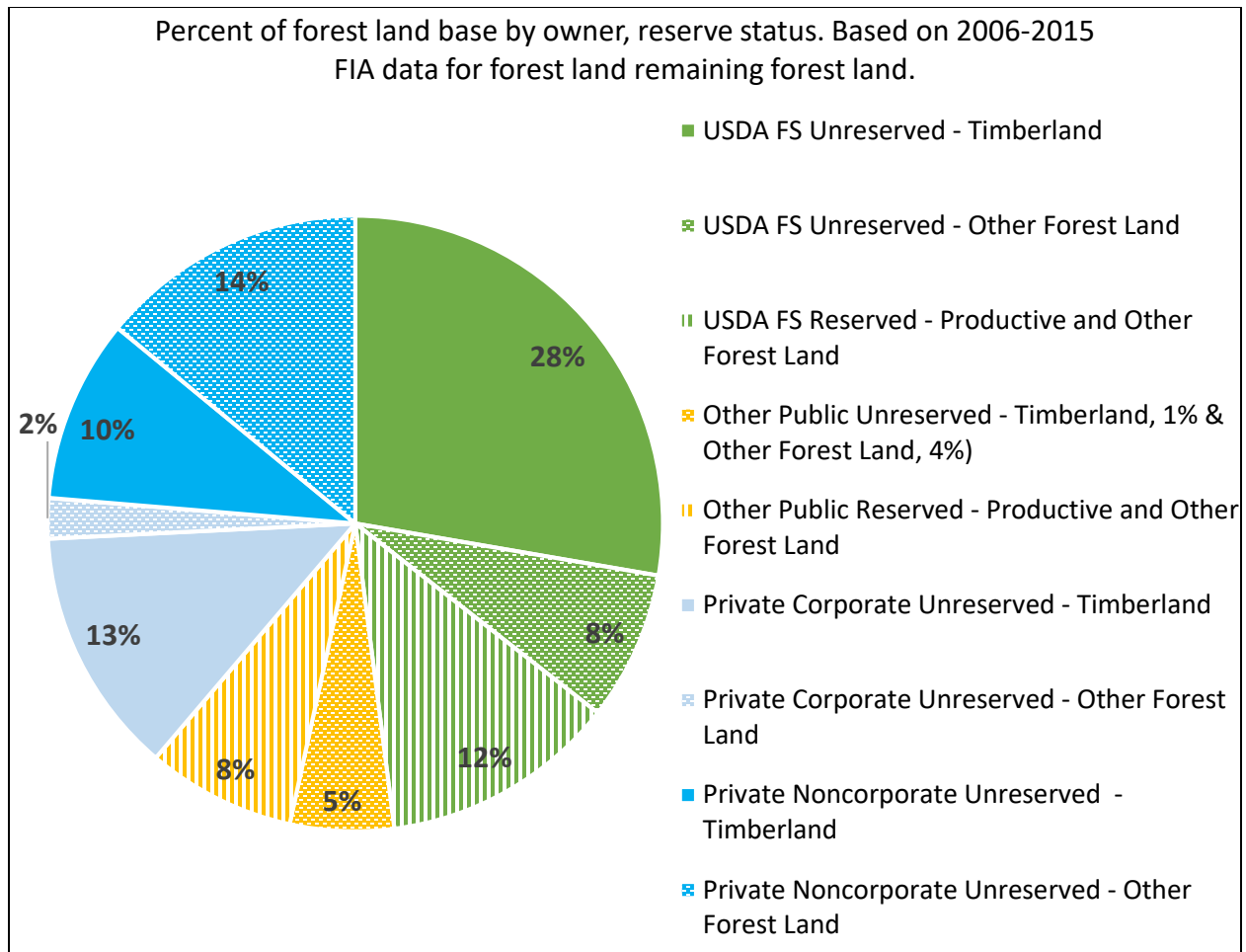


Figure 2.4: Percent of forest land base by owner, reserve status for forest land remaining forest land (2006-2015).

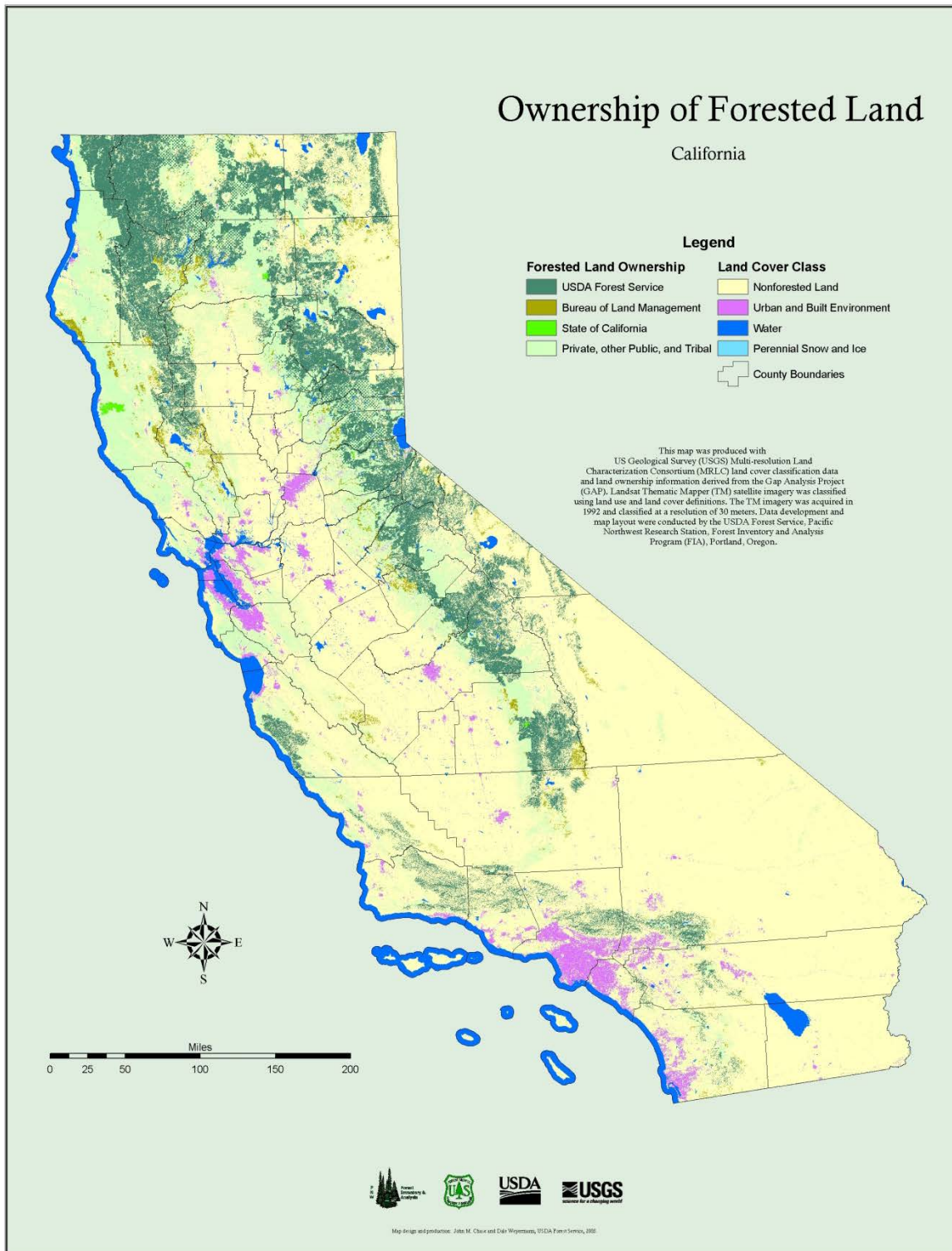


Figure 2.5: Ownership of Forested Land in California
 Source: USDA FS 2016b

3 Forest ecosystem carbon inventory methods

3.1 Use of IPCC inventory approach/methods

The Intergovernmental Panel on Climate Change (IPCC) was created in 1988 to prepare assessments on all aspects of climate change and its impacts based on available scientific information and is the key international body studying global warming. The IPCC issues guidance on reporting carbon stock inventories and emissions designed to implement the international United Nations Framework Convention on Climate Change (UNFCCC) 1992 Kyoto Protocol agreement. Although the U.S. is not a signatory to the Kyoto Protocol, the U.S. NGHGI follows IPCC guidance for international reporting for subsequent agreements and negotiations. Similarly, although California is not a reporting party to the Kyoto Protocol, this inventory will comply with IPCC-defined “good practices” as much as possible. The 2006 IPCC “Guidelines for National Greenhouse Gas Inventories” (IPCC 2006) provides a conceptual framework, sectoral scope definition, description of tiered inventory methods, calculation steps and uncertainty assessment steps. An important element specified in the 2006 Guidelines is a **key category analysis** in which key emissions categories are identified and prioritized. The focus of this report as directed by AB 1504 is on determining if the AB 32 Scoping Plan target for the forest sector in California of sequestering 5 million metric tons of CO₂e annually by 2020 is occurring. These legislative contexts serve to identify key categories for this analysis.

The key categories described in IPCC (2006) for forest-related fluxes include:

- CO₂ emissions and removals resulting from C stock changes in biomass, dead organic matter and mineral soils; and
- CO₂ and non-CO₂ emissions from fire on all managed land, including methane (CH₄), nitrous oxide (N₂O), non-methane volatile organic compounds (NMVOC), nitrogen oxides (NO_x), and carbon monoxide (CO).

Minor elements that may be relevant to forested wetlands and fertilized forest plantations include:

- N₂O emissions from managed soils, and
- CO₂ emissions associated with liming and urea application to managed soils.

The U.S. NGHGI only calculates N₂O emissions from southeastern forests and Douglas-fir stands in western Oregon and Washington (US EPA 2017), so these emissions are assumed to be negligible for California forests and are not included in this report. Similarly, the U.S. NGHGI only calculates CO₂ emissions associated with liming and urea for agricultural soils, so these emissions are assumed to be negligible for California forests and are not included in this report.

The IPCC guidelines only require reporting for **managed lands** under the assumption that nations cannot affect, or be held responsible, for changes happening on lands that aren't being managed. According to IPCC 2006, "managed land is land where human interventions and practices have been applied to perform production, ecological or social functions" (Paustian et al. 2006). Because even most Wilderness areas and National Parks in the U.S. are impacted by human management in some form, e.g., from fire suppression, in practice all lands in the lower 48 states are considered "managed" (e.g., US EPA 2017).

In 2014, the IPCC published the "Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol" (IPCC 2014) which provides additional guidance on estimating flux from land-use, land-use change and forestry (LULUCF) activities. For forest land, the primary change from IPCC 2006 are guidelines for reporting on forest management and on harvested wood products (HWP). Procedures for estimating HWP stocks and flux are addressed in section 5.

3.1.1 Rationale for use of Tier 3 approach

The IPCC guidance on greenhouse gas accounting describes three "tiers" or approaches to reporting that accommodate the range of data and institutional support in different countries. Gain-loss methods estimate the net balance of additions to and removals from each carbon stock. Stock-difference methods are a more rigorous approach that track the amounts in each carbon stock and their change over time.

Tier 1 methods are the simplest, and apply IPCC equations and default parameter values for emission and stock change factors (e.g., deforestation/afforestation, disturbance, harvest, grazing) to available information on land-use and activity (e.g., from land cover maps derived from satellite mapping). Tier 2 can use the same approach as Tier 1 but applies region- or country-specific emission and stock change factors. Tier 3 methods apply models and inventory measurements tailored to national conditions, are repeated over time, are driven by high-resolution activity data and disaggregated at sub-national level. Models are expected to undergo quality checks, audits, and validations and be thoroughly documented. Tier 3 methods are often referred to as "stock-difference," because C flux is derived from the difference in estimates of individual C pools at different points in time.

Most nations with more detailed economic and natural resource information are expected to follow the Tier 3 approach. This is the approach used by the U.S. NGHGI, built on a wide range of economic, environmental, and natural resource data already being collected for a variety of objectives. This is the approach used in this report as well, with a focus on forested lands as sampled by the FIA program.

Six land-use classes are recognized in IPCC assessments. While the IPCC does not prescribe specific definitions for each class, it does require that countries explicitly and consistently define and track them. These land-uses are further defined for the U.S. in the NGHGI (US EPA 2017) and are described in section 3.2.2. The IPCC land-use classes are:

1. Forest land: includes all land with woody vegetation, using consistent and well-defined criteria for minimum area, minimum cover, and minimum height at maturity to define “forest land” (specifying minimum width too is “good practice”). Assessment of this land-use class is split between land remaining forest land, and land converted to forest land from other uses. In the U.S., the FIA definition for forest land is used for reporting this category.
2. Cropland: cropped land and agro-forestry where structure falls below forest land.
3. Grassland: includes rangelands and pasture not considered cropland. Also includes systems with woody vegetation or herbs that fall below thresholds for forest land. For example, chaparral falls in this category in the U.S. NGHGI.
4. Wetlands: areas of peat extraction and covered by water for all or part of the year that doesn’t fall in the vegetated or settlement categories.
5. Settlements: developed land, including transportation infrastructure and settlements of any size, unless placed in other categories by national definitions.
6. Other land: bare soil, rock, ice, and all other land areas, including unmanaged lands.

In addition to identifying these six land-use categories and subcategories, IPCC requires distinguishing natural from planted forest, identifying areas subject to different natural disturbances and their effects on flux, identifying areas subject to management, and identifying areas of mineral and organic soils, with the latter split into drained, wet, or rewetting.

3.1.2 Determining the Forest Management Reference Level

The concept of a Forest Management Reference Level (FMRL) was established in the 1992 Kyoto Protocols and guidelines for implementing it are described in IPCC (2014), section 2.7.5. The FMRL is a baseline value of average annual net emissions and removals from “forest management” (i.e., all lands that remain forested or that change land-use to/from forest). All pools and gases and the area under forest management that are included in the calculation of the FMRL are to be identified. The FMRL facilitates consistent comparison of forest carbon stocks and losses through time by comparing one or more time periods to a reference baseline that is calculated in the same way, including all the same pools and assumptions.

The UNFCCC and AB 32 both refer to emissions in 1990 as the baseline that targets are tied to for future emissions levels.

For California, the availability of forest inventory data is more limited for the period including 1990 than for more recent years (2001 and on). Specifically, field measurements that span 1990 and that can be used to estimate change only consist of live trees on timberland outside of National Forests (Fried and Zhou 2008). Estimation of flux in 1990 for other lands and carbon pools requires substantial modeling and/or extrapolation from more recent datasets. An extrapolation approach was adopted for U.S. forests in the most recent U.S. NGHGI but the resolution of the estimates currently does not support analysis at less than the state level (US EPA 2017, Woodall et al. 2015). Some national and international assessments and negotiations have used other dates as baselines (e.g., 2005) to align better with available data.

In this report, we establish an FMRL for in-forest carbon based on data from the complete 10-year inventory in California conducted during the time-period 2001-2010 (the first comprehensive, standardized FIA inventory of California's forest lands since 1963 (Oswald and Hornibrook 1966)).

In this report, the FMRL provides a complete estimate of all pools of forest carbon in California and the trends over time as 10-year moving averages. Although there are large overlaps between periods, re-measurement data makes it possible to review trends from complete samples (i.e., all plots) in California for 2001-2010, 2002-2011, 2003-2012, 2004-2013, 2005-2014, and 2006-2015. However, estimates of change between 10-year stock averages (i.e., Stock-Change approach) are a less accurate and less precise way to infer flux than the GRM method described below. The FMRL identifies 6 key pools including Aboveground Live (trees and shrubs), Aboveground Dead (standing snags and down wood), Belowground Live (roots), Belowground Dead, and Soil Organic Carbon (organic soil layers; litter and duff will be included in the second inventory). The Harvested Wood Product (HWP) carbon pools will be added to the FMRL in the second 1504 full report.

Although we present data for the FMRL and 10-year moving stock averages to compare to it, in this report we determine annual flux through the Growth, Removals and Mortality (GRM) approach. Comprehensive forest inventories that are based on re-measured, permanent sample plots have the potential to provide the most accurate estimates of forest volume and carbon. This direct measurement of growth, removals and mortality would be considered an IPCC Tier 3 approach to carbon accounting as it is based on more advanced country-specific data and methods. It is also still considered a stock-difference approach, but by measuring changes in the same trees over time the components of change can be detailed (i.e., growth, removals, mortality).

The Forest Inventory and Analysis Program (FIA) of the USDA Forest Service began inventorying forest land in California in 2001 by installing a complete sample of the state each year using 10% of the full set of plots (16,868 on land). This equates to a complete sample of all inventory in California every 10 years. FIA completed their first full annualized inventory of California forests in 2010 (previous inventories were conducted periodically on a nominal 10-year interval). In 2011, FIA began re-measuring the same plot locations as established in 2001 and as of 2015, they had re-measured half of the plots in the state. As FIA re-measures more forest inventory plots in California (through 2020 and beyond) the ability to derive more precise estimates of change for smaller domains of interest will improve (e.g., regions and ownerships), and will be incorporated into future annual reports. The USDA Forest Service Pacific Northwest Research Station (PNW) manages the FIA program for the state of California.

3.2 Forest inventory compilation methods

This section is designed to document the basic estimation and compilation methods used for this report, and identify options for improving estimates in future reports. As mentioned above, this assessment relies primarily on empirical data from FIA inventories of the forests of California and to a large extent applies methods and models used in the NGHGI in accordance with IPCC guidance.

3.2.1 Inventory design

The population, or scope, of the inventory of California is the boundaries of the state, including offshore islands and approximately 3 nautical miles of ocean out from the coastline. Beginning in the 2001 nationally-standardized “annual inventory”, the sampling frame for this area was determined by a national layer of hexagons approximately 6,000 acres in size. Plot sample locations were identified within each hexagon in a manner sometimes referred to as “randomized systematic”. For hexagons that contained plot locations that were part of the previous FIA or National Forest System (NFS) inventories, the previous plot was selected for the annual inventory (or one was randomly selected if more than one was present). For hexagons without a previous plot, a new location was randomly generated within the hexagon. The total number of plots (forested and non-forested) in California is 17,641.

The hexagons in California are assigned to ten evenly-dispersed panels. Each panel is measured in a specific year, providing a balanced annual sample of the state each year. All panels are measured after ten years, at which point the cycle starts over and plots are re-measured on a ten-year interval. The first cycle of annual inventory in California occurred in 2001-2010, and five years of re-measurement data are available for this report, covering 2011-2015.

All inventory estimates are based upon the grid of plots and the classifications and measurements taken on them. The precision of the estimates is improved, however, by incorporating information from independent, ancillary datasets in a process referred to as “post-stratification” (MacLean 1972, Bechtold and Patterson 2005). Satellite imagery, historic maps, and ownership layers are combined and pixels with similar attributes related to forest/non-forest delineation and forest characteristics are grouped into strata. The number of pixels in each strata and the number of plots that intersect them are used to define weights for each plot in the inventory. Potentially-forested plots that were unable to be sampled (e.g., access was denied or plots were too hazardous to measure safely) are assumed to be missing at random. The methods represent nonsampled plots by increasing the weights of sampled plots found in the same strata as the nonsampled plots.

The plot sample and stratification are used in the calculation of sampling errors, which are provided with the results of this report. These errors describe the uncertainty associated with sampling the forest (i.e., with plots) instead of measuring the entire population. Additional details on inventory design and estimation methods are provided in Bechtold and Patterson (2005) and Christensen et al. (2016).

3.2.2 Forest land-use and land-use change

As provided for in IPCC guidelines, the NGHGI uses the FIA definition of forest land to define the specific lands covered, including the change in land-use between forest land and other land-uses. The current FIA definition of forest land (Woudenberg et al. 2010) is land with at least 10 percent cover by live forest trees of any size, or that formerly had such cover and that will be artificially or naturally regenerated (i.e., is not being managed for non-forest uses). The area must be at least 1 acre in size and be at least 120 feet wide. Tree-covered areas where management precludes natural vegetation development (e.g., through mowing, disking, regular herbicide application, or intensive grazing) are not considered forest land. FIA maintains a national list of species that are considered forest trees; these generally are species that form dominant central stems and attain heights greater than 16 feet across the majority of their range. However, some international definitions refer to trees being able to attain 16 feet in height “in situ”, and recent NGHGI and Resources Planning Act reports (RPA; Oswalt et al. 2014) have reclassified some forest land as “woodland”. The in-situ criteria implemented for NGHGI/RPA classifies plots based on a combination of current tree height, forest type, site class, and ecoregion. The criteria relevant to California that would result in changes of FIA data from forest land to woodland (a component of forest land) are:

- mean height of trees ≥ 5 inches diameter is < 16.4 feet; and
- FIA forest type code =184 (juniper woodland), 185 (pinyon-juniper woodland), 971 (deciduous oak woodland), 972 (evergreen oak woodland), 973 (mesquite woodland), or 976 (miscellaneous woodland hardwoods); and
- site class = 7 (unproductive forest of $< 20 \text{ ft}^3/\text{ac}/\text{yr}$ maximum growth; i.e., culmination of mean annual increment); and
- in ecoregions 322 (Mojave, Sonoran, and Colorado deserts), 341 (Mono and Southeastern Great Basin semi-deserts), or 342 (Northwestern Basin and Range).

The NGHGI also states that “land is not classified as Forest Land if completely surrounded by urban or developed lands, even if the criteria are consistent with the tree area and cover requirements for Forest Land. These areas are classified as Settlements” (US EPA 2017). Forested FIA plots in urban areas were not specifically excluded from the NGHGI calculations; instead, forest estimates were adjusted by the land-use categories derived from the USDA Natural Resources Conservation Service (NRCS) Natural Resources Inventory (NRI; e.g., USDA NRCS 2015) to implement these criteria.

In this analysis, we did not separate out FIA-classified forested lands that fell in the NGHGI-classes of woodland and urban from total forest land. We estimate that 414 ± 97 thousand acres of forest land meet the woodland definition, or 1.3% of the total forested area. Of the reclassified woodland, 85% of the area was on federal land, with the remainder on private land. Using currently-measured heights in the criteria ends up misclassifying some recently disturbed (seral) stands where trees have not reached their height potential. However, a ***potential change*** to match NGHGI reporting as closely as possible would be to incorporate woodland and urban criteria in the next iteration of the report.

Inventory crews delineate the area covered by different land-uses that fall in the FIA plot footprint. These proportions, in combination with the plot weights from the stratification, enable FIA to estimate the area of all land-use classes in the state (i.e., forest, non-forest, water). In sparsely-covered stands, crews take additional measurements and estimates (e.g., of dead or harvested trees) to determine whether the 10 percent threshold is met. Non-forest land-uses are identified either on the ground (for field-visited plots) or using recent imagery (for non-field-visited plots), which makes it possible to classify non-forest lands into most of the other IPCC classes (i.e., cropland, grassland, settlements, other). When plots were re-measured, changes in land-use within the plot footprint were delineated, enabling the estimation of change in forest land area and the land-uses that forest lands are coming from or changing into. Wetlands are apparently delineated in the USDA NRCS NRI used in the NGHGI, but their

locations are not yet clear; we assumed there was no land-use change between wetlands and forest.

The NGHGI definitions for non-forest land-uses are:

- Cropland: Areas used to produce adapted crops for harvest, including both cultivated and non-cultivated (e.g., hay, orchards), and agroforestry and windbreaks.
- Grassland: Areas where plant cover is composed principally of grasses, grass-like plants (i.e., sedges and rushes), forbs, or shrubs, including pastures and native rangelands. Savannas, deserts, and tundra, and drained wetlands with the appropriate plant cover are included. Systems with woody vegetation or herbs that fall below the thresholds for forest land are also included in grasslands (i.e., chaparral).
- Wetlands: Areas covered or saturated by water for all or part of the year, in addition to the areas of lakes, reservoirs, and rivers. Does not include areas of drained wetland that meet other categories, or un-drained forested wetlands.
- Settlements: Areas of at least 0.25 acres that includes residential, industrial, commercial, and institutional land; construction sites; public administrative sites; railroad yards; cemeteries; airports; golf courses; sanitary landfills; sewage treatment plants; water control structures and spillways; parks within urban and built-up areas; and highways, railroads, and other transportation facilities. Also included are tracts of less than 10 acres that may meet the definitions for Forest Land, Cropland, Grassland, or Other Land but are completely surrounded by urban or built-up land.
- Other Land: Areas of bare soil, rock, ice, and all land areas that do not fall into any of the other five land-use categories. Following IPCC (2006), C stock changes and non-CO₂ emissions are not estimated for Other Lands. However, C stock changes and non-CO₂ emissions are estimated for Land Converted to Other Land during the first 20 years following conversion to account for legacy effects.

Prior to the implementation of the national FIA field guide 6.0 in 2012, the definition of forest land used on the west coast was slightly different and was based on a 10 percent stocking threshold rather than cover. This was changed to cover to improve national and international consistency and the ability to relate ground classifications to imagery. The change in definition has little impact on the majority of forest land in California which easily exceeds both thresholds, but can lead to some differences in sparse forest conditions that may be found in oak and juniper woodlands (Azuma and Gray 2014). Nevertheless, the change raises the possibility that areas may change designation due to procedural change and not real change on the ground. PNW-FIA field crews have been distinguishing procedural from real changes and

taking additional measurements of cover and stocking in sparse stands to be able to better quantify the relationship between cover and stocking in different forest conditions. This will make it easier to compare estimates between older and newer inventories.

This report incorporates regional assessments of land-use change, after accounting for definition changes, procedural changes, and previous errors. This analysis of land-use change is NOT reflected in the publicly-available online FIA databases. The PNW-FIA program is in the process of evaluating how to implement databases that reflect correct analyses of change using current definitions while maintaining previous data used to generate earlier assessments.

3.2.3 Carbon pool calculations

Aboveground live tree—Estimates of aboveground live-tree woody C were based on regional FIA equations of the sum of bole, bark, and branch biomass in metric tons for each tree measurement multiplied by 0.5, the C fraction of biomass. Bole biomass (ground to tip) was calculated from regional species-specific volume equations documented in Zhou and Hemstrom (2010) and species-specific wood density values documented in Woudenberg et al. (2010). Bark and branch biomass were calculated from regional species-specific equations selected from Means et al. (1994) and documented in Zhou and Hemstrom (2010), except branch Equation 16 used Snell and Little (1983) and bark Equations 8 and 20 used Means et al. (1994) Equations 5 and 275, respectively. Most equations use both diameter at breast height (dbh) and height data, whereas a few bark and branch equations use diameter only. Foliage biomass was calculated using the Jenkins et al. (2003) ratios to total tree biomass as implemented in Woodall et al. (2011) and added to aboveground wood biomass before calculating aboveground live tree C. In contrast, the NGHGI estimates of live tree biomass are based on the “component ratio method” equations in Woodall et al. (2011). An expansion factor derived from the fixed-area plot size was used to convert individual tree C to an area basis (e.g., metric tons per acre).

Aboveground standing dead tree—Estimates of aboveground standing dead tree carbon followed the same procedures as for aboveground live trees, but with the following modifications. Gross volume from ground to tip was adjusted for broken tops by calculating the gross volume (to an intact “total” height estimated in the field or modeled using Barrett (2006)) and the net volume to the broken “actual” height with a Flewelling (1994) taper equation for Douglas-fir. The proportion of net to gross volume from the Flewelling equation was applied to reduce the gross volume calculated for each tree. In addition, the biomass of all components (bole, bark, and branch) were reduced for decay using the hardwood/softwood parameters in Harmon et al. (2011), Table 6. Standing dead biomass was further reduced to account for the tendency of bark and branches to be dropped from snags sooner than bole biomass; component reductions described in Harmon et al. (2011) were applied to further reduce bark

and branch biomass. Biomass calculations in metric tons were multiplied by 0.5 to calculate C. In contrast, the NGHGI estimates of standing dead tree biomass are based on the equations in Woodall et al. (2011) and the species-specific decay-reduction factors in the table REF_SPECIES in Woudenberg et al. (2010). The species-level decay factors appear to be based on small datasets and highly variable among similar species; the hardwood/softwood parameters seemed more reliable. Stumps are not included and it is unlikely that they will be included in future inventories.

Belowground live and standing dead tree (i.e., roots)—Estimates of belowground biomass (i.e., coarse roots > 2 mm diameter) were based on the ratios for species-groups developed in Jenkins et al. (2003) as implemented in Woodall et al. (2011); i.e., adjusting the estimate by the ratio of the FIA volume-based estimate of bole biomass to the Jenkins equation-based estimate. Decay class of standing dead trees was used to reduce belowground calculations using the species- and decay class-specific parameters in the REF_SPECIES table (Woudenberg et al. 2010); biomass calculations in metric tons were multiplied by 0.5 to calculate C.

Aboveground down wood—Estimates of carbon in down wood were based on the transect-intercept measurements of coarse wood (≥ 3 inches intersect diameter) and counts of fine wood (≥ 0.25 to < 3 inches diameter). Piles were not included, as the field estimates of pile density in the initial years of the inventory were unreliable. Biomass of coarse wood was calculated using the equations in Woodall and Monleon (2008) with wood density and decay-class reduction factors from the REF_SPECIES table (Woudenberg et al. 2010). A ***potential improvement*** for a future report would involve using the hardwood/softwood decay-reduction parameters from Harmon et al. (2011) instead (as described above for snags), as they seem less variable among similar species than the species-specific variables in REF_SPECIES, which were also derived from Harmon et al. (2011). Log inclinations were measured in PNW inventories starting in 2013 with the implementation of core FIA manual 6.0. Where available, inclinations were factored into the calculation of coarse wood biomass and carbon (inclined logs have a lower probability of being intercepted by a transect, so the calculated C per acre is greater than if the same log were lying flat). For the smaller size classes of down wood (“fine wood”) we followed the procedures in Woodall and Monleon (2008) where the fine wood piece counts in each size class are multiplied by a quadratic mean diameter (QMD) to calculate volume, and a wood density factor to calculate biomass, which is multiplied by 0.5 to calculate C. Parameters are specific to forest type group and available in REF_FOREST_TYPE_GROUP in the FIA database (FIADB) (Woudenberg et al. 2010). Although measurements of piles were taken, estimates of wood density in piles tended to be unrealistically high, particularly in the initial inventory years. As a result, we currently do not include pile data in the down wood calculations, but may be able to develop replacements for current values with reasonable assumptions with greater scrutiny.

Aboveground and belowground understory vegetation—Estimates of above- and belowground biomass and C of understory vegetation (which includes live trees < 1 inch in diameter) are based on the calculations from the U.S. Forest Carbon Budget Model (FORCARB2) (Smith et al. 2006), as populated in the FIADB. Calculations are based on FORCARB estimates of live-tree biomass, (calculated from forest type and stand age), and are highest at low levels of live tree biomass and decline slightly at higher levels. Dead understory vegetation is not included and there are no plans to include it at this time. **A potential improvement** for a future report would use the cover and layer height data collected on FIA plots to calculate understory biomass directly, provided suitable equations can be found.

Forest floor—We currently do not provide estimates for carbon in the forest floor (i.e., duff and litter). PNW-FIA crews have measured forest floor depth on the down wood transects since the beginning of annual inventory, but there were problems in the initial years with the measurements and with distinguishing nonsampled locations from measured zeros. Our initial calculations of stocks and flux of this pool indicated these problems were not trivial. The FIADB forest floor C variable is populated with the stand-age driven calculations in FORCARB2 (Smith et al. 2006). The NGHGI uses model calculations for forest floor and fine wood from FIA Phase 3 data and predictor variables of location, elevation, forest type group, live tree C, and some climate variables (Domke et al. 2016). **A planned improvement** for a future report is to either resolve the data problems (i.e., determine a subset of data that are reliable) or report estimates based on the models of Domke et al. (2016) or Smith et al. (2006).

Soil—We estimate soil organic C stocks using the calculations from Smith et al. (2006) as populated in FIADB, which are simply estimates of soil carbon based on forest type. The latest NGHGI report is based on a newer model that incorporated data from soil cores on FIA plots with other national datasets (Domke et al. 2017). We included estimates of soil C flux based on the changes in calculated forest type although it did not seem to be a realistic basis for soil C flux. **A potential improvement** for a future report would apply the newer modeled calculations from Domke et al. (2017).

3.2.4 Flux calculations

The Growth, Removals, and Mortality (i.e., GRM) approach was used to calculate change in forest C pools and the magnitude of flux by comparing measurements taken on the same set of plots and trees 10 years apart.

All flux calculations were summarized based on the condition classification at the initial measurement (e.g., owner, forest type, etc.). It was fairly common for the condition classification on a plot to change over time: usually it was a result of disturbance or management changing the forest type and/or stand size class, but sometimes there was a

change in land-use on the plot. The change in C was calculated for individual trees between measurements. For live trees that died or were cut between measurements, growth equations were used to estimate tree diameter and height at the midpoint of the measurement interval and calculate C at the time of death (Bechtold and Patterson 2005); using the dimensions at the first measurement would result in a biased under-estimate for mortality and harvest. New trees that grew into the sapling size class (≥ 1 inch diameter) between estimates were considered ingrowth (a component of growth). Live tree C was allocated into the components of change based on initial and re-measurement tree status, namely: growth, removals, and mortality. Change in C for standing dead trees was based on the difference in calculated C at each time-period and would include live tree C entering this pool through mortality, and dead tree C leaving this pool through decay, transition to other pools, or combustion; trees that fell over or were cut were assigned zero for the second measurement. Changes in down wood C were estimated at the plot level, based on calculations that did not incorporate log inclination from the most recent measurements. Changes in this pool include tree C entering this pool from live or standing dead pools and C leaving this pool through decay, transition to other pools, or combustion. Changes in understory vegetation were based on modeled estimates (from live tree biomass) from each measurement. As described above, flux was not calculated for forest floor; we assume zero flux for this pool. **A potential improvement** for a future report would be to identify reliable datasets and/or models to estimate forest floor values.

For land-use change (i.e., forest to non-forest or non-forest to forest), all non-soil pools were assumed to be zero for non-forest conditions. Although in some cases this is unrealistic (e.g., not all trees are cut when houses are built on forest land), there are currently no data to estimate those pools on non-forest lands. For soil organic carbon (SOC), the IPCC Tier 2 approach is to use country-specific data to assign carbon concentrations by land-use, climate zone, and soil type, and assume a 20-year lag for SOC to reach a new equilibrium. However, most of the recent IPCC values and research on SOC appear to focus on agricultural soils and effects of different types of management (Ogle et al. 2003, IPCC 2006). The approach in Ogle et al. (2003), which is used in the NGHGI, assumes that forest, rangeland, and urban land-uses have the same SOC as uncultivated land (primarily due to lack of information for urban). Because the agricultural land-uses involved in land-use changes in California were either pasture or orchard (i.e., did not involve any plowing or intensive row cropping), we assumed that SOC changes due to land-use were zero.

3.2.5 Disturbance classification and assessment

FIA crews identify the types of treatments and disturbances that have occurred on the plot since the previous measurement. Up to three management treatments, and up to three natural disturbances can be coded. Disturbances must meet a minimum threshold that cause mortality or damage to at least 25 percent of all trees in a stand or 50 percent of an individual species' count. We classified disturbance codes hierarchically for analysis, with both fire and harvest taking precedence over other disturbances. Harvest treatments of Trees removed (generic), Clearcut, Partial heavy, Partial light, Precommercial, and Improvement were classified as "Cut". Any record of fire (Fire [generic], Ground fire, and Crown fire) were classified as "Fire". If either of these types were recorded, they were identified with the condition; if both were recorded, the condition was classified as "Cut and Fire". (Note: Cut and Fire includes stands that were thinned and prescribe burned, as well as stands that were burned by wildfire and salvage-logged.) If neither of those were coded, then any insect or disease disturbances were used to classify the condition disturbance as "Insect and Disease". If nothing had been classified yet, then any weather disturbances (including landslide and avalanche) were coded as "Weather". Finally, if none of the previous had been recorded but treatment codes for Firewood cutting, Incidental cutting, Stand conversion, Clean and release, or Chaining were present, then the disturbance was classified as "Other cut". Although estimated trends in area burned are similar between FIA and other methods, other approaches don't distinguish forest from non-forest burned area (Christensen et al. 2016).

Because change analyses are based on the conditions as designated at the first measurement, and disturbance is coded at the second measurement, when condition mapping may change, a mechanism to associate the disturbance code with the condition as classified at the first measurement is needed. For changes in tree carbon, the individual trees were assigned to both the current and previous condition IDs. For the other pools (e.g., down wood and understory veg) biomass estimates for each subplot were proportioned by the condition-change proportions on the subplot to link up the first and second measurements and calculate change. **Potential additions:** there is substantial interest in using remote sensing of disturbances to provide modeled up-to-date estimates of change; however, this would also require modeling growth, mortality, and decay on the undisturbed plots which could require substantial effort.

3.2.6 Estimation of additional greenhouse gases

The primary non-CO₂ greenhouse gas emissions for forest land are for methane (CH₄) and nitrous oxide (N₂O) from combustion in prescribed fire and wildfire. The default IPCC (2006) method is to estimate pre-fire fuel mass (live vegetation, litter, and dead wood), and apply combustion factors for the amount of woody material consumed (defaults in IPCC 2006 Table

2.6). Because we have measurements of change in C pools on plots that burned, we used the change in C on each burned plot instead. We then multiplied the amount combusted by emissions factors listed in IPCC 2006 Table 2.5 ($\text{CH}_4=4.7$, $\text{N}_2\text{O}=0.26$ g/kg of dry matter burnt for non-tropical forests). The CO_2 equivalents for the greenhouse gas effect of these gases (i.e., 100-year global warming potentials) are listed in IPCC (2007b) as $\text{CH}_4=25$ and $\text{N}_2\text{O}=298$. Greenhouse gas equivalents were not found for CO and NO_x , so analyses of emissions of these gases were not included, which is consistent with the NGHGI.

4 Forest ecosystem results: Carbon flux, stock, and trends

In this analysis results of carbon physically present in the forest are given in metric tons (MT) of carbon (C). Results of carbon flux, the amount and rate of gaseous carbon being emitted or sequestered by the forest, are given in metric tons (MT) of carbon dioxide equivalent (CO_{2e}). Carbon can be converted to CO_{2e} by multiplying by 3.667. Negative values indicate an emission. Ranges in the text (i.e., ±) represent a 95% confidence interval (CI), while values in the tables report the sampling error (SE; CI = 1.96*SE).

4.1 Average annual net carbon flux

4.1.1 Statewide net carbon flux 2001-2005 & 2011-2015 – overview

As of 2015, California is exceeding the 5 MMT CO_{2e} target rate of annual sequestration established by AB 1504. Using recent FIA plot measurements, the 2015 statewide rate of carbon sequestration from all forest land across all ownerships is 33.6 ± 5.3 MMT CO_{2e} per year (95% CI), excluding net CO_{2e} contributions from other sources such as forest soils, harvested wood products, land moving to and from a forested condition, and non-CO₂ greenhouse gas emissions from wildfire (Table 4.1, 4.3). After accounting for these other CO₂ and greenhouse gas sources the 2015 statewide rate of carbon sequestration on all forest land is 32.8 ± 5.5 MMT CO_{2e} per year (95% CI; Table 4.2). This includes soil organic carbon estimated to sequester an additional 0.8 ± 1.0 MMT CO_{2e} per year (Table 4.1, 4.3). Changes in land-use between forest and non-forest land condition is estimated to have a net effect of emitting 1.2 ± 1.2 MMT CO_{2e} per year (Table 4.2, 4.9). Combined annual net emissions of non-CO₂ greenhouse gases (methane and nitrous oxide) from wildfire is also accounted for and is estimated to be 0.4 ± 0.1 MMT CO_{2e} per year (Table 4.2, 4.7). Flux associated with HWP pools will be determined in a later 1504 inventory.

This updated estimate of average annual carbon sequestration is based on a 10-year average from plots and trees initially measured between 2001 and 2005 then re-measured 10 years later between 2011 and 2015. Remeasuring permanently located inventory plots gives the FIA forest inventory program the unique ability to fully evaluate and monitor changes on each plot in all carbon pools especially changes in tree growth, removals, and mortality across all ownerships and forested areas of the state.

Table 4.1: Average annual net CO₂e flux from forest pools in forest land remaining forest land based on plots initially measured between 2001-2005 and re-measured between 2011-2015. Harvested wood product pools to be determined (TBD) based on results from annual surveys and models.

	Net flux	SE
	<i>million metric tons CO₂e</i>	
<i>Carbon pool</i>		
<i>Forest</i>		
Aboveground live*	25.0	2.3
Aboveground dead**	3.2	1.5
Belowground live***	4.8	0.5
Belowground dead****	0.5	0.02
Litter	TBD	TBD
<i>net flux</i>	33.6	2.8
Soil Organic C	0.8	0.5
<i>Harvested Wood</i>		
Products in use	TBD	TBD
Products at SWDS	TBD	TBD
Total net flux	34.4	2.8
*includes live trees, foliage, and understory veg		
**includes standing and down dead wood		
***includes live tree and understory veg roots		
****includes dead tree roots		

Table 4.2: Average annual net CO₂e flux from forest/HWP pools and non- CO₂ emissions from forest fires in Forest land remaining forest land and changes due to forest land conversions (i.e., by forest land-use and land-use change). Plots initially measured between 2001-2005 and re-measured between 2011-2015.

Land-use category	Net flux	SE
	<i>million metric tons CO₂e</i>	
Forest land remaining forest land		
changes in forest carbon stock	33.6	2.7
changes in soil carbon stock	0.8	0.5
non- CO ₂ emissions from forest fires	-0.4	0.05
<i>net flux</i>	<i>34.0</i>	<i>2.8</i>
Forest land conversions		
changes in forest carbon stock, forest to non-forest	-2.5	0.5
changes in forest carbon stock, non-forest to forest	1.3	0.3
<i>net flux</i>	<i>-1.2</i>	<i>0.6</i>
total net flux	32.8	2.8

4.1.2 Net carbon flux for forest lands remaining forest (FF)

4.1.2.1 Net carbon flux by pool and ownership

Table 4.3. Statewide estimate of average annual carbon flux CO₂e by pool and ownership, 2001-2005 to 2011-2015. Changes in CO₂e due to land-use changes and non-CO₂ greenhouse gas emissions are not included. See also Appendix 2, Table B1.

	Public						Private				Total	
	National Forest		Other Federal		State and Local Govt.		Corporate		Non Corporate			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>thousand metric tons CO₂ equivalent per year</i>												
Standing Live Tree												
Mortality	-24,238	1,399	-2,486	420	-1,276	370	-3,757	354	-3,921	332	-35,679	1,566
Cut	-1,488	306	-9	9	-8	6	-10,663	1,341	-1,476	404	-13,645	1,415
Gross Growth	33,117	707	4,459	407	3,296	367	18,554	883	13,773	794	73,199	1,188
Net	7,390	1,531	1,964	460	2,012	420	4,133	1,497	8,376	769	23,875	2,334
Foliage	431	78	95	24	104	18	220	77	354	36	1,203	118
Roots												
Live	1,684	303	358	105	398	84	882	308	1,527	160	4,849	475
Dead	519	204	-25	46	6	37	33	66	15	51	549	228
Standing Dead	3,525	997	-17	237	58	139	289	260	364	211	4,218	1,087
Dead Woody Debris	-252	732	186	337	93	178	-1,343	548	318	391	-998	1,066
Understory Vegetation												
Aboveground	-76	59	-16	34	-20	9	56	54	-47	20	-103	90
Belowground	-8	7	-2	4	-2	1	6	6	-5	2	-11	10
Total (excluding soils)¹	13,212	1,515	2,542	602	2,650	491	4,277	1,935	10,901	987	33,581	2,727
Soils	172	334	409	156	110	84	-41	283	131	199	781	514
Total (including soils)¹	13,384	1,592	2,951	632	2,759	510	4,236	1,936	11,032	999	34,363	2,787

¹assume flux from forest floor (i.e., litter and duff) is zero

Growth on live trees make up 89% of the annual aboveground CO₂e flux on forest land from all ownerships. Standing dead trees, fallen down wood, and understory vegetation make up the remaining 11% of aboveground CO₂e flux. Live trees including foliage and live roots contribute carbon at a net rate of about 30 ± 4.7 MMT CO₂e per year (Table 4.3). It is estimated that down wood as fallen logs and other decaying woody material is emitting CO₂e at a rate of 0.998 MMT CO₂e per year but the relatively large range ($\pm 2,089$ MMT CO₂e) suggests that this estimate is not significantly different from zero. Net emission of CO₂ from down wood is partially due to the overall rate of wood decay combined with losses from disturbance events such as wildfire exceeding the rate of recruitment of new material through fallen trees and branches. Potential woody material is also being partially off-set as harvested trees from what would become part of the down wood carbon pool. Carbon in wood products manufactured from a portion of the wood volume in these harvested trees is not immediately emitted as CO₂, but is stored as

sequestered C. See section 5 for a discussion of the role these harvested wood products play in the carbon cycle. The large increase in snag carbon on National Forests will likely result in future increases in down wood in unharvested stands.

As a single ownership, the national forests provide the largest contribution to overall net annual CO₂e sequestration accounting for 39% of the statewide net forest ecosystem carbon flux (Figure 4.1). Of the private ownerships, individual noncorporate owners contribute the most and sequester an estimated 33% to the statewide net CO₂e flux on forest land. Net tree growth on corporate forest land currently contributes about 13% to total annual carbon sequestration from California's forests.

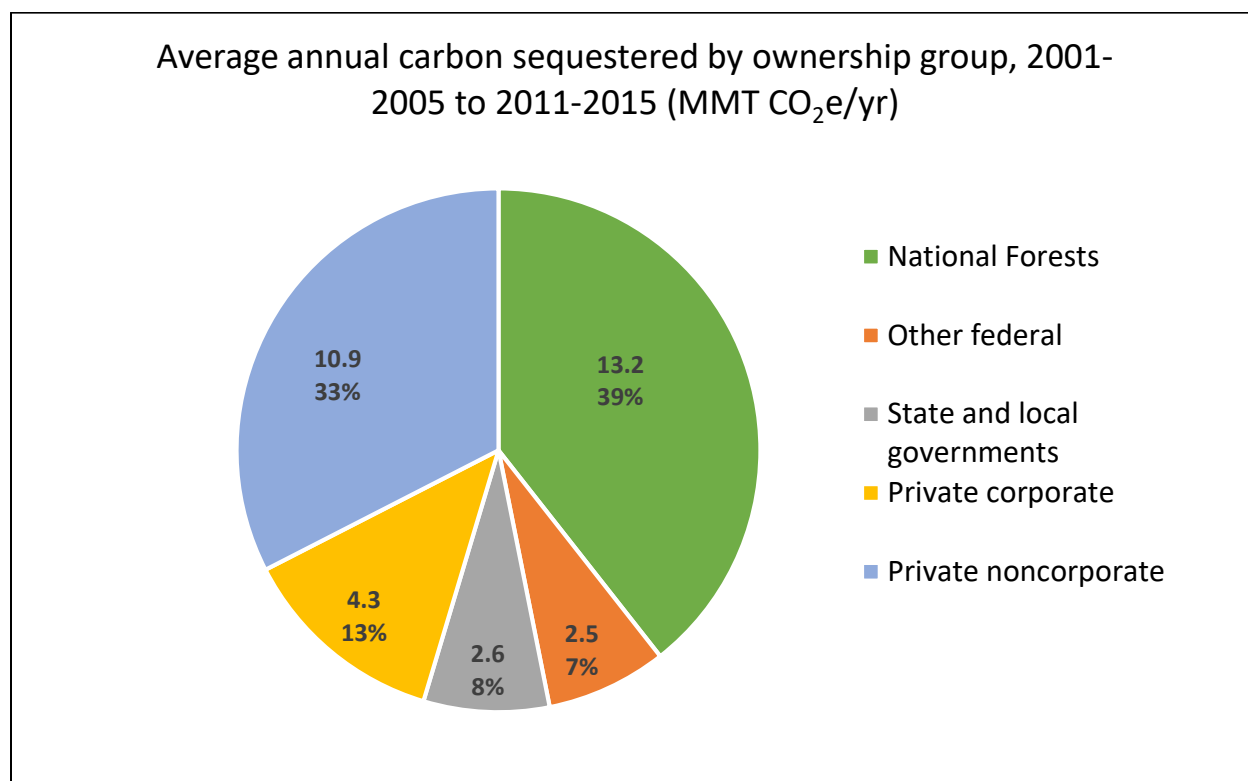


Figure 4.1. California average annual carbon sequestration rate by ownership group, 2001-2005 to 2011-2015 (MMT CO₂e/yr). Soils and forest floor flux assumed to be zero. Figure derived from Appendix 2, Table B1.

Evaluating the contribution of each ownership by carbon pool highlights the significant roles played by both the National Forests and private ownerships to overall annual carbon sequestration. It is the combined effect of annual growth on live trees from all ownerships that overcome annual carbon losses due to any single source of emission (Figure 4.2). National Forests and forest land managed by private individuals are each currently exceeding the 5 MMT

CO₂e per year target established by AB 1504 when evaluating flux on all forest land (Figure 4.2) or productive timberland alone (Figure 4.3).

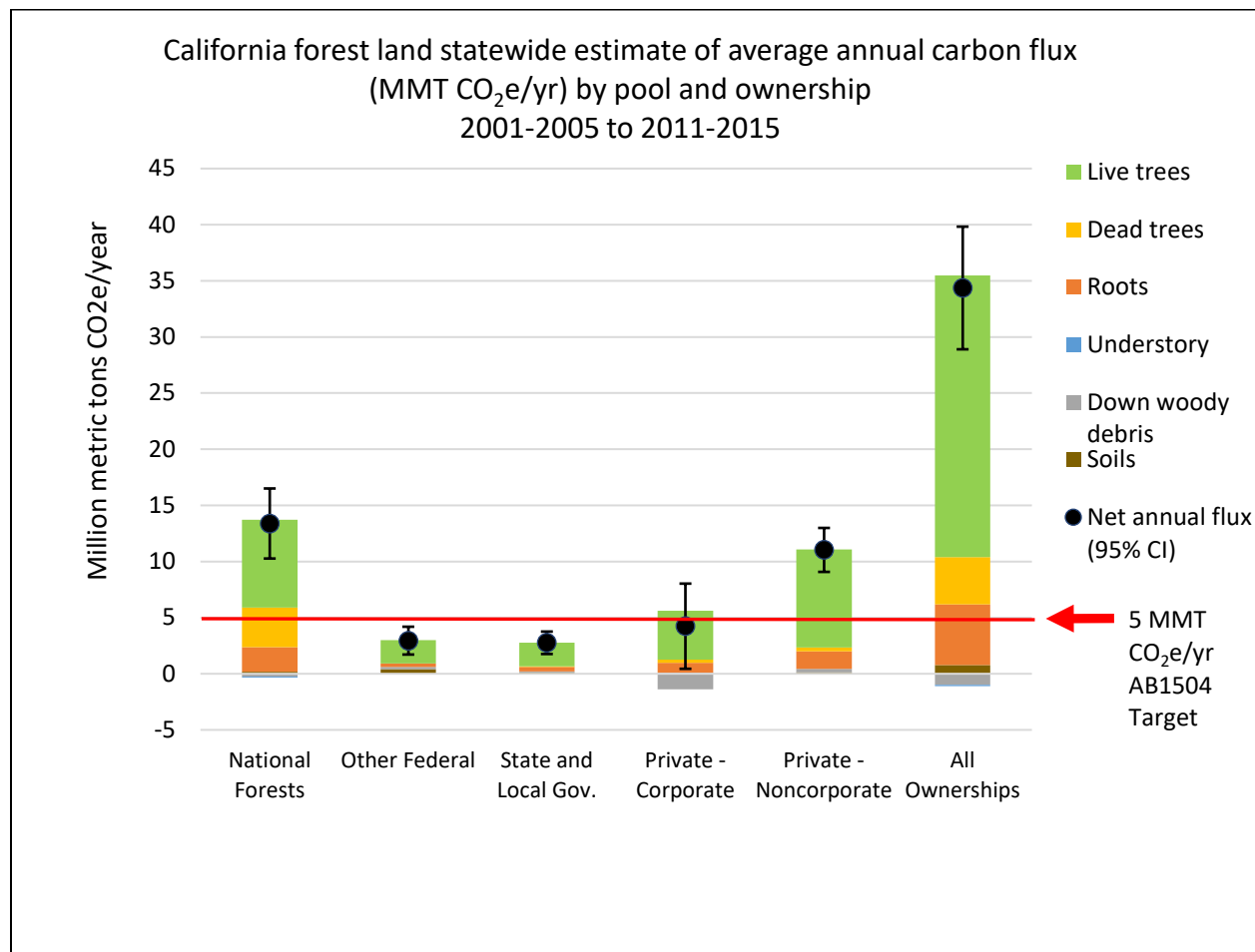


Figure 4.2. California forest land statewide estimate of average annual carbon flux (MMT CO₂e/yr) by pool and ownership, 2001-2005 to 2011-2015. Estimates exclude emissions from land-use changes (1.2 MMT CO₂e/yr) and non-CO₂ greenhouse gases (0.4 MMT CO₂e/yr). Roots includes belowground live and dead tree roots. Understory includes aboveground and belowground understory vegetation. Error bars represent the 95 percent confidence interval of net change. Figure derived from Appendix 2, Table B1.

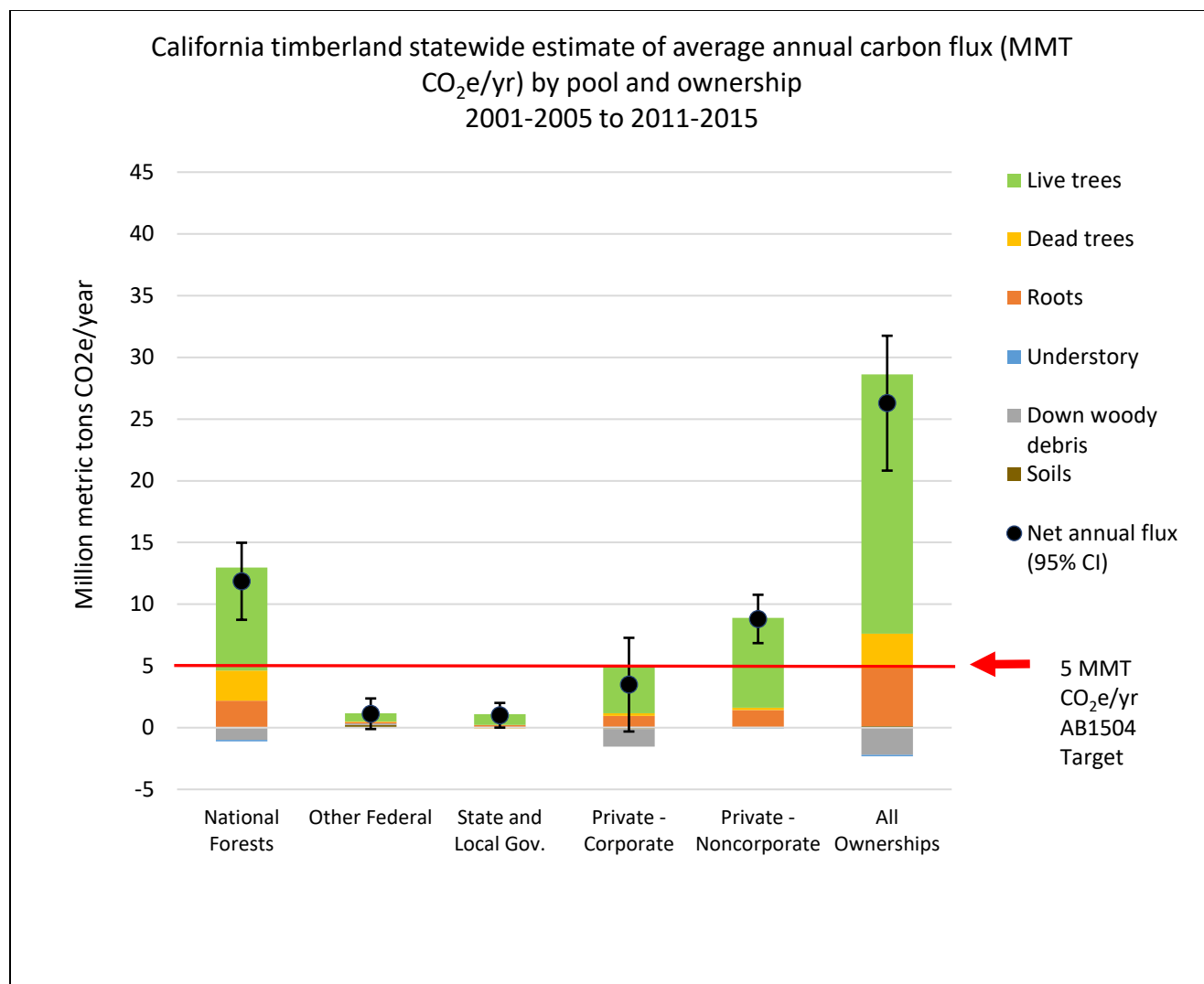


Figure 4.3. California timberland statewide estimate of average annual carbon flux (MMT CO₂e/yr) by pool and ownership, 2001-2005 to 2011-2015. Estimates exclude emissions from land-use changes and non-CO₂ greenhouse gases. Roots includes belowground live and dead tree roots. Understory includes aboveground and belowground understory vegetation. Error bars represent the 95 percent confidence interval of net change. Figure derived from Appendix 2, Table B1.

Only on reserved forest lands managed by the USDA Forest Service are carbon losses from mortality in the live tree pool estimated to exceed gains from live tree growth (Figure 4.4, Table 4.4). In these reserved forests, tree mortality primarily due to wildfire is currently driving the overall net carbon emission of 0.2 ± 0.47 metric tons CO₂e per acre per year (95% CI) in 2015. However, annual gross growth per acre on live trees is currently exceeding all other carbon losses from the live tree pool due to mortality or harvest on unreserved timberland for all other ownerships including lands managed by the Forest Service. By ownership, the annual net rate

of carbon sequestration is the greatest on timberland owned by private individuals where 1.33 ± 0.22 metric tons of CO_2e per acre are added each year (95% CI). Together, trees growing on all ownerships across all of California's forests are currently sequestering carbon at net annual rate of 0.79 ± 0.15 metric tons CO_2e per acre (95% CI). Average annual net change totals for the aboveground live tree carbon pool by ownership and land status are found in table 4.6 and discussed in section 4.1.2.3.

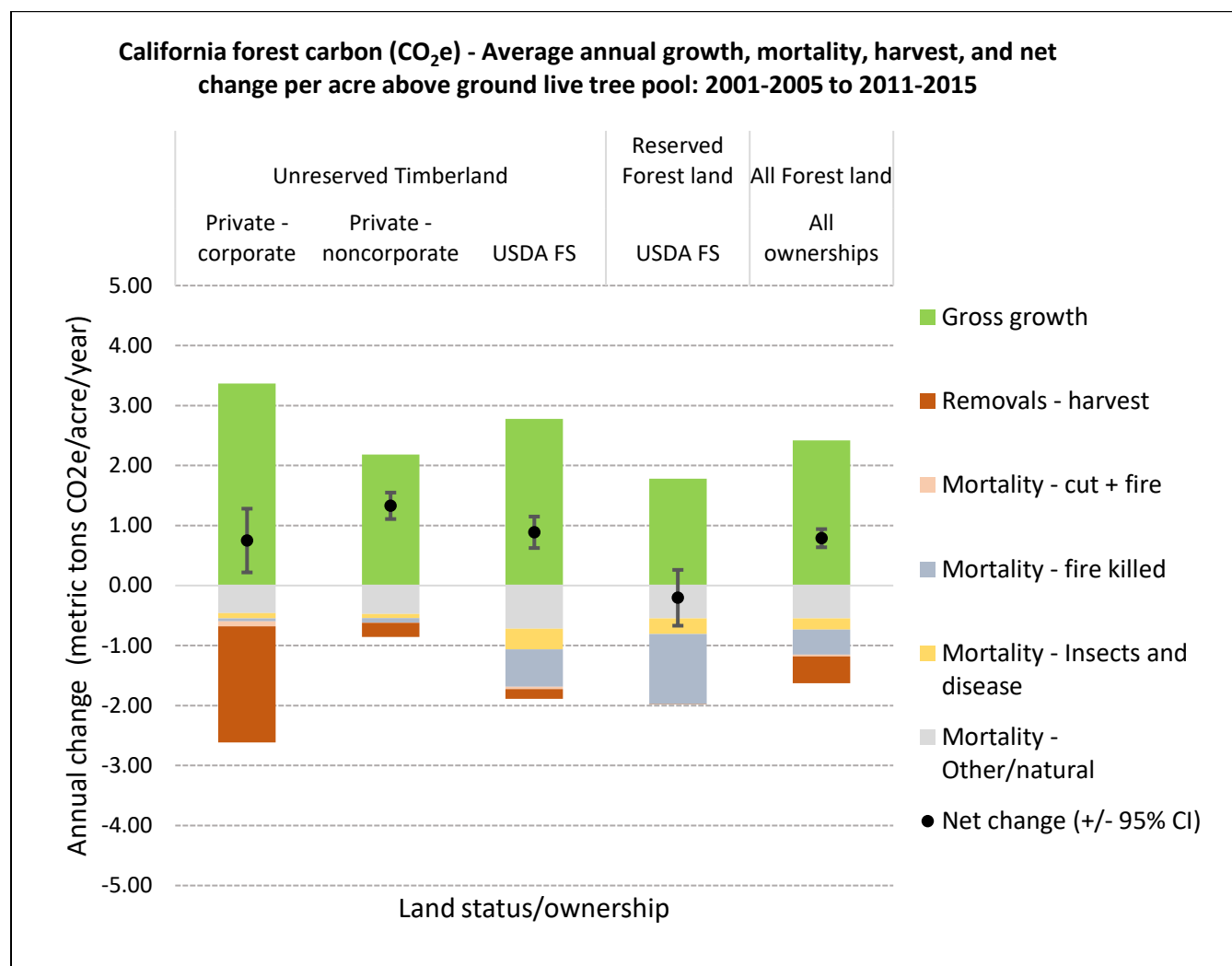


Figure 4.4. Average annual growth, mortality, harvest, and net change per acre in aboveground live tree carbon pool by ownership and land status of California's forests (MT CO_2e /acre/year), 2001-2005 to 2011-2015. The "all ownerships" category includes all other state and federal agencies managing fewer overall acres of forest land in California. The error bars represent the 95% confidence interval of net change. Figure derived from Appendix 2, Table B10.

Table 4.4. Average annual growth, mortality, harvest, and net change per acre in aboveground live tree carbon pool by ownership and land status of California’s forests, 2001-2005 to 2011-2015. The “all ownerships” category includes all other state and federal agencies managing fewer overall acres of forest land in California. Table derived from Appendix 2, Table B10. Average annual net change totals for the aboveground live tree carbon pool by ownership and land status found in table 4.6.

	Unreserved Forest land			Reserved Forest Land	All Forest Land
	Private - Corporate	Private - Noncorporate	National Forests	National Forests	All Ownerships
	<i>Metric tons CO₂e/acre/year</i>				
Gross tree growth	3.37	2.19	2.78	1.78	2.42
Removal - harvest	-1.93	-0.23	-0.16	-0.01	-0.45
Mortality – fire killed	-0.05	-0.07	-0.63	-1.17	-0.42
Mortality – cut and fire ¹	-0.08	-0.01	-0.04	0.00	-0.03
Mortality – insects and disease	-0.09	-0.07	-0.34	-0.26	-0.19
Mortality – natural/other	-0.46	-0.47	-0.72	-0.55	-0.55
Net change (95% CI)	0.75 (0.53)	1.33 (0.22)	0.89 (0.26)	-0.20 (0.47)	0.79 (0.15)

1. Mortality – Cut and fire: plots where tree mortality has occurred due to both harvest and fire.

4.1.2.2 Net carbon flux aboveground live tree pool, by region

By region, the Sierra/Cascades region has the most forest land and the greatest net live tree CO₂e flux due to higher total annual growth in its forests relative to growth from other regions (Figures 4.5 and 4.6, Table 4.5). This region also has the greatest rate of mortality but after accounting for harvest, Sierra/Cascades aboveground live tree pool is still sequestering 8.7 ± 3 MMT CO₂e/yr, which is more than any other region. The Southern Coastal Mountains and Deserts region is currently the only region where tree mortality is exceeding tree growth resulting in a net carbon reduction of the live tree pool of 1.1 ± 0.7 MMT CO₂e per year. Further analysis is needed to determine why this may be the case.



Figure 4.5. CAL FIRE ecoregions of used in this analysis, based on ecological sections as described by Cleland et al. (2007). To comply with FIA's individual ownership confidentiality requirements the southern two ecoregions are combined into a single area for analysis.

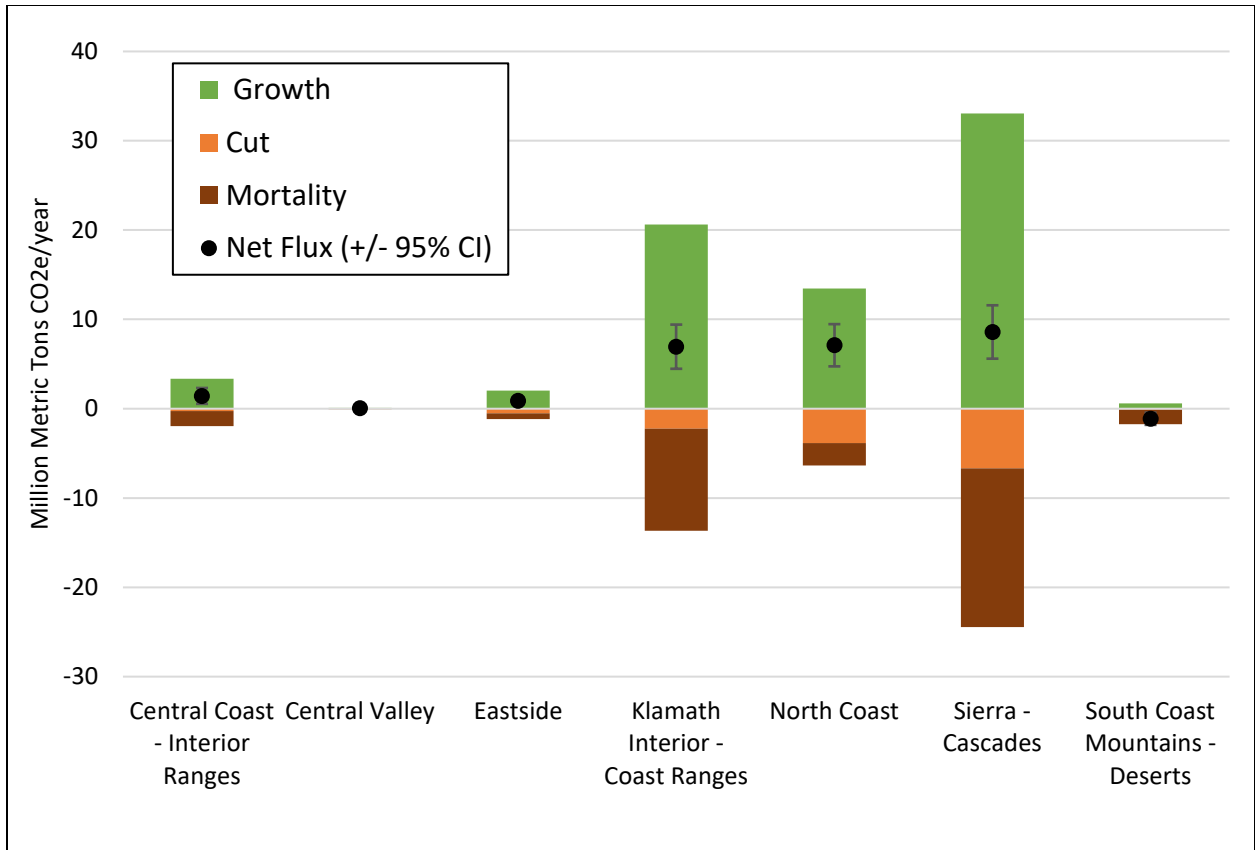


Figure 4.6. Average annual CO₂e change in live trees from growth, harvest, mortality, and net flux by ecological region, 2001-2005 to 2011-2015. Error bars represent the 95% confidence interval of estimated net flux. Figure derived from Appendix 2, Tables B2-B8.

Table 4.5. Average annual carbon (CO₂e) change in live trees from growth, harvest, mortality, and net flux by region, 2001-2005 to 2011-2015. Table derived from Appendix 2, Tables B2-B8.

Region	Gross Growth		Mortality		Harvest		Net Flux	
	Total	SE	Total	SE	Total	SE	Total	SE
<i>Thousand Metric Tons CO₂ equivalent per year</i>								
Central Coast/Interior Ranges	3,368	493	-1,684	343	-251	129	1,433	453
Central Valley	97	53	-30	24	-6	7	61	34
Eastside	2,013	228	-615	141	-529	162	870	216
Klamath Interior/Coast Ranges	20,624	927	-11,433	1,047	-2,249	584	6,943	1,262
North Coast	13,450	984	-2,484	414	-3,862	972	7,104	1,206
Sierra/Cascades	33,047	1,001	-17,795	1,169	-6,662	907	8,590	1,525
South Coast Mountains/Deserts	600	113	-1,638	392	-86	52	-1,124	349
All California	73,199	1,188	-35,679	1,566	-13,645	1,415	23,875	2,334

4.1.2.3 Disturbance effects on carbon flux

The net change in C by pool varied with management, disturbance, and ownership. In stands that experienced harvesting, the net change of live trees on National Forest lands was not significantly different from zero (-0.1 ± 0.4 MMT CO₂e per year, 95% CI), since on average growth almost equaled harvest on those stands (Table 4.6). In contrast, on private corporate lands, the net change on cut stands was -5.3 ± 2.2 MMT CO₂e per year, reflecting greater proportional removals of live trees in stands that were cut on that ownership compared to others. Additional losses of dead wood resulted in a net removal of -7.8 ± 3.0 MMT CO₂e per year in stands that were cut across all ownerships in California. Some amount of these removals may also remain stored in HWP or were utilized for bioenergy production, TBD in future reports.

The net change in C in stands that experienced fire in California was -6.1 ± 2 MMT CO₂e per year. Most of that loss occurred on National Forest lands. Although live tree mortality was twice that amount on National Forests (-10.8 ± 2.6 MMT CO₂e per year), growth was significant (reflecting many stands with partial mortality) and a large portion of the live tree C converted to standing dead tree C.

In contrast to stands experiencing fire and/or cutting, stands affected by weather disturbances or insect and disease accumulated C in the live and dead tree pools. Overall, in spite of statewide losses of -15.5 ± 3.8 MMT CO₂e per year from fire and/or cutting across California, accumulations on stands experiencing other disturbances, and undisturbed stands, resulted in a net accumulation overall of more than 30 MMT CO₂e per year.

Table 4.6. Average annual net carbon (CO₂e) flux by pool on forest land by disturbance type and ownership, 2001-2005 to 2011-2015. See also Appendix 2, Table B9.

	USDA Forest Service								Other Public				Private				Total			
	Timberland		Reserved		Other Forest		Total		Other Federal		State and Local Govt.		Corporate		Non Corporate		Total	Total		
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE		
<i>thousand metric tons CO2 equivalent per year</i>																				
Cut																				
Mortality	-184	93	-9	10	--	--	-193	94	--	--	--	--	-359	84	-177	71	-536	109	-728	144
Cut	-1,136	295	-5	5	--	--	-1,140	295	-8	9	--	--	-8,469	1,220	-937	380	-9,406	1,265	-10,554	1,299
Gross Growth	1,164	221	22	23	--	--	1,186	222	20	21	--	--	3,549	407	882	261	4,431	471	5,636	522
Net Live	-156	214	8	9	--	--	-148	214	11	12	--	--	-5,279	1,057	-231	331	-5,510	1,105	-5,647	1,126
Standing Dead Change	-174	99	--	--	--	--	-174	99	--	--	--	--	-116	88	29	46	-87	99	-261	140
Dead Woody Debris Change	-131	97	-2	2	--	--	-133	97	6	7	--	--	-582	294	37	187	-545	349	-672	362
Total Net ¹	-513	340	7	8	--	--	-505	340	20	21	--	--	-7,157	1,425	-211	431	-7,368	1,487	-7,853	1,525
Cut and Fire																				
Mortality	-326	180	--	--	--	--	-326	180	--	--	--	--	-466	197	-49	49	-515	203	-842	271
Cut	-110	58	--	--	--	--	-110	58	--	--	--	--	-1,172	543	--	--	-1,172	543	-1,282	546
Gross Growth	226	95	--	--	--	--	226	95	--	--	--	--	229	86	8	8	237	87	463	129
Net Live	-210	167	--	--	--	--	-210	167	--	--	--	--	-1,410	577	-41	41	-1,451	578	-1,661	602
Standing Dead Change	34	81	--	--	--	--	34	81	--	--	--	--	152	80	-11	11	141	81	175	115
Dead Woody Debris Change	-4	32	--	--	--	--	-4	32	--	--	--	--	62	142	-12	12	50	142	46	146
Total Net ¹	-216	165	--	--	--	--	-216	165	--	--	--	--	-1,458	613	-72	72	-1,530	617	-1,746	639
Fire																				
Mortality	-5,570	902	-4,689	923	-1,350	370	-10,766	1,302	-772	322	-302	164	-278	110	-449	154	-727	189	-12,566	1,364
Cut	-40	28	--	--	--	--	40	28	--	--	--	--	-19	17	-56	35	-75	39	-115	49
Gross Growth	1,985	283	1,353	242	347	94	3,492	378	442	142	64	40	163	70	262	89	425	113	4,422	421
Net Live	-3,624	789	-3,335	814	-1,003	320	-7,314	1,143	-330	226	-238	129	-134	87	-243	113	-377	142	-8,259	1,181
Standing Dead Change	2,153	609	1,308	531	354	212	3,529	816	148	90	85	52	-12	90	3	69	-9	113	3,753	830
Dead Woody Debris Change	-558	225	182	209	17	86	-385	312	-103	50	19	53	-136	68	217	117	81	136	-389	348
Total Net ¹	-2,396	612	-2,320	682	-796	270	-5,101	934	-384	262	-170	133	-312	182	-87	126	-398	221	-6,053	1,004

¹ Total Net value includes change from roots and understory vegetation which are not enumerated in this table.

Table 4.6. Average annual net carbon (CO₂e) flux by pool on forest land by disturbance type and ownership, 2001-2005 to 2011-2015 (Continued)

	USDA Forest Service								Other Public				Private						Total	
	Timberland		Reserved		Other		Total		Other		State and		Corporate		Non		Total		Total	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>thousand metric tons CO2 equivalent per year</i>																				
Insect and Disease																				
Mortality	-3,064	411	-1,039	298	-99	66	-4,200	511	-432	150	-172	107	-488	124	-435	122	-923	173	-5,728	568
Cut	-68	37	--	--	--	--	-68	37	--	--	--	--	-45	25	-44	30	-89	39	-156	54
Gross Growth	4,648	450	833	177	64	31	5,527	483	463	149	318	140	949	211	867	204	1,817	290	8,125	596
Net Live	1,516	384	-205	234	-35	45	1,259	452	31	98	146	91	417	118	388	111	805	160	2,241	497
Standing Dead Change	83	281	231	126	-9	21	327	308	132	84	-57	115	-38	55	18	81	-20	97	381	353
Dead Woody Debris Change	333	285	266	207	17	24	626	353	131	99	90	126	10	77	7	64	17	100	863	399
Total Net ¹	2,341	475	323	194	-28	54	2,640	516	339	154	217	119	478	164	510	188	988	248	4,183	602
Other cut and weather																				
Mortality	-533	161	-292	107	-131	54	-911	198	-35	19	-1	1	-264	119	-262	73	-526	139	-1,474	243
Cut	-87	36	-16	16	--	--	-103	39	--	--	-5	5	-332	132	-175	88	-507	157	-615	162
Gross Growth	1,169	236	365	114	157	66	1,615	264	115	72	58	59	978	253	711	190	1,690	314	3,478	421
Net Live	549	168	57	92	26	43	601	193	80	72	53	53	383	190	274	152	656	244	1,390	323
Standing Dead Change	-29	106	-66	119	2	49	-67	160	13	11	-19	21	17	12	125	46	142	47	68	169
Dead Woody Debris Change	115	143	127	84	57	56	278	172	10	22	59	48	-390	208	213	143	-177	253	170	310
Total Net ¹	752	214	100	141	78	107	906	258	121	94	99	63	83	243	687	239	770	342	1,896	443
Total																				
Mortality	-15,339	1,067	-7,931	908	-2,140	390	-24,238	1,399	-2,486	420	-1,276	370	-3,757	354	-3,921	332	-7,678	464	-35,679	1,566
Cut	-1,464	305	-22	17	-2	2	-1,488	306	-9	9	-8	6	-10,663	1,341	-1,476	404	-12,140	1,381	-13,645	1,415
Gross Growth	24,702	673	7,135	437	2,027	220	33,117	707	4,459	407	3,296	367	18,554	883	13,773	794	32,327	911	73,199	1,188
Net Live	7,898	1,195	-818	949	-116	369	7,390	1,531	1,964	460	2,012	420	4,133	1,497	8,376	769	12,509	1,661	23,875	2,334
Standing Dead Change	2,442	775	1,066	616	146	246	3,525	997	-17	237	58	139	289	260	364	211	653	335	4,218	1,087
Dead Woody Debris Change	-995	580	651	429	68	179	-252	732	186	337	93	178	-1,343	548	318	391	-1,025	674	-998	1,066
Total Net ¹	11,844	1,202	949	920	16	376	13,212	1,515	2,542	602	2,650	491	4,277	1,935	10,901	987	15,178	2,152	33,581	2,727

¹ Total Net value includes change from roots and understory vegetation which are not enumerated in this table.

4.1.2.4 Implications of recent tree mortality events on carbon flux

Substantial tree mortality has been observed in recent years in California associated with several years of severe drought. A concern has been raised that this mortality event has caused the forests in California to become net emitters of carbon due to dead tree decay. FIA is investigating this event in collaboration with UC Berkeley, but some preliminary results are available, which unlike other datasets used in this report, included plots measured in 2016.

On average between 2001-2016, there were 10 billion live trees in California, of which 187 million died each year, for an annual mortality rate of $1.88\% \pm 0.16\%$ (95% CI). For National Forests, there were 4.7 billion live trees, of which 102 million died each year, for an annual mortality rate of $2.18\% \pm 0.28\%$. This number is complementary to that provided by the Forest Service's Pacific Southwest Region Aerial Detection Survey of 100 million dead trees since 2010, because those surveys were focused on unusual groups of trees detectable from the air, instead of trees of all sizes (overstory and understory) and relatively normal mortality of scattered individual trees. As shown in previous results in this report, storage of carbon in live trees and dead wood all increased over this time-period. Mortality rates in terms of carbon were highest on National forest lands ($1.2 \pm 0.2\%$), with 44% of the mortality caused by fire. As a result, the increase in the live tree pool was modest (7.5 ± 3.0 MMT CO_{2e} per year) and the increase in the snag plus down wood pool substantial (3.4 ± 2.0 MMT CO_{2e} per year).

There was substantial year-to-year variation in the amount of carbon in mortality trees over the assessment period (Figure 4.7), driven primarily by mortality from fire. In spite of a big fire year in 2015, the amount of non-fire mortality in that year was the highest of the series (35.6 ± 7.3 MMT CO_{2e} per year). While drought-related mortality is known to have continued into 2016, the 2016 data available are a partial sample and we will not have reliable estimates until the 2017 field season is concluded. Although the 2016 wildfire season burned fewer acres than 2015, with similar or higher mortality it is possible that conversion of live to dead carbon occurred at similar rates in 2016.

The immediate effect of a pulse of tree mortality is to reduce storage in the live tree pool and convert live tree carbon to dead tree carbon. The increasing dead wood pool in recent years indicates that wood was being added at a faster rate than it was decaying, and that would be increased during a mortality pulse. Live tree growth is the engine that drives forest carbon sequestration. For the balance to result in a net emission, mortality would have to exceed growth for an extended period such that the live tree pool declines, the total dead tree pool stabilizes, and decay of the larger dead wood pool results in greater emissions.

Given a total dead pool of 116 ± 3.8 MMT C on National Forests (not including litter or duff), annual decay could range from a low of 4.4 MMT CO_{2e} per year (1%) to 21.3 MMT CO_{2e} per

year (5%). (Decay rates are highly variable—Kahl et al. 2017 found the former rate for conifers and the latter for hardwoods.) In order for forests to be net emitters, the sum of additions to dead wood and live wood (currently 13.1 ± 2.9 MMT CO₂e per year) would need to fall below that decomposition rate.

The available data on mean carbon storage in recent years in California, and on National Forests in particular, indicates that the forests are still a net sink of carbon from the atmosphere. It is possible that during the years of a severe drought, growth rates are so reduced and mortality so high that decay exceeds new storage. A physiological model would likely be required to assess that question (e.g., Turner et al. 2016).

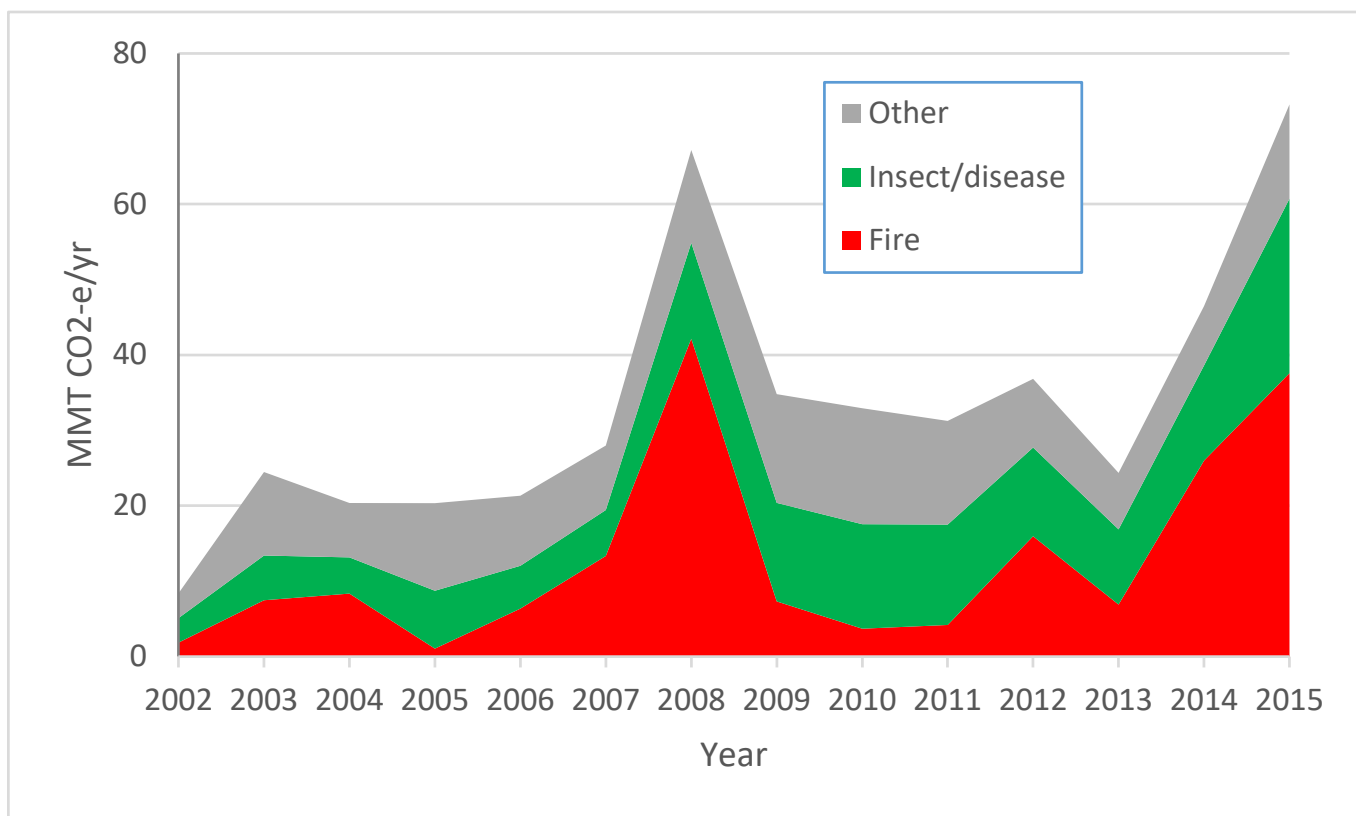


Figure 4.7. Estimated amount of carbon in mortality trees in California by year and cause of death, 2002-2015.

4.1.2.5 Net flux from non-CO₂ GHG emissions from wildfire

Emissions of methane and nitrous oxides due to fires on forest land are estimated to add 409 ± 123 thousand metric tons of CO₂e per year (95% CI) to California’s statewide emissions (Table 4.7). The greatest source of these emissions was from fire on National Forest lands. A substantial amount was also estimated for the “cut and fire” category on private corporate lands. There are a few uncertainties with this estimate that may result in compensating effects.

Our approach underestimates non-CO₂ gas emissions because we currently do not have an estimate of combustion of forest floor; and because, in the use of net change in C, some of the C that was combusted would be masked by subsequent forest growth. Alternatively, our approach may overestimate non-CO₂ gas emissions because some of the cut and fire category were cut before they were burned, so the amount combusted was less than the net change; and because some of the change in C of dead wood came from decay after the fire, and not entirely from combustion. We will examine options to refine this estimate. Nevertheless, we believe the calculation based on field measurements will be more accurate than a default emission factor applied to an estimate of area burned as in the default approach for IPCC 2006.

Table 4.7. Annual net emissions of non-CO₂ greenhouse gases from fire, 2001-2005 to 2011-2015. CO₂ values are from Table 4.6 and were used to calculate the other gases. See also Appendix 2, Table F1.

	Public						Private				Total		Total	
	National forest		Other federal		State and local govt.		Corporate		Non Corporate		Total	SE	Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE				
<i>Thousand metric tons CO2 equivalent per year</i>														
Cut and Fire														
CO2	-215	164	--	--	--	--	-1,457	612	-72	72	-1,529	616	-1,744	638
CH4	-7	5	--	--	--	--	-47	20	-2	2	-49	20	-56	20
N2O	-5	3	--	--	--	--	-31	13	-2	2	-32	13	-37	13
Fire														
CO2	-5,027	936	-384	262	-169	133	-312	182	-54	130	-365	223	-5,946	1,006
CH4	-161	30	-12	8	-5	4	-10	6	-2	4	-12	7	-190	32
N2O	-106	20	-8	6	-4	3	-7	4	-1	3	-8	5	-126	21
Total fire														
CO2	-5,242	950	-384	262	-169	133	-1,769	638	-126	149	-1,894	655	-7,690	1,191
CH4	-168	30	-12	8	-5	4	-57	20	-4	5	-61	21	-246	38
N2O	-111	20	-8	6	-4	3	-37	13	-3	3	-40	14	-162	25

4.1.3 Net carbon flux associated with forest land conversions (LF)

4.1.3.1 Changes in forest land area from forest land conversions

Approximately 28 ± 9 thousand acres (95% CI) of forest land were converted to non-forest (i.e., deforested) every year in California between 2001-2005 and 2011-2015 (Table 4.8). Most of the deforestation (62%) was to developed uses, with about 2/3 being urban and 1/3 being rights-of-way (i.e., roads, including logging roads). The conversion to cropland consisted of pasture and orchards. Approximately 13 ± 6 thousand acres of non-forest land were converted to forest every year (i.e., afforestation). Most of the afforestation (52%) was from grassland (primarily rangeland) and most of the remainder was from developed uses (primarily rights of way—e.g.,

abandoned logging roads). Overall there was a net loss of forest land at the rate of 14.6 ± 10.6 thousand acres per year, primarily to developed land-uses. The confidence interval is high compared to the estimate because it is a relatively rare event at the scale of the inventory. The majority of the forest land loss occurred on non-productive “other forest” (68%), followed by timberland (28%), with little change occurring on reserved lands (4%).

4.1.3.2 Net carbon flux from forest land conversions

Deforestation resulted in a loss of 2.5 ± 0.9 (95% CI) MMT CO₂e from forest carbon pools per year (Table 4.9). This was partially compensated for by the addition of 1.3 ± 0.6 MMT CO₂e per year due to afforestation, resulting in a net loss of 1.2 ± 1.1 MMT CO₂e per year. Most of the gains and losses were due to the live tree pool.

Uncertainties in land classification are low, because FIA plots are visited on the ground in the case where there is any potential for forest land to be present on the plot (based on past history, the vegetation of the local area, and examination of aerial photography). Non-forest plots which are not field visited are classified from aerial photography of at least 1 m resolution. Where definitions have changed over time, field crew measurements (i.e., the old way and the new way) and detailed written descriptions are used to correctly assess change between forested lands and other land-uses.

Table 4.8. Annual change in forest land area to/from other IPCC land-use classes in California, 2001-2005 to 2011-2015. See also Appendix 2, Table E1.

	Timberland		Other forest		Reserved		All forest land	
	Total	SE	Total	SE	Total	SE	Total	SE
<i>Acres per year</i>								
Forest to nonforest:								
Cropland	--	--	3,639	1,722	--	--	3,639	1,722
Developed	9,065	2,385	7,686	2,370	451	322	17,202	3,375
Grassland	1,841	1,510	3,839	1,900	56	68	5,735	2,428
Water	806	685	235	244	218	181	1,259	749
Total	11,711	2,887	15,398	3,524	726	388	27,835	4,569
Nonforest to forest:								
Cropland	261	195	--	--	--	--	261	195
Developed	4,683	1,363	705	389	100	79	5,487	1,420
Grassland	2,695	1,571	4,255	1,952	--	--	6,951	2,503
Other	--	--	168	175	--	--	168	175
Water	52	55	353	269	--	--	405	275
Total	7,691	2,094	5,481	2,015	100	79	13,272	2,904
Net change to forest land:								
Cropland	261	195	-3,639	1,722	--	--	-3,378	1,733
Developed	-4,382	2,757	-6,981	2,401	-351	331	-11,715	3,675
Grassland	854	2,179	417	2,715	-56	68	1,215	3,481
Other	--	--	168	175	--	--	168	175
Water	-754	687	118	363	-218	181	-854	798
Total	-4,021	3,590	-9,917	4,054	-626	396	-14,563	5,431

Table 4.9. Annual change in carbon pools due to change in land-use between forest and non-forest in California, 2001-2005 to 2011-2015. See also Appendix 2, Table E2.

	Forest to nonforest		Nonforest to forest		Net change	
	Total	SE	Total	SE	Total	SE
<i>Thousand metric tons CO2 equivalent per year</i>						
Carbon pool						
Live tree	-1,845	352	1,101	269	-744	446
Standing dead	-222	148	36	13	-187	149
Down wood	-173	43	54	27	-118	51
Understory veg	-262	44	135	29	-127	53
Soil*	0		0		0	
All pools	-2,502	462	1,326	298	-1,176	553

* No changes in landuse involved cultivated land so soil organic carbon change was assumed to be zero (Ogle et al. 2003)

4.2 Carbon stocks for forest land remaining forest land (FF)

4.2.1. FF land area

As of 2015 there are approximately 32 million acres of forest land across all ownerships in California. Public agencies and state/local governments manage the majority of these forests, (approximately 60%, 19.5 million acres) (Table 4.10). Private ownerships are split between corporate forest lands owning approximately 5 million acres, and private individuals owning approximately 7.4 million acres. By region, nearly half of the forested acres are found within the Sierra and Cascades Mountain ranges. The region with the next greatest share of forested area is the Klamath Interior and Coast Ranges region having approximately a quarter of all forested acres in the state. The North Coast region is the only region that has a disproportionately larger share of privately owned forests compared to those managed by public agencies. This region contains about 18% of all privately-owned forests, but only about 2% of all the public forest land. Western oak woodlands cover the greatest area of all forest types at approximately 8.9 ± 0.38 million acres, followed by California mixed conifer at approximately 8 ± 0.34 million acres (Table 4.11). **Planned improvement:** Regional area tables by forest type and ownership group will be included in a future report.

Table 4.10. Area of forest land remaining forest land by ownership group and region in California, 2006-2015. Table derived from Appendix 2, Tables A10-A16.

	Public	Private	All Ownerships	
Region: Land Status	Total	Total	Total	SE
	<i>Thousand acres</i>			
Central Coast/Interior Ranges:				
Unreserved forest land	260	1,106	1,367	84
Reserved forest land	482	0	482	49
Total forest land	743	1,106	1,849	96
Central Valley:				
Unreserved forest land	4	80	84	21
Reserved forest land	6	0	6	5
Total forest land	10	80	90	21
Eastside				
Unreserved forest land	2,057	532	2,590	117
Reserved forest land	297	0	297	43
Total forest land	2,354	532	2,886	124
Klamath Interior/Coast Ranges:				
Unreserved forest land	3,268	2,892	6,160	170
Reserved forest land	1,756	0	1,756	86
Total forest land	5,023	2,892	7,916	186
North Coast:				
Unreserved forest land	148	2,248	2,397	106
Reserved forest land	308	0	308	41
Total forest land	457	2,248	2,705	111
Sierra/Cascades:				
Unreserved forest land	6,691	5,247	11,939	206
Reserved forest land	3,207	0	3,207	115
Total forest land	9,897	5,247	15,145	226
South Coast Mountains/Deserts:				
Unreserved forest land	612	286	898	70
Reserved forest land	453	0	453	53
Total forest land	1,065	286	1,351	87
All California:				
Unreserved forest land	13,042	12,392	25,434	203
Reserved forest land	6,508	0	6,508	134
Total forest land	19,550	12,392	31,941	201

Table 4.11. Area of forest land remaining forest land by forest type, ownership group and region in California, 2006-2015. See also Appendix 2, Table A17.

Forest type group	U.S. Forest Service				Other Federal				State and local government				Private				All forest land		
	Timberland		Other forest land		Timberland		Other forest land		Timberland		Other forest land		Timberland		Other forest land		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	4,190	121	1,035	69	73	21	435	46	34	14	55	17	2,158	99	3	3	7,982	173	
Douglas-fir	156	29	167	31	18	11	49	18	22	11	30	14	683	60	--	--	1,125	79	
Fir / spruce / mountain hemlock	1,110	75	468	51	6	6	197	33	10	8	10	8	252	37	--	--	2,053	104	
Western Hemlock / Sitka spruce	--	--	--	--	--	--	1	1	--	--	1	1	36	15	--	--	38	15	
Lodgepole pine	232	36	480	50	--	--	232	36	9	8	6	6	66	20	--	--	1,024	75	
Pinyon / juniper	11	8	729	61	--	--	567	56	--	--	59	19	--	--	177	32	1,543	91	
Ponderosa pine	1,248	76	221	35	39	15	37	14	4	4	23	12	793	64	6	3	2,370	108	
Redwood	3	3	17	10	--	--	30	14	33	14	64	19	614	58	--	--	762	64	
Western larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Western white pine	18	9	141	29	--	--	13	9	--	--	--	--	--	--	--	--	171	32	
Other western softwoods	160	30	923	70	19	10	486	51	--	--	31	14	76	21	353	46	2,049	105	
Total	7,128	129	4,181	117	155	30	2,046	90	112	25	279	38	4,677	122	539	56	19,117	219	
Hardwoods:																			
Alder / maple	21	10	16	9	12	7	28	13	--	--	7	6	120	25	15	7	219	34	
Aspen / birch	13	8	44	15	--	--	9	7	--	--	1	1	14	9	--	--	80	20	
Elm / ash / cottonwood	--	--	5	5	--	--	1	1	--	--	8	6	--	--	17	8	30	11	
Tanoak / laurel	213	35	215	35	31	13	41	15	11	8	146	29	1,053	75	141	28	1,849	99	
Western oak	933	71	1,571	90	92	23	544	53	17	10	433	44	1,046	76	4,276	129	8,912	193	
Woodland hardwoods	35	14	105	23	--	--	65	19	--	--	20	11	7	5	34	13	265	37	
Exotic hardwoods	--	--	--	--	2	2	--	--	--	--	--	--	--	--	3	2	5	3	
Other hardwoods	130	27	88	23	10	7	32	14	4	4	40	16	149	29	84	21	538	55	
Total	1,345	83	2,043	101	147	29	719	61	32	13	656	55	2,388	106	4,568	132	11,898	214	
Nonstocked	398	46	228	36	8	6	65	19	--	--	8	7	187	30	32	12	926	70	
All forest types	8,871	121	6,452	131	311	42	2,830	97	144	28	943	61	7,252	120	5,140	140	31,941	201	

Note: Totals may be off because of rounding

4.2.2 FF carbon stock by ownership and land status, all California

FIA plot measurements currently indicate that in 2015 there are just over 2 billion metric tons of carbon stocks stored on forest land including forest soils across all ownerships in California (Table 4.12, Figures 4.9 and 4.10). Approximately two-thirds of these carbon stocks are found on public forest land with the National Forests containing over half of all carbon stocks (Figure 4.8, 4.9, 4.10). Just over half of all stored carbon is found aboveground in the live tree pool, and about a quarter is found belowground in forest soils (Figure 4.9). The remaining stored carbon is divided between dead trees, down wood, and understory vegetation pools. Approximately 62% of the forest carbon stores are found on unreserved timberland (Figure 4.10). Table 4.12 below provides detailed estimates of forest carbon stocks for each pool by ownership and land status updated for the ten-year measurement period between 2006 and 2015. Initial estimates of forest floor C based on FIA measurements compiled in Gray et al. (2016) for National Forests in Oregon and Washington suggested that the forest floor made up 10% of non-soil forest C, which would translate to 7% of total C (150 MMT C) in Table 4.12 if the same ratio held. We suspect this number is too high and will investigate a better estimation approach for future reporting.

Table 4.12. Forest land carbon stock by ownership and land status, all California, 2006-2015.
Table derived from Appendix 2, C tables.

Ownership	Land status	Live trees		Dead trees		Understory vegetation		Down wood	Soil	Total C	Acres
		Aboveground	Belowground	Aboveground	Belowground	Aboveground	Belowground				
<i>Million metric tons C¹</i>											
<i>x1000</i>											
National Forests	Timberland	383.87	73.02	37.39	8.9	7.88	0.88	39.59	159.17	710.69	8,871
	Other forest	26.83	5.35	1.98	0.5	4.29	0.48	4.11	33.41	76.96	2,440
	Reserved – productive	130.88	24.6	17.22	4.04	2.36	0.26	12.98	48.81	241.15	2,782
	Reserved - other	17.35	3.46	2.08	0.52	1.69	0.19	2.62	17.43	45.34	1,231
	Total	558.94	106.42	58.68	13.95	16.22	1.8	59.3	258.82	1,074.13	15,323
Other Federal	Timberland	11.53	2.34	0.68	0.18	0.36	0.04	0.93	4.92	20.99	310
	Other forest	7.66	0.21	0.4	0.11	2.09	0.23	1.14	15.26	27.09	1,111
	Reserved – productive	63.05	11.47	8.35	1.85	0.76	0.09	6.62	19.17	111.36	1,026
	Reserved - other	1.69	1.6	0.66	0.17	1	0.11	1.47	9.37	16.07	694
	Total	90.12	16.95	10.1	2.31	4.22	0.47	10.16	48.71	183.03	3,141
State and Local Government	Timberland	10.41	1.99	0.4	0.09	0.13	0.01	0.73	2.52	16.29	144
	Other forest	2.7	0.54	0.07	0.02	0.27	0.03	0.28	1.94	5.86	167
	Reserved – productive	33.46	6.35	1.43	0.39	0.37	0.04	2.27	5.4	49.72	329
	Reserved - other	8.07	1.53	0.34	0.08	0.68	0.08	0.74	5.24	16.76	446
	Total	54.65	10.41	2.24	0.59	1.46	0.16	4.03	15.1	88.64	1,086
Total Public	Timberland	405.82	77.35	38.48	9.17	8.37	0.93	41.25	166.61	747.97	9,325
	Other forest	37.19	6.1	2.45	0.63	6.65	0.74	5.54	50.61	109.91	3,718
	Reserved – productive	227.39	42.42	27.01	6.28	3.49	0.39	21.87	73.38	402.23	4,137
	Reserved - other	27.12	6.59	3.08	0.77	3.37	0.37	4.84	32.04	78.17	2,371
	Total	703.7	133.78	71.02	16.84	21.9	2.43	73.5	322.63	1,345.80	19,550
Private Corporate	Timberland	151.93	29.23	8.06	2.21	4.67	0.52	24.55	75.57	296.74	4,249
	Other forest	12.29	2.31	0.38	0.09	1.23	0.14	1.01	9.26	26.71	772
	Reserved – productive	--	--	--	--	--	--	--	--	--	--
	Reserved - other	--	--	--	--	--	--	--	--	--	--
	Total	164.22	31.54	8.44	2.3	5.9	0.66	25.57	84.83	323.45	5,021
Private Noncorporate	Timberland	135.92	26.71	4.79	1.23	3.33	0.37	12.46	46.67	231.48	3,003
	Other forest	58.05	11.27	1.76	0.47	6.97	0.77	5.47	51.76	136.53	4,368
	Reserved – productive	--	--	--	--	--	--	--	--	--	--
	Reserved - other	--	--	--	--	--	--	--	--	--	--
	Total	193.98	37.98	6.55	1.7	10.3	1.14	17.93	98.43	368.01	7,371
Total Private	Timberland	287.85	55.94	12.86	3.43	8	0.89	37.01	122.24	528.22	7,252
	Other forest	70.34	13.57	2.14	0.57	8.2	0.91	6.49	61.02	163.24	5,140
	Reserved – productive	--	--	--	--	--	--	--	--	--	--
	Reserved - other	--	--	--	--	--	--	--	--	--	--
	Total	358.2	69.51	14.99	4	16.2	1.8	43.5	183.26	691.46	12,392
All Ownerships	Timberland	693.67	133.28	51.33	12.6	16.37	1.82	78.26	288.85	1,276.19	16,577
	Other forest	107.54	19.67	4.58	1.2	14.85	1.65	12.02	111.63	273.14	8,858
	Reserved – productive	227.39	42.42	27.01	6.28	3.49	0.39	21.87	73.38	402.23	4,137
	Reserved - other	27.12	6.59	3.08	0.77	3.37	0.37	4.84	32.04	78.17	2,371
	Total	1,061.89	203.3	86.01	20.85	38.1	4.23	117	505.89	2,037.26	31,942

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

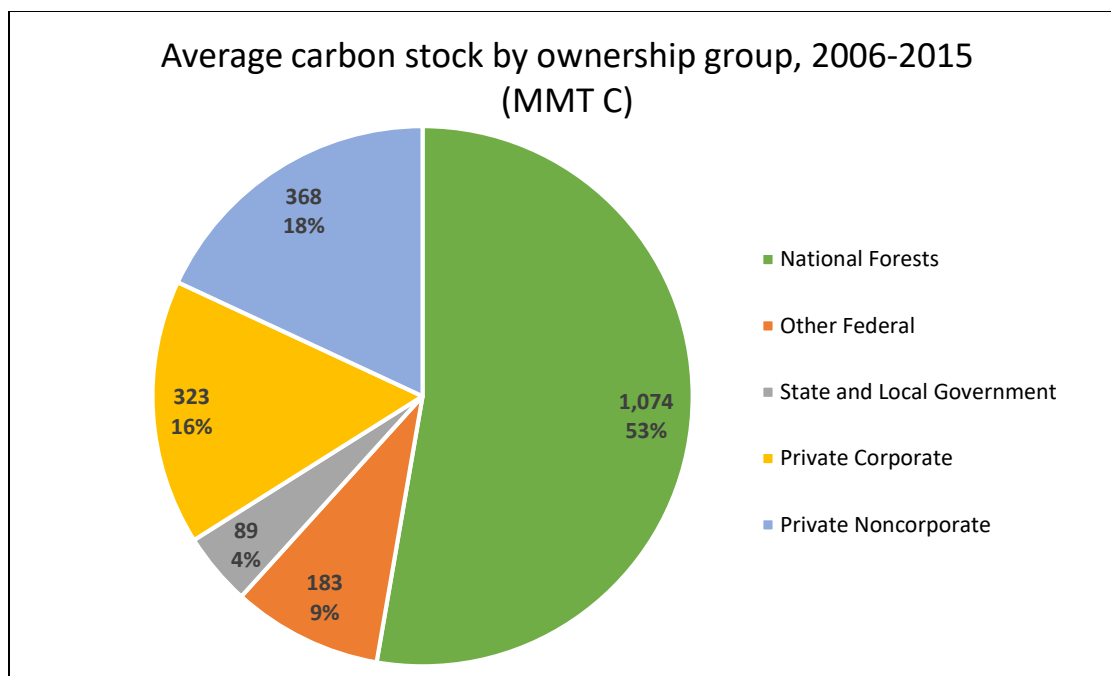


Figure 4.8. California statewide estimate of average carbon stock (MMT C) by ownership group, 2006-2015.

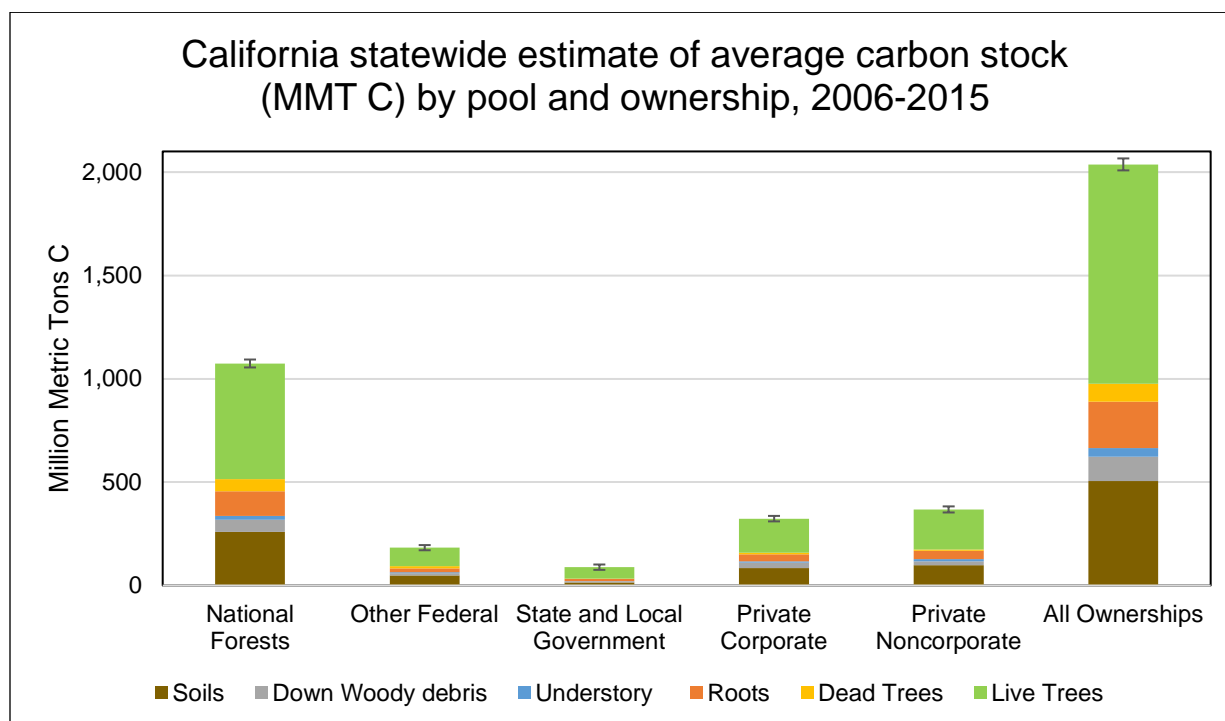


Figure 4.9. California statewide estimate of average carbon stock (MMT C) by pool and ownership, 2006-2015. Error bars represent 95 percent confidence interval of total stock for each ownership.

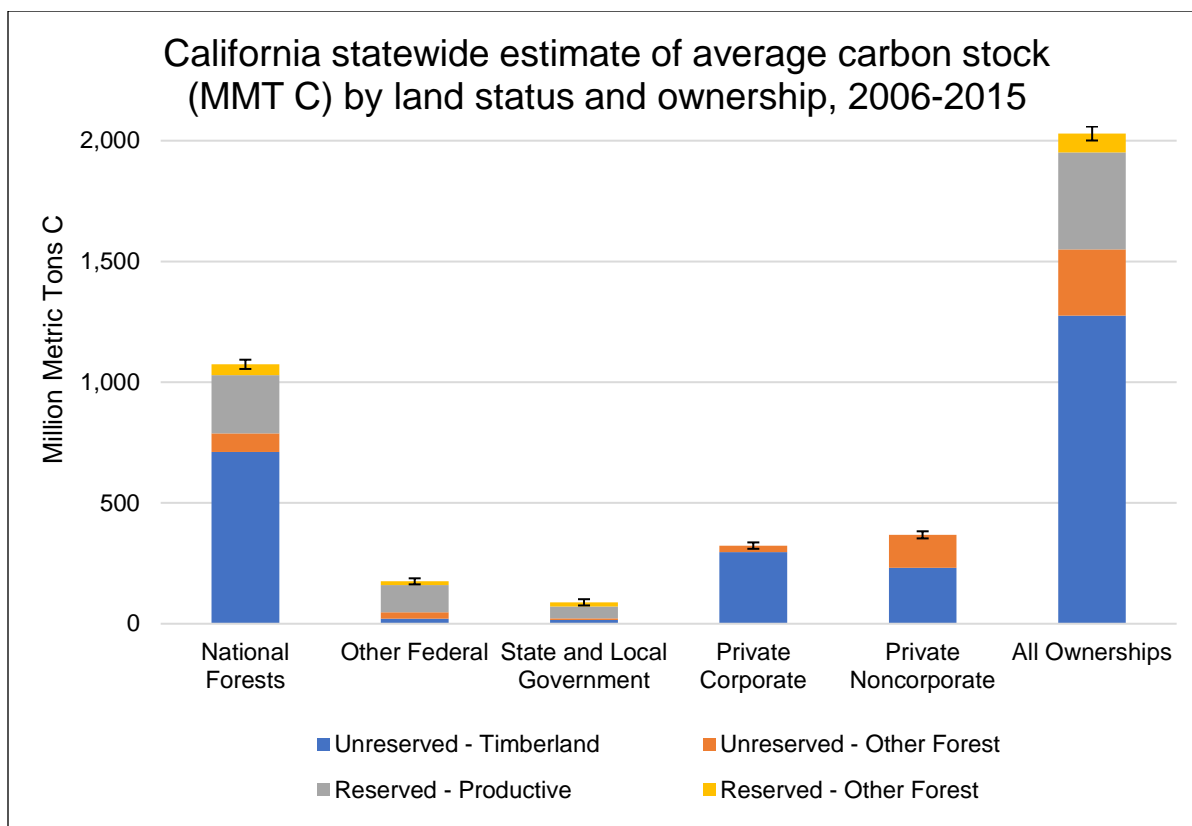


Figure 4.10. California statewide estimate of average carbon stock (MMT C) by land status and ownership, 2006-2015. Error bars represent 95 percent confidence interval of total stock for each ownership.

4.2.3 FF carbon stocks by pool and region

Tables 4.13 to 4.20 below summarize forest land carbon stocks by specific pool as found on both public and private ownerships for each region of the state. Similar to forested acres, nearly half of California's forest carbon stocks are found in a single region, the Sierra and Cascade Mountain Ranges, containing 47% of all forest carbon stocks (Table 4.19, Figure 4.11). The next largest carbon store, the Klamath Interior and Coast Ranges region has about half the carbon stocks as found in the Sierra and Cascades and just over a quarter of those found in the state (Table 4.17, Figure 4.11). For each of these regions the dead tree and down woody material pools are each about 10% of the live tree carbon pool. In these tables, the belowground carbon is accounted for by inclusion with its respective aboveground carbon pool (i.e., live tree roots are included with live trees). The carbon storage on reserve public forests and unreserved public and private forests varies by region, with private forests containing the majority of the carbon in the Central Coast and Interior Ranges, the Central Valley and the North Coast (Figure 4.11).

Table 4.13. Forest land carbon stocks by ownership and pool, 2006-2015: All California. Table derived from Appendix 2, C tables.

Ownership/forest land status	Live Trees	Dead Trees	Understory	Down wood	Soil	Total C	Acres
	<i>Million metric tons C¹</i>						<i>X1000</i>
Public reserved	309.7	37.14	7.644	26.71	105.43	486.62	6,508
Public unreserved	527.78	50.72	16.699	46.789	217.2	859.19	13,042
Private corporate	195.76	10.74	6.555	25.567	84.83	323.45	5,021
Private noncorporate	231.95	8.25	11.444	17.93	98.43	368.01	7,371
Total	1,265.19	106.85	42.343	116.995	505.89	2,037.27	31,942

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

Table 4.14. Forest land carbon stocks by ownership and pool, 2006-2015: Central coast/interior ranges. Table derived from Appendix 2, C tables.

Ownership/forest land status	Live Trees	Dead Trees	Understory	Down wood	Soil	Total C	Acres
	<i>Million metric tons C¹</i>						<i>X1000</i>
Public reserved	23.09	1.07	0.778	1.138	5.93	32.01	482
Public unreserved	4.6	0.18	0.445	0.458	3.01	8.69	260
Private corporate	7.31	0.18	0.278	0.488	2.04	10.29	175
Private noncorporate	31.09	1.08	1.489	1.956	11.48	47.1	931
Total	66.09	2.5	2.99	4.039	22.46	98.08	1,848

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

Table 4.15. Forest land carbon stocks by ownership and pool, 2006-2015: Central Valley. Table derived from Appendix 2, C tables.

Ownership/forest land status	Live Trees	Dead Trees	Understory	Down wood	Soil	Total C	Acres
	<i>Million metric tons C¹</i>						<i>X1000</i>
Public reserved	0.18	0	0.011	0.007	0.13	0.32	6
Public unreserved	0.1	0.01	0.011	0.007	0.05	0.18	4
Private corporate	0.13	0	0.011	0.001	0.08	0.22	7
Private noncorporate	1.1	0.03	0.122	0.079	0.9	2.23	73
Total	1.5	0.04	0.155	0.093	1.16	2.95	90

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

Table 4.16. Forest land carbon stocks by ownership and pool, 2006-2015: Eastside. Table derived from Appendix 2, C tables.

Ownership/forest land status	Live Trees	Dead Trees	Understory	Down wood	Soil	Total C	Acres
	<i>Million metric tons C¹</i>						<i>X1000</i>
Public reserved	4.84	0.59	0.434	0.598	4.21	10.67	297
Public unreserved	23.87	1.88	4.01	3.503	33.89	67.15	2,057
Private corporate	3.44	0.21	0.434	0.717	4.68	9.48	256
Private noncorporate	2.65	0.08	0.6	0.322	5.07	8.72	277
Total	34.8	2.76	5.478	5.142	47.85	96.03	2,886

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

Table 4.17. Forest land carbon stocks by ownership and pool, 2006-2015: Klamath Interior/Coast Ranges. Table derived from Appendix 2, C tables.

Ownership/forest land status	Live Trees	Dead Trees	Understory	Down wood	Soil	Total C	Acres
	<i>Million metric tons C¹</i>						<i>X1000</i>
Public reserved	96.85	12.91	0.002	7.874	29.19	146.82	1,756
Public unreserved	184.98	17.13	0.004	14.268	53.6	269.98	3,268
Private corporate	38.62	2.26	0.001	5.548	17.92	64.34	1,140
Private noncorporate	57.8	1.94	0.003	4.296	22.6	86.64	1,752
Total	378.25	34.23	0.01	31.986	123.31	567.79	7,916

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

Table 4.18. Forest land carbon stocks by ownership and pool, 2006-2015: North coast. Table derived from Appendix 2, C tables.

Ownership/forest land status	Live Trees	Dead Trees	Understory	Down wood	Soil	Total C	Acres
	<i>Million metric tons C¹</i>						<i>X1000</i>
Public reserved	37.67	2.35	0.455	2.189	4.67	47.33	308
Public unreserved	11.81	0.74	0.2	0.581	2.36	15.69	148
Private corporate	77	4.81	1.667	10.124	21.64	115.23	1,232
Private noncorporate	69.41	2.26	1.467	4.773	14.24	92.15	1,016
Total	195.89	10.16	3.788	17.667	42.91	270.41	2,704

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

Table 4.19. Forest land carbon stocks by ownership and pool, 2006-2015: Sierra/Cascades. Table derived from Appendix 2, C tables.

Ownership/forest land status	Live Trees	Dead Trees	Understory	Down wood	Soil	Total C	Acres
	<i>Million metric tons C¹</i>						<i>X1000</i>
Public reserved	142.19	18.54	3.179	13.879	55.59	233.38	3,207
Public unreserved	295.26	29.62	7.344	26.827	116.71	475.76	6,691
Private corporate	69	3.28	2.578	8.667	37.94	121.47	2,164
Private noncorporate	68.08	2.46	4.677	5.947	41.46	122.62	3,084
Total	574.53	53.9	17.778	55.32	251.7	953.22	15,146

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

Table 4.20. Forest land carbon stocks by ownership and pool, 2006-2015: South Coast Mountains/Deserts. Table derived from Appendix 2, C tables.

Ownership/forest land status	Live Trees	Dead Trees	Understory	Down wood	Soil	Total C	Acres
	<i>Million metric tons C¹</i>						<i>X1000</i>
Public reserved	4.88	1.68	0.712	1.025	5.73	14.02	453
Public unreserved	7.16	1.17	1.011	1.146	7.58	18.07	612
Private corporate	0.27	0	0.078	0.021	0.54	0.91	47
Private noncorporate	3.26	0.41	0.4	0.556	2.69	7.32	239
Total	15.57	3.26	2.201	2.748	16.54	40.32	1,351

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

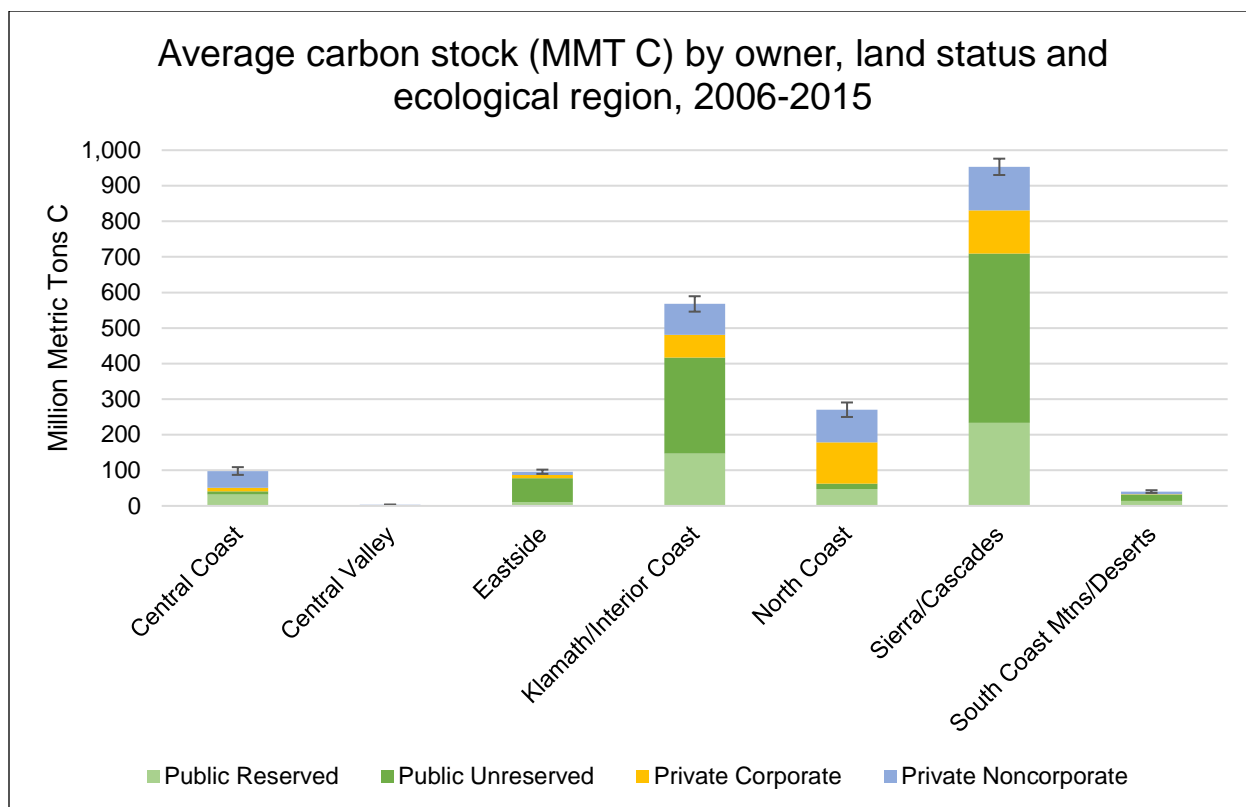


Figure 4.11. Average carbon stock (MMT C) by owner, land status and ecological region, 2006-2015. Error bars represent 95% confidence interval of estimated total stock for each region.

4.2.4 FF carbon stocks by forest type

The California mixed conifer forest type contains the largest carbon stock compared to all other forest types, storing approximately 664 ± 22 MMT C (95% CI; Table 4.21, Figure 4.12). Western oak forests follow with 333 ± 12 MMT C. For most forest types the majority of carbon stores are found in live trees, although there are some forest types showing higher stocks in the soil organic carbon pools (i.e., pinyon-juniper, other western softwoods, woodland hardwoods, exotic hardwoods). Dead trees comprise less than 10% of carbon stocks for all forest types. Most softwood carbon stocks are found on unreserved timberland. However, lodgepole pine, pinyon-juniper, western white pine and other western softwood forest types had a majority of their stocks outside of timberland, either in reserve forests or in unreserved forests not productive enough to be considered timberland. Approximately half of the carbon stocks associated with hardwood forest types are found in unreserved timberland (Table 4.22, figure 4.13). Although the California mixed conifer forest type has the largest stock and covers a substantial area, the redwood forest type has the highest carbon density per acre (figure 4.14). For information on forest types by region refer to appendix 1.

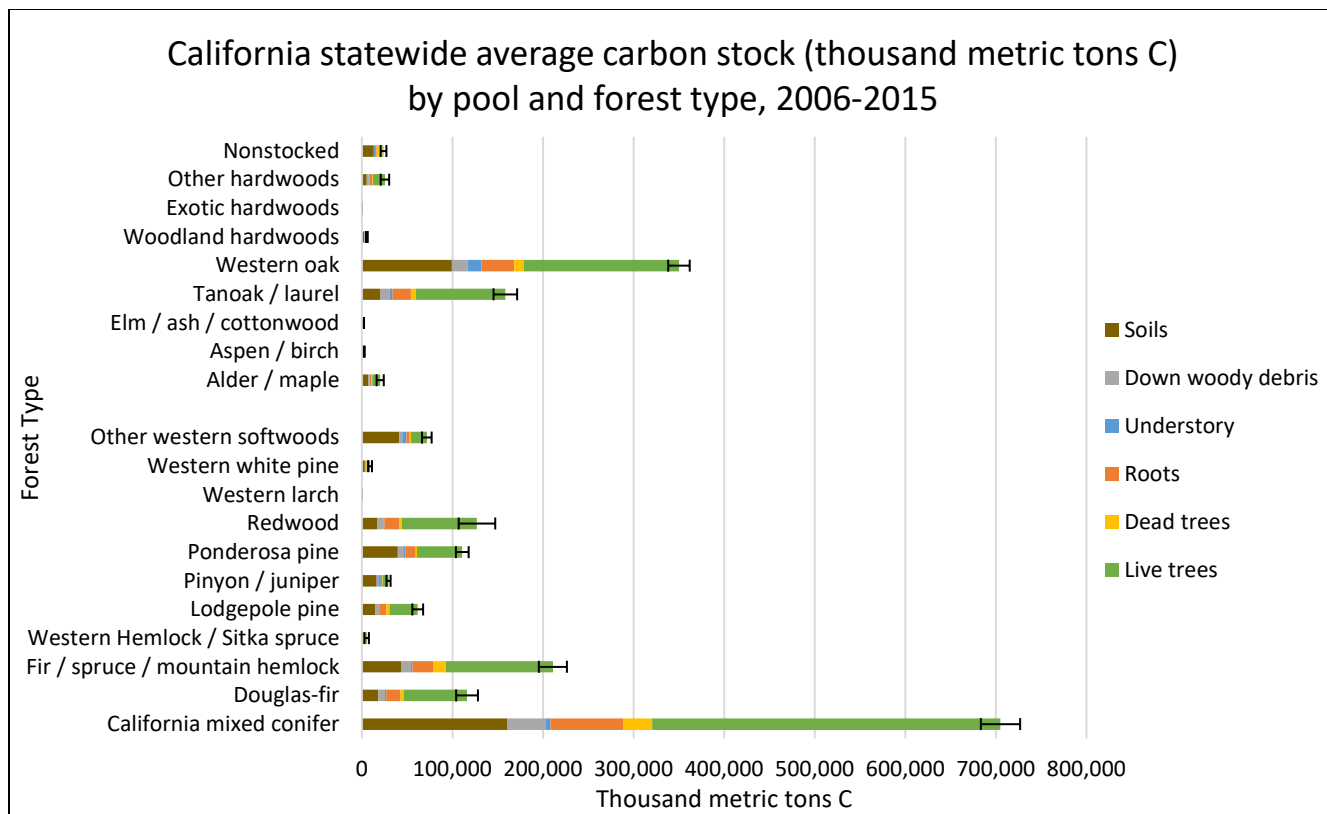


Figure 4.12. California statewide average carbon stock (thousand metric tons C) by pool and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type. Figure derived from Appendix 2, D tables.

Table 4.21. Forest land carbon stocks by forest type and pool, 2006-2015: All California. Table derived from Appendix 2, D tables.

Forest type group	Statewide						All pools	
	Live tree	Dead tree	Roots	Understory	Down woody debris	Soils		
	Thousand metric tons C						Total	SE
Softwoods:	Total	Total	Total	Total	Total	Total	Total	SE
California mixed conifer	384,408	32,178	80,398	5,702	41,552	160,870	705,108	11,074
Douglas-fir	69,584	4,163	15,436	1,345	7,324	18,270	116,122	6,138
Fir / spruce / mountain hemlock	118,074	14,110	22,786	1,686	11,108	43,130	210,895	7,912
Western Hemlock / Sitka spruce	2,325	292	590	47	265	1,780	5,299	1,258
Lodgepole pine	31,227	3,330	7,220	783	4,519	14,590	61,669	3,050
Pinyon / juniper	6,434	522	1,479	2,766	1,816	16,450	29,467	1,164
Ponderosa pine	49,817	1,742	11,062	2,663	5,930	39,640	110,854	3,598
Redwood	82,685	3,237	16,385	801	7,378	16,580	127,066	10,306
Western larch	--	--	--	--	--	--	--	--
Western white pine	3,657	588	842	181	376	3,400	9,044	1,077
Other western softwoods	17,514	1,320	3,673	4,737	3,180	41,290	71,714	2,720
Hardwoods:								
Alder / maple	8,888	695	1,952	361	1,445	6,880	20,221	2,021
Aspen / birch	966	37	180	139	242	780	2,344	415
Elm / ash / cottonwood	659	19	123	51	54	680	1,586	416
Tanoak / laurel	98,646	5,693	20,427	2,998	9,983	20,650	158,397	6,658
Western oak	171,236	10,424	36,643	15,001	17,322	99,480	350,106	6,073
Woodland hardwoods	1,375	309	335	468	303	2,740	5,529	487
Exotic hardwoods	3	--	--	9.2	7	50	69	31
Other hardwoods	13,274	936	2,960	926	1,800	5,570	25,466	2,385
Nonstocked	1,122	6,410	1,649	1,664	2,829	13,070	26,744	1,619
All forest types	1,061,894	86,005	224,140	42,327	117,433	505,890	2,037,690	14,775

Note: Totals may be off because of rounding

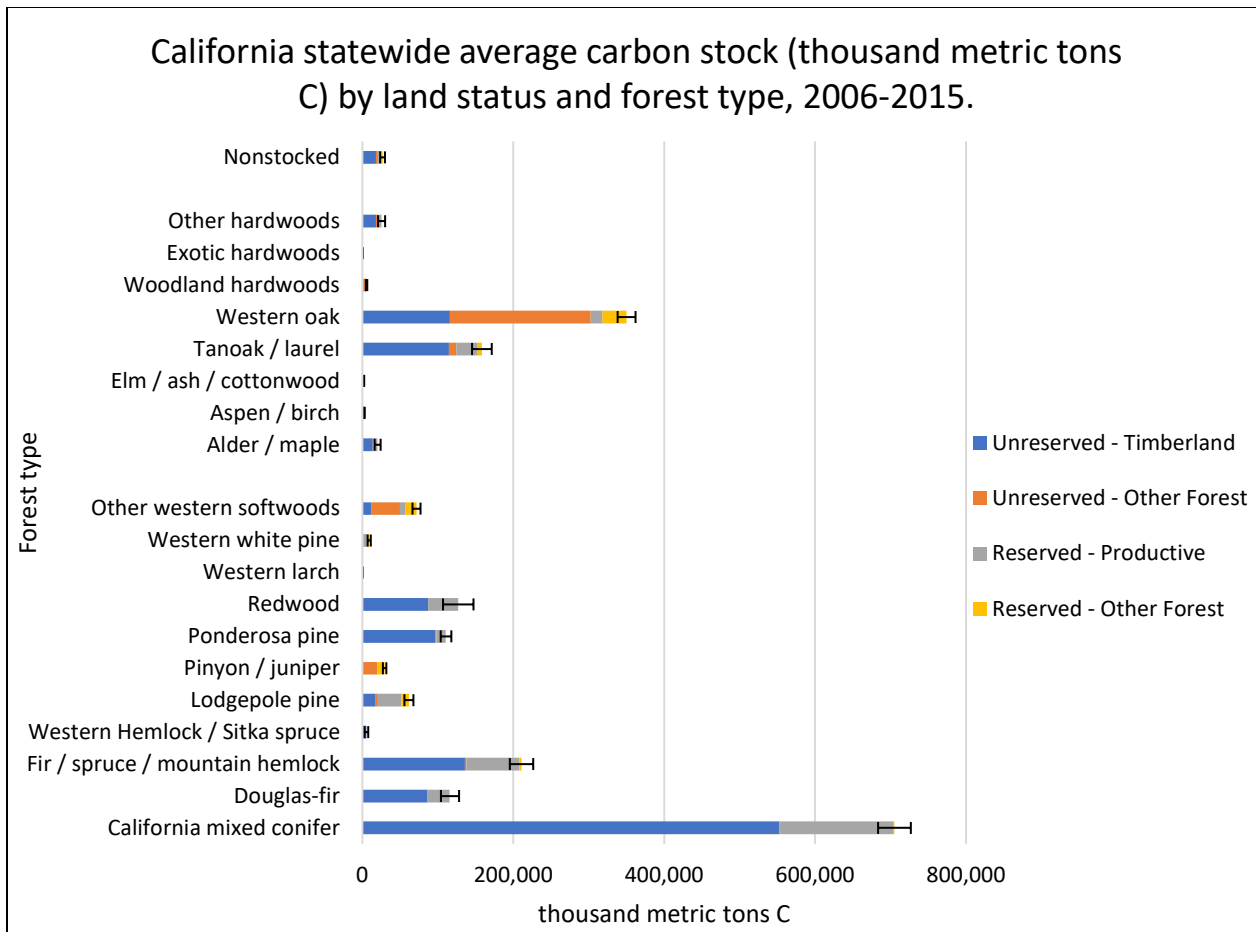


Figure 4.13. California statewide average carbon stock (thousand metric tons C) by land status and forest type. Error bars represent the 95% confidence interval of total stock for each forest type. Figure derived from Appendix 2, D tables.

Table 4.22. Forest land carbon stocks (thousand metric tons C) by forest type and land status, 2006-2015: All California. Table derived from Appendix 2, D tables.

Forest type group	All regions					
	Unreserved Forests		Reserved Forests		All forest land	
	Timberland	Other Forest	Productive	Other Forest		
	Total	Total	Total	Total	Total	SE
	<i>Thousand metric tons C</i>					
California mixed conifer	552,318	843	150,788	1,160	705,108	11,067
Douglas-fir	86,272	576	28,320	955	116,122	6,138
Fir / spruce / mountain hemlock	135,908	2,006	70,141	2,840	210,895	7,906
Western Hemlock / Sitka spruce	5,074	--	234	--	5,299	1,258
Lodgepole pine	17,550	2,951	30,840	10,319	61,669	3,045
Pinyon / juniper	254	19,595	185	9,434	29,467	1,156
Ponderosa pine	96,585	1,444	11,791	1,035	110,854	3,596
Redwood	87,285	--	39,782	--	127,066	10,299
Western larch	--	--	--	--	--	--
Western white pine	1,208	225	5,693	1,919	9,044	1,075
Other western softwoods	11,689	38,143	6,894	15,000	71,714	2,719
Total	994,142	65,771	344,665	42,641	1,447,219	15,537
Hardwoods:						
Alder / maple	13,691	1,460	4,474	594	20,221	2,021
Aspen / birch	1,001	450	586	317	2,344	416
Elm / ash / cottonwood	--	1,157	--	429	1,586	416
Tanoak / laurel	114,593	9,908	28,248	5,649	158,397	6,655
Western oak	116,128	186,315	15,909	31,769	350,106	6,060
Woodland hardwoods	986	3,661	--	881	5,529	488
Exotic hardwoods	34	35	--	--	69	31
Other hardwoods	17,953	3,096	3,875	531	25,466	2,383
Total	264,408	206,072	53,089	40,168	563,729	8,976
Nonstocked	17,852	2,522	4,789	1,591	26,744	1,615
All forest types	1,276,401	274,364	402,534	84,400	2,037,690	14,760

Note: Totals may be off because of rounding

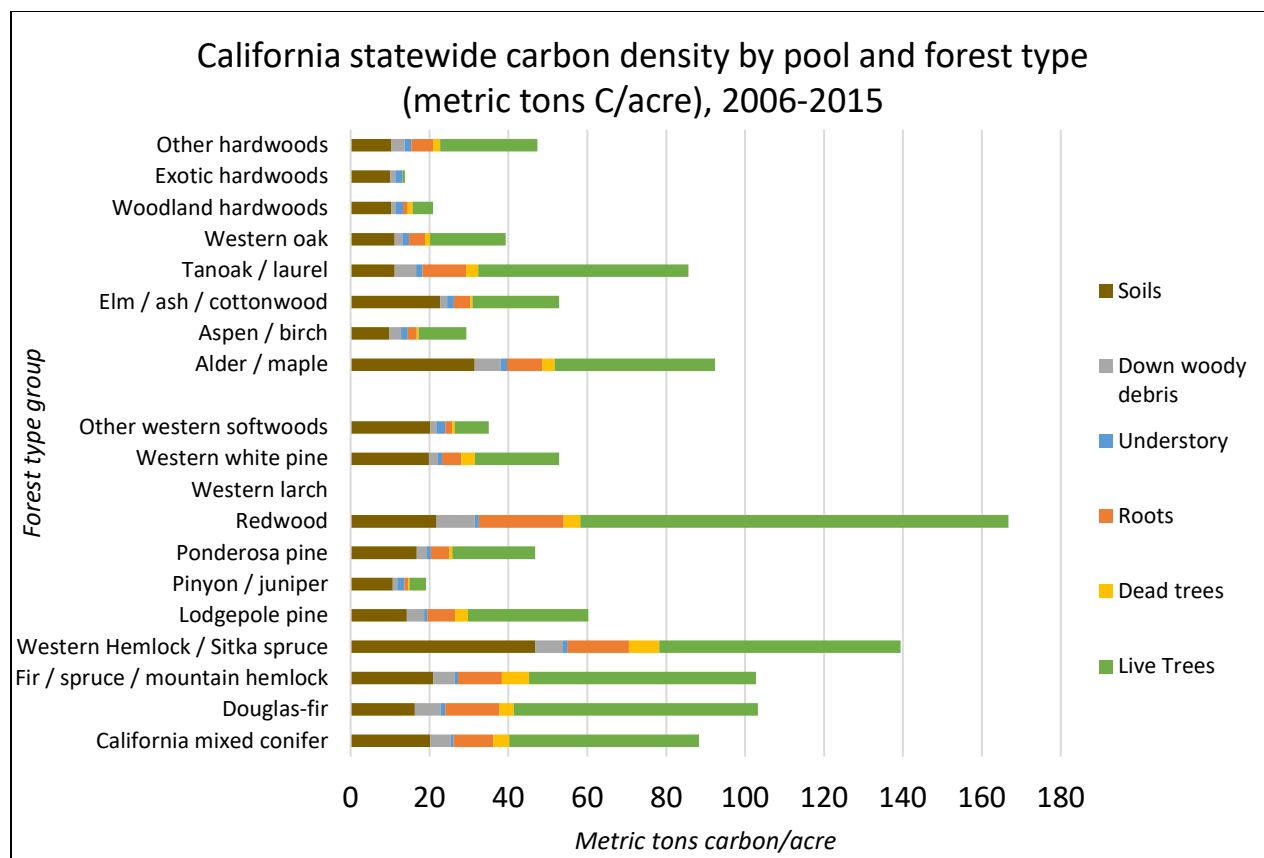


Figure 4.14. California statewide carbon density by pool and forest type (metric tons C/acre), 2006-2015.

4.2.5 FF carbon pools – stock and flux

The following tables provide carbon stock and flux data for each pool by ownership group. These carbon stock results are also compiled in table 4.12 as the totals for each pool for each ownership group. Carbon flux results are also compiled in table 4.3 as the totals for each pool for each ownership group.

4.2.5.1 Aboveground live (AGL) carbon

The aboveground carbon pool includes all live trees 1-inch dbh and larger and includes estimates of the live understory vegetation component. Carbon in live tree foliage is included in estimates of live tree stocks and flux. The decline in understory vegetation is an artifact of the model, which predicts less understory when there is more overstory tree carbon.

Table 4.23. Aboveground live carbon (C) stocks on forest land by ownership, 2006-2015. Table derived from Appendix 2, Tables C1 and C29.

Carbon pool	Public						Private					
	National Forests		Other Federal		State and Local Government		Corporate		Noncorporate		All ownerships	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million metric tons C¹</i>												
Live trees	558.94	8.98	90.12	5.94	54.65	6.42	164.22	6.06	193.98	6.93	1,061.89	13.74
Live understory	16.22	0.24	4.22	0.18	1.46	0.09	5.90	0.19	10.30	0.25	38.09	0.39

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

Table 4.24. Aboveground average annual live carbon flux (CO₂e) on forest land by ownership, 2001-2005 to 2011-2015.

Carbon pool	Public						Private					
	National Forests		Other Federal		State and Local Government		Corporate		Noncorporate		All ownerships	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million Metric Tons CO₂ Equivalent Per Year</i>												
Live trees	7.39	1.53	1.96	0.46	2.01	0.42	4.13	1.50	8.38	0.77	23.88	2.33
Live understory	-0.08	0.06	-0.02	0.03	-0.02	0.01	0.06	0.05	-0.05	0.02	-0.10	0.09

4.2.5.2 Belowground live and dead carbon

The belowground carbon pool in stocks and calculated flux includes estimates of carbon in live and dead tree roots. Estimated carbon in understory roots is also included with this pool.

Table 4.25. Belowground live and dead carbon (C) stocks on forest land by ownership, 2006-2015. Table derived from Appendix 2, Tables C43, C51 and C65.

Carbon pool	Public						Private					
	National Forests		Other Federal		State and Local Government		Corporate		Noncorporate		All ownerships	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million metric tons C¹</i>												
Live tree roots	106.42	1.71	16.95	1.06	10.41	1.17	31.54	1.17	37.98	1.35	203.30	2.58
Dead tree roots	13.95	0.48	2.31	0.22	0.59	0.09	2.30	0.19	1.70	0.11	20.85	0.58
Understory roots	1.80	0.03	0.47	0.02	0.16	0.01	0.66	0.02	1.14	0.03	4.23	0.04

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

Table 4.26. Belowground live and dead average annual carbon flux (CO₂e) on forest land by ownership, 2001-2005 to 2011-2015.

Carbon pool	Public						Private					
	National Forests		Other Federal		State and Local Government		Corporate		Noncorporate		All ownerships	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million Metric Tons CO₂ Equivalent Per Year</i>												
Live tree roots	1.68	0.30	0.36	0.11	0.40	0.08	0.88	0.31	1.53	0.16	4.85	0.48
Dead tree roots	0.52	0.20	-0.03	0.05	0.01	0.04	0.03	0.07	0.02	0.05	0.55	0.23
Understory roots	-0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	-0.01	0.00	-0.01	0.01

4.2.5.3 Aboveground dead down wood

The dead down wood carbon pool includes measurements of standing dead trees, estimates of carbon in dead understory vegetation, and down wood as measured along FIA's down wood transects at each sampled field plot.

Table 4.27. Aboveground dead wood carbon (C) stocks on forest land by ownership, 2006-2015. Table derived from Appendix 2, Tables C23 and C87.

Carbon pool	Public						Private					
	National Forests		Other Federal		State and Local Government		Corporate		Noncorporate		All ownerships	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million metric tons C¹</i>												
Standing dead trees	58.68	2.13	10.09	1.00	2.24	0.35	8.44	0.66	6.55	0.46	86.01	2.48
Down woody material	59.30	1.38	10.16	0.73	4.03	0.46	25.57	1.20	17.93	0.85	117.00	2.04

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

Table 4.28. Aboveground dead wood average annual carbon flux (CO₂e) on forest land by ownership, 2001-2005 to 2011-2015.

Carbon pool	Public						Private					
	National Forests		Other Federal		State and Local Government		Corporate		Noncorporate		All ownerships	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million Metric Tons CO₂ Equivalent Per Year</i>												
Standing dead trees	3.53	1.00	-0.02	0.24	0.06	0.14	0.29	0.26	0.36	0.21	4.22	1.09
Down woody material	-0.25	0.73	0.19	0.34	0.09	0.18	-1.34	0.55	0.32	0.39	-1.00	1.07

4.2.5.4 Forest floor carbon

No summary tables or flux estimates for forest floor (i.e., litter) carbon are currently provided with this report. See section 3.2.3 for additional information.

4.2.5.5 Soil organic carbon

Estimate of current soil carbon stocks by ownership. FIA soil estimates based on Smith et al. (2006), see section 3.2.3 for additional details about the soil pool.

Table 4.29. Soil organic carbon (C) stocks on forest land by ownership, 2006-2015. Table derived from Appendix 2, Table C73.

Carbon pool	Public						Private					
	National Forests		Other Federal		State and Local Government		Corporate		Noncorporate		All ownerships	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million metric ton Cs¹</i>												
Soil organic carbon	258.82	2.29	48.71	1.66	15.10	0.86	84.83	2.39	98.43	2.36	505.89	3.42

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

Table 4.30. Soil organic carbon average annual flux (CO₂e) on forest land by ownership, 2006-2015.

Carbon pool	Public						Private					
	National Forests		Other Federal		State and Local Government		Corporate		Noncorporate		All ownerships	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Million Metric Tons CO₂ Equivalent Per Year</i>												
Soil organic carbon	0.17	0.33	0.41	0.16	0.11	0.08	-0.04	0.28	0.13	0.20	0.78	0.51

4.3 Forest Management Reference Levels (FMRL) and C stock-change

As described in the 1992 Kyoto Protocols and Guidelines, the concept of a forest management reference level (FMRL) is used to establish baseline forest carbon stock values so that average annual net change from managed forests can be calculated (IPCC 2014, section 2.7.5) and for comparing long term projections to reference conditions in a consistent fashion. For this report, we have established FIA's initial 10-year forest inventory in California as the FMRL baseline, which was installed from 2001 through 2010. Calculating a current stock in a consistent way with the FMRL is an IPCC-recommended approach to carbon accounting and allows evaluation of relative changes in California forest carbon stocks by pool and ownership between measurement periods. In this way progress toward specific statewide climate objectives, such as are established by AB 1504 and AB 32 for California can be estimated. However, estimates of change between 10-year stock averages (i.e., Stock-Change approach) are not as accurate or precise as those made using the GRM approach. Each successive 10-year period includes 9 years of the previous period's measurements. For example, the periods 2005-2014 and 2006-2015 share data for years 2006-2014. Although these 10-year moving stock averages can be used for estimating the relative direction of change between periods, especially between two full 10-year inventories, it is problematic to use for evaluating flux until then. A more accurate and meaningful way to calculate change and the magnitude of flux is by using the Growth, Removals and Mortality (GRM) approach. This GRM approach is considered an IPCC Tier 3 approach to carbon accounting, which refers to using more advanced country-specific data and methods. The GRM method compares measurements taken on the same set of plots and trees at different times. This method measures trees 10 years apart to allow enough growth between each measurement to reliably distinguish measurement of actual change from possible measurement error. In addition, it makes it possible to identify causes of changes to individual plots instead of simply comparing total stocks. The GRM approach to calculate change is the approach used nationally by the FIA Program and is also used for this report (see section 4.1). Our estimate of C flux and current trends is determined by comparing measurements taken in 2001-2005 to those taken on the same plots and trees in 2011-2015. This provides 5 years of re-measured tree data to calculate actual growth, removals, and mortality on the same set of trees. However, because the current estimates of change use only 5 years of re-measured plot data, only 50 percent of all the plots initially installed from 2001 to 2010 are included. One would expect estimates of flux to change slightly as more data are collected, with improvements in sampling error as plots approach 100 percent re-measurement in 2020 and beyond. See section 3.1.2 for more information about FMRL and methods used.

Table 4.31 provides FMRL estimates from 2001-2010 by forest carbon pools including the total estimated carbon for this initial 10-year period. The 2001-2010 FMRL for total carbon from all pools including soils is 1,995 MMT C. The live tree pool accounts for approximately 51% of the entire forest carbon pool, while carbon in organic carbon in soils account for just over a quarter of the total carbon, 26%. Standing dead trees, down wood, understory vegetation, and roots account for the remaining carbon. The current stock values for each of these pools are estimated as stock totals for each 10-year period (i.e., complete plot set) through the current period of 2006-2015. During this time, there is no meaningful change in most carbon pools from the established FMRL except in growth from live trees (Figure 4.15), demonstrating the difficulty in using this approach as it does not take full advantage of re-measurement information. As was presented earlier in this section, we use the GRM approach to determine the 2015 statewide rate of carbon sequestration on all forest land including flux from forest land conversions but excluding other greenhouse gas emissions from fire, which is estimated at 33.2 ± 5.5 MMT CO₂e per year. The 2001-2010 FMRL baseline for live tree carbon is $1,025 \pm 27.5$ MMT C (95% CI) and in 2006-2015 total carbon in live trees increased to $1,062 \pm 26.9$ MMT C (95% CI). Using the stock-change approach comparing the 2006-2015 time-period to the FMRL, which is equivalent to a difference of 5 years, puts the net change in carbon stocks on all forest land at approximately 37 MMT C. When this value is converted to CO₂e and annualized over a 5-year period, it is equivalent to approximately 27 MMT CO₂e per year. This value is lower than the net sequestration rate determined by the direct-measurement GRM approach and again highlights some of the challenges with using the stock-change approach until full re-measurement is complete. Future forest carbon pools are projected out to the year 2020 by applying current flux estimates based on re-measured trees to each 2006-2015 C pool estimate (Figure 4.15) assuming a constant flux rate.

Table 4.31. Forest carbon pools by 10-year inventory period, 2001-2010 through 2006-2015. Table derived from Appendix 2, C tables.

Period	Live trees		Dead trees		Down Wood		Understory vegetation		Belowground roots		Soil		Total carbon
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total
<i>Years</i>	<i>Million metric tons C¹</i>												
2001-2010	1,025.37	14.01	79.36	2.35	115.75	1.86	44.56	0.43	216.81	2.78	513.38	3.31	1,995.23
2002-2011	1,034.66	14.11	81.70	2.38	115.87	1.92	44.13	0.43	218.97	2.80	510.42	3.31	2,005.75
2003-2012	1,035.28	13.52	83.22	2.41	115.56	1.94	43.74	0.44	218.76	2.70	512.17	3.40	2,008.73
2004-2013	1,045.40	13.67	83.54	2.43	115.36	1.95	43.02	0.44	220.58	2.72	508.29	3.41	2,016.19
2005-2014	1,054.90	13.63	84.43	2.46	115.76	1.99	42.62	0.43	222.54	2.72	507.04	3.42	2,027.29
2006-2015	1,061.89	13.73	86.00	2.48	117.0	2.04	42.32	0.39	224.14	3.15	505.89	3.42	2,037.26

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

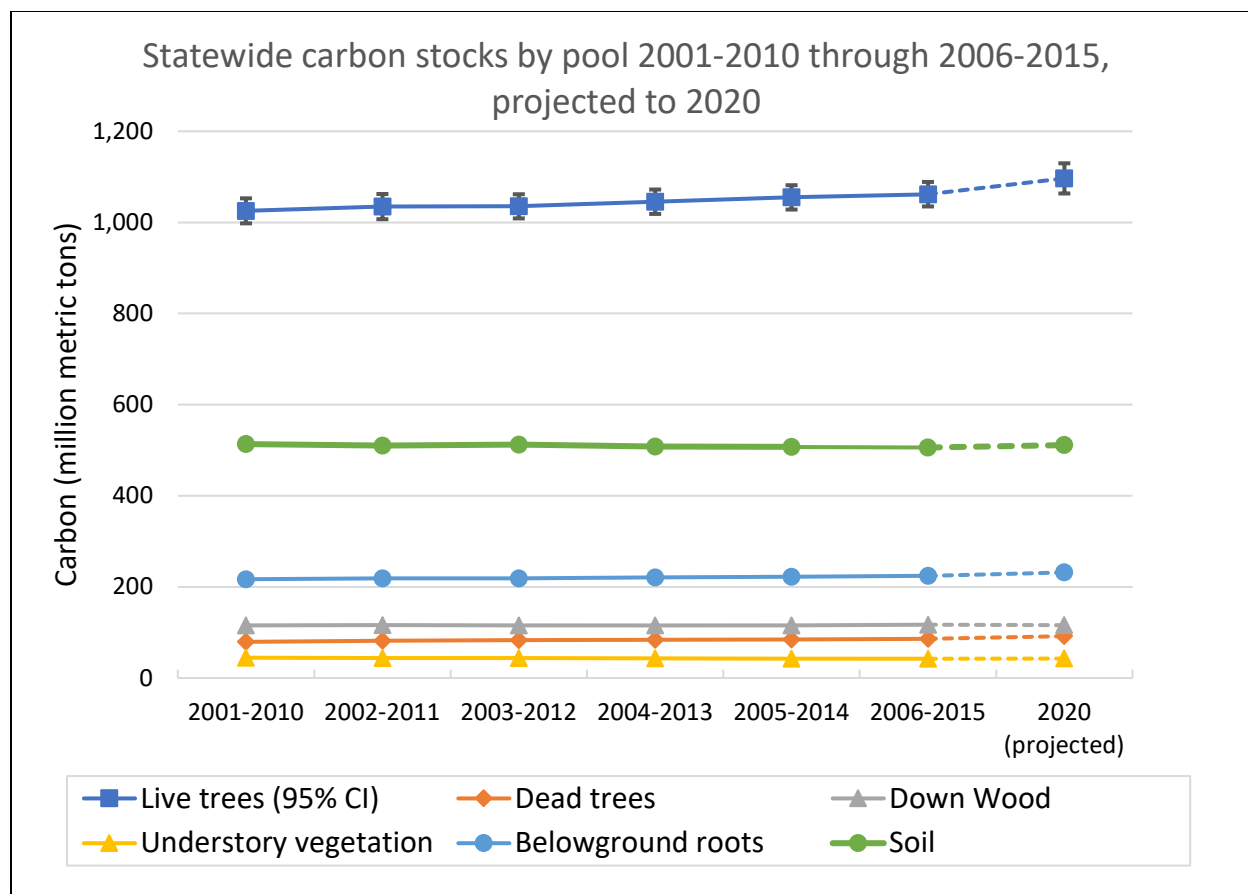


Figure 4.15. California carbon stocks by source pool, 2001-2010 through 2006-2015 with projection to 2020. Error bars represent the 95% confidence interval of live tree carbon stocks to 2020.

We also evaluate current C stocks by ownership from the 2001-2010 FMRL in 10-year periods to 2006-2015. The aboveground live tree C pool by ownership and land status is highlighted in Table 4.32. The live tree pool is evaluated on its own since re-measurement has so far suggested an elevated rate of annual flux relative to all other C pools. Most ownerships and land status (timberland and reserved forest land) indicate increasing or flat C stocks throughout this time-period based on the 2001-2010 FMRL and the standard error of each estimate. This same trend appears to persist when evaluating the sum of all C pools by the same ownership and land status groups (Table 4.33).

Table 4.32. Live tree carbon stocks by ownership and land status, 2001-2010 through 2006-2015. Table derived from Appendix 2, C tables.

Period	Unreserved timberland						Reserved forest land		All forest land	
	Private - corporate		Private - noncorporate		National forests		National forests		All ownerships	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>Years</i>	<i>Million metric tons C¹</i>									
2001-2010	146.57	5.71	198.39	6.82	403.18	8.85	138.86	6.99	1,025.37	14.01
2002-2011	145.78	5.72	198.32	6.91	409.14	9.01	140.89	7.10	1,034.66	14.11
2003-2012	147.79	5.61	199.41	6.97	404.68	7.80	145.73	6.03	1,035.28	13.52
2004-2013	152.79	5.75	200.03	7.07	407.55	7.85	145.82	6.09	1,045.40	13.67
2005-2014	155.54	5.76	198.39	6.99	409.94	7.82	148.35	6.14	1,054.90	13.63
2006-2015	164.22	6.06	193.98	6.93	410.70	7.86	148.23	6.14	1,061.89	13.74

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂)

Table 4.33. Forest carbon stocks by ownership and land status, 2001-2010 through 2006-2015. Standard errors not included due to combining mixed estimates from separate pools. Table derived from Appendix 2, C tables.

Period	Unreserved timberland			Reserved forest land	All forest land
	Private - corporate	Private - noncorporate	National forests	National forests	All ownerships
	Total	Total	Total	Total	Total
<i>Years</i>	<i>Million metric tons C¹</i>				
2001-2010	293.50	389.32	781.14	267.17	1,995.24
2002-2011	292.14	386.69	789.37	270.17	2,005.76
2003-2012	296.05	386.62	782.67	280.35	2,008.73
2004-2013	303.44	382.79	784.62	281.54	2,016.19
2005-2014	308.51	377.45	787.67	285.17	2,027.29
2006-2015	323.45	368.01	787.64	286.51	2,037.26

¹Multiply carbon (C) by 3.667 to calculate equivalent carbon dioxide (CO₂e)

5 Harvested Wood Products

5.1 Background

When trees are harvested from the forest, some of the material remains on-site to decay slowly over time, moving between forest ecosystem carbon pools, some might be burned on-site with immediate carbon and other greenhouse gas emissions, while some may be removed and stored as carbon in wood products, burned in energy production, or converted into other bioproducts. At the mill, sawlogs, pulpwood, fuelwood (termed timber product classes) are converted to primary timber products (i.e., lumber, plywood, veneer, residues, etc.). Each of these products are then allocated to various end-uses such as residential construction, manufacturing, packaging and shipping, or biomass energy, to name a few. Wood products within these various end-uses have different lifetimes. A product's half-life is the number of years it takes for half of the initial amount of wood to be discarded and can be used to determine how much of the original product remains in use versus disposed (Skog 2008). Once disposed, discarded wood products decay over time releasing carbon back to the atmosphere. The process by which this happens is dependent on the manner of disposal. In anaerobic environments such as in landfills, wood decay releases carbon (mostly in the form of methane) and ceases after several decades, leaving a carbon fraction that persists in solid form indefinitely. Newer technology at some landfills allows for methane capture and combustion (oxidation), thus reducing overall methane emissions to the atmosphere with formation of CO₂, a less powerful greenhouse gas. In some cases, products may be recycled, thus extending a portion of its useful life, or they could be burned for energy. When the product is kept out of the landfill methane emissions from landfill decay are substantially decreased.

The IPCC (2006) identifies several harvested wood product carbon pools, including harvested wood products in-use (HWP-use) and harvested wood products in solid waste disposal sites (HWP-SWDS) (figure 5.1). These pools represent carbon storage and are the only harvested wood product pools reported in the forest sector. Tracking harvested wood products used in energy production (HWP-energy pool) and burned without producing energy (HWP-burned pool) is needed for other aspects of carbon accounting. Carbon emissions from burning wood for energy (HWP-energy pool) are included in the energy sector for informational purposes only. The amount of harvested wood products burned without producing energy is used to calculate non-CO₂ emissions associated with harvested wood products and is reported in the forest sector. The loss of carbon associated with these pools is accounted for by not being present in any forest or harvested wood pools. While the HWP-SWDS pool represents stored carbon, this pool is also used to determine methane emissions from decay at landfills, which are included in the waste sector. Information from this report can support the CARB GHG inventory calculations for these emissions, although the HWP-SWDS pool may need to be

further broken down to include the quantity of short-lived products (e.g., paper) and long-lived products (e.g., solid wood). To account for the carbon in each of these pools, timber harvested in each year being reported must be followed through its life-cycle (Figure 5.1). **Timber product ratios**, **primary product ratios**, and **product half-lives** are applied at each stage to track the harvested carbon (Smith et al. 2006).

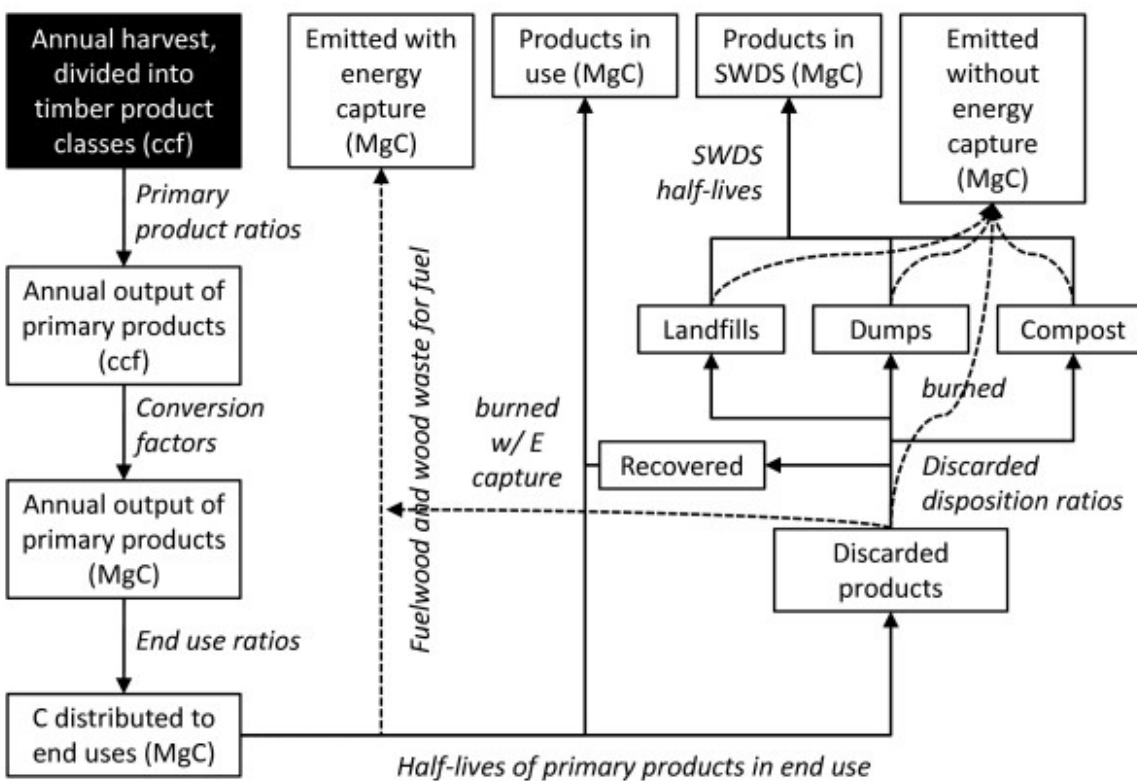


Figure 5.1: Schematic of calculations to quantify HWP storage and emissions for HWP pools using the IPCC/EPA approach. This figure does not depict the level of landfill methane capture that may occur with and without energy production. Source: Stockmann et al. 2012

5.2 Status of 1504 HWP C inventory

Through an agreement between CALFIRE, the USDA Forest Service Pacific Northwest Research Station, and the University of Montana, a detailed IPCC Tier 3 inventory of the harvested wood product carbon pools will be conducted for the AB 1504 Forest Ecosystem and Harvested Wood Products carbon inventory expected to be released in 2018. Carbon stocks for HWP pools will be based on a production approach, i.e., all timber that is produced from all ownerships in California will be evaluated regardless of whether it is consumed within the state of California or is exported to other states or countries. Imported wood products are not included in this

type of assessment because the emphasis is on the location of harvest. Care must be given if including imported wood products to avoid double-counting with the inventory in the country of origin. Additionally, products may still be in use or at the landfill from historic harvests. The HWP carbon accounting will include these products for as far back as harvest data allows, per IPCC guidance (IPCC 2006). Flux from the HWP pool is primarily calculated using the stock-difference approach, but knowing how long ago products entered the pool helps determine current stocks. Please refer to the U.S. NGHGI (US EPA 2017) or the USFS Pacific Southwest region and Northern region harvested wood product carbon inventories (Stockmann et al. 2014, Stockmann et al. 2012) for a description of harvested wood product carbon accounting methods.

Planned improvement: The following harvested wood product pools do not have an estimate for this report and will be determined in an upcoming AB 1504 carbon inventory:

- Harvested wood products in use (i.e., HWP-use, typically storage)
- Harvested wood products in solid waste disposal sites (SWDS) (i.e., HWP-SWDS, typically storage; also used to determine methane landfill emissions)
- Harvested wood products with energy production (i.e., HWP-energy, typically an emission, reported in energy sector for informational purposes only; does not differentiate between end-uses in the fuelwood category i.e., firewood, biomass energy plant feedstock)
- Harvested wood products burned without energy production (i.e., HWP-burned, carbon emissions from this pool implicitly accounted for in losses to the other forest ecosystem and HWP pools; used to determine non-GHG emissions)

It should also be noted that when by-products of commercial harvest, fuels reduction and salvage (i.e., logging slash, sub-merchantable biomass, dead material) are utilized to create energy, emissions from fossil fuel-based energy, in-forest decay, and open-pile burning may be reduced. Wood products can also have a lower emissions profile when used instead of other, more energy intensive building materials such as cement and steel. Currently IPCC does not provide guidance on addressing avoided emissions from burning wood for energy or wood product substitution. These emissions reductions are implicitly addressed in changes in emissions from other IPCC sectors and reporting categories such as the energy and building sectors. If wood is replacing fossil fuel energy or more energy-intensive materials, then emission from those categories should decrease. However, if overall consumption increases, the benefits from **wood material** and **energy substitution** (discussed further in section 8.6) could be diluted in the calculations. Additionally, as renewable energy use increases, the benefits of avoided fossil fuel emissions associated with wood products are likely to change. To fully understand the emissions reductions in these other sectors that might be directly

associated with the forest sector, additional quantification is needed. **Potential improvement:** It is a goal for future AB 1504 carbon inventories to provide information on actual avoided emissions to more fully describe the carbon benefits associated with forests and wood products through life-cycle analysis/inventory accounting, discussed further in section 7.2.6 and 8.6. Inclusion of these data would be for informational purposes only.

5.3 Carbon in harvested wood products and byproducts based on 2012 harvest

Although a detailed harvested wood product carbon inventory was not completed for this first AB 1504 report, the following section from the California Forest Carbon Plan (FCAT 2017) can serve as an introduction to harvested wood product carbon in California.

The following information on carbon in harvested wood products is based on green timber harvest volumes for a single year, 2012, reported in McIver et al. 2015 and updated via McIver and Morgan (2017) to better reflect the contributions of timber, slash, and bark. A description of methods to convert harvest volumes for timber, residues, bark, and slash to carbon mass and carbon dioxide mass equivalents can be found in the California Forest Carbon Plan (FCAT 2017). The information in this section should be used to understand how a single year of harvest with its associated byproducts contribute to a carbon profile of wood used in products and burned for energy. Further analysis of carbon that persists in wood products 100 years after the 2012 harvest are addressed later in table 5.2.

In California in 2012, approximately 1.06 MMT of carbon was processed into finished lumber and other products and 1.20 MMT of carbon was burned for energy production, including slash and bark byproducts (table 5.1).

For commercial trees harvested for timber products, 47% of the harvested carbon removed from the forest ended up in finished lumber, 10% in landscaping and other products, 7% in veneer and other products, 7% in pulp and fiberboard products, 29% in mill residues combusted for energy, and 0.08% in unutilized residue (Table 5.1(a)). Please note these percentages are not the same as the proportion of the volume of timber harvest by product due to different volume to mass conversions for solid wood products and residues.

Commercial timber harvest operations also resulted in bark as a byproduct. 63% of the carbon in bark byproduct was combusted for energy and 37% of the carbon in bark byproduct became landscaping and other products (Table 5.1(b)). 59 percent of landscaping and other products was comprised of residues from harvested wood, and 41% from the bark byproduct from harvested wood.

Slash (i.e., tops, limbs and associated bark) was another byproduct of the commercial timber harvest operations and, when removed from the forest, was exclusively combusted for bioenergy (Table 5.1(c)). Some slash and sub-merchantable material is left in the forest and transfers carbon to dead wood pools (e.g., **logging residuals**). These residuals eventually decompose or are disposed of through open pile-burning and are not accounted for in table 5.1, but are accounted for in the FIA plot measurements of forest ecosystem carbon pools. Logging residuals associated with the 2012 harvest are approximately 108 MMCF (USDA Forest Service 2012), representing 0.59 MMT C (calculated using methods described in FCAT 2017; value reported in FCAT 2017 incorrect due to spreadsheet error). This does not include sub-merchantable material cut for forest health and fuels reduction. If increased utilization of logging residuals and sub-merchantable material were economically and logistically possible, greater carbon benefits could be incurred.

It should be noted that in these calculations, bark and slash are addressed separately as they reflect additional utilization rather than trees that are specifically harvested for products/uses. Additionally, wood removed from the forest for commercial or personal-use fuelwood is not accounted for in table 5.1. The values in table 5.1 also only represent a snapshot in time and do not reflect carbon storage and emissions in products harvested in previous years, nor do they reflect a lifetime analysis that factors in allocation of primary products (i.e., lumber, veneer, etc.) to specific end-uses (i.e., construction, manufacturing, etc.) and the associated wood product half-lives. Consequently, these values do not provide an inventory of typical harvested wood product carbon pools such as products in-use versus products at the landfill. Lastly, these values do not reflect avoided emissions from wood product substitution of more energy intensive materials or from burning wood instead of fossil fuels for energy.

See Table 5.1(a-c) for the amount of carbon and carbon dioxide equivalent associated with each wood product/byproduct.

Table 5.1(a-c)(metric tons) a) 2012 Timber harvest carbon in end-uses, percentage represents the proportion of carbon contributed by each product from primary timber harvest; please note this is not the same as proportion of the volume of timber harvest by product due to different volume to mass conversions for solid wood products and residues b) Carbon associated with utilization of bark byproduct in 2012, percentage represents the proportion of carbon contributed by each use of bark; c) Carbon associated with utilization of slash (i.e., tops, limbs and associated bark) byproduct in 2012; percentage shows slash is exclusively combusted for energy.

TIMBER HARVEST				
% of Harvest C	C	CO ₂ e	Category	MMCF*
47%	635,498	2,330,372	Finished lumber	115.4
10%	138,913	509,393	Landscaping products	24.5
7%	92,516	339,257	Veneer and other products	16.8
7%	98,656	361,773	Pulp and fiberboard products	17.4
0.08%	1,134	4,158	Unutilized residue	0.2
29%	394,058	1,445,012	**Mill residues combusted for energy	69.5
Total	1,360,776	4,989,965		243.6
b) Byproduct - BARK				
% of byproduct C	C	CO ₂ e	Category	MMCF*
63%	166,128	609,192	**Bark combusted for energy	43.3
37%	97,522	357,615	Landscaping products	17.2
Total	263,651	966,807		60.5
c) Byproduct - SLASH (i.e., tops, limbs and associated bark)				
% of byproduct C	C	CO ₂ e	Category	MMCF*
100%	640,455	2,348,547	**Slash combusted for energy	116.3

*Harvest volumes reported in McIver et al. 2015 and updated via McIver and Morgan 2017 letter to FCAT are converted to carbon values. Refer to the California Forest Carbon Plan (FCAT 2017) for methods.

**carbon values associated with wood products combusted for bioenergy represent an emission. In a lifecycle analysis, net emissions for these products may be reduced when factoring in fossil fuel energy displacement, but is not calculated here.

5.4 Carbon profile of solid wood products and wood products combusted for energy

While bark and slash removed from the forest are typically analyzed separately from primary timber harvest products, for the purposes of this report they are included when looking at the carbon profile of solid wood products and wood products combusted for energy.

In 2012, finished lumber comprises 60% of solid wood product carbon, landscaping and other products (including bark contributions) comprise 22%, veneer and other products comprise 9%, and pulp and fiberboard products comprise 9% (figure 5.2(a)). Of the carbon found in harvested wood, 0.08% remains as unutilized residue to decay.

73% of the carbon associated with wood products combusted for bioenergy comes from harvest slash (i.e., tops, limbs and associated bark), 16% from mill residues, and 11% from bark (figure 5.2(b)).

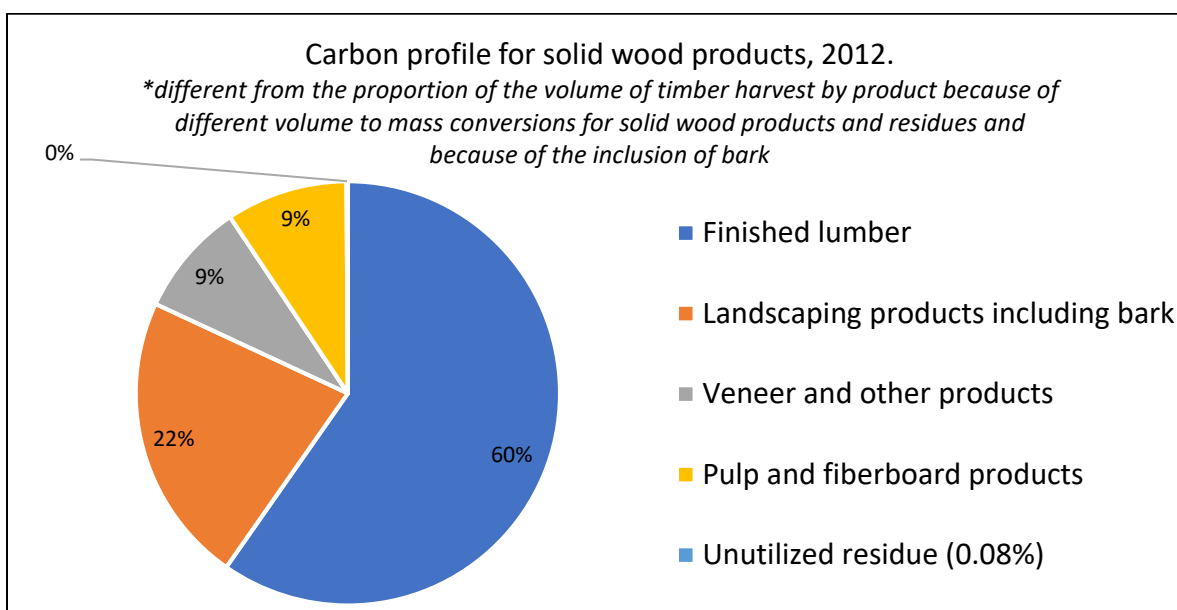


Figure 5.2(a). Carbon profile for solid wood products from the 2012 California timber harvest.

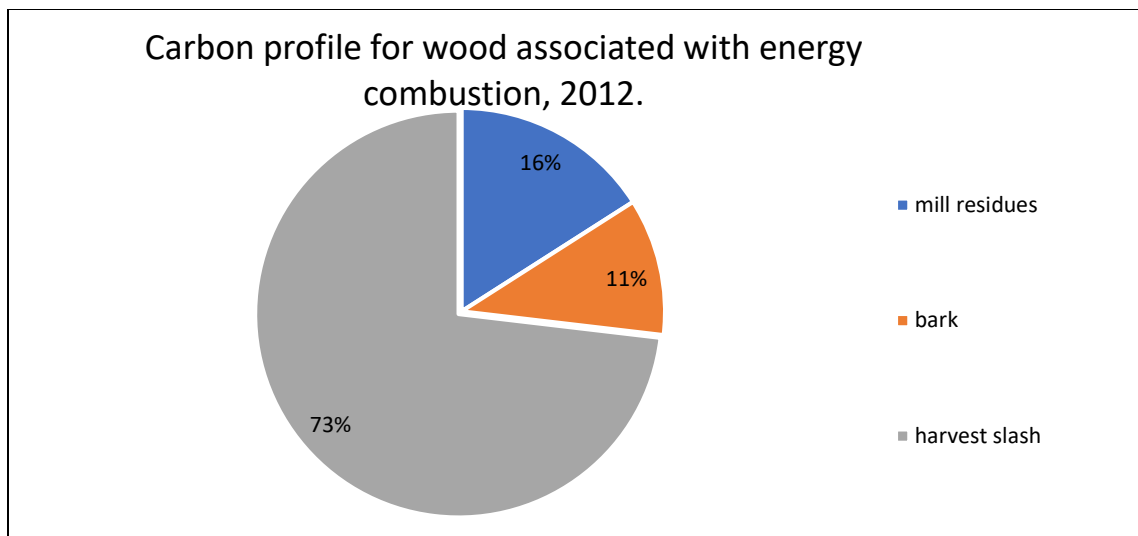


Figure 5.2(b). Carbon profile for wood associated with energy combustion from the 2012 California timber harvest.

In terms of harvest volume proportions (board foot Scribner) by ownership, 70% of harvested wood products in 2012 came from private corporate timberlands, 13% from private non-corporate timberlands, 14% from USDA Forest Service timberlands and 3% from other public timberlands (Figure 5.3). Private corporate timberland represents 13% of the forest land base, private noncorporate timberland represents 10% of the forest land base for a total of 23% in private timberlands, while public timberland represents 29% of the forest land base figure 2.4). Nearly all the wood from timber harvested was processed in California (i.e., 97%). Additional calculations are required to determine percentages of harvested carbon by ownership.

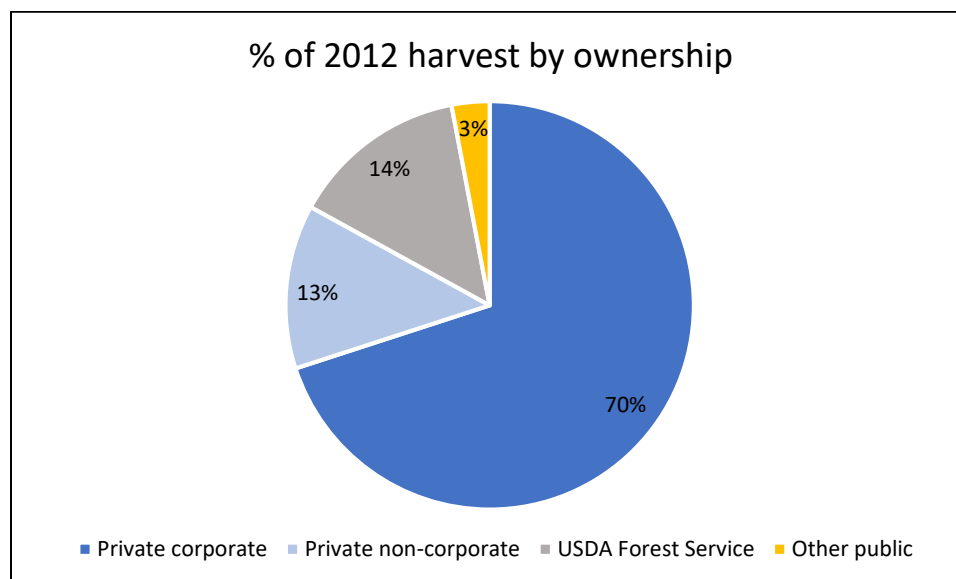


Figure 5.3. Percent of 2012 California timber harvest by ownership.

It should also be noted that timber harvest data from 2012 is not necessarily representative of historical timber harvest. Timber harvesting has been on the decline since the mid-1980s. McIver et al. (2015) estimated that timber harvesting in California was 1.425 billion board feet Scribner in 2012, and this represents a decline of 18% from 2006 (1.733 billion board feet) and a 36% decline from 2000 (2.250 billion board feet). However, the most recent data from the California State Board of Equalization show harvests are increasing again, with 1.591 billion board feet of timber harvested in 2015 and 12.9% of the harvest volume (0.205 billion board feet) from public lands and the remaining amount from private lands. It should be noted that harvest volumes reported by CA BOE data are typically slightly less than those reported by McIver et al. (2015) and are mentioned here just to show that harvest is trending upwards again.

5.5 More comprehensive harvested wood product carbon estimates

The diversity in the mix of products derived from timber harvests has been fairly consistent over time with notable utilization for bioenergy. Based on UC-Davis California Biomass Collaborative data last updated in 2015, forestry and wood waste materials generated 30% of the energy from solid fuel bioenergy feedstock, a mix of forestry, urban and agricultural materials generated 27%, a mix of urban and agricultural materials generated 34% and municipal solid waste generated approximately 10%, for a total of 726 gross megawatts (MW) of energy from solid fuel bioenergy feedstock (UC-Davis CBC 2015). Landfill gas (321 MW, gross), wastewater treatment plants with anaerobic digesters (88 MW), farms using manure in anaerobic digesters (6 MW), and facilities that use food processing and urban residues (3 MW) also generated bioenergy. Stewart and Nakamura (2012) estimated that using revised coefficients on mill and consumer wood utilization efficiencies from newer data substantially improves the estimates of climate benefits from harvested wood products.

Using data from the CA State Board of Equalization, Saah et al. (2015) estimated the amounts of wood product carbon generated from timber harvests in California from 2001 to 2010. These methods were built upon for analysis in the California Forest Carbon Plan (FCAT 2017) by refining methods to convert harvest volumes to carbon mass with species-specific softwood densities and board foot to cubic foot volume conversions. Over the period, approximately 90 % of harvested wood products were generated from privately-owned forests, with the majority used within the state. Using national and state mill efficiencies, wood product lifetimes and factors governing the fate of discarded wood products, Saah et al. then estimated how much carbon from each harvest year between 2001 and 2010 remained stored in wood products 100 years later and presented the amount as the ten-year average for this timeframe in Table 5.2.

This type of analysis follows the CA Forest Project Protocol (CFPP) (CAR 2012) and is a simpler accounting approach compared to the IPCC production accounting approach, as it focuses on single harvest years rather than net annual additions to and emissions from harvested wood product pools, including contributions from historic harvests (Stockmann et al. 2012).

Based on national factors reported by Smith et al. (2006), it was estimated that 100 years after timber current timber harvest, approximately 65% of wood product carbon would eventually be returned to the atmosphere. Using state-specific factors reported by Stewart and Nakamura (2012), the estimate was 61%. Using this approach, we estimate the ten-year average wood products in storage from 2001 to 2010 to range between 541,604 and 599,940 metric tons of carbon per year. Long-term storage estimates from harvest activities on public lands ranges from 53,394 to 59,146 metric tons of carbon per year, while estimates range from 488,208 to 540,796 metric tons of carbon per year from harvest on private lands. This analysis does not include potential carbon benefits from wood products in-use from harvests prior to the time-period of analysis or from additional utilization of slash and bark byproducts. It also does not provide information about avoided fossil fuel emissions from wood material and energy substitution.

Table 5.2. California Ten-Year Average Harvested Wood Products (2001 to 2010) Carbon Storage After 100 years.

Source		<i>Metric Tons of Carbon</i>		
		Public Ownership	Private Ownership	Total
Smith et al., 2010, 2006	10-year average annual storage from harvested wood products (2001 to 2010)	53,394	488,208	541,604
Stewart and Nakamura, 2012	10-year average annual storage from harvested wood products (2001 to 2010)	59,146	540,796	599,940

*Based on 100-year life cycle

Source: Derived from Saah et al., 2015 and expanded upon for California Forest Carbon Plan. Refer to FCAT (2017) for methods.

If we look at the 2012 timber harvest volumes analyzed for carbon content associated with various primary products, we get carbon values remaining in storage after 100 years similar to those based on the 2001-2010 harvests. The 2012 CA timber harvest volumes associated with various primary products are already converted from board feet to cubic feet, so resulting carbon calculations are more accurate. Table 5.3 does not address additional emissions from utilization of slash and bark for bioenergy in year 1 or additional storage benefits from utilization of bark for wood products, as reported in table 5.1.

Table 5.3. Carbon remaining in storage 100 years after 2012 CA timber harvest

Method	Metric tons of Carbon, TOTAL
Smith et al. (2006)	483,075
Stewart and Nakamura (2012)	553,057

A more comprehensive harvested wood products carbon inventory that follows the IPCC production accounting approach which factors in primary product ratios and end-uses, product lifetimes, contributions to harvested wood product pools from historic harvests etc. will occur in the upcoming AB 1504 Forest and Harvested Wood Product Carbon Inventory report in 2018 and will build off the work completed for the California Forest Carbon Plan and this first 1504 report.

6 Comparison with other reports

6.1 National Greenhouse Gas Inventory

Table 6.1. Differences between net carbon sequestration rates in the U.S. NGHGI and this report (MMT CO₂e/yr).

Inventory	Live Tree ¹	Non-live tree, non-soil	Method/year
<i>Net Sequestration, MMT CO₂e/yr</i>			
U.S. NGHGI (USDA OCE Climate Change Program Office 2016)	36.2	2.6	Stock-change, FIA direct-measurement 2013
1504 CA Forest Ecosystem & HWP (i.e., this report)	29.9	4.3	GRM, FIA direct-measurement 2015

¹ Live tree includes aboveground wood, foliage, and roots

The U.S. National Greenhouse Gas Inventory (NGHGI) is aggregated at the national level, so state-level estimates are not available to compare to those produced here. However, a report that uses the same data and methods is produced periodically that provides disaggregated results at regional and state levels. The most recent version of this report provides forest carbon stock and flux estimates for 2013, but does not include HWP (USDA OCE Climate Change Program Office 2016). The USDA report estimates live tree net stock change at 36.2 MMT CO₂e per year for California, while in this report we estimate the change at 29.9 MMT CO₂e per year (Table 6.1). The primary cause for this difference is in the use of regional equations used to calculate biomass from the tree measurements. While both methods are based on the same merchantable tree volume calculations as described in section 3, we use a set of regionally-derived biomass equations while the NGHGI uses national component ratio equations. Both approaches use equations with built-in assumptions and are based on small datasets resulting in estimates of unknown accuracy (Weiskittel et al. 2015). This issue is further discussed in section 7.2.1 of this report. In addition, the USDA flux estimates use a stock-change approach as opposed to a GRM approach, but given the similarity of the estimates from both approaches in this report the effect is likely minor.

The USDA (2016) report estimates total non-soil stock change at 38.8 MMT CO₂e; after subtracting the live tree change this results in a non-live tree, non-soil stock change of 2.6 MMT CO₂e per year. In comparison, we estimate changes in those pools of 4.3 MMT CO₂e per year, with most of the change attributed to standing dead trees. While the difference in tree-level biomass equations may have played a role, the use of models based on forest type and stand age to estimate down wood in the NGHGI report may have been a factor as well.

6.2 California Air Resources Board

Table 6.2. Differences between CARB inventory and this report.

Inventory	Net Sequestration (MMT CO ₂ e/yr)	Net flux from land-use change (MMT CO ₂ e/yr)	Stock (MMT C)	Pool	Method/year
Gonzalez et al. 2015, adjusted for undetected growth)	7.3 (7.8) ¹	-16.3 (-17.3) ¹	888 (945) ¹	Aboveground Live Vegetation (includes shrubs)	RS/land-cover change 2010
CARB 2017	7.1 (7.6) ¹	-16.5 (-17.5) ¹	892 (949) ¹	Aboveground Live Vegetation (includes shrubs)	RS/land-cover change 2010 & growth
1504 CA Forest Ecosystem & HWP (i.e., this report)	24	-1.2	1,025	Aboveground Live Tree (excludes shrubs)	GRM, FIA direct-measurement, 2010 data for stock, 2015 data for flux

¹Quantities in parenthesis use carbon fraction of biomass equal to 0.5 for better comparison to the FIA-based quantities

The California Air Resources Board (CARB) estimates for biomass, carbon stocks and stock change on forests and other lands for 2001 – 2010 are based on sources and methods developed under a contract with the University of California (Battles et al. 2013), reported in Gonzalez et al. (2015), and developed further under a follow-up contract (Saah et al. 2016). Gonzalez et al. (2015) reported a carbon stock of 840 ± 210 MMT C in 2010 and a net loss in aboveground live (AGL) carbon of 29 ± 10 MMT C in California forests remaining forests for the time-period of 2001-2010, or 12 MMT CO₂e per year. There is an approximate error of 25% associated with the C stock estimate and a 35% associated with the flux estimate. Other carbon pools were not estimated. Gonzalez et al. (2015) attributed most of the losses in aboveground live carbon to wildfire, but estimated net losses in unburned forests as well, and on both private and public lands. Gonzalez et al. (2015) used spatial data from LANDFIRE, which estimates vegetation types, canopy cover and height classes from Landsat remote sensing (RS) data calibrated against FIA and other field data. Regression equations were derived to relate the LANDFIRE tree-dominated vegetation types to the plots to estimate aboveground biomass densities. Aboveground live carbon stocks were then estimated using the carbon fraction of biomass (0.47 ± 0.0235 grams carbon/grams biomass) and land area. Stock change between 2001 and 2010 was determined by calculating the change in land cover area by vegetation type and cover/height and associated stock changes. However, the authors noted that due to the coarse resolution of height classes in LANDFIRE, the remote sensing based methods employed in the study exhibited sensitivity to disturbance, and less sensitivity to tree growth. Working from data reported in FIA database version 6.0 of plots first measured between 2001-2002 and re-measured between 2011-2012, the authors posited a decadal statewide average tree growth

rate of approximately 6% or $+47 \pm 8$ MMT C, representing tree growth undetected by remote sensing. By including this estimated undetected growth, the 2001-2010 AGL stock-change in forest land remaining forest land evaluates to a gain of 18 MMT C and would put the 2010 carbon stock at 888 MMT C (or 945 MMT C assuming a carbon fraction for biomass of 0.5). When annualized, the AGL stock-change rate evaluates to a gain of 2 MMT C per year or 7.3 MMT CO₂e per year (Table 6.2). For the more recent CARB inventory, live and dead pools were included, and a growth increment was applied to AGL stocks associated with tree-dominated areas that remained tree-dominated throughout the analysis period (CARB 2017). As a result, forest land AGL stocks in 2010 evaluated to 892 MMT C (or 949 MMT C assuming a carbon fraction for biomass of 0.5) and net sequestration evaluated to 7.1 MMT CO₂e per year (or 7.6 MMT CO₂e per year assuming a carbon fraction for biomass of 0.5).

In contrast, in 2010 we estimate slightly higher AGL stocks of $1,025 \pm 28$ MMT C. Using 2015 data, we estimate an annual AGL gain of 23.9 ± 4.6 MMT CO₂e per year (section 4). There is an approximate 3% error associated with the stock estimate and 19% associated with the flux estimate. Some of the differences may be attributed to the different time periods of analysis for flux estimates, land category definitions such as inclusion of shrub-dominated land in the Gonzalez/CARB estimates but not in the FIA estimate, slight differences in the carbon fraction of biomass used in the calculations for each estimate, and trade-offs associated with sources and methods. When the Gonzalez/CARB estimates use a 0.5 carbon fraction of biomass value instead of 0.47 their estimates approach the FIA estimates but are still slightly less. The Gonzalez approach appears to attribute greater losses of carbon in disturbed areas, and fewer gains of carbon in undisturbed areas, than the analysis in this report.

The Gonzalez paper attributes an additional aboveground live tree loss of 4.4 MMT C to land-use change, or 16.3 MMT CO₂e/yr, while in this report we estimate a net loss of 1.2 MMT CO₂e/yr. This difference is likely due to Gonzalez et al. (2015) using land cover as the basis for analysis, and estimating that forest land area was converted to non-forest at a rate of 1% per year, while our analyses are based on land-use and estimate the area of forest land converted to non-forest was at a rate of 0.08% per year. The land cover/land-use distinction is a common confusion about whether disturbances reflect a change in land-use (e.g., forest to grassland) or a change in successional status (e.g., mature to seedling stage (e.g., Coulston et al. 2014). Opportunities to further understand processes occurring in California's forests will accrue with advances in both remote sensing-based techniques and as the FIA program continues to refine methods to calculate carbon pools and to account for disturbance processes.

6.3 Periodic inventories

The inventory-based estimate for aboveground live tree carbon flux in 1990 on California timberland outside of National Forests was 10.6 MMT CO₂e per year (Fried and Zhou 2008), using re-measured live-tree measurements from 1980-83 to 1990-94. The inventory-based estimate for aboveground live tree flux on California timberland outside National Forests between 1990-1994 and 2007-2010 was 6.6 MMT CO₂e per year (Christensen et al. 2016). We found a somewhat higher accumulation in this report, indicating continuing sequestration of live tree carbon since before 1990 on these lands. Changes in inventory techniques and definitions preclude making a simple analysis of temporal patterns in stocks and flux of live trees and other pools, although a detailed tracking of change on individual plots through time might be possible to refine these estimates.

7 Strategies to improve the 1504 inventory

7.1 Potential improvements to data collection

7.1.1 Increased number of plots measured per year

The possibility of increasing the intensity of the FIA inventory has been raised as a way to get more precise information on conditions and changes in California's forest land. Concerns revolve around getting more precise estimates of the timing and causes of changes to forests, and getting more precise estimates of the changes on specific ownerships or vegetation types. The options to improve inventory precision include doubling the number of plots in the state (spatial intensification) and halving the measurement interval (temporal intensification).

While the number of plots measured each year would be the same for the temporal and spatial intensification, the implications for analysis of forest resources would differ. In the case of temporal intensification, a shorter cycle would provide better resolution on the timing of changes. However, the precision of estimates for any specific year (e.g., area burned in 2009) would be the same as the current inventory, as all the plots are used to do the calculation. Under temporal intensification, change and carbon flux estimates for the full set of re-measured plots would span 10 years instead of 20 under the current or spatially-intensified design. Measurement errors (e.g., shrinking trees, timing of plot measurements affecting number of growing seasons) would increase in importance. In the case of spatial intensification, more plots would provide more information on specific forest types, land owners, and regions and smaller confidence intervals for all the inventory estimates.

Doubling the number of plots (spatial intensification) enables more precise estimates for particular types of forest that are of interest. In general, the standard error for a doubling of plots will decrease by a factor of 0.71 ($=1/\sqrt{2}$). For example, for the estimate of live tree carbon change in the North Coast of $7,104 \pm 1,206$ (Table 4.5), based on available re-measurement of half the plots in California, the SE for double-intensity of plots would be 856. The mean using all the re-measured plots (10-year cycle) with a double-intensity would be 603, or half the current error estimate.

There are substantial logistical considerations involved in doubling the FIA sample each year, whether by spatial or temporal intensification, to ensure the resulting data are useful and accurate. There are 16,868 land plots in the California base inventory (all ownerships) and the current federal cost (field, data management, analysis, and overhead combined) is approximately \$1500 per plot. In many states, it has been advantageous to having the field work done by state crews or contractors. Regardless of who employs the field crews, significant

training and field testing would be desirable to ensure high-quality data. Fluctuation in budgets that result in changing the number and timing of plot measurement would complicate the analysis of the inventory and could render some intensified data unusable. Additional analysis of goals and options will be needed to flesh out potential strategies.

This report can serve as a starting point to identify specific concerns surrounding uncertainty values, such as for a particular ownership or region, or timing of estimates with further discussion regarding the best strategies to address these concerns.

7.1.2 Improved estimation of non-sampled plots

Many analysts within FIA share the concern expressed about the numbers of non-sampled plots we are experiencing in some states, particularly as a result of denied access on private non-industrial ownerships. The current national approach for accounting for non-sampled plots assumes that those plots are the same as the mean of the rest of the plots in the same stratum, but the strata are fairly coarse and this assumption could be resulting in biased estimates (i.e., inaccuracies). These biases could affect state-level or ecoregion-level estimates as well as the particular areas that are under-sampled. Several ideas have been generated for researching approaches to create better estimates that rely on different kinds of remote sensing, statistical procedures, and/or modeling. However, given current research capacity and priorities, we are not aware of a study currently focused on this issue. It should also be noted that under a temporal intensification strategy, it's possible that more frequent contact of private landowners could result in greater rates of denied access.

7.1.3 Increased use of remote sensing

There is substantial interest in using remote sensing of disturbances to provide modeled up-to-date estimates of change; however, this would also require modeling growth, mortality, and decay on the undisturbed plots which could require substantial effort and potentially introduce bias in the sample. Remotely-sensed data are already an integral part of inventory estimation as it is a key attribute used to post-stratify the data and build estimates and sampling errors. It might be possible to develop more precise estimates of change by incorporating remote-sensing change detection layers into the stratification. Change detection from satellite images is often used to model potential changes in disturbed areas, but those model estimates have difficulty assessing growth and land-use change, and would essentially be independent estimates outside the inventory estimation framework. As mentioned in section 7.1.2, use of high-resolution imagery (e.g., aerial photography) could greatly improve estimation of characteristics of non-sampled plots.

Improved estimation of changes in land-use and land cover on non-forest plots, and more rapid assessment of change on forest plots, should be possible by additional analysis of inventory plots with high-resolution imagery. FIA is currently developing the Image-based Change Estimation (ICE) project that interprets changes in cover and land-use at every forest and non-forest plot location on a 2-3 year schedule in order to provide more consistent and timely estimates of change. These data could be useful in estimating change in carbon stocks on non-forest land-uses that FIA currently is not funded to measure in the field (e.g., chaparral, agriculture, urban).

7.2 Potential improvements to data compilation

7.2.1 Better tree biomass equations

One of the weakest links in any and all forest carbon estimates may be the equations used to calculate tree biomass. The tree carbon estimates in this report are based on a combination of tree volume, bark, and branch equations that were created from independent datasets. Most of the biomass equations were developed to provide initial approximations, and are almost all based on small numbers of trees with a narrow range of sizes from one or two locations. These equations are then applied to all the trees in a region, resulting in estimates of unknown accuracy (Temesgen et al. 2015, Weiskittel et al. 2015). For example, the bark and branch calculations for all Ponderosa pine on the west coast are based on a sample of 23 trees at Pringle Falls Experimental Forest in central Oregon. While alternative national-scale biomass equations developed by Jenkins et al. (2003) are often used, they are essentially a reformulation and averaging of the same limited sets of regional equations. The national FIA component ratio estimates described in Woodall et al. (2011) are a potential improvement because they are scaled to the volume equations used by FIA, which generally are based on much larger samples than the biomass equations, but the overall accuracy of the estimates is still unknown.

The FIA program has attempted to reduce this uncertainty by funding detailed biomass studies to collect new data in geographically-distributed samples of trees growing in a range of conditions, that combine taper-based volume measurements with biomass measurements so that estimates will be additive and accurate. The initial effort is focused on the most abundant species in the nation (and includes the species that make up 75% of cubic volume in the west) and is incorporating existing and publicly-available volume and biomass data into an open library to aid in model development (Weiskittel et al. 2015). While many of the most important species in the West also occur in California, several species that are abundant in the state are not on the initial list (e.g., redwood, red fir, black oak). The current plan is to wrap up data

collection for the initial list by 2019 and produce a set of improved equations for implementation in FIA estimates in the following year or two.

7.2.2 Planned improvements identified in section 3

- 1) Create estimates of stock and flux for the forest floor pool by either resolving the data problems (i.e., determine a subset of data that are reliable) or reporting estimates based on the models of Domke et al. (2016) or Smith et al. (2006). Since these models include fine wood (e.g., with diameter <3") in the modeled estimates for forest floor, we would either have to subtract out the measured fine wood calculations currently included in dead wood, or drop the fine wood estimates from dead wood entirely.

7.2.3 Potential improvements identified in section 3

- 1) Separate out woodlands from forest using the NGHGI approach designed to exclude vegetation types where tree species rarely form single stems and do not attain a height of at least 16 feet in situ. Because the minimum height criteria could exclude recently-disturbed sites which merely haven't had enough time for the trees to reach site potential, we could add an additional limitation that the site has not had a severe disturbance within the last 30 years (or as far back as records go).
- 2) Remove forests less than 10 acres in size entirely surrounded by urban area, as in the NGHGI criteria, where they are classified as settlements. There might be a relatively simple (though imprecise) way to do this by identifying all forest plots within urban areas, or by classifying satellite-based vegetation maps and identifying plots where tree cover patches are too small.
- 3) For down wood carbon compilation, we could use the hardwood/softwood decay-reduction parameters from Harmon et al. (2011) instead of the species-level ones from the same publication which are currently used by FIA. The source data for the species-level parameters has small sample sizes for many species and exhibits unusual patterns of proportional decay with decay class when comparing among apparently-similar species.
- 4) For understory vegetation carbon compilation, use the cover and layer height data collected on FIA plots to calculate understory biomass directly, provided suitable equations can be found, instead of the modeled estimates currently used in the NGHGI.
- 5) For estimates of soil carbon, apply the newer modeled calculations from Domke et al. (2017) that incorporate soil core measurements rather than the ones used in previous NGHGI reports.

7.2.4 Planned improvements identified in section 4

- 1) Regional area tables by forest type and ownership group will be included in a future report.

7.2.5 Planned improvements identified in section 5

- 1) Include HWP carbon pools in the inventory based on IPCC Tier 3 inventory methods using the “production approach.” Pools include HWP-use, HWP-SWDS, HWP-energy, and HWP-burned. HWP-use and HWP-SWDS represent storage pools. HWP-SWDS is also used to calculate landfill methane emissions for the waste sector. HWP-energy is used for informational purposes only in the energy sector and HWP-burned is used to determine other GHG emissions associated with HWP.

7.2.6 Potential improvements identified in section 5

- 1) Include information on avoided fossil fuel emissions associated with HWP carbon pools to understand the potential benefits and trade-offs associated with wood energy and material substitution. These data would be used for informational purposes only as they are not currently a part of IPCC guidance for carbon accounting. Comprehensive life-cycle based analysis such as the Canadian Carbon Budget Model could be used to provide this information. UC-Berkeley researchers are currently exploring potential use of this model for the CA Natural Resources Agency. See section 8.6 for more information. Additional work could be explored in the future as well to provide this information.

8 Strategies leveraging forests for emissions reductions

8.1 Range of policy options

A range of policy options have been suggested for forest land management and resource use in the United States to reduce carbon emissions to or increase sequestration from the atmosphere (Malmsheimer et al. 2011, McKinley et al. 2011). Additionally, the Intergovernmental Panel on Climate Change's Fifth Assessment Report identifies strategies to mitigate potential negative climate change impacts through land management in the forest sector (Smith et al. 2014). Options include:

1. Promote afforestation/avoid deforestation: Forests store more C than other vegetation types and land-uses, so a net increase in forest land would increase sequestration. Reduce carbon losses in soils and biomass associated with land-use change.
2. Increase C stores in forests: Promoting forest growth through sustainable forest management practices would increase the amount of C stocks and/or increase sequestration, considering the age of the stand and other forest management objectives. Reduce carbon losses in soils and biomass associated with disturbance such as wildfires and pest outbreaks. Uncertainty about leakage effects. Trade-offs with carbon stored in harvested wood products.
3. Manage forest densities and fuels: In some forest types, thinning and prescribed fire can reduce the probability of trees dying in a fire, from pest outbreaks, or from density-dependent competition, but also reduces C stores in the near-term. Lack of consensus on trade-off effects on long-term sequestration.
4. Increase C in HWP pools: Continued or increased harvest, improved growth and yield, increased and efficient utilization of woody biomass, improved removal efficiency, diversifying products, increased use of long-term wood products, increased use-life through re-use or recycling, end-of-life energy capture, and reducing the climate impact from wood products such as by reducing landfill methane emissions or manufacturing emissions would increase sequestration and in some cases reduce fossil fuel emissions. Trade-offs with carbon stored within forests.
5. Wood energy and material substitution effects: Replacement of fossil fuel-based energy and fossil fuel-intensive construction materials with wood energy and construction materials would reduce fossil fuel emissions over time. Sustainability of forest practices, indirect land-use

changes, actual fossil fuel substitution, timing of mitigation benefits, and efficiency of waste and residue utilization and bioenergy systems must be considered. Life-cycle assessments can identify options with better greenhouse gas mitigation potential, such as sustainable use of biomass waste and residues. Lack of consensus on the extent to which substitution occurs and how to properly account for it.

8.1.1 CARB Forest Offset Protocol

The state of California has already made efforts to employ some of the climate mitigation strategies from the forest sector identified by the IPCC and others. Under the California Greenhouse Gas Cap-and-Trade program, the California Air Resources Board Compliance Offset Protocol for U.S. forests has identified reforestation, improved forest management, and avoided forest land conversion as eligible activities for offset credits (CARB 2013). Entities under the Cap and Trade regulation can use a limited number of offset credits to meet their compliance obligations, and all offset projects must result in GHG emissions reductions or removal enhancements additional to those legally required or that would otherwise occur based on a business-as-usual scenario. The following information summarizes the requirements for the forest offset credits; federal forest lands are excluded from the CARB forest offset protocol (CARB 2015).

Reforestation activities:

- Occur on land with less than 10% canopy cover for at least 10 years or land that has experienced a disturbance resulting in a loss of at least 20% of the aboveground biomass.
- Prohibit harvesting of planted trees for at least 30 years unless it is needed to prevent or reduce imminent threat of disease.

Improved forest management activities:

- Increase the overall age of the forest by increasing rotation ages.
- Increase the forest productivity by thinning diseased and suppressed trees.
- Manage competing brush and short-lived forest species.
- Increase the stocking of trees on understocked areas, and/or maintaining stocks at a high level.

Avoided conversion activities

- Utilize conservation easements or transfers of forest land to public ownership (excluding federal), thereby preventing conversion of private forest land to non-forest land-uses.

8.1.2 CA Forest Practice Act and Rules

One of the main purposes of AB 1504 (2010) is for the California Board of Forestry and Fire Protection to ensure that the rules and regulations that govern harvesting of commercial forest tree species consider the capacity of forests to sequester carbon dioxide sufficient to meet or exceed 5 MMT CO₂e annually by 2020, consistent with the Scoping Plan adopted by CARB. While this inventory has shown that California's forests are currently exceeding this goal, this sequestration rate may not be sustainable into the future given the uncertainty in the effects from climate change, the current level of forest disturbances from wildfire and pests, and aging of forests on federal lands. Additionally, with updates to the Scoping Plan and newer legislation specifying GHG emissions reductions, there may still be a need for the Board to review their rules and regulations. In a report to CAL FIRE, Buchholz et al. (2015) reviewed the California Forest Practice Act and Rules to determine the number of rules with carbon relevance and could serve as starting point for the Board.

The California Z'berg-Nejedly Forest Practice Act of 1973 (CA PRC § 4511-4629.13) provides a general set of definitions and regulations, and applies to private lands and non-federal public lands (except state parks) only. In a 2015 report to CALFIRE, Buchholz et al. identified 33 rules under this act with carbon relevance within the scope of the AB 1504 legislation. The following rules are likely to have the greatest influence:

- Maximum Sustained Production of High Quality Timber Products – Article 1, 4513(b)
- Stocking standards for point count and basal area – Article 5, 4561(a) and (b)
- Fire protection zone rules - Article 5, 4562
- Control of soil erosion - Article 5, 4562.5
- Nonindustrial Timber Management Plan - Article 7.5
- Conversions - Article 9

The California Forest Practice Rules (CA CCR tit. 14 § 895-1112) are intended to provide field personnel with working rules and apply to private land and non-federal public lands only. In reviewing the 2014 CA Forest Practice Regulations., Buchholz et al. also identified 225 rules with carbon relevance within the scope of the AB 1504 legislation, with the following likely having the greatest influence:

- Harvest Standards
 - Maximum Sustained Production of High Quality Timber Products – Subchapter 4, 5, & 6, Article 3, 913, 933, 953
 - Resource conservation standards for minimum stocking – Subchapter 4, 5, & 6, Article 2, 912.7
- Wildfire/Pest Control/Wildlife:
 - Treatment of logging slash to reduce fire hazard – Subchapter 4, 5, & 6, Article 7, 917.2, 937.2, 957.2
 - Burning of piles and concentrations of slash - Subchapter 4, 5, & 6, Article 7, 917.5, 937.5, 957.5
 - Protection of Residual Trees - Subchapter 4, 5, & 6, Article 7, 917.7, 937.7, 957.7
 - Fire Protection - Subchapter 4, 5, & 6, Article 8, 918, 938, 958
 - Emergency notice for fuel hazard reduction – Subchapter 7, Article 2, 1052.4
- Soil Erosion
 - Tractor operations - Subchapter 4, 5, & 6, Article 4, 914.2(c), 934.2(c), 954.2(c)
 - Timber operation, winter period - Subchapter 4, 5, & 6, Article 4, 914.7, 934.7, 954.7
 - Use of heavy equipment for site preparation - Subchapter 4, 5, & 6, Article 5, 915.1, 935.1, 955.1
 - Treatment of vegetative matter - Subchapter 4, 5, & 6, Article 5, 915.2, 935.2, 955.2
 - Reduction of soil loss - Subchapter 4, 5, & 6, Article 6, 916.7, 936.7, 956.7
- Conversion - Subchapter 7, Article 7, 1103, 1104.1, 1104.2

Additional work is required to determine how forest carbon dynamics would change with the current implementation of these rules (i.e., baseline, business-as-usual) compared to changes to these rules. However, the results from the first AB 1504 Forest Ecosystem and Harvested Wood Product Carbon Inventory and the initial list of forest practice rules and regulations affecting forest carbon (Buchholz et al. 2015) could serve as a starting point in evaluating potential policy changes to affect forest carbon sequestration.

8.2 Promote afforestation/avoid deforestation associated with forest land conversion

Forests store more carbon per acre than other vegetation types and land-uses. Although it is counterintuitive, demand for wood products and a robust timber industry provides incentives to retain and maintain forests (Miner et al. 2014). Historically, forestry in the U.S. has demonstrated that forest area can increase and emissions can decrease with increased timber demand and production (Miner et al. 2014, Heath et al. 2010). Strategies that incentivize a robust timber industry within the state could ultimately help conserve California's forests.

However, even with sufficient demand for timber, if there are other more valuable uses for land then the market forces may not be sufficient to retain forest land. One study found that increased timber prices were still not strong enough to encourage increased investment in forest land in the West (Nepal et al. 2015). In these cases, instituting policies that decrease forest land-use conversions might be necessary (Skog et al. 2014). While the CARB Compliance Offset Protocol for U.S. forests provides some tools to reduce forest land conversions and the CA Forest Carbon Plan has identified that reducing forest land conversion is an important strategy in protecting the forest carbon sink, additional work may be needed to ensure adequate policies, tools, and incentives exist to encourage forest landowners to maintain their forests, including the federal government.

Gaining greater understanding of the conversions that do occur would provide insight into additional efforts that may be needed to reduce forest land conversions. Forest land-use conversions are currently permitted under the Forest Practice Rules through a timberland conversion permit (CA CCR tit. 14 § 1103), with exemptions permitted for conversions less than 3 acres in size (CA CCR tit. 14 § 1104.1) or for larger scale conversions for subdivision development on lands not zone as timberland production zones (CA CCR tit. 14 § 1104.2). Buchholz et al. (2015) recommended establishing a database of all reported timberland conversions to analyze their GHG consequences. However, such a database would only capture those completed legally. There appear to be many illegal forest land conversions, such as to marijuana grows, that do not go through the timberland conversion permit or exemption process. FIA data reflect land conversions that happen on plots to which crews are allowed access, which is unlikely in the case of illegal conversions. In the case of marijuana grows, if the FIA crew came across what appeared to be an illegal grow operation, they are instructed to leave immediately for their own safety. The timberland conversion permit and exemption process also does not address conversions on oak woodlands, which are not a commercial tree species in California and are not subject to the Forest Practice Rules. For oak woodlands that were initially dense enough to qualify as "forest" rather than "rangeland," FIA would have

ground measurements of the amount of carbon lost to development. For lower-density oak woodlands that do not qualify as forest, additional information could be included during FIA's photo-interpretation of land-use to estimate loss of woodlands.

In this report, the carbon density of California forest lands being deforested was similar to those on newly-forested lands being afforested (25 vs. 27 metric tons/acre, respectively). In contrast, in Oregon deforested lands tend to be carbon-dense Douglas-fir forest while afforested lands tend to be carbon-sparse juniper forest (Gray et al. 2014). In addition to the impacts of wholesale conversion of forest land to development, dispersed housing within forest land (e.g., low density residential or vacation homes) tends to be associated with reduced likelihood of forest management and changes in forest condition (Kline et al. 2004, Azuma et al. 2014). These changes in management in the wildland urban interface may lead to higher fire severity in those forests when fire occurs.

Opportunities and benefits for afforestation depend on the potential vegetation types of specific locations. Opportunities to convert non-forest to forest in productive vegetation types (e.g., mixed conifer forest) may be more limited due to existing population and land-uses than in lower-productivity areas (e.g., oak woodlands and juniper forests in current rangeland). Assessing the amount of effort required to reforest marginal lands could be useful. For example, promoting trees in urban areas, or in areas where trees might not naturally occur, may have limited climate benefits if the trees require large inputs of fertilizer, water, and energy (McKinley et al. 2011).

8.3 Increasing carbon stores in forests

Forest development after severe disturbances like clearcutting or stand-replacing wildfire follows a characteristic sigmoidal curve of carbon accumulation (Figure 2.2). Live tree mass accumulates slowly at first, then rapidly as canopy cover reaches a maximum and trees mature, then slowly again as trees fully occupy the site and come close to the maximum amount of biomass a site can support (e.g., Ryan et al. 2010, Gray et al. 2016). The maximum carbon stores are generally found in the oldest stands, although net accumulation approaches zero as these forests approach the carbon sink saturation point (Gray et al. 2016). Disturbances or thinning of even-aged or uneven-aged stands that cause partial mortality or removal temporarily reduce total stand carbon stores and temporarily reduce carbon accumulation rates (Oliver and Larson 1990, McKinley et al. 2011).

Extensive carbon losses to forests and soils can occur through poor land management practices. However, the California Z'berg-Nejedly Forest Practice Act of 1973 (CA PRC § 4511-4629.13) and associated Forest Practice Rules (CA CCR tit. 14 § 895-1112) were enacted to ensure that

private commercial harvest is done in a manner that preserves and protects the state's natural resources and results in sustained timber yield (discussed further in section 8.3). A variety of federal laws establish sustained yield directives for different federal land management agencies conducting timber harvests, such as the National Forest Management Act of 1976 which pertains to the U.S. Forest Service, or the Federal Land Policy and Management Act of 1976 which pertains to the U.S. Bureau of Land Management.

While minimizing disturbance and harvest and promoting maximum stand development would store more carbon in forests, as discussed in the previous section, reduced revenue could incentivize deforestation for some landowners. In addition, denser forests could be more prone to severe and uncontrollable wildfire, and reduced harvesting in one region could simply result in leakage, with forest products being harvested somewhere else. For forests that are managed for wood products, the decision of when to harvest, and how much of the wood in the stand to remove, affects the amount of carbon stored on the landscape, the rate at which carbon will subsequently be accumulated in the forest, and the rate at which carbon is being stored in wood products.

For many landowners where the primary objective is revenue, the decision of when to harvest is heavily influenced by estimates of *net present value* (NPV) or the revenue discounted by compounded interest on investment in regeneration and other stand management activities. Alternatively, for landowners where the objective is maximizing the amount of wood product, the decision of when to harvest is heavily influenced by the estimated point at which stands reach *culmination of mean annual increment* (CMAI). Management to CMAI results in stands that are older and store more carbon than management for NPV (Smith 1986, Newman 1988). Management to CMAI, also referred to as *maximum sustained yield*, would also create more wood products for potential storage in the HWP pool. Under the National Forest Management Act of 1976, National Forests are precluded from scheduling rotations (i.e., stand replacing harvests) before the estimated age of CMAI. The California Forest Practices rules also encourage landowners to develop a Sustained Yield Plan where "maximum sustained production" is a key criterion, along with environmental and economic considerations.

In addition to rotation considerations, carbon in forests can be increased by promoting increased forest growth (McKinley et al. 2011). Fertilizing, planting, and control of competing vegetation can greatly boost growth, but also involve energy costs. Short-rotation high-volume tree crops (i.e., hybrid poplar) can be part of a carbon sequestration strategy as well (Malsheimer et al. 2011).

In terms of leakage, although California and the United States have sustainable forest management policies, timber demand in California is such that the state could be receiving imports from places where sustainable forest practices are not employed. In supplemental

calculations completed for Battles et al. 2014, it was found that California harvests supplied over 30% of the state's wood demand in the 1970s, but dropped to less than 10% in the first decade of the 2000's (Buchholz and Robards 2013). As California timber demand exceeds within-state supply, it's possible that leakage in the form of increased harvests elsewhere within the United States or in other countries is occurring. The magnitude of leakage depends on the level of sustainable forestry practiced in supplying wood to meet California demand. Research could determine if negative leakage is occurring from wood product demand within the state and identify strategies to minimize it if it is occurring. Possible strategies could include identifying if and where it would be possible to increase harvests within the state as long as other forest ecosystem services are still being provided, or could include policies to incentivize sustainably harvested imports.

8.4 Manage forest densities and fuels

Large areas of forest land in the western United States have been managed with effective fire suppression for almost a century (Agee 1993). In many forest types, the removal of frequent fire (e.g., average rotations < 30 years) has resulted in the development of denser stands with small trees (e.g., Dolanc et al. 2014). In the mixed conifer forests of the Sierra Nevada, compared to historic conditions, more of the current carbon stock is in higher densities of small, fire-prone trees (Collins et al. 2011, North et al. 2009, Lydersen et al. 2013, Earles et al. 2014). Stands with this kind of structure tend to burn at greater intensity, with higher mortality of overstory trees, than stands affected by frequent fire. Denser stands may also lead to higher mortality of overstory trees during severe drought due to competition for soil moisture. Consequently, these stands are at risk of losing carbon stocks in live pools, decreasing the stability of California's forest carbon sink.

Thinning stands from below is an effective management approach that can reduce the probability of the remaining trees dying in a subsequent fire or from pest outbreaks. Prescribed burning during optimal conditions can reduce live and dead fuels in the understory, thereby reducing the probability of the remaining trees dying in a subsequent fire. Depending on the landowner objectives, thinning alone, or thinning followed by burning, may be used to promote stand resilience to fire and pest outbreaks. However, both treatments also reduce the amount of carbon stored in the forest (McKinley et al. 2011), although some of the carbon in this material may be transferred to HWP pools depending on what happens to the wood. Additionally, while the quantity of the forest carbon stock may decrease, the quality may improve if treatments result in more carbon stored in live pools compared to dead pools or if growth rates increase as a result of less competition and improved growing conditions. However, treatments involving prescribed fire can also result in additional greenhouse gas emissions.

There is a lack of consensus on the overall impact on carbon sequestration of thinning and/or burning. While there is agreement that fire severity is reduced in the short term, it is not clear how long the treatments are effective (e.g., Campbell and Agar 2013). Treatments may need to be repeated, potentially without the revenue available from harvesting merchantable material in the first entry. There is disagreement whether the survival of more live trees in lower density stands stores more carbon on the landscape compared to a greater abundance of dead snags and down wood that may take decades to decay (e.g. North and Hurteau 2011, Mitchell et al. 2009). Mitchell et al. (2009) found that dead wood persisted after fire in the wetter forest types with longer fire rotations of the Pacific Northwest (i.e., west Cascade western hemlock – Douglas fir and Coast Range western hemlock – Sitka Spruce forests) and in some cases in the dry Ponderosa pine forests of the east Cascades. However, in these dry Ponderosa pine forests with fire regimes and climate more typical of California forests, there were carbon benefits associated with certain types of fuel reduction treatments in stand conditions with uncharacteristic levels of understory fuel accumulation. There is also disagreement on whether treatment can ever affect fire behavior at the landscape scale, given that there is a very low likelihood that the small proportion of the landscape that is effectively treated will be visited by the small proportion of the landscape affected by wildfire each year (Restaino and Peterson 2013). However, while the modern burn probability is hard to predict for any single project or site, both modeling and empirical analysis reveal that burn rates are increasing in conifer forests throughout the west, and are likely to increase further due to climate change (Westerling et al. 2006, Westerling et al. 2011, Dennison et al. 2014). The increasing size of individual wildfires is resulting in larger patches of complete overstory tree mortality (Miller et al. 2009, Miller & Safford, 2012) and limit natural conifer regeneration due to lack of seed source (Carlson et al. 2012, Collins and Roller 2013) which can negatively impact current and future forest carbon stocks.

Reducing forest densities and fuels to mitigate wildfire severity is a management strategy for addressing a wide range of objectives beyond their impact on carbon sequestration (e.g. Mitchell et al. 2009). The discussion over appropriate trade-offs for the quantity, quality, and stability of carbon storage will depend on management objectives and expectations for particular vegetation types.

8.5 Increase carbon in HWP pools

8.5.1 Use of life-cycle analysis

Carbon stored in harvested wood product pools may provide several benefits, but has associated trade-offs with forest ecosystem pools and intersects with a variety of other sectors. Consequently, it is important to mention the use of **life-cycle analysis (LCA)**, which can help identify key trade-offs between forest management and fossil fuel use. LCA's help keep track of the complex series of interactions between such things as impacts to forest area and forest carbon stocks, timing of changes in carbon storage and emissions, the magnitude and warming impact of near-term and long-term emissions, and additional environmental impacts that may exist (Lippke et al. 2011, Miner et al. 2014, Skog et al. 2014, Bergman et al. 2014). This type of analysis extends beyond the forest to evaluate the energy, materials and associated emissions and waste required to produce wood products for every stage along the production and supply chain, including forest regeneration and management, harvesting, transport, processing, manufacture, use, maintenance and final disposal (Lippke et al. 2011; Heath et al. 2010, figure 8.1). LCA's are important in understanding the benefits associated with HWP pools, as well as wood energy and material substitution.

Valuable information for life-cycle analysis can be obtained from mill surveys that measure the inputs and outputs for various stages of wood processing (Puettmann and Wilson 2005, Puettmann et al. 2010). Components of life-cycle analysis can vary depending on the study and are also not required in IPCC carbon accounting. For example, LCA's can include other greenhouse gas emissions from in-forest decay of logging residues, but this is not mentioned as a requirement in IPCC carbon accounting (IPCC 2006, 2014). Other LCA components may be required for IPCC carbon accounting, but in sectors other than the forest sector. For example, methane emissions from landfills are to be included in the waste sector (IPCC 2006).

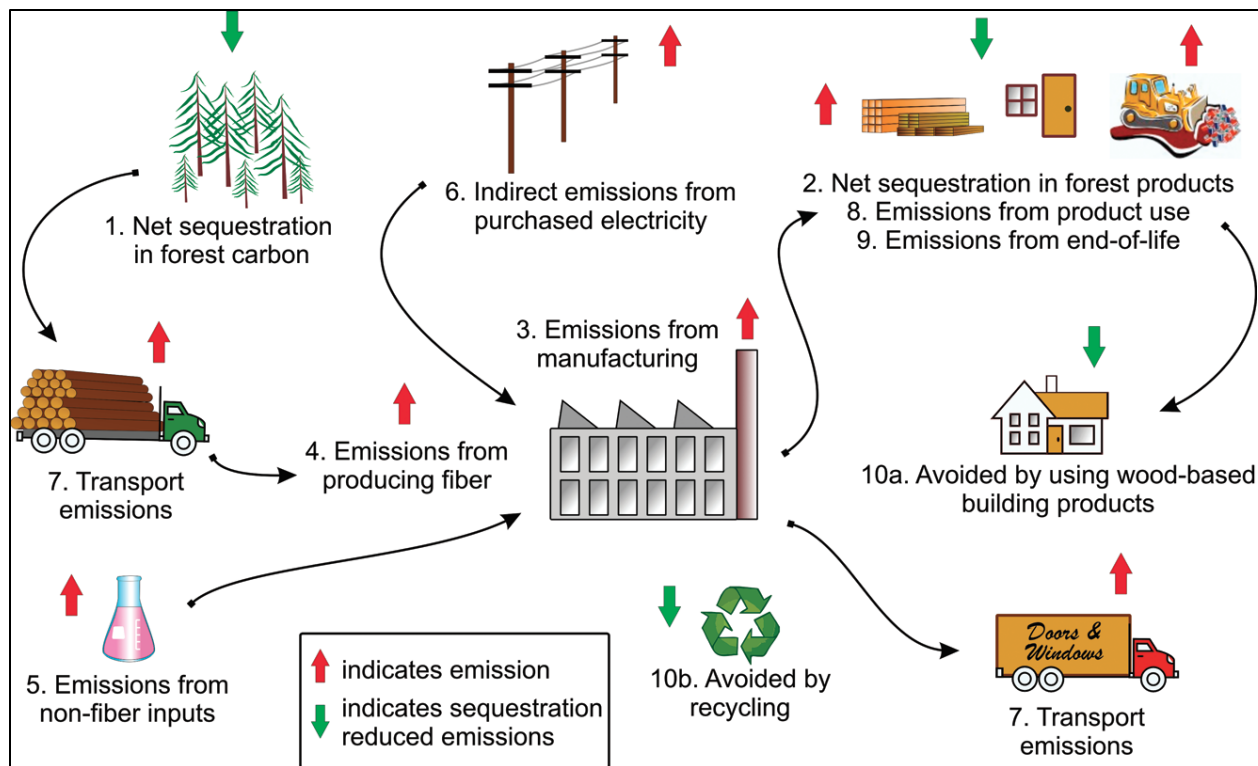


Figure 8.1: Depiction of emissions along a product's life-cycle. *Source:* Heath et al. 2010.

In order to conduct a life-cycle analysis, **life-cycle inventories** (LCI) must be conducted to actually measure and account for inputs and outputs for all stages along a product's life-cycle. LCI's can be further broken down into **attributorial** and **consequential life-cycle inventories** (ALCI and CLCI). Attributorial LCI allows for comparison of the direct impacts from substituting one product for another and can serve to pinpoint opportunities for efficiency at various stages of a product's life-cycle or along the supply chain (Brander et al. 2008). However, ALCI does not account for indirect effects from changing outputs, such as changes in carbon storage and emissions resulting from actual production changes from product substitution or indirect land-use changes in response to price (Lippke et al. 2011, Brander et al. 2008, Skog et al. 2014).

Consequential LCI's do consider indirect impacts of changing outputs, and is highly dependent on the complex intricacies of economic drivers of markets such as supply, demand, and price elasticities for the product itself, its co-products, its substitute products, as well as the inputs to make each (Brander et al. 2008). Additionally, while CLCI can address broad impacts of changing production, it is insufficient to identify opportunities for improving efficiencies in a product life-cycle, nor is it appropriate to use as an accounting method (Lippke et al. 2011, Brander et al. 2008).

Progress is being made in the international community in developing complex life-cycle based models that can account for changes in forest ecosystem and harvested wood product pools

under different forest management and climate scenarios, including effects from land-use change, disturbance, and wood material and energy substitution. The Canadian Carbon Budget Model (CBM) (Kurz et al. 2009, Smyth et al. 2014) and separate modeling efforts in Sweden (Gustavsson et al. 2017) are two examples. More recently, CBM has been successfully employed in other countries as both a comprehensive, IPCC-compliant forest carbon accounting verification tool for national GHG inventories, as well as a tool to estimate future forest carbon budgets under different forest management scenarios (Pilli et al. 2016, Kim et al. 2016). The USDA Forest Service is exploring the potential use of CBM with FIA data to assess climate change mitigation options in the U.S. Forest Sector and is also evaluating use of their Integrated Terrestrial Ecosystem Carbon (InTEC) model to examine the relative effects on carbon dynamics from disturbance, climate, and atmospheric data (Dugan et al. 2017a, 2017b). University of CA (UC)-Berkeley researchers are evaluating use of CBM with the USDA Forest Service BioSum model through on-going work for the California Natural Resources Agency. BioSum is capable of simulating various forest management scenarios using FIA data in growth and yield modeling highly-developed for U.S. forests. The work done in this report to refine carbon calculations for various pools will only serve to enhance the information these other modeling efforts can provide

8.5.2 Increasing HWP carbon pools

Increasing the size of the harvested wood product (HWP) pools without counter-vailing decreases in forest ecosystem carbon can also reduce net emissions to the atmosphere through increasing carbon stored in wood products and increasing avoided fossil fuel emissions from wood energy and material substitution (Malmshemer et al. 2011, McKinley et al. 2011). While avoided emissions are discussed in more depth in section 8.6, they are integral in considering HWP carbon benefits and difficult to isolate in discussion, so they are also discussed in this section. Increases to the HWP pools can occur through continued or increased harvest following maximum sustained yield principles. Harvest can decrease stocks in forest ecosystem carbon pools, but can also promote growth by delaying the point when forests reach the **carbon sink saturation point**.

Improving growth and yield through forest management where trees are harvested can increase the amount of wood available for utilization to maximize carbon benefits (Skog et al. 2014). One LCA from Sweden found that increasing biomass production through fertilization can result in increased carbon benefits if the avoided emissions from utilizing the additional material for wood energy or material substitution occurs (Sathre et al. 2010). However, fertilization benefits need to be balanced with the emissions associated with fertilizer production and environmental impacts of increased use (Skog et al. 2014).

Increasing utilization of woody biomass, such as sub-merchantable material, logging slash and waste is another strategy to increase the HWP pools. The California timber industry already uses a substantial amount of mill residues for internal energy production, leaving little as waste. The industry also employs additional utilization of timber harvest byproducts such as bark and slash for both wood products and bioenergy (McIver et al. 2015), resulting in increases to the HWP pools and avoided fossil fuels from wood energy substitution (discussed further in section 8.6.1). It will be important to accurately reflect this level of additional utilization in the 1504 harvested wood product carbon inventory. Despite high utilization, increasing removals of forest residuals can result in increased carbon benefits (Lippke et al. 2011, Gustavsson et al. 2017). In California, if logistics and economics allowed for it, increased removal of tops and limbs associated with timber harvest, sub-merchantable material from fuel reduction projects, or dead material from tree mortality could be possible. An upcoming USDA Forest Service logging utilization study is expected to identify the amount of additional material that is left on-site and potentially available for removal from the forest.

Whether or not increased removals occur, improving the efficiencies of removals can also increase the material available for the HWP pool. In a study from Sweden, systems that bundle slash prior to transport offsite have been found to increase efficiency by delivering more material for utilization at less cost when compared to chipping on-site, although chipping on-site might be more effective for small-scale end-users (Gustavsson et al. 2011). In 2003, the USDA Forest Service conducted several case studies to evaluate the bundling systems throughout the west, including one site on the Eldorado National Forest (Rummer et al. 2003). Production rates for removing material from the forest ranged from 6.5-10 bundles per machine hour with approximately 2.5 bone dry tons per bundle. Material was removed from landing piles at around 20 bundles per machine hour. The efficiency and cost-effectiveness depends on a variety of factors including the harvest system and the amount, distribution and condition of slash. If maximum removals of forest residuals available from forest management in California is ever achieved, harvesting a portion of the stumps from final fellings, leaving enough on-site to provide necessary soil and erosion benefits, can provide additional material for utilization if further GHG mitigation is needed (Gustavsson et al. 2017).

In addition to increasing biomass utilization in general, diversifying biomass products is a potential strategy that may improve the economics of biomass utilization and increase HWP pools. Promoting small diameter wood product development such as for laminated beams or small diameter bridges can increase the ability to utilize material typically considered sub-merchantable. Additional uses for biomass include gasification, transportation biofuels and biochemical compounds (Gustavsson et al. 2017, Skog et al. 2014). Different uses will result in different levels of benefits. For example, LCA shows that avoided fossil fuel emissions are higher when biomass energy is used to replace heat and electricity generation rather than being used

for transportation fuels (Gustavsson et al. 2006). However, with advancements in wood utilization for jet fuel this may change (USDA 2016). Instead of hauling biomass to conversion facilities, another option includes producing biochar on-site and then using it on-site as a soil amendment (Skog et al. 2014, Smith et al. 2014).

Humboldt State University and its partners have initiated the Waste to Wisdom project with a \$5.88 million grant from the U.S. Department of Energy's Biomass Research and Development Initiative program (W2W 2017). This project seeks to address the financial and logistical challenges many western forests face in reducing stand densities and fuel loading by expanding research on the conversion of forest residues into bioenergy and other bio-based products. A biochar production system, a torrefier, and a briquetter are the biomass conversion technologies being evaluated. These are different biomass densification technologies that can produce products that can be used for energy or in the case of biochar, as a soil amendment. Projects aimed at improving forest residue collection through sorting and management during harvesting, bailing and pre-hauling options, and centrally locating processing sites are being explored. Ultimately each biomass conversion system will be prepared for mobile operation in the field, operational field protocols for the biomass conversion system and forest residue collection systems will be developed, the systems will be tested in the field, and the economic feasibility, and social, environmental and life cycle impacts will be evaluated, with intention to scale up the most promising option to achieve commercialization. In addition to the Waste to Wisdom effort, the California Tree Mortality Task Force and the California Forest Biomass Working Group are also working on facilitating biomass utilization for energy and expanding biomass markets and technologies. Other legislative support and research and development for biomass utilization is discussed in the California Forest Carbon Plan (FCAT 2017). Outside of California, the Bioenergy Alliance Network of the Rockies (BANR), led by Colorado State University, is investigating the use of beetle-killed trees as a sustainable feedstock to produce biofuels and biochar (BANR 2017). Additionally, the USDA Forest Service Rocky Mountain Research Station (RMRS) led a \$5.3 million Biomass Research and Development Initiative (BRDI) to explore feedstock development, biofuels and biobased products development, and biofuels development analysis (USDA FS 2016a).

Strategies aimed at increasing the use of long-term wood products, such as by promoting the use of wood in non-residential construction (discussed further in section 8.6.2) and designing products for longer useful life-spans would also increase the HWP pools. Strategies to extend the use-life of products, such as through re-use or recycling, can also increase the HWP pools (Lippke et al. 2011, Heath et al. 2010). Avoided fossil fuel emissions can occur from extending the life of wood products by increasing the wood supply available for substitution (discussed further in section 8.6), decreasing emissions compared to harvesting virgin material, increasing the carbon stored in forests from reduced harvest, and decreasing methane emissions

associated with products being placed in a SWDS (Heath et al. 2010, Smyth et al. 2014, Skog 2008, Skog et al. 2014). One LCA found that in the long-term maintaining forest in an active, sustainable harvesting cycle of new wood for construction rather than re-using old wood with no additional harvest can result in greater carbon storage through continued forest growth (Bergman et al. 2012). However, there are numerous benefits in addition to just carbon from reducing waste and re-using materials that should be considered. Consequently, through Assembly Bill 341 (Chapter 476, Statutes of 2011) the state of California has identified a general 75% recycling goal, including source reduction, recycling, and composting by 2020. The California Building Standards Commission (CBSC) Green Building Standards Code (CALGreen) has also identified a recycling or re-use goal of 50% for residential construction and demolition debris (C & D) (CBSC 2014) and 65% for non-residential C & D (CBSC 2016), with wood waste making up the majority of the C & D waste stream. One strategy to facilitate recycling or re-use is by building construction that is “designed for disassembly” so that materials can be more easily salvaged during demolition (Lippke et al. 2011).

Capturing products at the end of their useful life for use in bioenergy production can also increase the HWP pools and result in carbon benefits through wood energy substitution (discussed further in section 8.6.1). The California Department of Resources, Recycling, and Recovery (CALRecycle) has identified that in addition to direct re-use, markets for wood waste include use as feedstock for engineered wood products, landscape mulch, soil conditioner, animal bedding, compost additive, sewage sludge medium and boiler fuel (CALRecycle 2011).

When products do end up in the landfill, reducing methane emissions from landfills reduces the climate impact of wood products, such as by capturing methane from landfills before it reaches the atmosphere, with further reductions if the methane can be used in place of fossil fuels for energy production (Heath et al. 2010, Gustavsson et al. 2006). The California Air Resources Board has established regulations that require installation of methane gas collection and control systems at active, inactive, and closed municipal solid waste landfills with at least 450,000 tons of waste in-place, received after January 1, 1977 (CARB 2014). CALRecycle, in consultation with CARB, the California Energy Commission, and the California Public Utilities Commission, is also providing technical assistance and incentives to increase landfill gas recovery (CALRecycle 2013).

Other opportunities to reduce the climate impact from wood products include reducing emissions associated with manufacturing (Heath et al. 2010). LCI’s have identified that opportunities for energy conservation include low energy drying processes, low energy or faster hot-pressing processes, and low energy resin production (Puettmann and Wilson 2005, Puettmann et al. 2010). The upcoming California sawmill energy-use study will determine the percentages of renewable energy sources used compared to fossil fuel-based energy sources in

California's timber industry and can serve to identify other opportunities for energy conservation within the manufacturing process.

8.6 Wood energy and material substitution

8.6.1 Wood energy substitution

Harvested wood products used in energy production (HWP-energy pool) increase with increases to the HWP in-use pool, as the generation of mill residues and byproducts such as slash and bark increases. This reflects the relationship between the HWP-energy and the byproducts of the HWP in-use pools, which comprise the wood material typically burned for energy (figure 5.2b). As identified in section 8.5.2, there are a variety of ways to increase HWP pools in general. However, there are strategies that directly affect the HWP-energy pool and are subject to a variety of logistical and economic constraints surrounding biomass utilization and bioenergy production. These strategies include:

- Increasing utilization of sub-merchantable material, slash, and byproducts, which is subject to a variety of logistical and economic constraints.
- Diversifying wood products, especially for use specifically in bioenergy production (i.e., torrefied wood and briquettes discussed above).
- Capturing products at the end of their useful life for bioenergy production.

Regardless of the size of the HWP-energy pool, whenever wood is burned for energy instead of fossil fuels, actual substitution benefits can occur through avoided fossil fuel emissions. These avoided emissions occur both under business-as-usual practices (i.e., actual avoided emissions) and through changes to increase bioenergy production above business-as-usual (i.e., additional avoided emissions). The magnitude of wood energy substitution benefits depends on the type of fossil fuel substituted (Buchholz et al. 2016, Lippke et al. 2011). For example, displacing oil results in greater avoided emissions than displacing natural gas. The difficulty in establishing actual avoided emissions lies in establishing when substitution is actually occurring versus when wood bioenergy would have been the primary source of energy anyway. The difficulty in establishing additional avoided emissions lies in establishing the increase in wood use for energy over business-as-usual. In either scenario, identifying the fossil fuel actually being substituted for is another challenge. Lastly, as the share of renewable energy increases, such as from wind or solar, wood energy substitution benefits decrease.

There can be other avoided GHG emissions associated with burning wood for energy in addition to avoided fossil fuel emissions. For example, while carbon losses are established through changes in the various forest ecosystem pools, utilizing material from the forest may result in

other avoided GHG emissions associated with burning material on site or from decay. Burning material at the end of its useful life for energy rather than placing it in a landfill may result in decreased methane emissions. Life-cycle analysis can be used to help identify the benefits and trade-offs associated with wood energy substitution.

In addition to the complexities in accounting for wood energy substitution, the potential to increase wood used for energy production in California has many challenges involving infrastructure, air quality, environmental justice issues and expiring power contracts. For a more detailed discussion of these challenges refer to the Forest Carbon Plan (FCAT 2017).

8.6.2 Wood material substitution

As in the case of wood energy substitution, strategies to increase the HWP pools would also increase the material available for wood material substitution. While carbon storage benefits are accounted for in the HWP-use and HWP-SWDS pools, wood material substitution benefits are incurred in the form of avoided fossil fuel emissions when wood is used instead of other, more energy-intensive materials. This is not to say that wood is the material with the greatest associated carbon benefits, as there may be less energy-intensive materials such as adobe or straw bale construction, although they may not have greater carbon benefits after carbon sequestration from tree growth is accounted for.

In terms of where one could expect benefits from material substitution, more energy-intensive materials such as concrete, steel, brick, aluminum, gypsum and plastic are common alternatives to wood in construction and packaging (Gustavsson et al. 2006, Lippke et al. 2010).

Construction represents the single largest wood products market in the U.S. (McKeever et al. 2011), so it stands to reason that it also represents the largest opportunity for wood substitution. However, with timber already comprising 90-94% of the materials in residential construction in the U.S., substitution in this arena is limited (McKeever et al. 2011, Gustavsson et al. 2006, Sathre and O'Connor 2010, Nepal et al. 2016). Expanding wood use, specifically for framing, in low-rise (i.e., less than 6 stories), non-residential buildings does represent a significant opportunity. Currently, low-rise buildings comprise the majority of non-residential buildings in the U.S., with wood wall framing in only 12% of these buildings (Nepal et al. 2016). Stores, offices, schools and other public buildings have the greatest potential and feasibility for increased wood use (Nepal et al. 2016). Additionally, substitution benefits from wood use instead of their non-wood counterpart are greatest for specific products, such as solid wood doors, railroad ties, lumber, utility poles, pine decking, cedar siding, and hardwood flooring (Bergman et al. 2014). These benefits may be even greater if lumber is green rather than kiln-dried (Puettmann and Wilson 2005, O'Neil et al. 2013), with the latter being the case for some of the wood products produced in California (e.g., coastal redwood). Cross-laminated timber

may also make it possible to increase wood-use in high-rise buildings. More specific analysis of construction in California may better identify wood material substitution opportunities within the state.

Again, as with wood energy substitution, these avoided emissions occur both under business-as-usual practices (i.e., actual avoided emissions) and through changes to increase wood use instead of more energy-intensive materials above business-as-usual (i.e., additional avoided emissions). The magnitude of wood material substitution benefits depends on the type of material and product substituted (Puettmann and Wilson 2005, Lippke et al. 2011). The difficulty in establishing actual avoided emissions lies in establishing when substitution is actually occurring versus when wood materials would have been the primary material used anyway. The difficulty in establishing additional avoided emissions lies in establishing the increase in wood used instead of more energy-intensive materials over business-as-usual. In either scenario, identifying the products actually being substituted for is another challenge.

It should also be noted that substitution benefits are unlikely to occur without policies incentivizing the use of wood products or market changes to prices that increase the demand for some goods while decreasing demand for others (Lippke et al. 2011). Consequently, strategies that encourage utilization of the least fossil-fuel intensive products, such as by revising building codes based on life-cycle analysis or by establishing prices that reflect the magnitude of carbon emissions associated with a product, could encourage substitution (Lippke et al. 2011, Kurz et al. 2016).

In substitution analysis, while ALCIs may easily address direct substitution or identify opportunities for efficiency along a product's life cycle, CLCIs may be necessary to address the complexities in substitution analysis, such as economic drivers of markets, determining the trade-offs in emissions from wood and substitution products, and indirect effects from changes in outputs of these products such as changes in land-use. For example, one CLCI found that increased international demand for wood energy shifted lumber production to the U.S., which increased the amount of timber plantations in the southern U.S., shifting the competitive advantage for softwood plywood construction from the western U.S. entirely to the South. This ultimately resulted in less harvest internationally and in the western U.S., which increased forest ecosystem carbon pools in these regions (Nepal et al. 2015). However, when looking at increased use of wood in low-rise non-residential buildings, the western U.S. ended up producing more softwood plywood than the southern and northern U.S. (Nepal et al. 2016).

8.6.3 IPCC and substitution

Numerous studies have highlighted that when forests are sustainably managed, there are substantial long-term carbon benefits from long-lived wood products when the avoided fossil

fuel emissions from biomass energy or wood product (i.e., material) substitution is accounted for (Stewart and Nakamura 2012, Smyth et al. 2014, O’Neil and Lippke 2010, Lippke et al. 2008, 2010, 2011, Miner et al. 2014, Ryan et al. 2010, Gustavsson et al. 2006, 2017, Kurz et al. 2016, Perez-Garcia et al. 2005, Sathre and O’Connor 2010, Pingoud et al. 2001, Puettmann et al. 2013, Bergman et al. 2014, Winistorfer et al. 2005, Nepal et al. 2015, 2016, Puettmann and Wilson 2005, Ter-Mikaelian et al. 2008, O’Neil et al. 2013). Some studies have shown that these benefits can result in significantly less carbon emissions than scenarios without harvest by delaying when forests reach the carbon sink saturation point and by realizing avoided fossil fuel emissions from wood energy and material substitution (Bergman et al. 2012, Heath et al. 2010, Lippke et al. 2008, 2011, O’Neil and Lippke 2010, Miner et al. 2014, Gustavsson et al. 2011, 2017, Smyth et al. 2014, Kurz et al. 2016, Nepal et al. 2016). However, many of these studies are attributional life-cycle analyses, which by nature directly compare products assuming one is fully substituted for the other to calculate the difference in the carbon footprint between the two, when in reality the occurrence of substitution is subject to a variety of factors. As a result, many of these studies may overstate the substitution benefits.

Nevertheless, there is robust evidence and high agreement that wood energy and material substitution have important climate mitigation benefits (Smith et al. 2014), although currently there is no way to isolate these benefits when following IPCC accounting guidelines. Current IPCC guidance emphasizes the importance of including carbon stored in harvested wood products in greenhouse gas inventories (IPCC 2014). The IPCC also recognizes in other reports that wood energy and material substitution are important climate mitigation strategies, with benefits being the highest when wood products are long-lived and harvest by-products, wood wastes, and end-of-life products are utilized for bioenergy (Smith et al. 2014). IPCC also states that, “In the long term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual sustained yield of timber, fiber, or energy from the forest, will generate the largest sustained mitigation benefit” (IPCC 2007a).

However, IPCC guidance also emphasizes that biogenic carbon emissions associated with burning wood for energy (i.e., the HWP-energy pool) should be considered as instant oxidation to be included in the energy sector for informational purposes only and while they are not to be counted towards total emissions (IPCC 2014), this accounting fails to capture the fossil fuel emissions reductions from burning wood for energy instead. Additionally, IPCC currently does not provide a way to directly capture the substantial benefits of substituting wood for more energy-intensive materials. Instead, emissions reductions from wood energy and material substitution are implicit in changes in emissions in other IPCC sectors and reporting categories, such as energy and buildings. However, if overall consumption increases, the benefits from wood substitution could be diluted in the calculations. Despite IPCC recognition that wood energy and material substitution can have important climate benefits, the simplified IPCC

accounting assumptions will not result in policies that best achieve long-term cumulative emissions reductions through forest management (Skog 2008, Lippke et al. 2011, Kurz et al. 2016).

Consequently, arguments have been made for inclusion of an additional pool in harvested wood product accounting, referred to as the displacement, substitution, or avoided emissions pool (O'Neil and Lippke 2010, Lippke et al. 2010, 2011, Perez-Garcia et al. 2005, Heath et al. 2010). As there is currently no IPCC guidance on inclusion of such a pool, this information could be included for informational purposes only to inform forest management policy decisions in the context of emissions reductions. Inclusion of such information will need to accurately determine actual levels of substitution and which materials and energy sources are being substituted. In addition to actual avoided fossil fuel emissions, there can be other forms of avoided emissions associated with the forest sector. Burning wood for energy can decrease other GHG emissions from burning wood in the forest or from decay. Re-using, recycling, and capturing products at the end of their life for energy production can decrease the amount of wood transferred to landfills, and therefore result in avoided landfill methane emissions. Reducing emissions associated with wood manufacturing can also decrease emissions in other sectors. Further analysis is needed to determine whether and how these avoided emissions could and should be incorporated into avoided emissions associated with the forest sector.

In addition to quantifying actual avoided emissions from current practices, further analysis could occur to identify potential additional avoided emissions resulting from future changes to policy. To fully understand trade-offs with substitution, sustainability of forest practices, indirect land-use changes, actual fossil fuel substitution, timing of mitigation benefits, and efficiency of waste and residue utilization and bioenergy systems should be considered. As there is currently no standard for evaluating the avoided fossil fuel emissions from wood energy or material substitution, life-cycle assessments can be used to evaluate potential substitution benefits and identify options with better greenhouse gas mitigation potential, such as sustainable use of biomass waste and residues. It is a future goal to provide information to the CA Board of Forestry and Fire Protection on avoided emissions to inform policy decisions, either through the on-going UC-Berkeley work for the CA Natural Resources Agency exploring use of the CBM, or through additional future efforts. Since AB 1504 (2010) specifies that California forests are to be managed for multiple ecosystem services beyond just carbon, consideration of forest management policies that result in avoided fossil fuel emissions will need to be tempered with the need to maintain resilient, healthy forests and the objectives and constraints on different land ownerships.

9 Conclusions

As of 2015, California's forests remain net sinks, sequestering 33.6 MMT CO₂e per year, excluding net flux from soils, forest land conversions, non-CO₂ emissions from wildfires, or harvested wood products. After accounting for these other sources (except HWP), the rate of carbon sequestration is 32.8 MMT CO₂e per year. Carbon stocks are just over 2 billion metric tons. However, in many forest types current stocking levels reflect over a century of fire suppression and may not represent stand densities that are resilient to disturbances common to California forests such as fire or pest outbreaks. Additionally, as the forests age in unharvested stands, growth rates slow. Older forests tend to store more carbon, but they might not accumulate new carbon as quickly as younger, fast-growing stands. Consequently, the stocks and flux represented in this report may not be sustainable in the future without forest management.

Forests perform a wide range of ecosystem services and are managed for a wide range of economic, ecological, and aesthetic values. Not all of these values and objectives are compatible with minimizing net carbon emissions to the atmosphere, but opportunities for integrating carbon goals with existing management goals likely exist. If mature forests are approaching carbon sink saturation due to slowing tree growth rates, or there is a need to reduce stand densities for other forest health objectives, climate mitigation strategies can aim to maximize the sum from forest ecosystem carbon stocks, harvested wood product carbon stocks, and wood material and energy substitution to maintain and enhance forest ecosystem carbon stocks while also increasing carbon benefits from harvested wood products.

The potential for forests and harvested wood products to mitigate carbon emissions can involve a variety of sectors beyond just the forest sector, such as the energy and waste sectors (Kurz et al. 2016) and extend beyond the boundaries of California. Evaluating the ecological impacts and interaction between emissions from each of these sectors and geographic areas will be key to identifying strategies that capitalize on the ability for California forests to remove carbon from the atmosphere and store it long-term within forests and wood products, as well as the potential for wood energy and material substitution to result in avoided fossil fuel emissions. New models are being developed to assess climate change mitigation options in the U.S. forest sector and could prove to be useful for leveraging California's forests for emissions reductions.

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Glossary

Afforestation: An increase in the area of forest land caused by a change in land-use; includes intentionally planted and tended lands as well as lands naturally occupied by establishing trees.

Atmospheric-flow Approach: Accounts for carbon fluxes to/from the atmosphere for lands and wood products pools, including imported wood products.

Attributional Life Cycle Inventory: Allows for comparison of the direct impacts from substituting one product for another and can serve to pinpoint opportunities for efficiency at various stages of a product's life-cycle or along the supply chain. Does not account for indirect effects from changing outputs, such as changes in carbon storage and emissions resulting from actual production changes from product substitution or indirect land-use changes in response to price fluctuations.

Biomass energy: The use of harvested wood, particularly unmerchantable residues, to meet commercial and residential energy and/or heating needs, potentially reducing the use of fossil fuels to meet those needs instead. Considered by many to be a net reduction in carbon emissions since those residues would otherwise decay and result in emissions anyway (albeit at a slower rate).

Carbon sink saturation point: The point at which annual forest emission equals uptake as forests age.

Consequential Life Cycle Inventory: Considers indirect impacts of changing outputs, and is highly dependent on the complex intricacies of economic drivers of markets such as supply, demand, and price elasticities for the product itself, its co-products, its substitute products, as well as the inputs to make each.

Culmination of mean annual increment: The point in stand development when the rate of accumulation of wood over the life of the stand reaches a maximum, calculated as the amount of wood accumulated divided by the number of years elapsed.

Decomposition: Consumption of organic matter, primarily by microbes, resulting in carbon dioxide emissions to the atmosphere.

Deforestation: A decrease in the area of forest land caused by a change in land-use; does not include areas of temporary tree mortality from logging or fire where planting or natural regeneration is expected to occur.

Forest land: Under the FIA definition, Land that has at least 10 percent crown cover by live tally trees of any size or has had at least 10 percent canopy cover of live tally species in the past, based on the presence of stumps, snags, or other evidence. To qualify, the area must be at least 1.0 acre in size and 120.0 feet wide. Forest land includes transition zones, such as areas between forest and non-forest lands that meet the minimal tree stocking/cover and forest areas adjacent to urban and built—up lands. Roadside, streamside, and shelterbelt strips of trees must have a width of at least 120 feet and continuous length of at least 363 feet to qualify as forest land. Unimproved roads, trails, and meadows less than 120 feet wide or less than an acre in size, and streams less than 30 feet wide in forest areas are classified as forest. Tree-covered areas in agricultural production settings, such as fruit orchards, or tree—covered areas in urban settings subjected to regular mowing, such as city parks, are not considered forest land. Per this definition, chaparral is not included in the definition for forest land unless it also meets the minimum stocking or crown cover requirements to qualify as forest land.

Forest land status: Refers to the different FIA categories of forest land (i.e., productive forest land, timberland, other forest land) including the reserve categories (i.e., reserved or unreserved), defined below.

Flux: The net change in carbon in one or more pools over a specific period of time, expressed as either a total or a rate. Often expressed as an exchange with the atmosphere, with negative numbers indicating a net removal of carbon from the atmosphere. However not all carbon exchanges occur with the atmosphere (e.g., live trees convert to dead wood when they die).

IPCC: The Intergovernmental Panel on Climate Change is a United Nations-sponsored panel of scientists that develops guidance on the conduct of carbon emissions assessments, among other things.

Key category analysis: An assessment where key carbon emission categories are identified and prioritized, called for in the 2006 IPCC Guidelines.

Land status: Refers to the FIA distinction between forest land and non-forest (i.e., crops, improved pasture, residential areas, city parks, etc.) or other area (i.e., water). Also includes forest land status categories.

Leakage: Where increases in carbon stores in one region from reduced harvest are offset by decreases in carbon stores in another region from increased harvest to meet demand, resulting in no net reduction in carbon emissions to the atmosphere.

Life-cycle analysis: Comparing differences in inputs and outputs between different management and production scenarios. Can identify key trade-offs between forest management and fossil fuel-use.

Life-cycle inventory: Measures every input (energy, materials, etc.) and every output (emissions, waste, product and co-products) for every stage along a product's life-cycle.

Logging residuals: Slash, such as tops and limbs, and sub-merchantable material left on-site after harvest.

Managed land: An IPCC designation of lands included in carbon emission assessments, consisting of those where human interventions and practices have affected production, ecological or social functions. In practice, the United States considers all lands except for portions of interior Alaska as "managed".

Maximum sustained yield: The management of a forest ownership or landscape to maximize wood products, usually by applying estimates of culmination of mean annual increment.

Net present value: The value of harvested wood from a stand after discounting investments in that stand at a desired rate of compound interest. Artificial regeneration and other stand management costs are usually considered as investments.

Other forest land: Forested lands not capable of producing at least 20 cubic feet of wood per acre at culmination of mean annual increment.

Permanence: Refers to the desire for increases in carbon stores to last over the long term, particularly in the calculation of carbon credits, and not result in increased risk of losses from natural disturbance.

Pool: A category containing carbon mass, e.g., live trees, down wood, harvested wood products.

Primary Product Ratios: Used to distribute timber primary products to specific primary wood products (i.e., lumber, veneer, pulp and board, bioenergy, mill residue, etc.).

Product Half-lives: The rate at which carbon in the products in-use category passes into the discarded category, representing the transition between the two pools.

Production Approach: Carbon for all California-origin timber is estimated, regardless of whether it is consumed within the state of California or is exported to other states or countries. Carbon in imported wood products is not included in the estimates to avoid double-counting with the state/country of wood origin. Similarly, importers of California-origin wood would not be able to include carbon in those wood products in their inventory to avoid double-counting.

Productive Capacity: Ability for land to grow commercial tree species.

Productive forest land: Forested lands capable of producing at least 20 cubic feet of wood per acre at culmination of mean annual increment.

Reserve status: Lands where management for the production of wood products is precluded permanently by law, including Wildernesses, National Parks, National Recreation Areas, and State Parks. In some cases, timber harvest can occur for various resource objectives (i.e., restoration, salvage, etc.).

Respiration: The process of living tissues using carbohydrates and producing carbon dioxide emissions to the atmosphere, for example leaves and roots of living trees.

Sequestration: A net increase in carbon stores in one or more pools (categories) over a specific period of time.

Substitution: Refers to the possibility that the use of wood products in construction or other products results in a net reduction of carbon emissions if the alternatives require more carbon-based energy to produce.

Stocks: The amount of carbon in one or more pools (categories) at one point in time (synonym: stores).

Stores: The amount of carbon in one or more pools (categories) at one point in time (synonym: stocks).

Timberland: Forested lands capable of producing at least 20 cubic feet of wood per acre at culmination of mean annual increment, and not reserved (i.e., where management for production of wood products is not precluded).

Timber Product Ratios: Used to distribute annual harvest volumes to specific timber product classes (i.e., sawlogs, pulpwood, fuelwood, etc.)

Wood energy substitution: When wood is burned for energy production instead of fossil fuels, resulting in avoided fossil fuel emissions.

Wood material substitution: When wood is used instead of more fossil fuel energy-intensive materials, resulting in avoided fossil fuel emissions.

Working forests: Forests in which trees are harvested regularly.

Appendix 1: Forest carbon stock by forest type and region

A1.1 Central Coast and Interior Ranges

Table A1.1.1. Central Coast and Interior Ranges: Forest land carbon stocks (thousand metric tons C) by forest type and pool, 2006-2015.

Forest type group	Central Coast and Interior Ranges						All pools	
	Live tree	Dead tree	Roots	Understory	Down woody debris	Soils		
	<i>Thousand metric tons C</i>							
Softwoods:	Total	Total	Total	Total	Total	Total	Total	SE
California mixed conifer	--	--	--	--	--	--	--	0
Douglas-fir	1,094	5	233	16	47	240	1,635	781
Fir / spruce / mountain hemlock	--	--	--	--	--	--	--	0
Western Hemlock / Sitka spruce	--	--	--	--	--	--	--	0
Lodgepole pine	--	--	--	--	--	--	--	0
Pinyon / juniper	178	11	38	177	38	1,050	1,492	260
Ponderosa pine	91	5	20	35	8	270	429	172
Redwood	19,151	439	3,551	136	1,047	3,120	27,444	4,539
Western larch	--	--	--	--	--	--	--	0
Western white pine	--	--	--	--	--	--	--	0
Other western softwoods	543	46	141	4	30	210	974	483
Hardwoods:								
Alder / maple	357	2	75	11	18	210	673	414
Aspen / birch	--	--	--	--	--	--	--	0
Elm / ash / cottonwood	42	--	--	4	10	60	117	55
Tanoak / laurel	9,115	415	1,863	278	746	1,910	14,327	2,245
Western oak	22,151	934	4,313	2,175	1,709	14,410	45,692	2,020
Woodland hardwoods	8	21	5	6	10	30	80	32
Exotic hardwoods	--	--	--	5	0	30	35	20
Other hardwoods	2,975	117	621	139	297	850	4,999	1,310
Nonstocked	18	--	--	13	4	90	125	63
All forest types	55,724	1,995	10,871	3,000	3,964	22,470	98,024	5,548

Note: Totals may be off because of rounding

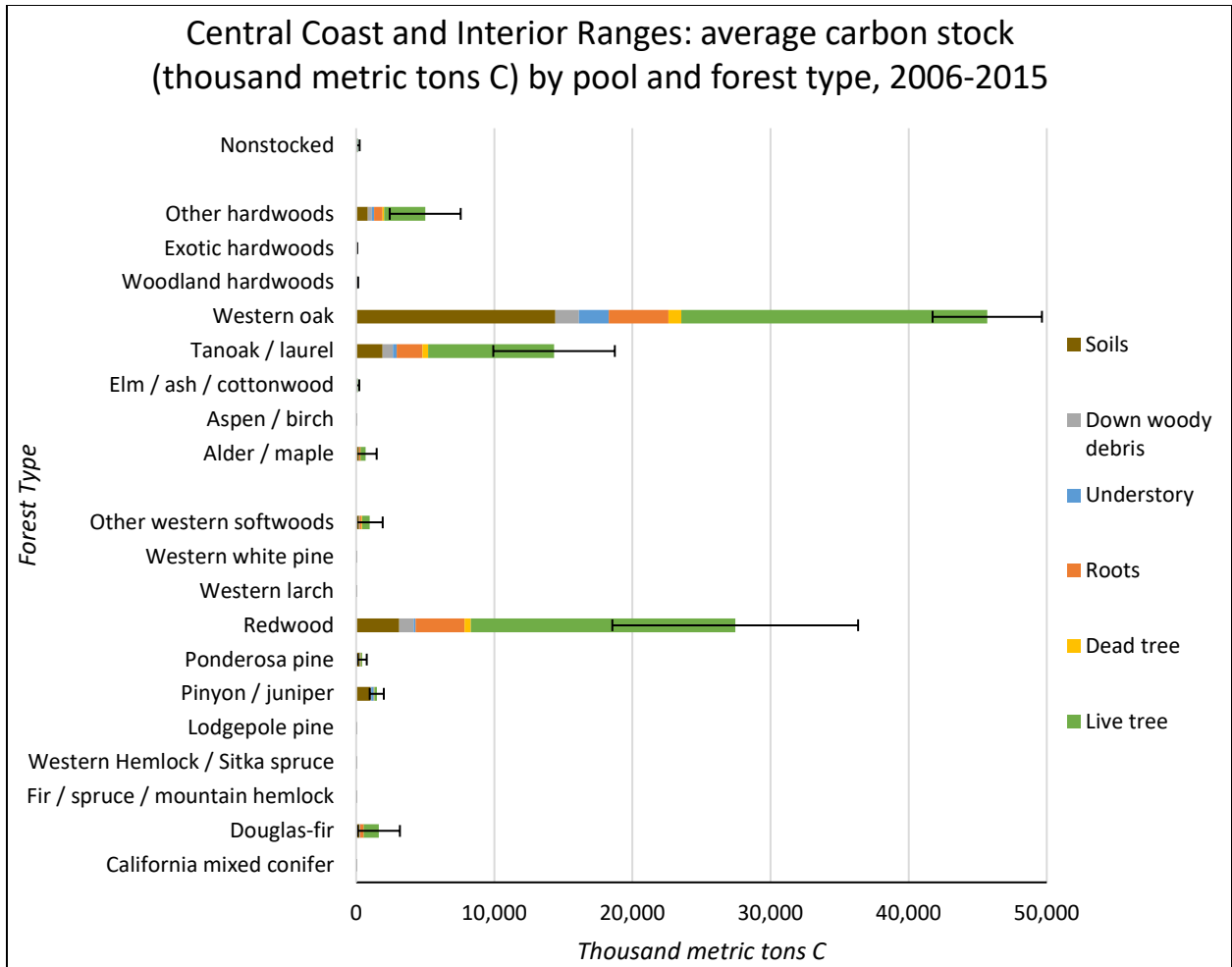


Figure A1.1.1. Central Coast and Interior Ranges: average carbon stock (thousand metric tons C) by pool and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

Table A1.1.2. Central Coast and Interior Ranges: Forest land carbon stocks (thousand metric tons C) by forest type and land status, 2006-2015.

Forest type group	Central Coast and Interior Ranges					
	Unreserved Forests		Reserved Forests		All forest land	
	Timberland	Other Forest	Productive	Other Forest		
Softwoods:	Total	Total	Total	Total	Total	SE
	<i>Thousand metric tons C</i>					
California mixed conifer	--	--	--	--	--	--
Douglas-fir	1,635	--	--	--	1,635	781
Fir / spruce / mountain hemlock	--	--	--	--	--	--
Western Hemlock / Sitka spruce	--	--	--	--	--	--
Lodgepole pine	--	--	--	--	--	--
Pinyon / juniper	--	1,348	--	153	1,492	260
Ponderosa pine	--	299	--	130	429	172
Redwood	16,539	--	10,905	--	27,444	4,539
Western larch	--	--	--	--	--	--
Western white pine	--	--	--	--	--	--
Other western softwoods	974	--	--	--	974	483
Total	19,147	1,648	10,905	283	31,974	4,639
Hardwoods:						
Alder / maple	--	89	574	--	673	414
Aspen / birch	--	--	--	--	--	--
Elm / ash / cottonwood	--	109	--	17	125	55
Tanoak / laurel	4,978	3,265	3,898	2,195	14,327	2,245
Western oak	1,167	32,695	476	11,355	45,692	2,020
Woodland hardwoods	--	--	--	80	80	32
Exotic hardwoods	--	35	--	--	35	20
Other hardwoods	2,186	631	1,950	222	4,999	1,310
Total	8,332	36,814	6,897	13,868	65,923	3,231
Nonstocked	--	83	--	46	129	63
All forest types	27,481	38,555	17,801	14,198	98,024	5,548

Note: Totals may be off because of rounding

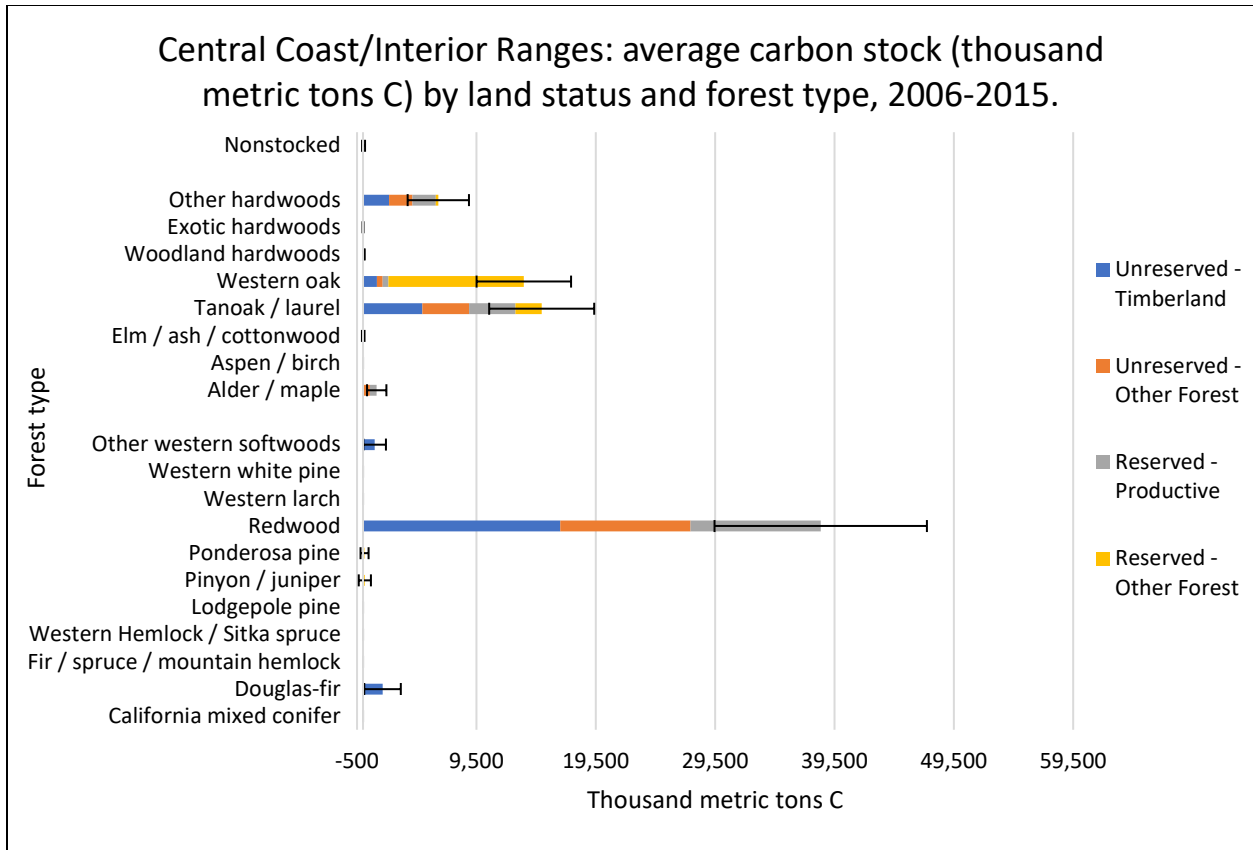


Figure A1.1.2. Central Coast/Interior Ranges: average carbon stock (thousand metric tons C) by land status and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

A1.2 Central Valley

Table A1.2.1. Central Valley: Forest land carbon stocks (thousand metric tons C) by forest type and pool, 2006-2015.

Forest type group	Central Valley						All pools	
	Live tree	Dead tree	Roots	Understory	Down woody debris	Soils		
	<i>Thousand metric tons C</i>							Total
Softwoods:	Total	Total	Total	Total	Total	Total	Total	SE
California mixed conifer	--	--	--	--	--	--	--	--
Douglas-fir	--	--	--	--	--	--	--	--
Fir / spruce / mountain hemlock	--	--	--	--	--	--	--	--
Western Hemlock / Sitka spruce	--	--	--	--	--	--	--	--
Lodgepole pine	--	--	--	--	--	--	--	--
Pinyon / juniper	--	--	--	--	--	--	--	--
Ponderosa pine	--	--	--	--	--	--	--	--
Redwood	--	--	--	--	--	--	--	--
Western larch	--	--	--	--	--	--	--	--
Western white pine	--	--	--	--	--	--	--	--
Other western softwoods	--	--	--	--	--	--	--	--
Hardwoods:								
Alder / maple	--	--	--	--	--	--	--	--
Aspen / birch	--	--	--	--	--	--	--	--
Elm / ash / cottonwood	386	15	75	20	27	280	803	348
Tanoak / laurel	--	--	--	--	--	--	0	0
Western oak	867	16	177	132	57	860	2,109	363
Woodland hardwoods	--	--	--	--	--	--	0	0
Exotic hardwoods	--	--	--	0.1	--	--	0.1	0.1
Other hardwoods	--	--	--	--	--	--	0	0
Nonstocked	--	--	--	--	--	--	--	0
All forest types	1,253	31	252	152	84	1,140	2,912	501

Note: Totals may be off because of rounding

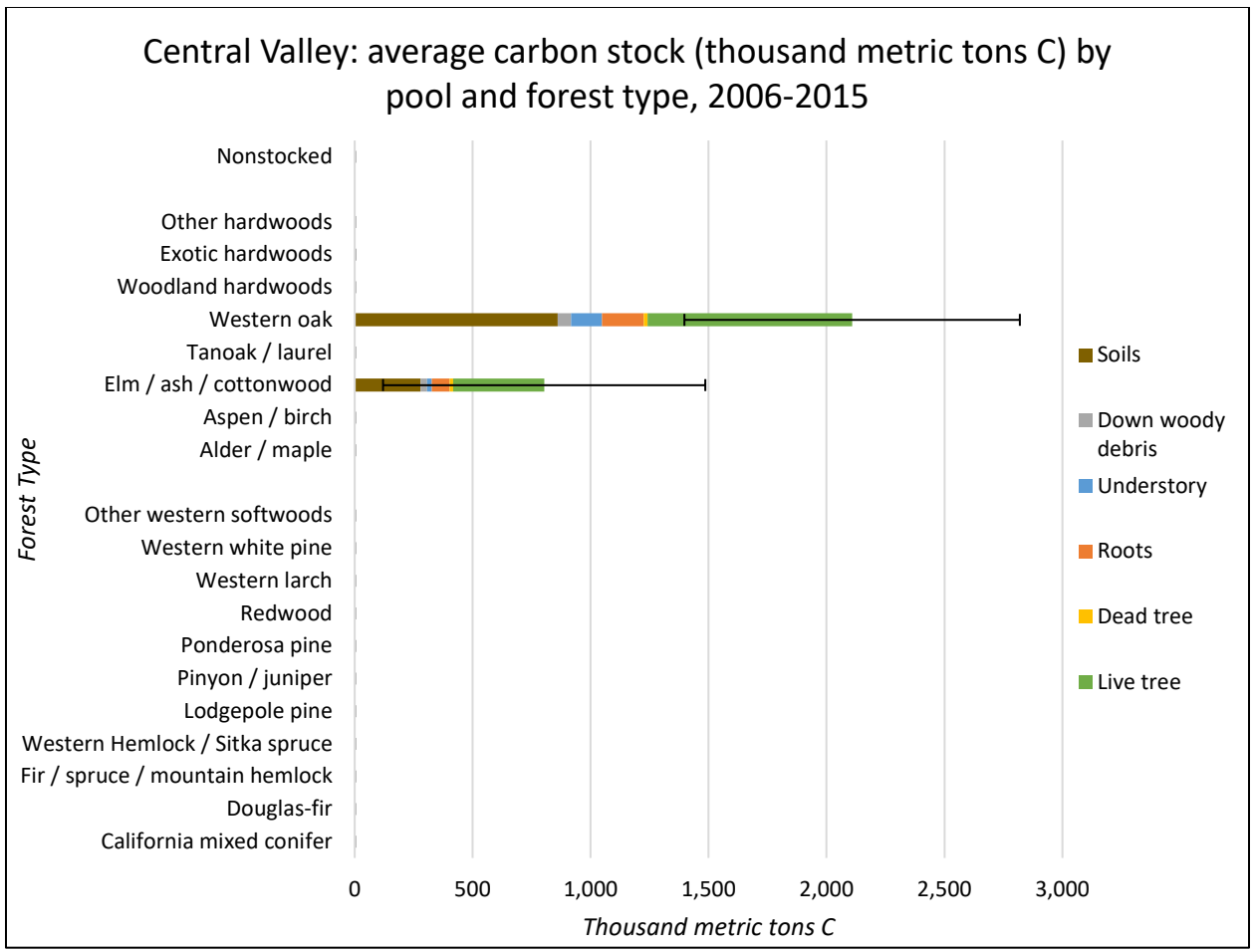


Figure A1.2.1. Central Valley: average carbon stock (thousand metric tons C) by pool and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

Table A1.2.2. Central Valley: Forest land carbon stocks (thousand metric tons C) by forest type and land status, 2006-2015.

Forest type group	Central Valley					
	Unreserved Forests		Reserved Forests		All forest land	
	Timberland	Other Forest	Productive	Other Forest		
Softwoods:	Total	Total	Total	Total	Total	SE
<i>Thousand metric tons C</i>						
California mixed conifer	--	--	--	--	--	--
Douglas-fir	--	--	--	--	--	--
Fir / spruce / mountain hemlock	--	--	--	--	--	--
Western Hemlock / Sitka spruce	--	--	--	--	--	--
Lodgepole pine	--	--	--	--	--	--
Pinyon / juniper	--	--	--	--	--	--
Ponderosa pine	--	--	--	--	--	--
Redwood	--	--	--	--	--	--
Western larch	--	--	--	--	--	--
Western white pine	--	--	--	--	--	--
Other western softwoods	--	--	--	--	--	--
Total	--	--	--	--	--	--
Hardwoods:						
Alder / maple	--	--	--	--	--	--
Aspen / birch	--	--	--	--	--	--
Elm / ash / cottonwood	--	509	--	294	803	348
Tanoak / laurel	--	--	--	--	--	--
Western oak	--	2,091	--	28	2,109	363
Woodland hardwoods	--	--	--	--	--	--
Exotic hardwoods	0.1	--	--	--	0.1	0.1
Other hardwoods	--	--	--	--	--	--
Total	0.1	2,601	--	311	2,912	501
Nonstocked	--	--	--	--	--	--
All forest types	0.1	2,601	--	311	2,912	501

Note: Totals may be off because of rounding

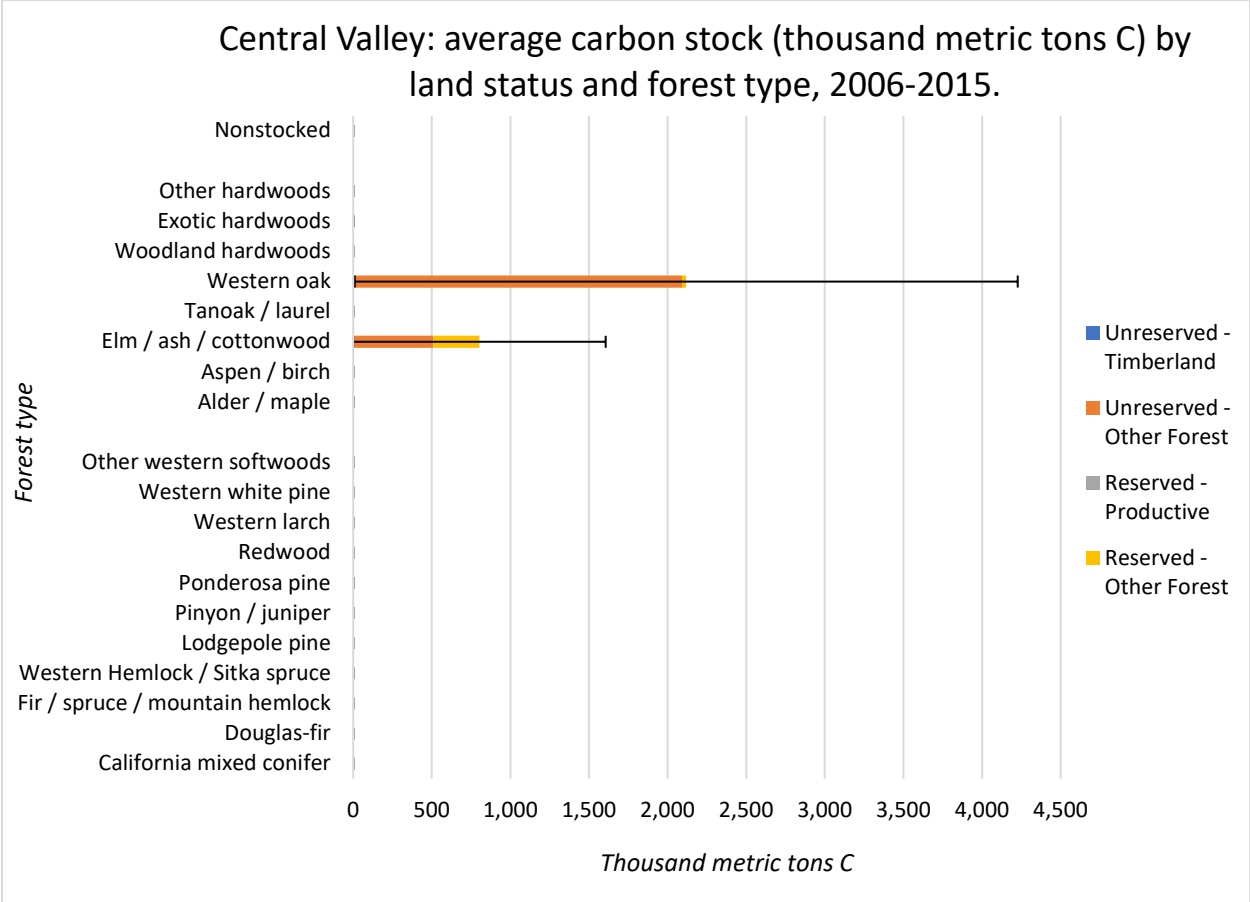


Figure A1.2.2. Central Valley: average carbon stock (thousand metric tons C) by land status and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

A1.3 Eastside

Table A1.3.1. Eastside: Forest land carbon stocks (thousand metric tons C) by forest type and pool, 2006-2015.

Forest type group	Eastside						All pools	
	Live tree	Dead tree	Roots	Understory	Down woody debris	Soils	Total	SE
	<i>Thousand metric tons C</i>							
Softwoods:	Total	Total	Total	Total	Total	Total	Total	SE
California mixed conifer	6,410	362	1,278	242	1,131	5,920	15,343	1,294
Douglas-fir	--	--	--	--	--	--	0	0
Fir / spruce / mountain hemlock	4,813	611	901	90	581	2,240	9,236	1,469
Western Hemlock / Sitka spruce	--	--	--	--	--	--	0	0
Lodgepole pine	1,219	43	269	27	187	570	2,315	601
Pinyon / juniper	3,003	214	688	1,185	770	7,050	12,911	761
Ponderosa pine	6,392	173	1,407	483	1,033	6,510	15,998	1,185
Redwood	--	--	--	--	--	--	0	0
Western larch	--	--	--	--	--	--	0	0
Western white pine	--	--	--	--	--	--	0	0
Other western softwoods	6,207	270	1,207	2,899	963	21,780	33,326	1,712
Hardwoods:								
Alder / maple	--	--	--	0.1	--	--	0.1	0.1
Aspen / birch	407	17	71	69	119	400	1,083	245
Elm / ash / cottonwood	--	--	--	--	--	--	0	0
Tanoak / laurel	--	--	--	--	--	--	0	0
Western oak	174	6	44	34	55	230	544	163
Woodland hardwoods	444	196	132	142	103	850	1,867	280
Exotic hardwoods	--	--	--	--	--	--	0	0
Other hardwoods	62	211	55	65.4	106	360	859.6	237.1
Nonstocked	80	146	48	245	159	1,950	2628.24	407.55
All forest types	29,211	2,248	6,100	5,483	5,208	47,850	96,099	3,049

Note: Totals may be off because of rounding

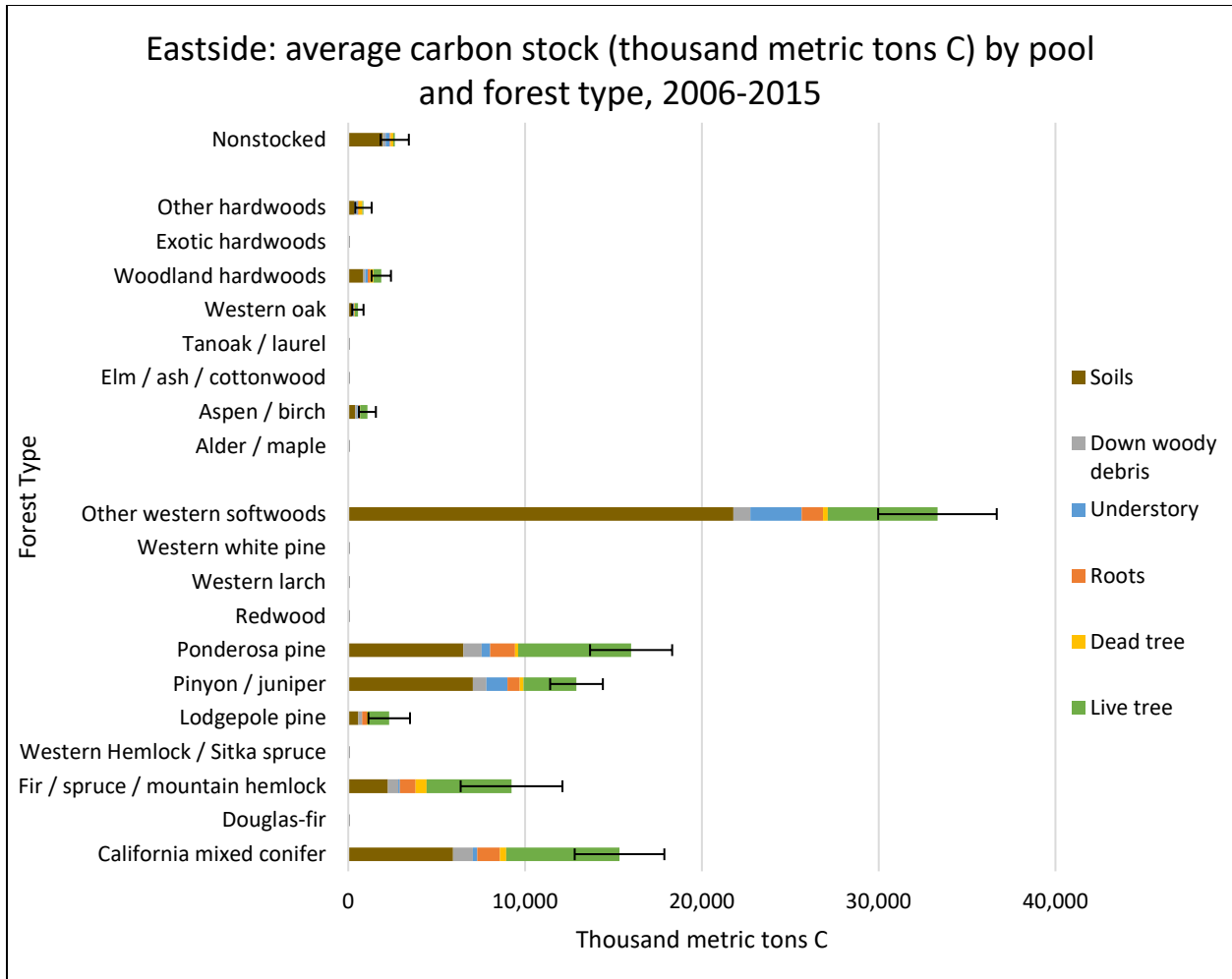


Figure A1.3.1. Eastside: average carbon stock (thousand metric tons C) by pool and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

Table A1.3.2. Eastside: Forest land carbon stocks (thousand metric tons C) by forest type and land status, 2006-2015.

Forest type group	Eastside					
	Unreserved Forests		Reserved Forests		All forest land	
	Timberland	Other Forest	Productive	Other Forest		
Softwoods:	Total	Total	Total	Total	Total	SE
	<i>Thousand metric tons C</i>					
California mixed conifer	14,880	462	--	--	15,343	1,294
Douglas-fir	--	--	--	--	--	--
Fir / spruce / mountain hemlock	6,634	--	2,603	--	9,236	1,469
Western Hemlock / Sitka spruce	--	--	--	--	--	--
Lodgepole pine	966	1,338	--	--	2,315	601
Pinyon / juniper	98	9,392	--	3,411	12,911	761
Ponderosa pine	14,694	239	1,065	--	15,998	1,185
Redwood	--	--	--	--	--	--
Western larch	--	--	--	--	--	--
Western white pine	--	--	--	--	--	--
Other western softwoods	3,699	26,552	--	3,073	33,326	1,712
Total	40,972	37,995	3,668	6,485	89,129	2,985
Hardwoods:						
Alder / maple	--	--	--	0.1	0.1	0.1
Aspen / birch	721	317	44	0.2	1,083	245
Elm / ash / cottonwood	--	--	--	--	--	--
Tanoak / laurel	--	--	--	--	--	--
Western oak	225	308	--	--	544	163
Woodland hardwoods	707	1,160	--	--	1,867	280
Exotic hardwoods	--	--	--	--	--	--
Other hardwoods	423	48	387	--	860	237
Total	2,078	1,833	432	0.2	4,351	470
Nonstocked	1,930	612	--	88	2,628	408
All forest types	44,979	40,438	4,098	6,574	96,099	3,049

Note: Totals may be off because of rounding

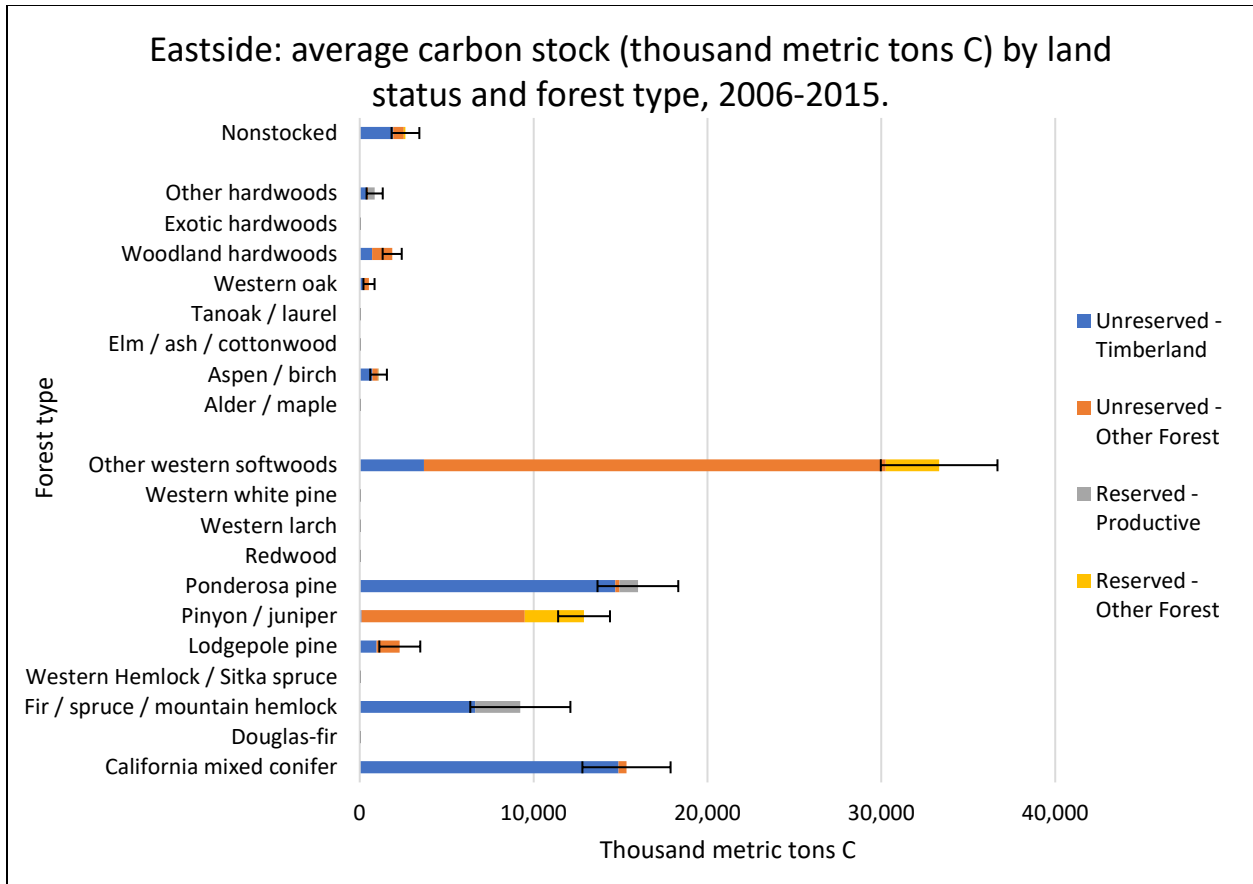


Figure A1.3.2. Eastside: average carbon stock (thousand metric tons C) by land status and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

A1.4 Klamath/Interior Coast Ranges

Table A1.4.1. Klamath/Interior Coast Ranges: Forest land carbon stocks (thousand metric tons C) by forest type and pool, 2006-2015.

Forest type group	Klamath/Interior Coast Ranges						All pools	
	Live tree	Dead tree	Roots	Understory	Down woody debris	Soils		
	<i>Thousand metric tons C</i>						Total	SE
Softwoods:	Total	Total	Total	Total	Total	Total	Total	SE
California mixed conifer	141,185	12,130	31,522	1,808	13,801	53,880	254,326	7,761
Douglas-fir	31,808	2,383	7,214	587	2,748	8,060	52,800	4,121
Fir / spruce / mountain hemlock	15,348	2,430	3,075	302	1,218	7,030	29,403	2,964
Western Hemlock / Sitka spruce	117	--	--	2	2	90	234	150
Lodgepole pine	293	11	54	34	20	350	761	244
Pinyon / juniper	--	--	--	--	--	--	0	0
Ponderosa pine	5,605	311	1,265	208	537	3,560	11,486	1,261
Redwood	7,098	249	1,344	36	561	690	9,978	3,904
Western larch	--	--	--	--	--	--	0	0
Western white pine	610	124	131	104	115	1,090	2,173	450
Other western softwoods	559	45	110	153	236	1,400	2,503	461
Hardwoods:								
Alder / maple	3,449	193	734	157	738	2,980	8,252	1,245
Aspen / birch	12	--	--	8	3	40	65	43
Elm / ash / cottonwood	65	3	12	5	7	70	162	88
Tanoak / laurel	36,672	2,816	7,894	1,027	3,447	7,070	58,926	4,417
Western oak	67,168	4,488	14,791	4,926	6,840	32,950	131,163	4,338
Woodland hardwoods	62	4	8	16	4	90	184	73
Exotic hardwoods	--	--	--	--	--	--	0.0	0.0
Other hardwoods	5,100	440	1,193	256	731	1,570	9,290	1,441
Nonstocked	223	1,694	417	301	888	2,380	5,902	842
All forest types	315,373	27,323	69,790	9,927	31,896	123,300	577,609	11,042

Note: Totals may be off because of rounding

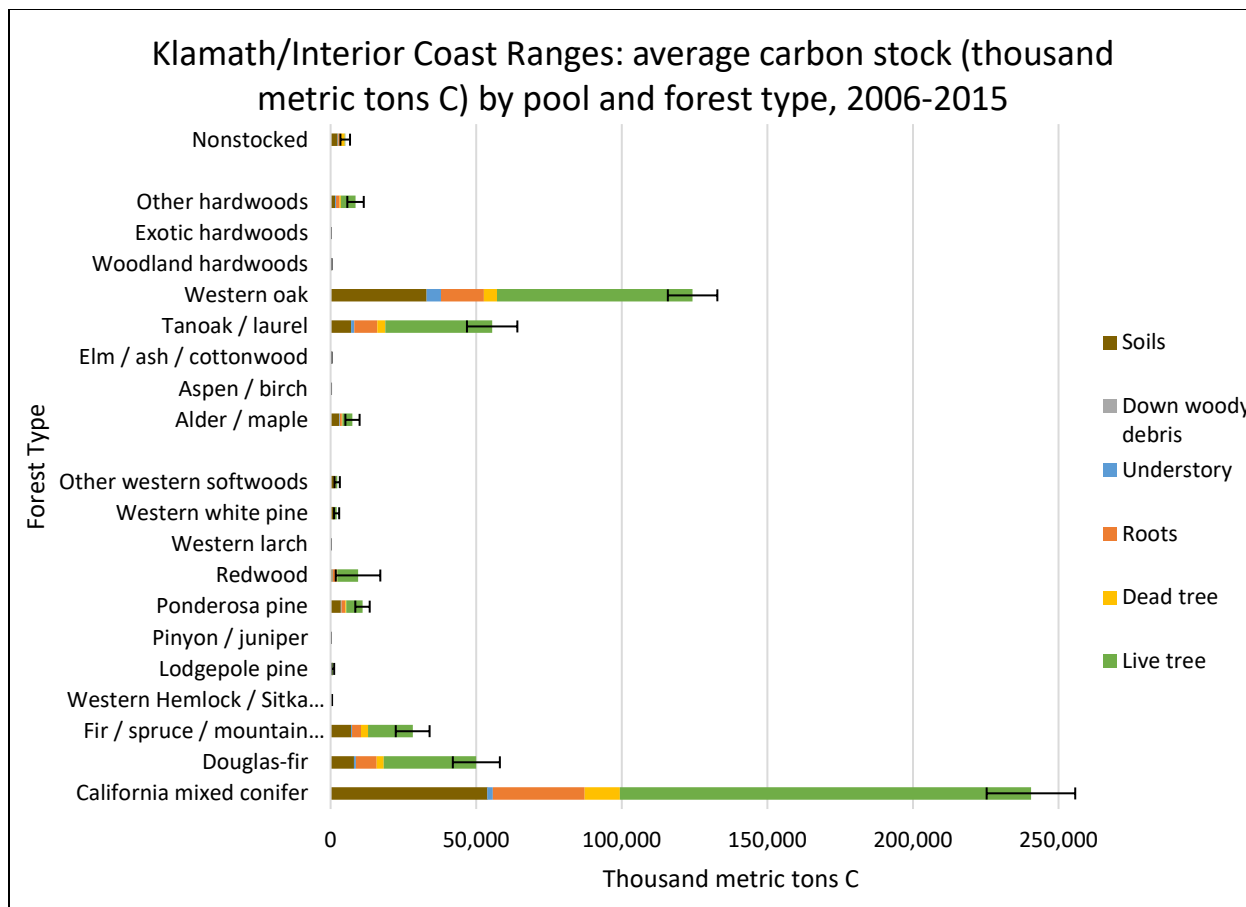


Figure A1.4.1. Klamath/Interior Coast Ranges: average carbon stock (thousand metric tons C) by pool and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

Table A1.4.2. Klamath/Interior Coast Ranges: Forest land carbon stocks (thousand metric tons C) by forest type and land status, 2006-2015.

Forest type group	Klamath/Interior Coast Ranges					
	Unreserved Forests		Reserved Forests		All forest land	
	Timberland	Other Forest	Productive	Other Forest		
	Total	Total	Total	Total	Total	SE
	<i>Thousand metric tons C</i>					
California mixed conifer	193,560	245	60,521	--	254,326	7,761
Douglas-fir	34,880	576	16,389	955	52,800	4,121
Fir / spruce / mountain hemlock	12,095	713	15,999	586	29,403	2,964
Western Hemlock / Sitka spruce	--	--	234	--	234	150
Lodgepole pine	262	--	333	175	761	244
Pinyon / juniper	--	--	--	--	--	--
Ponderosa pine	8,502	--	2,644	339	11,486	1,261
Redwood	1,720	--	8,259	--	9,978	3,904
Western larch	--	--	--	--	--	--
Western white pine	444	225	1,150	356	2,173	450
Other western softwoods	496	1,602	223	184	2,503	461
Total	251,956	3,361	105,745	2,604	363,664	9,643
Hardwoods:						
Alder / maple	4,324	655	2,689	583	8,252	1,245
Aspen / birch	--	--	--	65	65	43
Elm / ash / cottonwood	--	151	--	11	162	88
Tanoak / laurel	39,385	2,808	15,225	1,507	58,926	4,417
Western oak	58,363	55,880	7,485	9,443	131,163	4,338
Woodland hardwoods	--	61	--	123	184	73
Exotic hardwoods	--	--	--	--	--	--
Other hardwoods	8,474	116	467	242	9,290	1,441
Total	110,550	59,661	25,856	11,975	208,041	6,359
Nonstocked	2,862	255	2,785	--	5,902	842
All forest types	365,367	63,277	134,386	14,578	577,609	11,042

Note: Totals may be off because of rounding

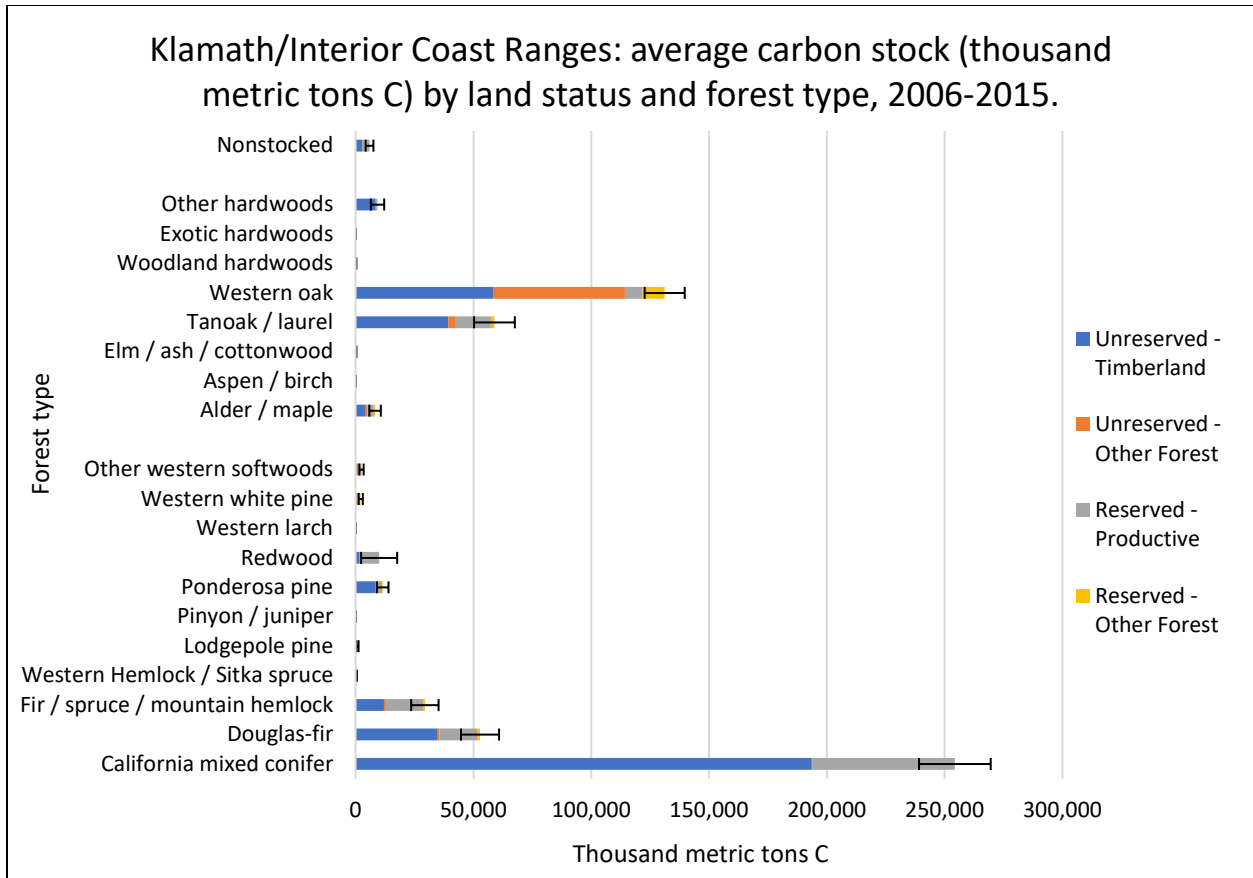


Figure A1.4.2. Klamath/Interior Coast Ranges: average carbon stock (thousand metric tons C) by land status and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

A1.5 North Coast

Table A1.5.1. North Coast: Forest land carbon stocks (thousand metric tons C) by forest type and pool, 2006-2015.

Forest type group	North Coast						All pools	
	Live tree	Dead tree	Roots	Understory	Down woody debris	Soils		
	<i>Thousand metric tons C</i>						Total	SE
Softwoods:	Total	Total	Total	Total	Total	Total	Total	SE
California mixed conifer	68	4	11	3	22	50	157	84
Douglas-fir	36,683	1,775	7,989	743	4,529	9,970	61,689	4,589
Fir / spruce / mountain hemlock	421	36	86	7	20	200	770	322
Western Hemlock / Sitka spruce	2,208	292	567	45	263	1,700	5,074	1,252
Lodgepole pine	28	8	7	5	2	50	100	58
Pinyon / juniper	--	--	--	--		--	0	0
Ponderosa pine	--	--	--	--		--	0	0
Redwood	56,408	2,549	11,483	625	5,727	12,700	89,492	8,594
Western larch	--	--	--	--		--	0	0
Western white pine	--	--	--	--		--	0	0
Other western softwoods	1,307	64	297	36	175	510	2,389	972
Hardwoods:								
Alder / maple	3,811	412	889	146	567	2,800	8,626	1,357
Aspen / birch	--	--	--	--		--	0	0
Elm / ash / cottonwood	--	--	--	--		--	0	0
Tanoak / laurel	49,843	2,420	10,084	1,549	5,362	10,720	79,978	4,507
Western oak	8,744	231	1,762	504	768	3,440	15,449	1,399
Woodland hardwoods	94	--	--	2	6	10	133	88
Exotic hardwoods	--	--	--	--		--	0	0
Other hardwoods	3,239	59	675	107	193	690	4,962	1,071
Nonstocked	18	10	6	11	38	80	163	71
All forest types	162,870	7,863	33,876	3,781	17,672	42,910	268,972	10,397

Note: Totals may be off because of rounding

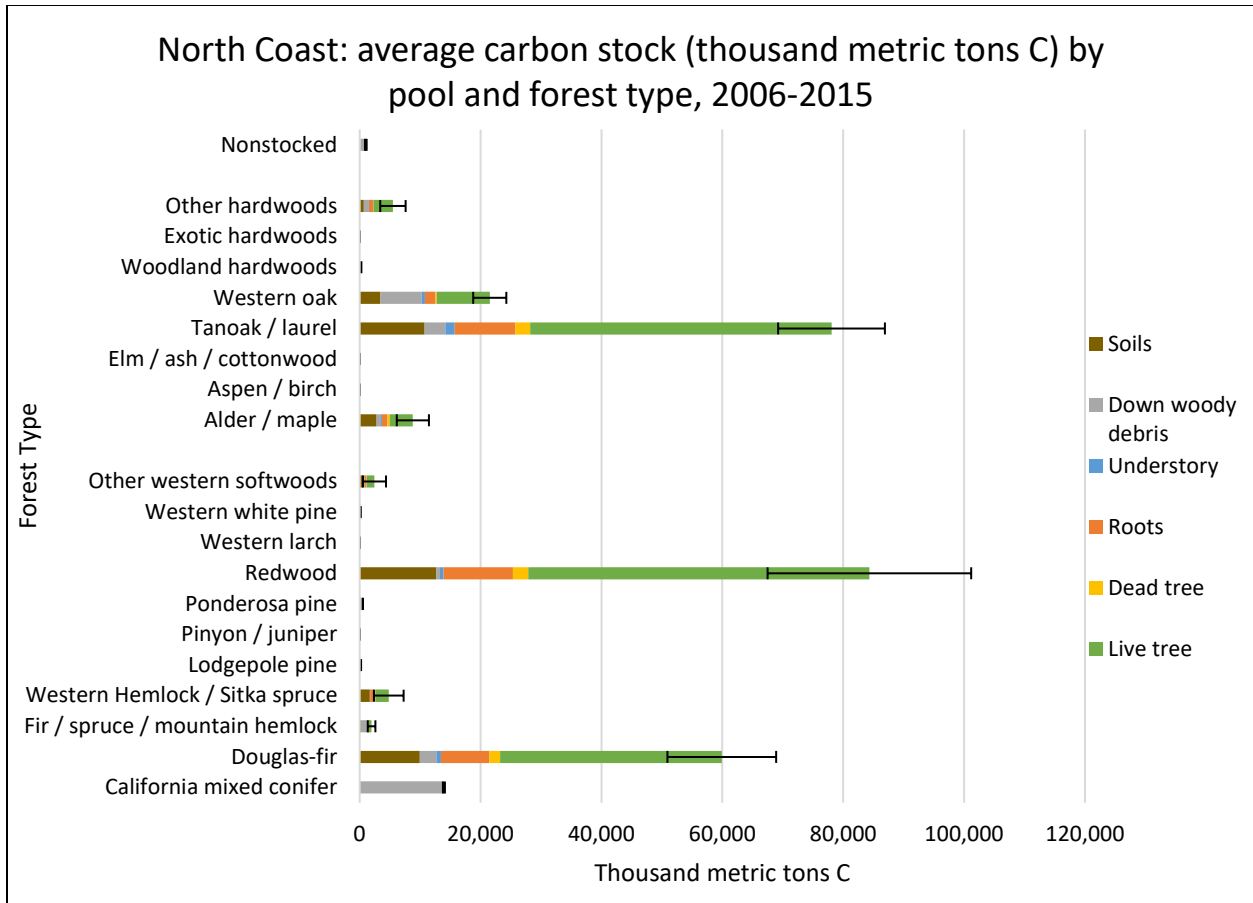


Figure A1.5.1. North Coast: average carbon stock (thousand metric tons C) by pool and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

Table A1.5.2: North Coast: Forest land carbon stocks (thousand metric tons C) by forest type and land status, 2006-2015.

Forest type group	North Coast					
	Unreserved Forests		Reserved Forests		All forest land	
	Timberland	Other Forest	Productive	Other Forest		
Softwoods:	Total	Total	Total	Total	Total	SE
	<i>Thousand metric tons C</i>					
California mixed conifer	157	--	--	--	157	84
Douglas-fir	49,759	--	11,931	--	61,689	4,589
Fir / spruce / mountain hemlock	770	--	--	--	770	322
Western Hemlock / Sitka spruce	5,074	--	--	--	5,074	1,252
Lodgepole pine	--	--	100	--	100	58
Pinyon / juniper	--	--	--	--	--	--
Ponderosa pine	--	--	--	--	--	--
Redwood	68,865	--	20,627	--	89,492	8,594
Western larch	--	--	--	--	--	--
Western white pine	--	--	--	--	--	--
Other western softwoods	1,895	--	15	467	2,389	972
Total	126,521	--	32,672	467	159,671	9,617
Hardwoods:						
Alder / maple	7,097	316	1,211	--	8,626	1,357
Aspen / birch	--	--	--	--	--	--
Elm / ash / cottonwood	--	--	--	--	--	--
Tanoak / laurel	65,548	3,535	9,126	1,760	79,978	4,507
Western oak	7,335	7,282	--	832	15,449	1,399
Woodland hardwoods	--	--	--	133	133	88
Exotic hardwoods	--	--	--	--	--	--
Other hardwoods	3,799	93	1,060	--	4,962	1,071
Total	83,779	11,226	11,407	2,733	109,138	4,948
Nonstocked	163	--	--	--	163	71
All forest types	210,465	11,226	44,080	3,203	268,972	10,397

Note: Totals may be off because of rounding

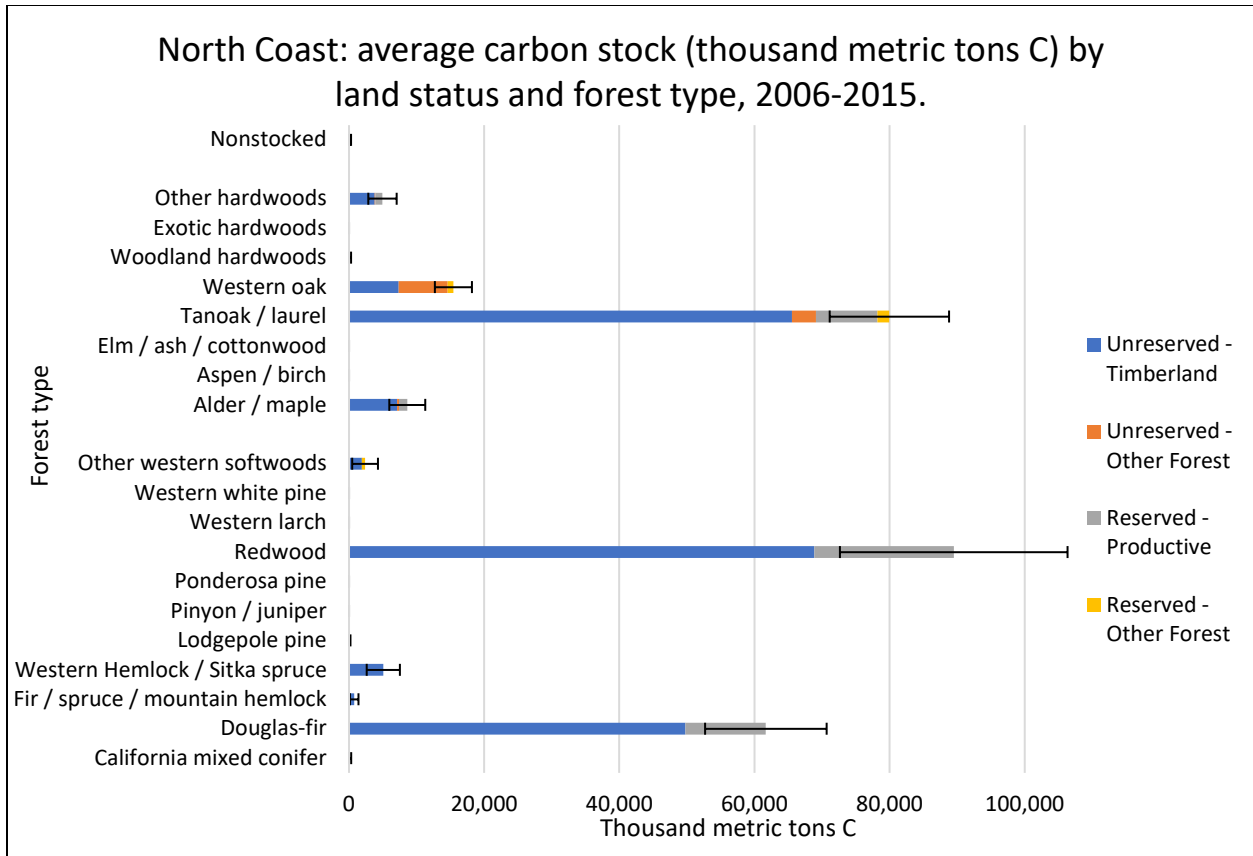


Figure A1.5.2. North Coast: average carbon stock (thousand metric tons C) by land status and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

A1.6 Sierra/Cascades

Table A1.6.1. Sierra/Cascades: Forest land carbon stocks (thousand metric tons C) by forest type and pool, 2006-2015.

Forest type group	Sierra/Cascades						All pools	
	Live tree	Dead tree	Roots	Understory	Down woody debris	Soils		
<i>Thousand metric tons C</i>								
Softwoods:	Total	Total	Total	Total	Total	Total	Total	SE
California mixed conifer	234,305	19,328	47,134	3,590	26,156	99,460	429,974	9,496
Douglas-fir	--	--	--	--		--	0	0
Fir / spruce / mountain hemlock	96,968	10,991	18,633	1,281	9,244	33,440	170,557	7,288
Western Hemlock / Sitka spruce	--	--	--	--		--	0	0
Lodgepole pine	29,416	3,193	6,812	707	4,215	13,360	57,703	2,975
Pinyon / juniper	2,270	156	512	637	605	3,790	7,970	655
Ponderosa pine	36,701	1,204	8,137	1,887	4,195	28,350	80,473	3,186
Redwood	28	--	--	5	42	70	151	84
Western larch	--	--	--	--		--	0	0
Western white pine	3,048	463	711	77	262	2,310	6,871	975
Other western softwoods	8,595	856	1,858	1,623	1,722	16,970	31,624	1,794
Hardwoods:								
Alder / maple	1,090	86	222	37	116	730	2,281	714
Aspen / birch	546	20	105	62	120	350	1,203	332
Elm / ash / cottonwood	132	1	--	17	9	210	388	181
Tanoak / laurel	2,966	39	574	132	424	880	5,015	1,201
Western oak	65,352	3,551	14,017	6,359	6,577	41,950	137,806	3,850
Woodland hardwoods	286	32	81	136	50	800	1,384	241
Exotic hardwoods	--	--	--	--		--	0	0
Other hardwoods	1,814	108	397	291	462	1,720	4,792	829
Nonstocked	777	3,877	1,006	936	1,629	7,320	15,545	1,241
All forest types	484,294	43,906	100,225	17,776	55,827	251,690	953,718	11,713

Note: Totals may be off because of rounding

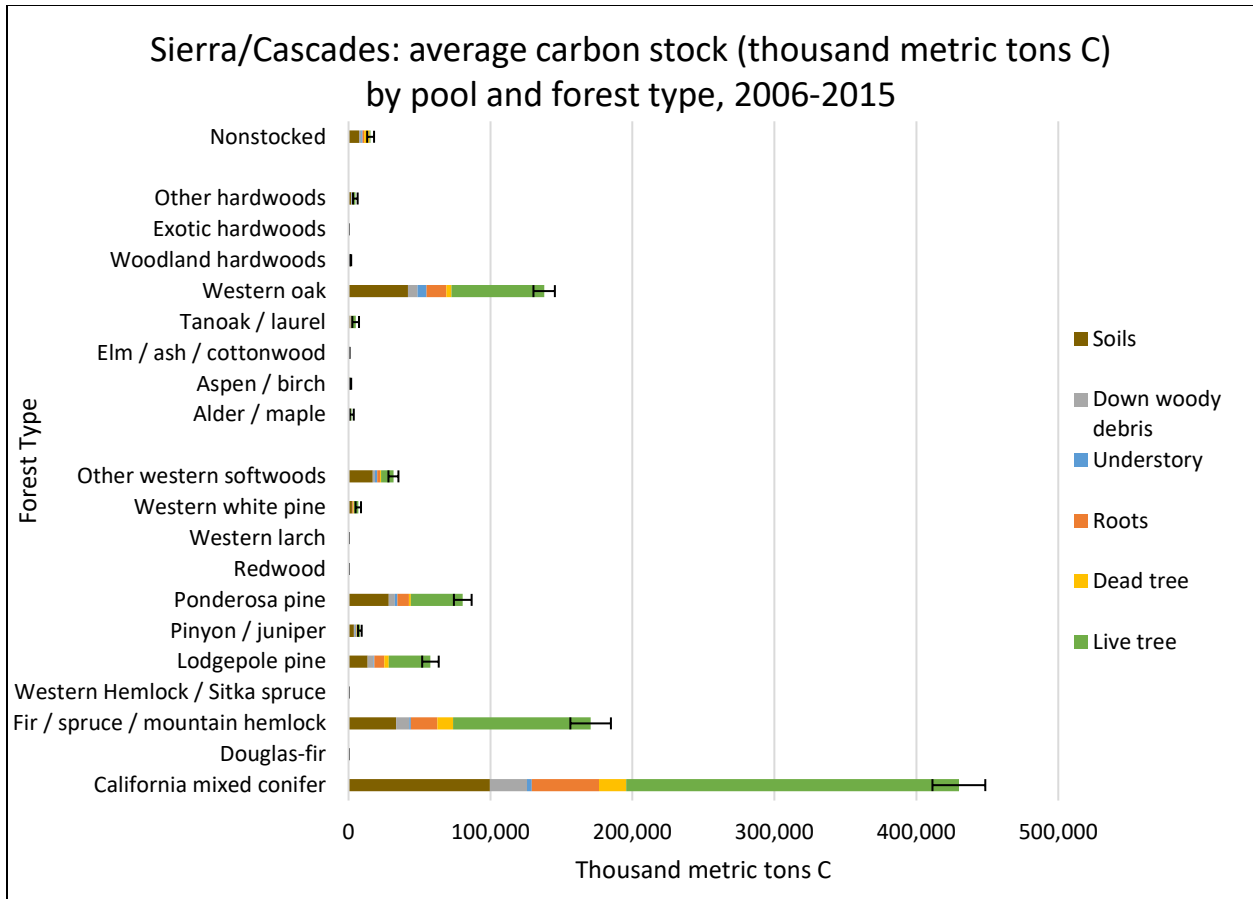


Figure A1.6.1. Sierra/Cascades: average carbon stock (thousand metric tons C) by pool and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

Table A1.6.2. Sierra/Cascade: Forest land carbon stocks (thousand metric tons C) by forest type and land status, 2006-2015.

Forest type group	Sierra/Cascades					
	Unreserved Forests		Reserved Forests		All forest land	
	Timberland	Other Forest	Productive	Other Forest		
Softwoods:	Total	Total	Total	Total	Total	SE
	<i>Thousand metric tons C</i>					
California mixed conifer	341,181	48,271	39,992	49,340	429,974	9,496
Douglas-fir	--	--	--	--	--	--
Fir / spruce / mountain hemlock	115,491	30,438	22,800	32,004	170,557	7,288
Western Hemlock / Sitka spruce	--	--	--	--	--	--
Lodgepole pine	16,323	17,182	18,356	25,722	57,703	2,975
Pinyon / juniper	157	3,377	1,086	3,292	7,970	655
Ponderosa pine	72,422	3,592	3,696	3,603	80,473	3,186
Redwood	151	--	--	--	151	84
Western larch	--	--	--	--	--	--
Western white pine	763	2,220	2,874	3,784	6,871	975
Other western softwoods	4,068	10,663	7,447	13,663	31,624	1,794
Total	550,553	115,741	96,249	131,400	785,314	11,605
Hardwoods:						
Alder / maple	2,281	--	--	--	2,281	714
Aspen / birch	278	404	285	552	1,203	332
Elm / ash / cottonwood	--	388	--	--	388	181
Tanoak / laurel	4,690	270	2	27	5,015	1,201
Western oak	46,209	48,025	5,910	10,514	137,806	3,850
Woodland hardwoods	256	710	91	305	1,384	241
Exotic hardwoods	--	--	--	--	--	--
Other hardwoods	3,069	1,190	15	68	4,792	829
Total	56,774	50,856	6,303	11,474	152,861	4,170
Nonstocked	12,160	1,049	1,202	1,161	15,545	1,241
All forest types	619,487	167,655	103,755	144,036	953,718	11,713

Note: Totals may be off because of rounding

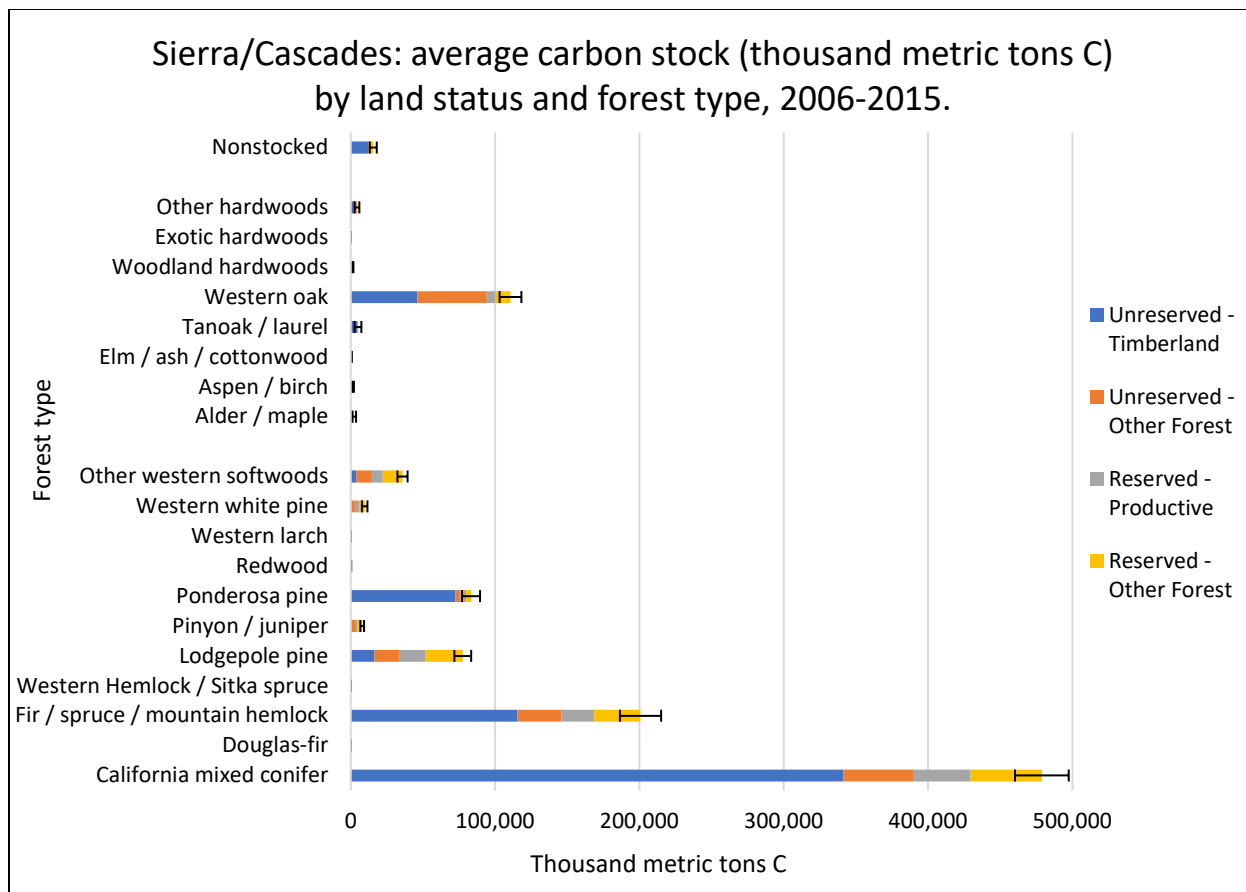


Figure A1.6.2. Sierra/Cascades: average carbon stock (thousand metric tons C) by land status and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

A1.7 South Coast Mountains and Deserts

Table A1.7.1. South Coast Mountains and Deserts: Forest land carbon stocks (thousand metric tons C) by forest type and pool, 2006-2015.

Forest type group	South Coast Mountains/Deserts						All pools	
	Live tree	Dead tree	Roots	Understory	Down woody debris	Soils		
	<i>Thousand metric tons C</i>						Total	SE
Softwoods:	Total	Total	Total	Total	Total	Total	Total	SE
California mixed conifer	2,440	354	453	60	442	1,550	5,299	1,009
Douglas-fir	--	--	--	--		--	0	0
Fir / spruce / mountain hemlock	524	41	90	8	45	220	927	432
Western Hemlock / Sitka spruce	--	--	--	--		--	0	0
Lodgepole pine	272	76	79	11	96	260	794	248
Pinyon / juniper	982	141	240	766	403	4,560	7,092	605
Ponderosa pine	1,028	49	235	50	157	940	2,459	497
Redwood	--	--	--	--		--	0	0
Western larch	--	--	--	--		--	0	0
Western white pine	--	--	--	--		--	0	0
Other western softwoods	303	38	61	22	55	430	909	298
Hardwoods:								
Alder / maple	181	2	34	9	5	160	391	204
Aspen / birch	--	--	--	--		--	0	0
Elm / ash / cottonwood	34	1	--	5	2	60	108	93
Tanoak / laurel	50	1	--	12	5	80	159	87
Western oak	6,781	1,198	1,540	870	1,317	5,650	17,356	1,199
Woodland hardwoods	481	56	89	167	129	960	1,882	292
Exotic hardwoods	3	--	--	4.1	7	20	34	22
Other hardwoods	84	1	--	68	10	380	563	162
Nonstocked	6	681	168	159	110	1,260	2,384	464
All forest types	13,169	2,638	3,026	2,208	2,783	16,530	40,355	1,935

Note: Totals may be off because of rounding

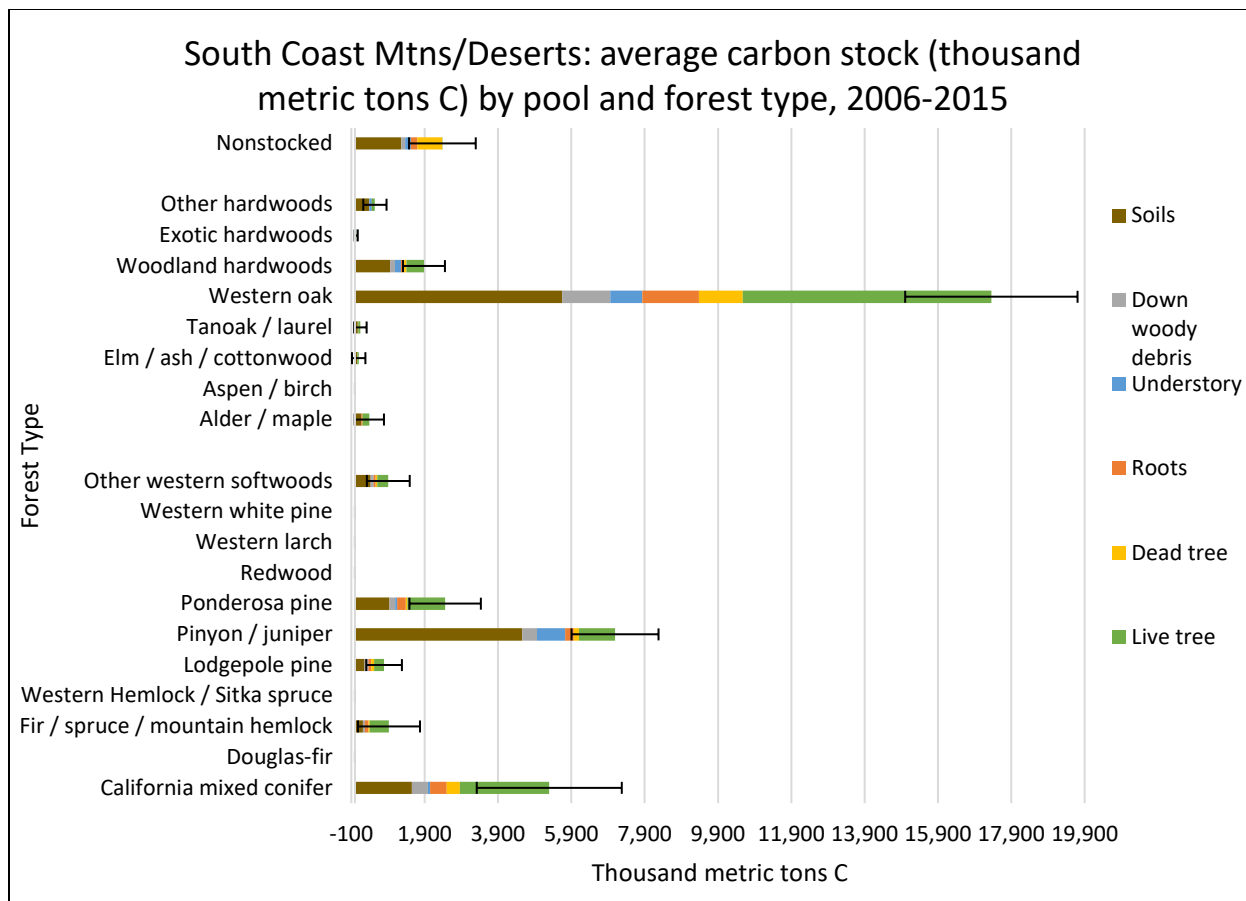


Figure A1.7.1. South Coast Mountains/Deserts: average carbon stock (thousand metric tons C) by pool and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

Table A1.7.2. South Coast Mountains/Deserts: Forest land carbon stocks (thousand metric tons C) by forest type and land status, 2006-2015.

Forest type group	South Coast Mountains/Deserts					
	Unreserved Forests		Reserved Forests		All forest land	
	Timberland	Other Forest	Productive	Other Forest		
Softwoods:	Total	Total	Total	Total	Total	SE
<i>Thousand metric tons C</i>						
California mixed conifer	2,538	--	2,759	--	5,299	1,009
Douglas-fir	--	--	--	--	--	--
Fir / spruce / mountain hemlock	927	--	--	--	927	432
Western Hemlock / Sitka spruce	--	--	--	--	--	--
Lodgepole pine	--	--	--	794	794	248
Pinyon / juniper	--	4,428	--	2,663	7,092	605
Ponderosa pine	967	--	1,492	--	2,459	497
Redwood	--	--	--	--	--	--
Western larch	--	--	--	--	--	--
Western white pine	--	--	--	--	--	--
Other western softwoods	558	289	--	61	909	298
Total	4,992	4,718	4,250	3,518	17,479	1,396
Hardwoods:						
Alder / maple	--	391	--	--	391	204
Aspen / birch	--	--	--	--	--	--
Elm / ash / cottonwood	--	--	--	107	108	93
Tanoak / laurel	--	--	--	159	159	87
Western oak	2,828	9,851	1,561	3,105	17,356	1,199
Woodland hardwoods	23	1,619	--	231	1,882	292
Exotic hardwoods	34	--	--	--	34	22
Other hardwoods	--	563	--	--	563	162
Total	2,895	12,432	1,561	3,604	20,492	1,266
Nonstocked	726	535	797	315	2,384	464
All forest types	8,623	17,686	6,609	7,438	40,355	1,935

Note: Totals may be off because of rounding

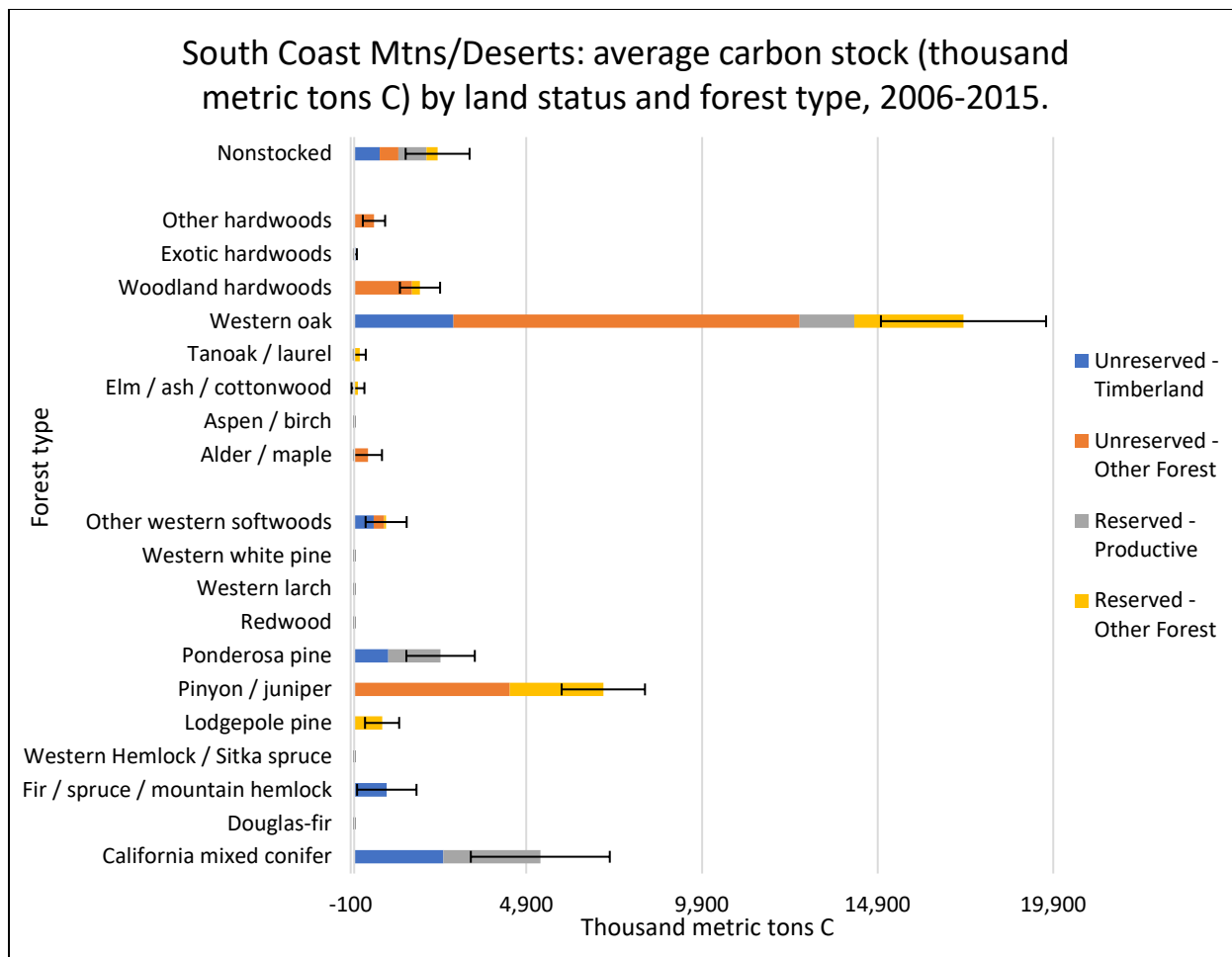


Figure A1.7.2. South Coast Mountains/Deserts: average carbon stock (thousand metric tons C) by land status and forest type, 2006-2015. Error bars represent the 95% confidence interval of total stock for each forest type.

Appendix 2: 2006 - 2015 California FIA forest carbon inventory tables

Flux are based on plots initially measured between 2001-2005 and re-measured between 2011-2015.

Stocks are based on 10-year averages with the current reporting period being 2006-2015.

A. Area

Sampled Area

Table A1- A8: Area of Sampled Land by Land Status and Owner Group, 2006-2015: [Region]

Table A1: Area of Sampled Land by Land Status and Ownership Group, 2006-2015: All California

Table A2: Area of Sampled Land by Land Status and Owner Group, 2006-2015: Central Coast and Interior Ranges

Table A3: Area of Sampled Land by Land Status and Owner Group, 2006-2015: Central Valley

Table A4: Area of Sampled Land by Land Status and Owner Group, 2006-2015: Eastside

Table A5: Area of Sampled Land by Land Status and Owner Group, 2006-2015: Klamath Interior Coast Ranges

Table A6: Area of Sampled Land by Land Status and Owner Group, 2006-2015: North Coast

Table A7: Area of Sampled Land by Land Status and Owner Group, 2006-2015: Sierra Cascades

Table A8: Area of Sampled Land by Land Status and Owner Group, 2006-2015: South Coast Mountains and Deserts

Forest Area for Forest Land Remaining Forest (FF)

Table A9- A16: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: [Region]

Table A9: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: All California

Table A10: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table A11: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: Central Valley

Table A12: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: Eastside

Table A13: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table A14: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: North Coast

Table A15: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Table A16: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Forest Area for Forest Land Remaining Forest (FF): By Forest Type, Owner Group and Forest Land Status

Table A17: Area of Forest Land by Forest Type, Owner Group and Forest Land Status, 2006-2015: All California

*regional tables will be included in future report

B. Net Carbon Flux for Forest Land Remaining Forest (FF)

Net Carbon Flux for All Pools by Owner Group

Tables B1- B10: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: [Region]

Table B1: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: All California

Table B2: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: Central Coast and Interior Ranges

Table B3: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: Central Valley

Table B4: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: Eastside

Table B5: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: Klamath Interior Coast Ranges

Table B6: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: North Coast

Table B7: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: Sierra Cascades

Table B8: Annual Net Change in Carbon Stocks on Forest Land for all Pools by Owner Group, 2001-2005 to 2011-2015: South Coast Mountains and Deserts

Disturbance Effects on Net Forest Carbon Flux

Table B9: Annual Net Change in Carbon Stocks for Aboveground Pools on Forest Land by Disturbance, Forest Land Status and Owner Group, 2001-2005 to 2011-2015: All California

Table B10: Annual Net Change Per Acre in Carbon Stock for Aboveground Pools on Forest Land by Disturbance, Forest Land Status and Owner Group, 2001-2005 to 2011-2015: All California

C. Forest Carbon Stocks for Forest Land Remaining Forest (FF): by Owner Group and Forest Land Status

Aboveground Live Tree Pool

Tables C1 – C8: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: [Region]

Table C1: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: All California (Same as Table C14)

Table C2: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table C3: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: Central Valley

Table C4: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: Eastside

Table C5: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table C6: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: North Coast

Table C7: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Table C8: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Tables C9 – C14: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, All California, (10-year averages): [Years]

Table C9: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, All California, (10-year averages): 2001-2010

Table C10: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, All California, (10-year averages): 2002-2011

Table C11: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, All California, (10-year averages): 2003-2012

Table C12: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, All California, (10-year averages): 2004-2013

Table C13: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, All California, (10-year averages): 2005-2014

Table C14: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, All California (10-year averages): 2006-2015 (Same as Table C1)

Aboveground Dead Tree Pool

Tables C15 - C22: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: [Region]

Table C15: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: All California (Same as Table C28)

Table C16: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table C17: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Central Valley

Table C18: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Eastside

Table C19: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table C20: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: North Coast

Table C21: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Table C22: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Tables C23 - C28 – Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees Foliage (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): [Years]

Table C23: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees Foliage (≥1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2001-2010

Table C24: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees Foliage (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2002-2011

Table C25: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees Foliage (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2003-2012

Table C26: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees Foliage (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2004-2013

Table C27: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees Foliage (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2005-2014

Table C28: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees Foliage (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2006-2015 (Same as Table C15)

Aboveground Live Understory Vegetation Pool

Tables C29 - C36: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: [Region]

Table C29: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: All California (information from Table C29 combined with information from Table C43 in Table C42)

Table C30: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table C31: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: Central Valley

Table C32: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: Eastside

Table C33: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table C34: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: North Coast

Table C35: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Table C36: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Aboveground and Belowground Live Understory Vegetation, 10-Year Averages

Tables C37 – C42: Aboveground and Belowground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, All California (10-year averages): [Years]

Table C37: Aboveground and Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, All California (10-year averages): 2001-2010

Table C38: Aboveground and Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, All California (10-year averages): 2002-2011

Table C39: Aboveground and Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, All California (10-year averages): 2003-2012

Table C40: Aboveground and Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, All California (10-year averages): 2004-2013

Table C41: Aboveground and Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, All California (10-year averages): 2005-2014

Table C42: Aboveground and Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, All California (10-year averages): 2006-2015 (Same as Table C29 and Table C43 combined)

Belowground Live Understory Vegetation Pool

Tables C43 – C50: Belowground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: [Region]

Table C43: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: All California (information from Table C43 combined with information from Table C29 in Table C42)

Table C44: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table C45: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: Central Valley

Table C46: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: Eastside

Table C47: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table C48: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: North Coast

Table C49: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Table C50: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Belowground Live Tree Pool

Tables C51 - 58: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: [Region]

Table C51: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: All California (information from Table C51 combined with information from Table C65 in Table C64)

Table C52: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Range

Table C53: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Central Valley

Table C54: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Eastside

Table C55: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table C56: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: North Coast

Table C57: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Table C58: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Belowground Live and Dead Tree Pool, 10-year averages

Tables C59 - C64: Belowground Carbon, Dry Weight of Live and Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): [Years]

Table C59: Belowground Carbon, Dry Weight of Live and Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2001-2010

Table C60: Belowground Carbon, Dry Weight of Live and Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2002-2011

Table C61: Belowground Carbon, Dry Weight of Live and Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2003-2012

Table C62: Belowground Carbon, Dry Weight of Live and Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2004-2013

Table C63: Belowground Carbon, Dry Weight of Live and Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2005-2014

Table C64: Belowground Carbon, Dry Weight of Live Trees and Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2006-2015 (Same as Table C51 and Table C65 combined)

Belowground Dead Tree Pool

Tables C65 – 72: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: [Regions]

Table C65: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: All California

Table C66: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table C67: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Central Valley

Table C68: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Eastside

Table C69: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table C70: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: North Coast

Table C71: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Table C72: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Soil Organic Carbon Pool

Tables C73 – C80: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: [Region]

Table C73: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: All California (Same as Table C86)

Table C74: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table C75: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: Central Valley

Table C76: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: Eastside

Table C77: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table C78: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: North Coast

Table C79: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Table C80: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Tables C81 – C86: Soil Organic Carbon by Owner Group and Forest Land Status, All California (10 year averages): [Years]

Table C81: Soil Organic Carbon by Owner Group and Forest Land Status, All California (10-year averages): 2001-2010

Table C82: Soil Organic Carbon by Owner Group and Forest Land Status, All California (10-year averages): 2002-2011

Table C83: Soil Organic Carbon by Owner Group and Forest Land Status, All California (10-year averages): 2003-2012

Table C84: Soil Organic Carbon by Owner Group and Forest Land Status, All California (10-year averages): 2004-2013

Table C85: Soil Organic Carbon by Owner Group and Forest Land Status, All California (10-year averages): 2005-2014

Table C86: Soil Organic Carbon by Owner Group and Forest Land Status, All California (10-year averages): 2006-2015 (Same as Table C73)

Aboveground Down Dead Wood Pool

Tables C87 – C94: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2005-2016: [Region]

Table C87: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2005-2016: All California (information duplicated in Table C100)

Table C88: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2005-2016: Central Coast and Interior Ranges

Table C89: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2005-2016: Central Valley

Table C90: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2005-2016: Eastside

Table C91: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2005-2016: Klamath Interior Coast Ranges

Table C92: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2005-2016: North Coast

Table C93: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2005-2016: Sierra Cascades

Table C94: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2005-2016: South Coast Mountains and Deserts

Tables C95 - C100: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, All California (10-year averages): [Years]

Table C95: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, All California (10-year averages): 2001-2010

Table C96: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, All California (10-year averages): 2002-2011

Table C97: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, All California (10-year averages): 2003-2012

Table C98: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, All California (10-year averages): 2004-2013

Table C99: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, All California (10-year averages): 2005-2014

Table C100: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, All California (10-year averages): 2006-2015 (information duplicated in Table C87)

D. Forest Carbon Stocks for Forest Land Remaining Forest (FF): by Forest Type and Forest Land Status

Aboveground Live Tree Pool

Tables D1 - D8: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: [Region]

Table D1: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Land Status, 2006-2015: All California

Table D2: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Land Status, 2006-2015: Central Coast and Interior Ranges

Table D3: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Land Status, 2006-2015: Central Valley

Table D4: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Land Status, 2006-2015: Eastside

Table D5: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Land Status, 2006-2015: Klamath Interior Coast Ranges

Table D6: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Land Status, 2006-2015: North Coast

Table D7: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Land Status, 2006-2015: Sierra Cascades

Table D8: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Land Status, 2006-2015: South Coast Mountains and Deserts

Aboveground Dead Tree Pool

Tables D9 – D16: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: [Region]

Table D9: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: All California

Table D10: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table D11: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Central Valley

Table D12: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inches) by Forest Type and Forest Land Status, 2006-2015: Eastside

Table D13: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table D14: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: North Coast

Table D15: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Table D16: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status - South Coast Mountains and Deserts

Aboveground Live Understory Vegetation Pool

Tables D17 – D24: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Forest Type and Forest Land Status, 2006-2015: [Region]

Table D17: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: All California

Table D18: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table D19: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Central Valley

Table D20: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Eastside

Table D21: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table D22: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: North Coast

Table D23: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Table D24: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Belowground Live Understory Vegetation Pool

Tables D25 - D32 – Belowground Carbon, Dry Weight of Live Understory Vegetation by Forest Type and Forest Land Status, 2006-2015: [Region]

Table D25: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: All California

Table D26: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table D27: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Central Valley

Table D28: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Eastside

Table D29: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table D30: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: North Coast

Table D31: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Table D32: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Belowground Live Tree Pool

Tables D33 – D40 – Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: [Region]

Table D33: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: All California

Table D34: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table D35: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Central Valley

Table D36: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Eastside

Table D37: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table D38: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: North Coast

Table D39: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Table D40: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Belowground Dead Tree Pool

Tables D41 - 48 – Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: [Region]

Table D41: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: All California

Table D42: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table D43: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Central Valley

Table D44: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Eastside

Table D45: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table D46: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: North Coast

Table D47: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Table D48: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Soil Organic Carbon Pool

Tables D49 – D56 – Soil Organic Carbon by Forest Type Group and Forest Land Status, 2006-2015: [Region]

Table D49: Soil Organic Carbon by Forest Type Group and Forest Land Status, 2006-2015: All California

Table D50: Soil Organic Carbon by Forest Type Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table D51: Soil Organic Carbon by Forest Type Group and Forest Land Status, 2006-2015: Central Valley

Table D52: Soil Organic Carbon by Forest Type Group and Forest Land Status, 2006-2015: Eastside

Table D53: Soil Organic Carbon by Forest Type Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table D54: Soil Organic Carbon by Forest Type Group and Forest Land Status, 2006-2015: North Coast

Table D55: Soil Organic Carbon by Forest Type Group and Forest Land Status, 2006-2015: Sierra Cascades

Table D56: Soil Organic Carbon by Forest Type Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Aboveground Down Dead Wood Pool:

Tables D57 – D64 – Aboveground Carbon Mass of Down Dead Wood by Forest Type Group and Forest Land Status, 2006-2015: [Region]

Table D57: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: All California

Table D58: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Table D59: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: Central Valley

Table D60: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: Eastside

Table D61: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Table D62: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: North Coast

Table D63: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Table D64: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

E. Forest Land Conversions (LF)

Changes in Area from Forest Land-Use Conversions

Table E1: Annual Change in Forest Land Area To and From Other IPCC Land-Use Classes in California, 2001-2005 to 2011-2015

Net Forest Carbon Flux from Forest Land-Use Conversions

Table E2: Annual Change in Carbon Pools Due to Change in Land-Use Between Forest and Non-forest in California, 2001-2005 to 2011-2015

F. Net Flux from Other GHG emissions

Table F1 - Annual Net Emissions of Non-CO₂e Greenhouse Gases from Fire, 2001-2005 to 2011-2015

Table A1: Area of Sampled Land by Land Status and Ownership Group, 2006-2015: All California

Land Status	Ownership Group											
	National Forest		Other Federal		State and Local Govt.		Private		Unknown		Total	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>											
Unreserved Forest Land:												
Timberland	8,871	121	311	42	144	28	7,252	120	--	--	16,577	169
Other Unreserved Forest Land	2,440	100	1,110	75	167	30	5,140	140	--	--	8,857	187
Total, Unreserved	11,310	120	1,421	85	311	41	12,392	153	--	--	25,434	203
Reserved Forest Land:												
Reserved Productive Forest Land	2,782	91	1,026	62	329	36	--	--	--	--	4,137	115
Other Reserved Forest Land	1,231	76	694	61	446	46	--	--	--	--	2,371	108
Total, Reserved Forest Land	4,013	93	1,720	81	775	55	--	--	--	--	6,508	134
Total, Forest Land	15,323	122	3,141	100	1,086	61	12,392	153	--	--	31,941	201
Nonforest and Other Area:												
Nonforest Land	5,210	113	23,597	130	2,870	87	36,266	185	25	13	67,969	212
Noncensus Water	28	8	20	9	9	4	122	24	--	--	179	27
Census Water	--	--	--	--	4,974	69	--	--	--	--	4,974	69
Total, Nonforest and Other Area	5,238	113	23,617	130	7,854	107	36,388	184	25	13	73,122	202
Total, All Sampled Area	20,561	68	26,758	127	8,940	117	48,779	154	25	13	105,064	45

Table A2: Area of Sampled Land by Land Status and Ownership Group, 2006-2015: Central Coast and Interior Ranges

Land Status	Ownership Group											
	National Forest		Other Federal		State and Local Govt.		Private		Unknown		Total	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>											
Unreserved Forest Land:												
Timberland	2	1	--	--	15	9	197	34	--	--	214	35
Other Unreserved Forest Land	83	21	128	27	33	13	909	67	--	--	1,153	77
Total, Unreserved	84	21	128	27	48	16	1,106	75	--	--	1,367	84
Reserved Forest Land:												
Reserved Productive Forest Land	30	13	--	--	80	21	--	--	--	--	110	25
Other Reserved Forest Land	124	27	10	8	237	34	--	--	--	--	372	44
Total, Reserved Forest Land	154	30	10	8	318	38	--	--	--	--	482	49
Total, Forest Land	239	37	139	28	365	40	1,106	75	--	--	1,849	96
Nonforest and Other Area:												
Nonforest Land	479	52	717	66	332	43	5,849	176	12	9	7,389	199
Noncensus Water	--	--	4	4	1	1	12	7	--	--	17	8
Census Water	--	--	--	--	1,015	72	--	--	--	--	1,015	72
Total, Nonforest and Other Area	479	52	721	66	1,348	84	5,861	177	12	9	8,421	212
Total, All Sampled Area	718	64	859	72	1,713	94	6,967	194	12	9	10,270	234

Table A3: Area of Sampled Land by Land Status and Ownership Group, 2006-2015: Central Valley

Land Status	Ownership Group											
	National Forest		Other Federal		State and Local Govt.		Private		Unknown		Total	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>											
Unreserved Forest Land:												
Timberland	--	--	--	--	--	--			--	--		
Other Unreserved Forest Land	--	--	--	--	4	3	80	20	--	--	84	21
Total, Unreserved	--	--	--	--	4	3	80	20	--	--	84	21
Reserved Forest Land:												
Reserved Productive Forest Land	--	--	--	--	--	--	--	--	--	--	--	--
Other Reserved Forest Land	--	--	1	1	5	5	--	--	--	--	6	5
Total, Reserved Forest Land	--	--	1	1	5	5	--	--	--	--	6	5
Total, Forest Land	--	--	1	1	9	6	80	20	--	--	90	21
Nonforest and Other Area:												
Nonforest Land	--	--	267	41	161	31	11,741	215	7	7	12,175	220
Noncensus Water	--	--	--	--	2	2	24	12	--	--	26	13
Census Water	--	--	--	--	152	30	--	--	--	--	152	30
Total, Nonforest and Other Area	--	--	267	41	315	44	11,766	215	7	7	12,354	222
Total, All Sampled Area	--	--	267	41	324	45	11,845	216	7	7	12,443	223

Table A4: Area of Sampled Land by Land Status and Ownership Group, 2006-2015: Eastside

Land Status	Ownership Group											
	National Forest		Other Federal		State and Local Govt.		Private		Unknown		Total	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>											
Unreserved Forest Land:												
Timberland	699	61	32	14	--	--	304	42	--	--	1,036	76
Other Unreserved Forest Land	829	64	491	52	6	6	228	37	--	--	1,554	91
Total, Unreserved	1,528	87	523	54	6	6	532	56	--	--	2,590	117
Reserved Forest Land:												
Reserved Productive Forest Land	55	18	--	--	6	6	--	--	--	--	60	19
Other Reserved Forest Land	106	26	121	27	9	8	--	--	--	--	236	39
Total, Reserved Forest Land	161	32	121	27	15	10	--	--	--	--	296	43
Total, Forest Land	1,689	92	644	59	21	12	532	56	--	--	2,886	124
Nonforest and Other Area:												
Nonforest Land	1,052	72	3,770	142	304	42	1,290	86	--	--	6,416	184
Noncensus Water	--	--	--	--	--	--	6	6	--	--	6	6
Census Water	--	--	--	--	299	43	--	--	--	--	299	43
Total, Nonforest and Other Area	1,052	72	3,770	142	603	60	1,296	86	--	--	6,721	189
Total, All Sampled Area	2,741	113	4,414	151	624	61	1,828	102	--	--	9,607	222

Table A5: Area of Sampled Land by Land Status and Ownership Group, 2006-2015: Klamath Interior Coast Ranges

Land Status	Ownership Group											
	National Forest		Other Federal		State and Local Govt.		Private		Unknown		Total	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>											
Unreserved Forest Land:												
Timberland	2,587	106	133	29	20	10	1,676	94	--	--	4,416	145
Other Unreserved Forest Land	380	46	126	26	22	11	1,216	80	--	--	1,744	96
Total, Unreserved	2,967	113	259	39	42	15	2,892	121	--	--	6,160	170
Reserved Forest Land:												
Reserved Productive Forest Land	1,318	73	66	20	7	5	--	--	--	--	1,391	76
Other Reserved Forest Land	275	40	65	19	25	12	--	--	--	--	365	46
Total, Reserved Forest Land	1,594	81	131	28	31	14	--	--	--	--	1,756	86
Total, Forest Land	4,561	133	389	47	73	20	2,892	121	--	--	7,916	186
Nonforest and Other Area:												
Nonforest Land	340	42	339	44	75	19	2,155	107	6	6	2,916	124
Noncensus Water	7	4	2	2	2	2	45	14	--	--	56	15
Census Water	--	--	--	--	178	32	--	--	--	--	178	32
Total, Nonforest and Other Area	348	42	341	44	254	38	2,200	108	6	6	3,149	129
Total, All Sampled Area	4,909	140	731	66	328	44	5,092	162	6	6	11,065	227

Table A6: Area of Sampled Land by Land Status and Ownership Group, 2006-2015: North Coast

Land Status	Ownership Group											
	National Forest		Other Federal		State and Local Govt.		Private		Unknown		Total	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>											
Unreserved Forest Land:												
Timberland	23	12	60	19	53	17	2,050	98	--	--	2,185	101
Other Unreserved Forest Land	7	6	2	3	5	3	198	32	--	--	212	32
Total, Unreserved	29	13	62	20	57	18	2,248	102	--	--	2,397	106
Reserved Forest Land:												
Reserved Productive Forest Land	12	9	90	23	150	27	--	--	--	--	252	37
Other Reserved Forest Land	--	--	7	6	50	17	--	--	--	--	57	18
Total, Reserved Forest Land	12	9	96	24	200	32	--	--	--	--	308	41
Total, Forest Land	41	16	158	30	258	33	2,248	102	--	--	2,705	111
Nonforest and Other Area:												
Nonforest Land	--	--	100	25	82	21	1,124	80	--	--	1,306	86
Noncensus Water	--	--	--	--	1	2	15	8	--	--	17	8
Census Water	--	--	--	--	1,042	73	--	--	--	--	1,042	73
Total, Nonforest and Other Area	--	--	100	25	1,125	76	1,139	80	--	--	2,364	113
Total, All Sampled Area	41	16	258	39	1,382	83	3,388	132	--	--	5,069	161

Table A7: Area of Sampled Land by Land Status and Ownership Group, 2006-2015: Sierra Cascades

Land Status	Ownership Group											
	National Forest		Other Federal		State and Local Govt.		Private		Unknown		Total	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>											
Unreserved Forest Land:												
Timberland	5,420	134	84	22	56	18	2,990	115	--	--	8,550	177
Other Unreserved Forest Land	793	65	265	39	73	21	2,258	103	--	--	3,388	129
Total, Unreserved	6,213	141	349	45	129	28	5,247	146	--	--	11,939	206
Reserved Forest Land:												
Reserved Productive Forest Land	1,246	77	870	59	75	21	--	--	--	--	2,192	99
Other Reserved Forest Land	581	55	364	46	70	20	--	--	--	--	1,015	74
Total, Reserved Forest Land	1,827	86	1,235	71	145	29	--	--	--	--	3,206	115
Total, Forest Land	8,040	159	1,584	79	273	40	5,247	146	--	--	15,145	226
Nonforest and Other Area:												
Nonforest Land	1,599	84	1,132	78	145	26	3,376	133	--	--	6,252	177
Noncensus Water	21	7	8	4	3	2	13	6	--	--	45	10
Census Water	--	--	--	--	292	42	--	--	--	--	292	42
Total, Nonforest and Other Area	1,619	84	1,140	78	440	49	3,390	133	--	--	6,589	182
Total, All Sampled Area	9,659	172	2,724	105	714	64	8,637	192	--	--	21,734	277

Table A8: Area of Sampled Land by Land Status and Ownership Group, 2006-2015: South Coast Mountains and Deserts

Land Status	Ownership Group											
	National Forest		Other Federal		State and Local Govt.		Private		Unknown		Total	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>											
Unreserved Forest Land:												
Timberland	139	29	2	2	--	--	35	14	--	--	177	32
Other Unreserved Forest Land	349	43	97	24	24	11	250	37	--	--	721	63
Total, Unreserved	489	51	99	24	24	11	286	40	--	--	898	70
Reserved Forest Land:												
Reserved Productive Forest Land	121	28	--	--	11	9	--	--	--	--	132	29
Other Reserved Forest Land	144	30	126	28	51	18	--	--	--	--	321	44
Total, Reserved Forest Land	265	40	126	28	62	19	--	--	--	--	453	53
Total, Forest Land	754	65	225	36	86	22	286	40	--	--	1,351	87
Nonforest and Other Area:												
Nonforest Land	1,740	87	17,273	167	1,773	76	10,731	221	--	--	31,516	288
Noncensus Water	--	--	6	6	--	--	6	6	--	--	12	9
Census Water	--	--	--	--	1,995	90	--	--	--	--	1,995	90
Total, Nonforest and Other Area	1,740	87	17,279	167	3,768	117	10,737	221	--	--	33,524	299
Total, All Sampled Area	2,493	105	17,504	168	3,855	118	11,023	224	--	--	34,875	307

Table A9: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: All California

Owner Class	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>													
USDA Forest Service:														
National Forest	8,871	121	2,440	100	11,310	120	2,782	91	1,231	76	4,013	93	15,323	122
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	8,871	121	2,440	100	11,310	120	2,782	91	1,231	76	4,013	93	15,323	122
Other Federal Government:														
Bureau of Land Management	297	42	932	69	1,229	80	50	18	212	36	262	40	1,491	86
Department of Defense and Energy	13	9	72	20	85	22	--	--	5	6	5	6	91	23
National Park Service	--	--	--	--	--	--	972	60	462	52	1,434	76	1,434	76
U.S. Fish and Wildlife Service	--	--	--	--	--	--	4	4	1	1	4	4	4	4
Other Federal	--	--	107	25	107	25	--	--	14	9	14	9	121	26
Total	311	42	1,110	75	1,421	85	1,026	62	694	61	1,720	81	3,141	100
State and Local Government:														
Local	49	17	115	25	164	30	38	14	167	30	205	32	370	43
State	95	22	44	16	138	27	286	33	273	38	559	48	697	48
Other Public	--	--	9	7	9	7	5	5	6	6	11	8	19	11
Total	144	28	167	30	311	41	329	36	446	46	775	55	1,086	61
Private:														
Corporate	4,249	122	772	65	5,021	134	--	--	--	--	--	--	5,021	134
Noncorporate Private:														
Total, Noncorporate Private	3,003	116	4,368	133	7,371	164	--	--	--	--	--	--	7,371	164
All Private	7,252	120	5,140	140	12,392	153	--	--	--	--	--	--	12,392	153
All Owners	16,577	169	8,857	187	25,434	203	4,137	115	2,371	108	6,508	134	31,941	201

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

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

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

Table A10: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Owner Class	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>													
USDA Forest Service:														
National Forest	2	1	83	21	84	21	30	13	124	27	154	30	239	37
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	2	1	83	21	84	21	30	13	124	27	154	30	239	37
Other Federal Government:														
Bureau of Land Management	--	--	63	19	63	19	--	--	5	5	5	5	67	20
Department of Defense and Energy	--	--	44	15	44	15	--	--	--	--	--	--	44	15
National Park Service	--	--	--	--	--	--	--	--	6	6	6	6	6	6
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	22	11	22	11	--	--	--	--	--	--	22	11
Total	--	--	128	27	128	27	--	--	10	8	10	8	139	28
State and Local Government:														
Local	--	--	25	11	25	11	38	14	111	24	150	27	175	29
State	15	9	8	7	22	11	37	15	120	25	157	29	179	31
Other Public	--	--	--	--	--	--	5	5	6	6	11	8	11	8
Total	15	9	33	13	48	16	80	21	237	34	318	38	365	40
Private:														
Corporate	36	14	139	27	175	31	--	--	--	--	--	--	175	31
Noncorporate Private:														
Total, Noncorporate Private	162	31	769	62	931	69	--	--	--	--	--	--	931	69
All Private	197	34	909	67	1,106	75	--	--	--	--	--	--	1,106	75
All Owners	214	35	1,153	77	1,367	84	110	25	372	44	482	49	1,849	96

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

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

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

Table A11: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: Central Valley

Owner Class	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>													
USDA Forest Service:														
National Forest	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal Government:														
Bureau of Land Management	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	1	1	1	1	1	1
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	1	1	1	1	1	1
State and Local Government:														
Local	--	--	4	3	4	3	--	--	--	--	--	--	4	3
State	--	--	--	--	--	--	--	--	5	5	5	5	5	5
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	4	3	4	3	--	--	5	5	5	5	9	6
Private:														
Corporate	--	--	7	6	7	6	--	--	--	--	--	--	7	6
Noncorporate Private:														
Total, Noncorporate Private	--	--	73	19	73	19	--	--	--	--	--	--	73	19
All Private	--	--	80	20	80	20	--	--	--	--	--	--	80	20
All Owners	--	--	84	21	84	21	--	--	6	5	6	5	90	21

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

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

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

Table A12: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: Eastside

Owner Class	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>													
USDA Forest Service:														
National Forest	699	61	829	64	1,528	87	55	18	106	26	161	32	1,689	92
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	699	61	829	64	1,528	87	55	18	106	26	161	32	1,689	92
Other Federal Government:														
Bureau of Land Management	32	14	456	50	489	52	--	--	54	19	54	19	543	55
Department of Defense and Energy	--	--	28	14	28	14	--	--	--	--	--	--	28	14
National Park Service	--	--	--	--	--	--	--	--	66	20	66	20	66	20
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	6	6	6	6	--	--	--	--	--	--	6	6
Total	32	14	491	52	523	54	--	--	121	27	121	27	644	59
State and Local Government:														
Local	--	--	6	6	6	6	--	--	--	--	--	--	6	6
State	--	--	--	--	--	--	6	6	9	8	15	10	15	10
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	6	6	6	6	6	6	9	8	15	10	21	12
Private:														
Corporate	191	34	65	20	256	39	--	--	--	--	--	--	256	39
Noncorporate Private:														
Total, Noncorporate Private	113	26	163	32	277	41	--	--	--	--	--	--	277	41
All Private	304	42	228	37	532	56	--	--	--	--	--	--	532	56
All Owners	1,036	76	1,554	91	2,590	117	60	19	236	39	296	43	2,886	124

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

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

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

Table A13: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Owner Class	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>													
USDA Forest Service:														
National Forest	2,587	106	380	46	2,967	113	1,318	73	275	40	1,594	81	4,561	133
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	2,587	106	380	46	2,967	113	1,318	73	275	40	1,594	81	4,561	133
Other Federal Government:														
Bureau of Land Management	133	29	119	26	251	39	6	6	24	12	29	14	281	41
Department of Defense and Energy	--	--	--	--	--	--	--	--	5	6	5	6	5	6
National Park Service	--	--	--	--	--	--	60	19	35	14	95	24	95	24
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	7	5	7	5	--	--	1	1	1	1	8	6
Total	133	29	126	26	259	39	66	20	65	19	131	28	389	47
State and Local Government:														
Local	7	6	11	8	18	10	--	--	6	6	6	6	24	11
State	13	9	10	7	23	11	7	5	19	11	25	13	49	17
Other Public	--	--	1	1	1	1	--	--	--	--	--	--	1	1
Total	20	10	22	11	42	15	7	5	25	12	31	14	73	20
Private:														
Corporate	928	72	212	35	1,140	80	--	--	--	--	--	--	1,140	80
Noncorporate Private:														
Total, Noncorporate Private	748	65	1,004	73	1,752	97	--	--	--	--	--	--	1,752	97
All Private	1,676	94	1,216	80	2,892	121	--	--	--	--	--	--	2,892	121
All Owners	4,416	145	1,744	96	6,160	170	1,391	76	365	46	1,756	86	7,916	186

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

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

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

Table A14: Area of Forest Land by Owner Group and Class and Forest Land Status, 2006-2015: North Coast

Owner Class	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>													
USDA Forest Service:														
National Forest	23	12	7	6	29	13	12	9	--	--	12	9	41	16
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	23	12	7	6	29	13	12	9	--	--	12	9	41	16
Other Federal Government:														
Bureau of Land Management	48	17	--	--	48	17	43	16	--	--	43	16	91	24
Department of Defense and Energy	11	9	--	--	11	9	--	--	--	--	--	--	11	9
National Park Service	--	--	--	--	--	--	43	17	7	6	50	18	50	18
U.S. Fish and Wildlife Service	--	--	--	--	--	--	4	4	--	--	4	4	4	4
Other Federal	--	--	2	3	2	3	--	--	--	--	--	--	2	3
Total	60	19	2	3	62	20	90	23	7	6	96	24	158	30
State and Local Government:														
Local	7	7	3	3	10	7	--	--	38	15	38	15	48	16
State	46	16	2	2	47	16	150	27	12	9	163	28	210	28
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	53	17	5	3	57	18	150	27	50	17	200	32	258	33
Private:														
Corporate	1,200	79	33	13	1,232	80	--	--	--	--	--	--	1,232	80
Noncorporate Private:														
Total, Noncorporate Private	850	69	166	29	1,016	74	--	--	--	--	--	--	1,016	74
All Private	2,050	98	198	32	2,248	102	--	--	--	--	--	--	2,248	102
All Owners	2,185	101	212	32	2,397	106	252	37	57	18	308	41	2,705	111

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

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

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

Table A15: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Owner Class	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>													
USDA Forest Service:														
National Forest	5,420	134	793	65	6,213	141	1,246	77	581	55	1,827	86	8,040	159
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	5,420	134	793	65	6,213	141	1,246	77	581	55	1,827	86	8,040	159
Other Federal Government:														
Bureau of Land Management	84	22	250	38	334	44	2	2	96	24	98	24	431	49
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	869	59	266	40	1,135	68	1,135	68
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	16	10	16	10	--	--	2	2	2	2	18	10
Total	84	22	265	39	349	45	870	59	364	46	1,235	71	1,584	79
State and Local Government:														
Local	35	15	47	17	82	22	--	--	5	5	5	5	87	23
State	21	11	18	11	39	16	75	21	64	20	139	29	178	32
Other Public	--	--	8	7	8	7	--	--	--	--	--	--	8	7
Total	56	18	73	21	129	28	75	21	70	20	145	29	273	40
Private:														
Corporate	1,890	98	274	40	2,164	104	--	--	--	--	--	--	2,164	104
Noncorporate Private:														
Total, Noncorporate Private	1,100	77	1,984	97	3,084	121	--	--	--	--	--	--	3,084	121
All Private	2,990	115	2,258	103	5,247	146	--	--	--	--	--	--	5,247	146
All Owners	8,550	177	3,388	129	11,939	206	2,192	99	1,015	74	3,206	115	15,145	226

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

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

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

Table A16: Area of Forest Land by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Owner Class	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand acres</i>													
USDA Forest Service:														
National Forest	139	29	349	43	489	51	121	28	144	30	265	40	754	65
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	139	29	349	43	489	51	121	28	144	30	265	40	754	65
Other Federal Government:														
Bureau of Land Management	--	--	44	16	44	16	--	--	33	14	33	14	77	21
Department of Defense and Energy	2	2	--	--	2	2	--	--	--	--	--	--	2	2
National Park Service	--	--	--	--	--	--	--	--	83	22	83	22	83	22
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	53	18	53	18	--	--	11	8	11	8	64	20
Total	2	2	97	24	99	24	--	--	126	28	126	28	225	36
State and Local Government:														
Local	--	--	19	9	19	9	--	--	7	6	7	6	25	11
State	--	--	6	6	6	6	11	9	44	17	55	19	61	20
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	24	11	24	11	11	9	51	18	62	19	86	22
Private:														
Corporate	5	5	42	16	47	17	--	--	--	--	--	--	47	17
Noncorporate Private:														
Total, Noncorporate Private	30	13	208	34	239	36	--	--	--	--	--	--	239	36
All Private	35	14	250	37	286	40	--	--	--	--	--	--	286	40
All Owners	177	32	721	63	898	70	132	29	321	44	453	53	1,351	87

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

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

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

Table A17: Area of Forest Land by Forest Type, Owner Group and Forest Land Status, 2006-2015: All California

Forest type group	U.S. Forest Service				Other Federal				State and local government				Private				All forest land	
	Timberland		Other forest land		Timberland		Other forest land		Timberland		Other forest land		Timberland		Other forest land		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	4,190	121	1,035	69	73	21	435	46	34	14	55	17	2,158	99	3	3	7,982	173
Douglas-fir	156	29	167	31	18	11	49	18	22	11	30	14	683	60	--	--	1,125	79
Fir / spruce / mountain hemlock	1,110	75	468	51	6	6	197	33	10	8	10	8	252	37	--	--	2,053	104
Western Hemlock / Sitka spruce	--	--	--	--	--	--	1	1	--	--	1	1	36	15	--	--	38	15
Lodgepole pine	232	36	480	50	--	--	232	36	9	8	6	6	66	20	--	--	1,024	75
Pinyon / juniper	11	8	729	61	--	--	567	56	--	--	59	19	--	--	177	32	1,543	91
Ponderosa pine	1,248	76	221	35	39	15	37	14	4	4	23	12	793	64	6	3	2,370	108
Redwood	3	3	17	10	--	--	30	14	33	14	64	19	614	58	--	--	762	64
Western larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western white pine	18	9	141	29	--	--	13	9	--	--	--	--	--	--	--	--	171	32
Other western softwoods	160	30	923	70	19	10	486	51	--	--	31	14	76	21	353	46	2,049	105
Total	7,128	129	4,181	117	155	30	2,046	90	112	25	279	38	4,677	122	539	56	19,117	219
Hardwoods:																		
Alder / maple	21	10	16	9	12	7	28	13	--	--	7	6	120	25	15	7	219	34
Aspen / birch	13	8	44	15	--	--	9	7	--	--	1	1	14	9	--	--	80	20
Elm / ash / cottonwood	--	--	5	5	--	--	1	1	--	--	8	6	--	--	17	8	30	11
Tanoak / laurel	213	35	215	35	31	13	41	15	11	8	146	29	1,053	75	141	28	1,849	99
Western oak	933	71	1,571	90	92	23	544	53	17	10	433	44	1,046	76	4,276	129	8,912	193
Woodland hardwoods	35	14	105	23	--	--	65	19	--	--	20	11	7	5	34	13	265	37
Exotic hardwoods	--	--	--	--	2	2	--	--	--	--	--	--	--	--	3	2	5	3
Other hardwoods	130	27	88	23	10	7	32	14	4	4	40	16	149	29	84	21	538	55
Total	1,345	83	2,043	101	147	29	719	61	32	13	656	55	2,388	106	4,568	132	11,898	214
Nonstocked	398	46	228	36	8	6	65	19	--	--	8	7	187	30	32	12	926	70
All forest types	8,871	121	6,452	131	311	42	2,830	97	144	28	943	61	7,252	120	5,140	140	31,941	201

Note: Totals may be off because of rounding

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

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

Table B1: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: All California

	Public						Private				Total		Total	
	National Forest		Other Federal		State and Local Govt.		Corporate		Non Corporate		Total	SE	Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE				
	<i>thousand metric tons CO2 equivalent per year</i>													
Standing Live Tree														
Mortality	-24,238	1,399	-2,486	420	-1,276	370	-3,757	354	-3,921	332	-7,678	464	-35,679	1,566
Cut	-1,488	306	-9	9	-8	6	-10,663	1,341	-1,476	404	-12,140	1,381	-13,645	1,415
Gross Growth	33,117	707	4,459	407	3,296	367	18,554	883	13,773	794	32,327	911	73,199	1,188
Net	7,390	1,531	1,964	460	2,012	420	4,133	1,497	8,376	769	12,509	1,661	23,875	2,334
Foliage	431	78	95	24	104	18	220	77	354	36	574	84	1,203	118
Roots														
Live	1,684	303	358	105	398	84	882	308	1,527	160	2,409	342	4,849	475
Dead	519	204	-25	46	6	37	33	66	15	51	49	84	549	228
Standing Dead	3,525	997	-17	237	58	139	289	260	364	211	653	335	4,218	1,087
Dead Woody Debris	-252	732	186	337	93	178	-1,343	548	318	391	-1,025	674	-998	1,066
Understory Vegetation														
Aboveground	-76	59	-16	34	-20	9	56	54	-47	20	9	58	-103	90
Belowground	-8	7	-2	4	-2	1	6	6	-5	2	1	6	-11	10
Total (excluding soils)	13,212	1,515	2,542	602	2,650	491	4,277	1,935	10,901	987	15,178	2,152	33,581	2,727
Soils	172	334	409	156	110	84	-41	283	131	199	90	346	781	514
Total (including soils)	13,384	1,592	2,951	632	2,759	510	4,236	1,936	11,032	999	15,268	2,159	34,363	2,787

Table B2: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: Central Coast and Interior Ranges

	National Forest		Public				Private				Total		Total	
	Total	SE	Other Federal		State and Local Govt.		Corporate		Non Corporate		Total	SE	Total	
			Total	SE	Total	SE	Total	SE	Total	SE				
	<i>thousand metric tons CO2 equivalent per year</i>													
Standing Live Tree														
Mortality	-559	271	-58	73	-249	79	-94	46	-725	178	-819	183	-1,684	343
Cut	--	--	--	--	-3	4	--	--	-248	129	-248	129	-251	129
Gross Growth	173	78	59	34	935	274	521	156	1,680	373	2,200	403	3,368	493
Net	-386	223	1	46	683	234	427	142	707	281	1,134	313	1,433	453
Foliage	-11	6		1	27	11	10	5	18	12	29	13	45	18
Roots														
Live	-58	36	7	6	130	49	44	23	67	49	111	54	189	82
Dead	44	35	3	5	14	11		6	27	17	27	18	88	42
Standing Dead	212	169	10	14	32	21	5	31	159	79	165	84	418	190
Dead Woody Debris	-102	47	39	38	131	78	-93	106	164	183	71	212	139	234
Understory Vegetation														
Above Ground	3	2		1	-6	4	-2	1	2	2		2	-3	5
Below Ground					-1									1
Total (excluding soils)	-298	178	60	25	1,009	325	391	179	1,145	430	1,536	465	2,308	594
Soils		2	--	--	86	74	1	1	-17	17	-16	17	69	76
Total (including soils)	-298	178	60	25	1,095	356	392	179	1,128	431	1,520	466	2,377	612

Table B3: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: Central Valley

	Public				Private				Total		Total			
	National Forest		Other Federal		State and Local Govt.		Corporate		Non Corporate		Total		Total	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE		
<i>thousand metric tons CO2 equivalent per year</i>														
Standing Live Tree														
Mortality					--	--			-30	24	-30	24	-30	24
Cut					--	--			-6	7	-6	7	-6	7
Gross Growth					7	7			90	53	90	53	97	53
Net					7	7			54	33	54	33	61	34
Foliage										1		1		1
Roots														
Live					1	1			11	7	11	7	12	7
Dead					--	--			3	2	3	2	3	2
Standing Dead					--	--			11	9	11	9	11	9
Dead Woody Debris					4	5			11	11	11	11	16	12
Understory Vegetation														
Above Ground														
Below Ground														
Total (excluding soils)					13	13			90	48	90	48	103	50
Soils					--	--			--	--	--	--	--	--
Total (including soils)					13	13			90	48	90	48	103	50

Table B4: Annual Net Change in Carbon Stocks on Forest Land, 2001-2005 to 2011-2015: Eastside

	National Forest		Public				Private				Total		Total	
	Total	SE	Other Federal		State and Local Govt.		Corporate		Non Corporate		Total	SE	Total	
			Total	SE	Total	SE	Total	SE	Total	SE				
	<i>thousand metric tons CO2 equivalent per year</i>													
Standing Live Tree														
Mortality	-401	91	-14	8	0.0	1	-185	106	-15	13	-200	107	-615	141
Cut	-132	77	--	--	--	--	-325	135	-71	45	-397	142	-529	162
Gross Growth	1,230	166	127	23	27	27	494	136	136	53	629	145	2,013	228
Net	697	136	113	24	26	27	-16	157	50	28	33	160	870	216
Foliage	41	9	7	2	1	1	-1	9	5	2	4	9	53	13
Roots														
Live	149	32	21	5	4	5	1	31	13	6	14	31	188	46
Dead	-53	23	-4	3	-2	2	12	14	-6	5	6	15	-53	28
Standing Dead	-221	99	-14	11	-9	12	60	65	-27	24	33	70	-210	122
Dead Woody Debris	-150	126	76	74	-9	10	-2	72	-23	23	-25	75	-108	165
Understory Vegetation														
Above Ground	-47	26	12	32	-1	1	4	16	-3	6	1	17	-35	45
Below Ground	-5	3	1	4				2		1		2	-4	5
Total (excluding soils)	410	220	214	87	10	8	58	205	8	52	66	212	700	319
Soils	124	109	67	101	--	--	78	71	56	58	134	92	325	175
Total (including soils)	534	243	281	148	10	8	136	216	64	92	200	236	1,025	371

Table B5: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: Klamath Interior Coast Ranges

	National Forest		Public				Private				Total		Total	
	Total	SE	Other Federal		State and Local Govt.		Corporate		Non Corporate		Total	SE	Total	
			Total	SE	Total	SE	Total	SE	Total	SE				
	<i>thousand metric tons CO2 equivalent per year</i>													
Standing Live Tree														
Mortality	-8,713	987	-522	206	-145	105	-1,012	211	-1,041	167	-2,053	267	-11,433	1,047
Cut	-159	92	-9	9	--	--	-1,940	573	-140	70	-2,081	577	-2,249	584
Gross Growth	11,607	635	1,145	294	98	49	3,697	420	4,078	467	7,775	609	20,624	927
Net	2,734	977	614	201	-47	100	745	660	2,896	397	3,641	768	6,943	1,262
Foliage	153	52	29	12		2	25	36	119	18	145	40	327	67
Roots														
Live	631	204	126	48	-4	16	166	141	540	81	705	162	1,458	265
Dead	225	134	34	15	3	3	11	30	-28	35	-17	46	246	142
Standing Dead	1,438	638	110	58	39	27	130	119	-44	147	86	189	1,674	668
Dead Woody Debris	-368	430	-126	207	42	30	-26	259	156	162	129	305	-323	567
Understory Vegetation														
Above Ground	-25	25	-18	8			30	20	-40	14	-10	24	-53	35
Below Ground	-3	3	-2	1			3	2	-4	2	-1	3	-6	4
Total (excluding soils)	4,786	981	767	283	34	78	1,085	806	3,595	503	4,680	946	10,266	1,394
Soils	-70	225	151	89	9	9	-144	106	89	104	-55	149	35	284
Total (including soils)	4,716	1,041	918	307	42	79	941	852	3,683	524	4,625	997	10,300	1,476

Table B6: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: North Coast

	National Forest		Public				Private				Total		Total	
	Total	SE	Other Federal		State and Local Govt.		Corporate		Non Corporate		Total	SE	Total	
			Total	SE	Total	SE	Total	SE	Total	SE				
	<i>thousand metric tons CO2 equivalent per year</i>													
Standing Live Tree														
Mortality	-95	56	-126	58	-705	353	-863	154	-695	137	-1,558	202	-2,484	414
Cut	--	--	--	--	--	--	-3,428	919	-434	333	-3,862	972	-3,862	972
Gross Growth	319	165	802	248	1,514	335	6,735	767	4,081	538	10,816	889	13,450	984
Net	224	125	675	220	809	350	2,444	996	2,952	553	5,396	1,129	7,104	1,206
Foliage		8	29	11	49	15	150	51	136	26	286	56	364	60
Roots														
Live	7	32	104	47	164	71	525	211	602	115	1,127	238	1,403	254
Dead	12	8	-10	8	6	25	32	47	5	20	37	51	45	58
Standing Dead	50	30	-8	10	5	111	147	168	159	67	307	181	354	214
Dead Woody Debris	15	67	38	70	-61	147	-682	380	-131	202	-813	431	-822	465
Understory Vegetation														
Above Ground	-1	1		1	-7	4	-24	9	-7	3	-31	10	-39	10
Below Ground					-1		-3	1	-1		-3	1	-4	1
Total (excluding soils)	307	177	827	265	965	394	2,590	1,322	3,715	658	6,305	1,468	8,404	1,548
Soils	1	1	--	--	29	38	260	216	-56	99	205	238	234	241
Total (including soils)	308	177	827	265	993	396	2,850	1,252	3,659	641	6,509	1,396	8,638	1,481

Table B7: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: Sierra Cascades

	National Forest		Public				Private				Total		Total	
			Other Federal		State and Local Govt.		Corporate		Non Corporate					
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>thousand metric tons CO2 equivalent per year</i>														
Standing Live Tree														
Mortality	-13,057	1,073	-1,703	365	-123	45	-1,604	238	-1,308	194	-2,912	302	-17,795	1,169
Cut	-1,137	279	--	--	-5	5	-4,970	850	-551	174	-5,521	863	-6,662	907
Gross Growth	19,310	752	2,315	263	680	193	7,108	569	3,634	351	10,741	621	33,047	1,001
Net	5,116	1,146	612	349	553	176	534	877	1,774	321	2,309	934	8,590	1,525
Foliage	292	57	30	18	27	9	35	45	79	16	114	47	464	76
Roots														
Live	1,158	218	111	78	107	35	145	171	318	72	463	186	1,839	298
Dead	239	145	-50	41	-20	22	-22	32	11	25	-12	41	157	158
Standing Dead	1,814	732	-120	226	-42	59	-54	142	68	108	14	178	1,667	790
Dead Woody Debris	193	562	138	238	-5	30	-539	268	83	221	-456	348	-130	703
Understory Vegetation														
Above Ground	-28	46	-11	8	-6	7	48	47	1	13	49	49	5	67
Below Ground	-3	5	-1	1	-1	1	5	5		1	5	5	1	7
Total (excluding soils)	8,781	1,143	709	449	615	187	153	1,127	2,333	447	2,486	1,213	12,591	1,731
Soils	184	214	144	79	-14	11	-236	129	68	123	-167	178	147	291
Total (including soils)	8,965	1,180	853	464	601	185	-83	1,169	2,402	467	2,319	1,260	12,738	1,791

Table B8: Annual Net Change in Carbon Stocks on Forest Land for All Pools by Owner Group, 2001-2005 to 2011-2015: South Coast Mountains and Deserts

	Public						Private				Total		Total	
	National Forest		Other Federal		State and Local Govt.		Corporate		Non Corporate		Total		Total	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons CO2 equivalent per year</i>													
Standing Live Tree														
Mortality	-1,414	383	-63	56	-55	38			-107	50	-107	50	-1,638	392
Cut	-60	47	--	--	--	--			-25	21	-25	21	-86	52
Gross Growth	479	105	11	6	35	28			75	29	75	29	600	113
Net	-995	340	-51	54	-20	38			-58	48	-58	48	-1,124	349
Foliage	-45	16	-1	1		2			-3	2	-3	2	-50	16
Roots														
Live	-203	70	-11	10	-4	8			-22	13	-22	13	-240	72
Dead	53	47	2	10	5	8			3	3	3	3	63	49
Standing Dead	232	206	4	40	32	39			36	21	36	21	304	215
Dead Woody Debris	160	111	21	29	-9	37			59	59	59	59	231	135
Understory Vegetation														
Above Ground	21	10	1	1	1	1							23	10
Below Ground	2	1											3	1
Total (excluding soils)	-774	289	-35	47	5	32			15	84	15	84	-790	306
Soils	-66	52	47	29	--	--			-10	8	-10	8	-29	60
Total (including soils)	-840	317	12	49	5	32			5	85	5	85	-819	333

Table B9: Annual Net Change in Carbon Stocks for Aboveground Pools on Forest Land by Disturbance, Forest Land Status and Owner Group, 2001-2005 to 2011-2015: All California

	USDA Forest Service						Other Public						Private						Total	
	Timberland		Reserved		Other Forest		Total		Other Federal		State and Local Govt.		Corporate		Non Corporate		Total			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>thousand metric tons CO2 equivalent per year</i>																				
Cut																				
Mortality	-184	93	-9	10	--	--	-193	94	--	--	--	--	-359	84	-177	71	-536	109	-728	144
Cut	-1,136	295	-5	5	--	--	-1,140	295	-8	9	--	--	-8,469	1,220	-937	380	-9,406	1,265	-10,554	1,299
Gross Growth	1,164	221	22	23	--	--	1,186	222	20	21	--	--	3,549	407	882	261	4,431	471	5,636	522
Net Live	-156	214	8	9	--	--	-148	214	11	12	--	--	-5,279	1,057	-231	331	-5,510	1,105	-5,647	1,126
Standing Dead Change	-174	99	--	--	--	--	-174	99	--	--	--	--	-116	88	29	46	-87	99	-261	140
Dead Woody Debris Change	-131	97	-2	2	--	--	-133	97	6	7	--	--	-582	294	37	187	-545	349	-672	362
Total Net ¹	-513	340	7	8	--	--	-505	340	20	21	--	--	-7,157	1,425	-211	431	-7,368	1,487	-7,853	1,525
Cut and Fire																				
Mortality	-326	180	--	--	--	--	-326	180	--	--	--	--	-466	197	-49	49	-515	203	-842	271
Cut	-110	58	--	--	--	--	-110	58	--	--	--	--	-1,172	543	--	--	-1,172	543	-1,282	546
Gross Growth	226	95	--	--	--	--	226	95	--	--	--	--	229	86	8	8	237	87	463	129
Net Live	-210	167	--	--	--	--	-210	167	--	--	--	--	-1,410	577	-41	41	-1,451	578	-1,661	602
Standing Dead Change	34	81	--	--	--	--	34	81	--	--	--	--	152	80	-11	11	141	81	175	115
Dead Woody Debris Change	-4	32	--	--	--	--	-4	32	--	--	--	--	62	142	-12	12	50	142	46	146
Total Net ¹	-216	165	--	--	--	--	-216	165	--	--	--	--	-1,458	613	-72	72	-1,530	617	-1,746	639
Fire																				
Mortality	-5,570	902	-4,689	923	-1,350	370	-10,766	1,302	-772	322	-302	164	-278	110	-449	154	-727	189	-12,566	1,364
Cut	-40	28	--	--	--	--	40	28	--	--	--	--	-19	17	-56	35	-75	39	-115	49
Gross Growth	1,985	283	1,353	242	347	94	3,492	378	442	142	64	40	163	70	262	89	425	113	4,422	421
Net Live	-3,624	789	-3,335	814	-1,003	320	-7,314	1,143	-330	226	-238	129	-134	87	-243	113	-377	142	-8,259	1,181
Standing Dead Change	2,153	609	1,308	531	354	212	3,529	816	148	90	85	52	-12	90	3	69	-9	113	3,753	830
Dead Woody Debris Change	-558	225	182	209	17	86	-385	312	-103	50	19	53	-136	68	217	117	81	136	-389	348
Total Net ¹	-2,396	612	-2,320	682	-796	270	-5,101	934	-384	262	-170	133	-312	182	-87	126	-398	221	-6,053	1,004
Insect and Disease																				
Mortality	-3,064	411	-1,039	298	-99	66	-4,200	511	-432	150	-172	107	-488	124	-435	122	-923	173	-5,728	568
Cut	-68	37	--	--	--	--	-68	37	--	--	--	--	-45	25	-44	30	-89	39	-156	54
Gross Growth	4,648	450	833	177	64	31	5,527	483	463	149	318	140	949	211	867	204	1,817	290	8,125	596
Net Live	1,516	384	-205	234	-35	45	1,259	452	31	98	146	91	417	118	388	111	805	160	2,241	497
Standing Dead Change	83	281	231	126	-9	21	327	308	132	84	-57	115	-38	55	18	81	-20	97	381	353
Dead Woody Debris Change	333	285	266	207	17	24	626	353	131	99	90	126	10	77	7	64	17	100	863	399
Total Net ¹	2,341	475	323	194	-28	54	2,640	516	339	154	217	119	478	164	510	188	988	248	4,183	602
Other cut and weather																				
Mortality	-533	161	-292	107	-131	54	-911	198	-35	19	-1	1	-264	119	-262	73	-526	139	-1,474	243
Cut	-87	36	-16	16	--	--	-103	39	--	--	-5	5	-332	132	-175	88	-507	157	-615	162
Gross Growth	1,169	236	365	114	157	66	1,615	264	115	72	58	59	978	253	711	190	1,690	314	3,478	421
Net Live	549	168	57	92	26	43	601	193	80	72	53	53	383	190	274	152	656	244	1,390	323
Standing Dead Change	-29	106	-66	119	2	49	-67	160	13	11	-19	21	17	12	125	46	142	47	68	169
Dead Woody Debris Change	115	143	127	84	57	56	278	172	10	22	59	48	-390	208	213	143	-177	253	170	310
Total Net ¹	752	214	100	141	78	107	906	258	121	94	99	63	83	243	687	239	770	342	1,896	443
Total																				
Mortality	-15,339	1,067	-7,931	908	-2,140	390	-24,238	1,399	-2,486	420	-1,276	370	-3,757	354	-3,921	332	-7,678	464	-35,679	1,566
Cut	-1,464	305	-22	17	-2	2	-1,488	306	-9	9	-8	6	-10,663	1,341	-1,476	404	-12,140	1,381	-13,645	1,415
Gross Growth	24,702	673	7,135	437	2,027	220	33,117	707	4,459	407	3,296	367	18,554	883	13,773	794	32,327	911	73,199	1,188
Net Live	7,898	1,195	-818	949	-116	369	7,390	1,531	1,964	460	2,012	420	4,133	1,497	8,376	769	12,509	1,661	23,875	2,334
Standing Dead Change	2,442	775	1,066	616	146	246	3,525	997	-17	237	58	139	289	260	364	211	653	335	4,218	1,087
Dead Woody Debris Change	-995	580	651	429	68	179	-252	732	186	337	93	178	-1,343	548	318	391	-1,025	674	-998	1,066
Total Net ¹	11,844	1,202	949	920	16	376	13,212	1,515	2,542	602	2,650	491	4,277	1,935	10,901	987	15,178	2,152	33,581	2,727

¹Total Net value includes change from roots and understory vegetation which are not enumerated in this table.

Table B10: Annual Net Change Per Acre in Carbon Stock for Aboveground Pools on Forest Land by Disturbance, Forest Land Status and Owner Group, 2001-2005 to 2011-2015: All California

	USDA Forest Service						Other Public				Private				Total					
	Timberland		Reserved		Low Productive		Total		Other Federal		State and Local Govt.		Corporate		Non Corporate		Total			
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE		
	metric tons CO2 equivalent per year and acre																			
Cut																				
Mortality	0.0206	0.0105	0.0023	0.0023	--	--	0.0131	0.0064	--	--	--	--	0.0652	0.0152	0.0280	0.0112	0.0453	0.0093	0.0241	0.0048
Cut	0.1276	0.0330	0.0012	0.0012	--	--	0.0775	0.0200	0.0031	0.0031	--	--	1.5366	0.2156	0.1487	0.0601	0.7962	0.1071	0.3489	0.0429
Gross Growth	0.1308	0.0248	0.0055	0.0055	--	--	0.0806	0.0151	0.0072	0.0076	--	--	0.6439	0.0712	0.1400	0.0410	0.3751	0.0399	0.1863	0.0173
Net Live	-0.0175	0.0241	0.0020	0.0020	--	--	-0.0100	0.0146	0.0041	0.0042	--	--	-0.9579	0.1890	-0.0367	0.0525	-0.4665	0.0936	-0.1866	0.0372
Standing Dead Change	-0.0195	0.0111	--	--	--	--	-0.0118	0.0067	--	--	--	--	-0.0211	0.0159	0.0046	0.0073	-0.0074	0.0084	-0.0086	0.0046
Change	-0.0147	0.0109	-0.0006	-0.0006	--	--	-0.0090	0.0066	0.0021	0.0021	--	--	-0.1056	0.0532	0.0059	0.0297	-0.0461	0.0296	-0.0222	0.0120
Total Net	-0.0576	0.0382	0.0018	0.0018	--	--	-0.0344	0.0231	0.0074	0.0079	--	--	-1.2986	0.2546	-0.0335	0.0683	-0.6237	0.1259	-0.2596	0.0504
Cut and Fire																				
Mortality	0.0367	0.0203	--	--	--	--	0.0222	0.0123	--	--	--	--	0.0846	0.0356	0.0078	0.0078	0.0436	0.0171	0.0278	0.0090
Cut	0.0124	0.0066	--	--	--	--	0.0075	0.0040	--	--	--	--	0.2127	0.0982	--	--	0.0992	0.0459	0.0424	0.0180
Gross Growth	0.0254	0.0107	--	--	--	--	0.0154	0.0065	--	--	--	--	0.0415	0.0156	0.0013	0.0013	0.0201	0.0073	0.0153	0.0043
Net Live	-0.0236	0.0187	--	--	--	--	-0.0143	0.0113	--	--	--	--	-0.2558	-0.2558	-0.0065	-0.0065	-0.1228	-0.1228	-0.0549	0.0199
Standing Dead Change	0.0038	0.0091	--	--	--	--	0.0023	0.0055	--	--	--	--	0.0277	0.0145	-0.0018	-0.0018	0.0119	0.0068	0.0058	0.0038
Change	-0.0004	0.0036	--	--	--	--	-0.0003	0.0022	--	--	--	--	0.0112	0.0257	-0.0019	-0.0019	0.0042	0.0120	0.0015	0.0048
Total Net	-0.0243	0.0185	--	--	--	--	-0.0147	0.0112	--	--	--	--	-0.2646	0.1109	-0.0114	-0.0114	-0.1295	0.0522	-0.0577	0.0211
Fire																				
Mortality	0.6260	0.1009	1.1690	0.2313	0.4512	0.1201	0.7320	0.0883	0.2826	0.1173	0.3011	0.1638	0.0505	0.0199	0.0712	0.0243	0.0615	0.0160	0.4154	0.0451
Cut	0.0045	0.0032	--	--	--	--	0.0027	0.0019	--	--	--	--	0.0034	0.0034	0.0089	0.0056	0.0064	0.0033	0.0038	0.0016
Gross Growth	0.2231	0.0317	0.3374	0.0607	0.1160	0.0304	0.2374	0.0256	0.1618	0.0516	0.0636	0.0402	0.0295	0.0126	0.0416	0.0141	0.0360	0.0096	0.1462	0.0139
Net Live	-0.4073	0.0884	-0.8316	0.2035	-0.3352	0.1049	-0.4973	0.0776	-0.1208	0.0824	-0.2375	-0.2375	-0.0243	0.0158	-0.0385	0.0178	-0.0319	0.0120	-0.2730	0.0390
Standing Dead Change	0.2420	0.0684	0.3262	0.1326	0.1182	0.0706	0.2399	0.0554	0.0542	0.0328	0.0848	0.0515	-0.0021	0.0163	0.0004	0.0110	-0.0008	0.0096	0.1240	0.0275
Change	-0.0627	0.0253	0.0455	0.0521	0.0058	0.0287	-0.0262	0.0212	-0.0379	0.0183	0.0188	0.0529	-0.0247	0.0123	0.0344	0.0186	0.0068	0.0115	-0.0129	0.0115
Total Net	-0.2693	0.0687	-0.5785	0.1705	-0.2660	0.0888	-0.3468	0.0635	-0.1405	0.0957	-0.1697	0.1329	-0.0565	0.0330	-0.0138	0.0201	-0.0337	0.0187	-0.2001	0.0332
Insect and Disease																				
Mortality	0.3444	0.0459	0.2590	0.0744	0.0331	0.0220	0.2856	0.0346	0.1582	0.0547	0.1719	0.1054	0.0885	0.0223	0.0691	0.0192	0.0781	0.0146	0.1893	0.0188
Cut	0.0076	0.0042	--	--	--	--	0.0046	0.0025	--	--	--	--	0.0081	0.0045	0.0070	0.0047	0.0075	0.0033	0.0052	0.0018
Gross Growth	0.5224	0.0496	0.2078	0.0439	0.0215	0.0104	0.3758	0.0327	0.1697	0.0541	0.3175	0.1398	0.1723	0.0378	0.1376	0.0319	0.1538	0.0245	0.2686	0.0197
Net Live	0.1704	0.0430	-0.0512	0.0582	-0.0115	0.0150	0.0856	0.0307	0.0114	0.0359	0.1456	0.0916	0.0756	0.0213	0.0616	0.0174	0.0682	0.0136	0.0741	0.0164
Standing Dead Change	0.0093	0.0316	0.0577	0.0313	-0.0030	0.0069	0.0222	0.0209	0.0482	0.0309	-0.0571	0.1155	-0.0069	0.0099	0.0028	0.0128	-0.0017	0.0082	0.0126	0.0117
Change	0.0375	0.0320	0.0664	0.0516	0.0057	0.0079	0.0426	0.0240	0.0480	0.0363	0.0897	0.1258	0.0018	0.0139	0.0010	0.0101	0.0014	0.0084	0.0285	0.0132
Total Net	0.2631	0.0530	0.0804	0.0483	-0.0092	0.0180	0.1795	0.0350	0.1240	0.0563	0.2163	0.1180	0.0867	0.0297	0.0809	0.0296	0.0836	0.0210	0.1383	0.0199
Other Cut and Weather																				
Mortality	0.0599	0.0181	0.0728	0.0265	0.0438	0.0177	0.0619	0.0135	0.0129	0.0068	0.0008	0.0008	0.0479	0.0215	0.0416	0.0114	0.0446	0.0117	0.0487	0.0080
Cut	0.0098	0.0041	0.0040	0.0039	--	--	0.0070	0.0027	--	--	0.0045	0.0045	0.0602	0.0239	0.0278	0.0139	0.0429	0.0133	0.0203	0.0054
Gross Growth	0.1313	0.0265	0.0910	0.0281	0.0524	0.0220	0.1098	0.0179	0.0421	0.0265	0.0582	0.0581	0.1775	0.0455	0.1129	0.0300	0.1430	0.0266	0.1150	0.0139
Net Live	0.0617	0.0189	0.0142	0.0229	0.0086	0.0144	0.0409	0.0131	0.0292	0.0263	0.0528	0.0523	0.0694	0.0344	0.0434	0.0241	0.0556	0.0207	0.0459	0.0107
Standing Dead Change	-0.0033	0.0119	-0.0165	0.0297	0.0006	0.0164	-0.0046	0.0109	0.0047	0.0041	-0.0193	-0.0193	0.0031	0.0021	0.0198	0.0072	0.0120	0.0040	0.0023	0.0056
Change	0.0129	0.0161	0.0316	0.0209	0.0190	0.0187	0.0189	0.0117	0.0038	0.0080	0.0585	0.0475	-0.0708	0.0378	0.0338	0.0227	-0.0150	0.0214	0.0056	0.0103
Total Net	0.0845	0.0240	0.0249	0.0351	0.0262	0.0358	0.0616	0.0176	0.0442	0.0342	0.0987	0.0619	0.0150	0.0441	0.1090	0.0379	0.0652	0.0289	0.0627	0.0146
Total																				
Mortality	1.7239	0.1168	1.9774	0.2262	0.7155	0.1220	1.6480	0.0945	0.9103	0.1485	1.2742	0.3639	0.6818	0.0603	0.6221	0.0483	0.6499	0.0382	1.1793	0.0517
Cut	0.1646	0.0342	0.0055	0.0041	0.0007	0.0007	0.1012	0.0208	0.0032	0.0034	0.0079	0.0062	1.9349	0.2354	0.2343	0.0636	1.0276	0.1171	0.4510	0.0468
Gross Growth	2.7762	0.0627	1.7788	0.0942	0.6775	0.0607	2.2517	0.0469	1.6325	0.1290	3.2905	0.3160	3.3666	0.1228	2.1853	0.1001	2.7364	0.0738	2.4195	0.0393
Net Live	0.8876	0.1338	-0.2040	0.2374	-0.0387	0.1234	0.5025	0.1042	0.7190	0.1647	2.0084	0.4023	0.7499	0.2710	1.3290	0.1125	1.0589	0.1402	0.7892	0.0772
Standing Dead Change	0.2744	0.0871	0.2659	0.1540	0.0490	0.0824	0.2397	0.0678	-0.0064	0.0868	0.0574	0.1382	0.0525	0.0472	0.0577	0.0335	0.0553	0.0284	0.1394	0.0360
Change	-0.1119	0.0652	0.1622	0.1069	0.0227	0.0600	-0.0172	0.0498	0.0682	0.1232	0.0928	0.1767	-0.2436	0.0990	0.0505	0.0620	-0.0867	0.0570	-0.0330	0.0352
Total Net	1.3311	0.1339	0.2366	0.2285	0.0053	0.1256	0.8983	0.1033	0.9306	0.2146	2.6448	0.4571	0.7761	0.3507	1.7296	0.1450	1.2848	0.1818	1.1100	0.0903

Table C1: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: All California

**information duplicated in Table C14 in million metric tons C*

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	383,872	8,061	26,832	2,072	410,704	7,862	130,884	6,202	17,348	1,818	148,232	6,144	558,936	8,977
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	383,872	8,061	26,832	2,072	410,704	7,862	130,884	6,202	17,348	1,818	148,232	6,144	558,936	8,977
Other Federal Government:														
Bureau of Land Management	11,276	2,177	6,373	881	17,649	2,328	2,634	1,030	1,300	314	3,933	1,077	21,582	2,540
Department of Defense and Energy	257	200	791	281	1,047	345	--	--	145	150	145	150	1,192	376
National Park Service	--	--	--	--	--	--	60,385	5,750	6,339	1,161	66,724	5,809	66,724	5,809
U.S. Fish and Wildlife Service	--	--	--	--	--	--	28	28	14	14	41	31	41	31
Other Federal	--	--	496	158	496	158	--	--	80	55	80	55	576	167
Total	11,532	2,183	7,660	933	19,192	2,352	63,046	5,793	7,878	1,198	70,924	5,844	90,116	5,937
State and Local Government:														
Local	2,588	1,123	2,071	537	4,660	1,253	3,517	1,407	3,370	749	6,886	1,553	11,546	1,988
State	7,824	2,071	608	398	8,431	2,076	29,616	6,502	4,666	1,161	34,282	6,569	42,714	6,180
Other Public	--	--	22	20	22	20	326	363	38	41	364	365	386	366
Total	10,412	2,344	2,702	669	13,114	2,413	33,459	6,639	8,073	1,358	41,533	6,717	54,646	6,416
Private:														
Corporate	151,930	5,958	12,291	1,380	164,221	6,062	--	--	--	--	--	--	164,221	6,062
Noncorporate Private:														
Total, Noncorporate Private	135,923	6,720	58,052	2,566	193,975	6,934	--	--	--	--	--	--	193,975	6,934
All Private	287,853	7,239	70,343	2,826	358,196	7,206	--	--	--	--	--	--	358,196	7,206
All Owners	693,670	11,033	107,536	3,673	801,206	10,858	227,389	10,763	33,299	2,563	260,688	10,801	1,061,894	13,735

Note: Totals may be off because of rounding

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

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

Table C2: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>thousand metric tons C</i>														
USDA Forest Service:														
National Forest	6	5	678	344	684	344	3,733	2,413	1,898	693	5,631	2,523	6,315	2,546
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	6	5	678	344	684	344	3,733	2,413	1,898	693	5,631	2,523	6,315	2,546
Other Federal Government:														
Bureau of Land Management	--	--	244	95	244	95	--	--	7	8	7	8	251	96
Department of Defense and Energy	--	--	682	274	682	274	--	--	--	--	--	--	682	274
National Park Service	--	--	--	--	--	--	--	--	189	210	189	210	189	210
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	94	61	94	61	--	--	--	--	--	--	94	61
Total	--	--	1,020	295	1,020	295	--	--	196	210	196	210	1,216	362
State and Local Government:														
Local	--	--	632	306	632	306	3,517	1,407	2,601	693	6,118	1,526	6,751	1,553
State	1,434	946	75	55	1,509	962	5,216	2,338	1,977	518	7,193	2,394	8,703	2,554
Other Public	--	--	--	--	--	--	326	363	38	41	364	365	364	365
Total	1,434	946	707	311	2,142	1,009	9,059	2,739	4,616	844	13,675	2,828	15,817	2,949
Private:														
Corporate	2,644	1,178	3,558	869	6,203	1,464	--	--	--	--	--	--	6,203	1,464
Noncorporate Private:														
Total, Noncorporate Private	14,114	3,001	12,059	1,175	26,174	3,204	--	--	--	--	--	--	26,174	3,204
All Private	16,758	3,212	15,618	1,449	32,376	3,502	--	--	--	--	--	--	32,376	3,502
All Owners	18,198	3,372	18,024	1,550	36,222	3,691	12,792	3,650	6,710	1,105	19,502	3,792	55,724	5,295

Note: Totals may be off because of rounding

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

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

Table C3: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: Central Valley

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal Government:														
Bureau of Land Management	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	14	14	14	14	14	14
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	14	14	14	14	14	14
State and Local Government:														
Local	--	--	81	72	81	72	--	--	--	--	--	--	81	72
State	--	--	--	--	--	--	--	--	134	136	134	136	134	136
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	81	72	81	72	--	--	134	136	134	136	215	154
Private:														
Corporate	--	--	106	96	106	96	--	--	--	--	--	--	106	96
Noncorporate Private:														
Total, Noncorporate Private	--	--	918	362	918	362	--	--	--	--	--	--	918	362
All Private	--	--	1,024	374	1,024	374	--	--	--	--	--	--	1,024	374
All Owners	--	--	1,105	381	1,105	381	--	--	148	137	148	137	1,253	405

Note: Totals may be off because of rounding

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

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

Table C4: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: Eastside

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	12,919	1,455	4,738	642	17,657	1,589	1,826	852	1,294	437	3,120	955	20,777	1,852
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	12,919	1,455	4,738	642	17,657	1,589	1,826	852	1,294	437	3,120	955	20,777	1,852
Other Federal Government:														
Bureau of Land Management	388	191	1,801	260	2,190	322	--	--	332	135	332	135	2,521	344
Department of Defense and Energy	--	--	109	64	109	64	--	--	--	--	--	--	109	64
National Park Service	--	--	--	--	--	--	--	--	374	145	374	145	374	145
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	24	24	24	24	--	--	--	--	--	--	24	24
Total	388	191	1,934	267	2,322	328	--	--	706	197	706	197	3,029	374
State and Local Government:														
Local	--	--	52	53	52	53	--	--	--	--	--	--	52	53
State	--	--	--	--	--	--	175	194	52	46	227	200	227	200
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	52	53	52	53	175	194	52	46	227	200	279	206
Private:														
Corporate	2,612	584	281	101	2,893	593	--	--	--	--	--	--	2,893	593
Noncorporate Private:														
Total, Noncorporate Private	1,635	460	598	157	2,233	485	--	--	--	--	--	--	2,233	485
All Private	4,247	740	879	186	5,126	763	--	--	--	--	--	--	5,126	763
All Owners	17,554	1,660	7,603	722	25,158	1,808	2,000	874	2,053	481	4,053	996	29,211	2,061

Note: Totals may be off because of rounding

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

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

Table C5: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	136,921	6,951	8,469	1,390	145,391	7,017	65,175	4,487	5,014	1,154	70,189	4,532	215,580	8,124
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	136,921	6,951	8,469	1,390	145,391	7,017	65,175	4,487	5,014	1,154	70,189	4,532	215,580	8,124
Other Federal Government:														
Bureau of Land Management	5,019	1,313	2,119	591	7,138	1,443	424	426	371	230	794	484	7,932	1,519
Department of Defense and Energy	--	--	--	--	--	--	--	--	145	150	145	150	145	150
National Park Service	--	--	--	--	--	--	8,422	3,831	524	281	8,946	3,842	8,946	3,842
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	30	19	30	19	--	--	16	18	16	18	46	26
Total	5,019	1,313	2,149	591	7,168	1,443	8,846	3,848	1,055	393	9,901	3,869	17,069	4,098
State and Local Government:														
Local	304	256	156	105	460	276	--	--	105	108	105	108	564	296
State	855	555	44	39	899	556	523	458	463	311	987	606	1,885	823
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	1,159	611	199	112	1,359	621	523	458	568	329	1,091	615	2,450	874
Private:														
Corporate	28,928	2,714	3,237	640	32,165	2,808	--	--	--	--	--	--	32,165	2,808
Noncorporate Private:														
Total, Noncorporate Private	32,377	3,444	15,733	1,536	48,110	3,751	--	--	--	--	--	--	48,110	3,751
All Private	61,304	4,263	18,970	1,656	80,274	4,553	--	--	--	--	--	--	80,274	4,553
All Owners	204,404	8,303	29,788	2,250	234,191	8,529	74,545	5,924	6,637	1,263	81,181	5,986	315,373	10,204

Note: Totals may be off because of rounding

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

Table C6: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: North Coast

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	1,512	935	53	51	1,566	936	2,173	1,684	--	--	2,173	1,684	3,738	1,925
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	1,512	935	53	51	1,566	936	2,173	1,684	--	--	2,173	1,684	3,738	1,925
Other Federal Government:														
Bureau of Land Management	2,999	1,489	--	--	2,999	1,489	2,164	937	--	--	2,164	937	5,163	1,758
Department of Defense and Energy	253	200	--	--	253	200	--	--	--	--	--	--	253	200
National Park Service	--	--	--	--	--	--	5,605	2,616	136	105	5,742	2,617	5,742	2,617
U.S. Fish and Wildlife Service	--	--	--	--	--	--	28	28	--	--	28	28	28	28
Other Federal	--	--	16	17	16	17	--	--	--	--	--	--	16	17
Total	3,253	1,502	16	17	3,268	1,502	7,797	2,762	136	105	7,933	2,760	11,201	3,124
State and Local Government:														
Local	835	863	22	22	857	864	--	--	576	255	576	255	1,432	900
State	4,175	1,624	12	11	4,187	1,624	19,779	6,496	1,153	964	20,932	6,565	25,119	6,437
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	5,010	1,839	34	25	5,044	1,839	19,779	6,496	1,729	997	21,508	6,570	26,552	6,498
Private:														
Corporate	63,296	4,948	1,187	462	64,482	4,966	--	--	--	--	--	--	64,482	4,966
Noncorporate Private:														
Total, Noncorporate Private	51,627	4,880	5,270	1,178	56,897	5,003	--	--	--	--	--	--	56,897	5,003
All Private	114,923	6,549	6,457	1,263	121,379	6,633	--	--	--	--	--	--	121,379	6,633
All Owners	124,698	7,002	6,559	1,264	131,257	7,080	29,749	7,257	1,865	1,002	31,614	7,322	162,870	9,935

Note: Totals may be off because of rounding

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

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

Table C7: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	229,833	7,793	9,949	1,336	239,782	7,759	55,768	4,694	7,796	1,155	63,565	4,740	303,346	8,811
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	229,833	7,793	9,949	1,336	239,782	7,759	55,768	4,694	7,796	1,155	63,565	4,740	303,346	8,811
Other Federal Government:														
Bureau of Land Management	2,870	936	2,138	611	5,008	1,119	46	49	571	169	617	176	5,625	1,127
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	46,358	4,119	4,969	1,092	51,326	4,203	51,326	4,203
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	169	95	169	95	--	--	48	50	48	50	217	108
Total	2,870	936	2,307	617	5,177	1,121	46,403	4,119	5,588	1,104	51,991	4,202	57,168	4,254
State and Local Government:														
Local	1,449	671	953	404	2,402	796	--	--	--	--	--	--	2,402	796
State	1,359	853	469	392	1,829	925	3,763	1,429	756	262	4,519	1,444	6,348	1,647
Other Public	--	--	22	20	22	20	--	--	--	--	--	--	22	20
Total	2,809	1,085	1,444	564	4,253	1,221	3,763	1,429	756	262	4,519	1,444	8,772	1,828
Private:														
Corporate	54,303	3,692	3,851	728	58,153	3,745	--	--	--	--	--	--	58,153	3,745
Noncorporate Private:														
Total, Noncorporate Private	35,544	2,893	21,310	1,421	56,854	3,157	--	--	--	--	--	--	56,854	3,157
All Private	89,846	4,392	25,161	1,566	115,007	4,517	--	--	--	--	--	--	115,007	4,517
All Owners	325,358	8,976	38,861	2,213	364,219	9,018	105,935	6,404	14,140	1,619	120,075	6,492	484,294	10,605

Note: Totals may be off because of rounding

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

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

Table C8: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>thousand metric tons C</i>														
USDA Forest Service:														
National Forest	2,681	781	2,945	523	5,625	944	2,209	703	1,346	441	3,554	826	9,179	1,253
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	2,681	781	2,945	523	5,625	944	2,209	703	1,346	441	3,554	826	9,179	1,253
Other Federal Government:														
Bureau of Land Management	--	--	70	39	70	39	--	--	19	13	19	13	89	41
Department of Defense and Energy	3	3	--	--	3	3	--	--	--	--	--	--	3	3
National Park Service	--	--	--	--	--	--	--	--	148	66	148	66	148	66
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	163	104	163	104	--	--	16	12	16	12	179	105
Total	3	3	234	111	237	111	--	--	182	68	182	68	419	130
State and Local Government:														
Local	--	--	175	112	175	112	--	--	88	79	88	79	263	136
State	--	--	8	8	8	8	160	211	130	74	290	223	298	223
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	183	112	183	112	160	211	219	108	378	236	561	261
Private:														
Corporate	148	145	71	37	219	149	--	--	--	--	--	--	219	149
Noncorporate Private:														
Total, Noncorporate Private	627	363	2,163	532	2,790	654	--	--	--	--	--	--	2,790	654
All Private	775	391	2,235	533	3,009	671	--	--	--	--	--	--	3,009	671
All Owners	3,459	874	5,596	762	9,055	1,167	2,368	734	1,746	459	4,115	861	13,169	1,449

Note: Totals may be off because of rounding

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

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

Table C9: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, All California, (10-year averages): 2001-2010

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>million metric tons C</i>														
USDA Forest Service:														
National Forest	371.72	8.89	31.46	2.19	403.18	8.85	121.29	6.82	17.57	1.84	138.86	6.99	542.04	8.81
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	371.72	8.89	31.46	2.19	403.18	8.85	121.29	6.82	17.57	1.84	138.86	6.99	542.04	8.81
Other Federal Government:														
Bureau of Land Management	10.01	1.81	6.18	0.83	16.19	1.96	0.79	0.47	1.24	0.25	2.04	0.53	18.23	2.02
Department of Defense and Energy	--	--	0.75	0.26	0.89	0.30	--	--	--	--	--	--	0.89	0.30
National Park Service	--	--	--	--	--	--	56.74	6.09	5.66	0.99	62.40	6.03	62.40	6.03
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.61	0.28	0.61	0.28	1.26	0.91	--	--	1.61	0.95	2.22	0.99
Total	10.15	1.81	7.54	0.90	17.69	1.99	58.86	6.15	7.25	1.05	66.11	6.09	83.80	6.29
State and Local Government:														
Local	1.71	0.91	1.99	0.57	3.70	1.08	2.58	1.18	3.87	0.85	6.44	1.45	10.14	1.81
State	6.35	1.90	0.57	0.29	6.92	1.92	31.90	7.53	5.08	1.23	36.98	7.62	43.91	7.67
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	0.51	0.40
Total	8.06	2.10	2.58	0.64	10.65	2.20	34.93	7.63	8.98	1.49	43.91	7.76	54.56	7.87
Private:														
Corporate	139.31	5.66	7.27	0.94	146.57	5.71	--	--	--	--	--	--	146.57	5.71
Noncorporate Private:														
Total, Noncorporate Private	133.93	6.52	64.46	2.80	198.39	6.82	--	--	--	--	--	--	198.39	6.82
All Private	273.24	7.11	71.72	2.89	344.96	7.15	--	--	--	--	--	--	344.96	7.15
All Owners	663.18	11.58	113.31	3.77	776.48	11.58	215.07	11.46	33.81	2.59	248.88	11.61	1,025.37	14.01

Note: Totals may be off because of rounding

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

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

Table C10: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, All California (10-year averages): 2002-2011

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>million metric tons C</i>														
USDA Forest Service:														
National Forest	378.07	9.05	31.07	2.22	409.14	9.01	123.24	6.93	17.65	1.88	140.89	7.10	550.03	9.00
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	378.07	9.05	31.07	2.22	409.14	9.01	123.24	6.93	17.65	1.88	140.89	7.10	550.03	9.00
Other Federal Government:														
Bureau of Land Management	10.04	1.82	6.10	0.82	16.14	1.98	0.82	0.49	1.28	0.25	2.09	0.55	18.23	2.03
Department of Defense and Energy	--	--	0.78	0.26	0.93	0.30	--	--	--	--	--	--	0.93	0.30
National Park Service	--	--	--	--	--	--	57.90	6.15	5.78	1.00	63.68	6.10	63.68	6.10
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.61	0.28	0.61	0.28	1.26	0.91	--	--	1.61	0.95	2.21	0.99
Total	10.19	1.82	7.49	0.90	17.68	2.01	60.03	6.22	7.40	1.06	67.43	6.15	85.11	6.35
State and Local Government:														
Local	1.62	0.93	2.02	0.57	3.64	1.10	2.64	1.22	3.92	0.86	6.56	1.49	10.20	1.84
State	6.33	1.89	0.67	0.38	7.00	1.93	32.37	7.56	5.34	1.26	37.71	7.66	44.71	7.71
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	0.52	0.41
Total	7.95	2.10	2.71	0.69	10.66	2.21	35.47	7.66	9.29	1.52	44.76	7.80	55.42	7.92
Private:														
Corporate	136.54	5.64	9.24	1.15	145.78	5.72	--	--	--	--	--	--	145.78	5.72
Noncorporate Private:														
Total, Noncorporate Private	135.76	6.62	62.56	2.75	198.32	6.91	--	--	--	--	--	--	198.32	6.91
All Private	272.30	7.25	71.80	2.90	344.10	7.29	--	--	--	--	--	--	344.10	7.29
All Owners	668.51	11.70	113.07	3.80	781.58	11.69	218.74	11.59	34.35	2.64	253.08	11.74	1,034.66	14.11

Note: Totals may be off because of rounding

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

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

Table C11: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, All California (10-year averages): 2003-2012

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>million metric tons C</i>														
USDA Forest Service:														
National Forest	375.70	7.99	28.98	2.14	404.68	7.80	127.16	6.06	18.57	1.92	145.73	6.03	550.41	8.81
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	375.70	7.99	28.98	2.14	404.68	7.80	127.16	6.06	18.57	1.92	145.73	6.03	550.41	8.81
Other Federal Government:														
Bureau of Land Management	10.74	1.88	6.34	0.87	17.08	2.05	1.10	0.59	1.07	0.26	2.17	0.64	19.26	2.13
Department of Defense and Energy	--	--	0.71	0.25	0.97	0.32	--	--	--	--	--	--	1.11	0.35
National Park Service	--	--	--	--	--	--	57.88	5.59	5.99	1.10	63.87	5.63	63.87	5.63
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.65	0.29	0.65	0.29	0.54	0.57	--	--	0.91	0.64	1.56	0.70
Total	11.00	1.88	7.71	0.95	18.70	2.08	59.53	5.58	7.57	1.15	67.09	5.62	85.80	5.70
State and Local Government:														
Local	1.80	0.99	1.75	0.51	3.55	1.12	3.19	1.35	3.48	0.79	6.67	1.52	10.23	1.87
State	6.50	1.88	0.72	0.42	7.22	1.88	29.39	6.65	4.66	1.15	34.05	6.71	41.27	6.33
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	8.31	2.11	2.49	0.66	10.80	2.18	32.89	6.78	8.18	1.36	41.07	6.85	51.87	6.54
Private:														
Corporate	138.46	5.53	9.33	1.17	147.79	5.61	--	--	--	--	--	--	147.79	5.61
Noncorporate Private:														
Total, Noncorporate Private	139.03	6.75	60.38	2.62	199.41	6.97	--	--	--	--	--	--	199.41	6.97
All Private	277.49	7.07	69.71	2.81	347.20	7.06	--	--	--	--	--	--	347.20	7.06
All Owners	672.49	10.78	108.89	3.70	781.38	10.62	219.58	10.66	34.32	2.62	253.90	10.70	1,035.28	13.52

Note: Totals may be off because of rounding

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

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

Table C12: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, All California (10-year averages): 2004-2013

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>million metric tons C</i>														
USDA Forest Service:														
National Forest	379.47	8.05	28.08	2.12	407.55	7.85	127.45	6.14	18.37	1.94	145.82	6.09	553.37	8.91
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	379.47	8.05	28.08	2.12	407.55	7.85	127.45	6.14	18.37	1.94	145.82	6.09	553.37	8.91
Other Federal Government:														
Bureau of Land Management	10.76	1.90	6.37	0.88	17.13	2.08	1.49	0.68	1.17	0.27	2.67	0.73	19.80	2.18
Department of Defense and Energy	--	--	0.73	0.25	0.98	0.32	--	--	--	--	--	--	1.13	0.35
National Park Service	--	--	--	--	--	--	58.85	5.67	6.40	1.15	65.25	5.72	65.25	5.72
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	0.56	0.17
Total	11.01	1.91	7.58	0.92	18.60	2.10	60.37	5.67	7.81	1.18	68.18	5.72	86.78	5.79
State and Local Government:														
Local	1.88	1.02	1.89	0.52	3.76	1.16	3.38	1.34	3.45	0.77	6.84	1.51	10.60	1.89
State	6.81	1.96	0.72	0.42	7.53	1.96	29.27	6.66	4.65	1.16	33.92	6.72	41.45	6.32
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	8.69	2.20	2.63	0.67	11.32	2.27	32.98	6.78	8.14	1.36	41.13	6.86	52.44	6.54
Private:														
Corporate	142.62	5.67	10.17	1.25	152.79	5.75	--	--	--	--	--	--	152.79	5.75
Noncorporate Private:														
Total, Noncorporate Private	140.15	6.86	59.87	2.58	200.03	7.07	--	--	--	--	--	--	200.03	7.07
All Private	282.77	7.20	70.04	2.80	352.81	7.17	--	--	--	--	--	--	352.81	7.17
All Owners	681.94	10.93	108.33	3.69	790.27	10.76	220.81	10.75	34.32	2.64	255.13	10.79	1,045.40	13.67

Note: Totals may be off because of rounding

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

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

Table C13: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, All California (10-year averages): 2005-2014

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>million metric tons C</i>														
USDA Forest Service:														
National Forest	382.56	8.03	27.38	2.08	409.94	7.82	130.04	6.21	18.31	1.94	148.35	6.14	558.30	8.94
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	382.56	8.03	27.38	2.08	409.94	7.82	130.04	6.21	18.31	1.94	148.35	6.14	558.30	8.94
Other Federal Government:														
Bureau of Land Management	11.39	2.23	6.48	0.89	17.87	2.38	1.99	0.78	1.16	0.27	3.15	0.83	21.02	2.49
Department of Defense and Energy	--	--	0.76	0.28	1.02	0.34	--	--	--	--	--	--	1.16	0.37
National Park Service	--	--	--	--	--	--	59.70	5.73	6.41	1.17	66.11	5.78	66.11	5.78
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	0.56	0.17
Total	11.64	2.23	7.72	0.94	19.37	2.40	61.72	5.74	7.80	1.19	69.52	5.79	88.88	5.90
State and Local Government:														
Local	2.65	1.14	2.04	0.53	4.69	1.26	3.38	1.34	3.44	0.75	6.83	1.50	11.52	1.95
State	7.24	1.98	0.77	0.42	8.01	1.99	29.20	6.47	4.67	1.15	33.87	6.54	41.88	6.14
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	9.89	2.28	2.83	0.68	12.72	2.35	32.92	6.60	8.15	1.35	41.07	6.68	53.79	6.37
Private:														
Corporate	144.37	5.67	11.17	1.31	155.54	5.76	--	--	--	--	--	--	155.54	5.76
Noncorporate Private:														
Total, Noncorporate Private	138.14	6.78	60.25	2.60	198.39	6.99	--	--	--	--	--	--	198.39	6.99
All Private	282.51	7.11	71.42	2.83	353.93	7.08	--	--	--	--	--	--	353.93	7.08
All Owners	686.60	10.93	109.36	3.68	795.96	10.76	224.67	10.71	34.27	2.64	258.94	10.74	1,054.90	13.63

Note: Totals may be off because of rounding

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

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

Table C14: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inches) by Owner Group and Forest Land Status, All California (10-year averages): 2006-2015.

**information duplicated in Table C1 in thousand metric tons C*

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>million metric tons C</i>														
USDA Forest Service:														
National Forest	383.87	8.06	26.83	2.07	410.70	7.86	130.88	6.20	17.35	1.82	148.23	6.14	558.94	8.98
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	383.87	8.06	26.83	2.07	410.70	7.86	130.88	6.20	17.35	1.82	148.23	6.14	558.94	8.98
Other Federal Government:														
Bureau of Land Management	11.28	2.18	6.37	0.88	17.65	2.33	2.63	1.03	1.30	0.31	3.93	1.08	21.58	2.54
Department of Defense and Energy	0.26	0.20	0.79	0.28	1.05	0.35	--	--	0.15	0.15	0.15	0.15	1.19	0.38
National Park Service	--	--	--	--	--	--	60.39	5.75	6.34	1.16	66.72	5.81	66.72	5.81
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.03	0.03	0.01	0.01	0.04	0.03	0.04	0.03
Other Federal	--	--	0.50	0.16	0.50	0.16	--	--	0.08	0.06	0.08	0.06	0.58	0.17
Total	11.53	2.18	7.66	0.93	19.19	2.35	63.05	5.79	7.88	1.20	70.92	5.84	90.12	5.94
State and Local Government:														
Local	2.59	1.12	2.07	0.54	4.66	1.25	3.52	1.41	3.37	0.75	6.89	1.55	11.55	1.99
State	7.82	2.07	0.61	0.40	8.43	2.08	29.62	6.50	4.67	1.16	34.28	6.57	42.71	6.18
Other Public	--	--	0.02	0.02	0.02	0.02	0.33	0.36	0.04	0.04	0.36	0.37	0.39	0.37
Total	10.41	2.34	2.70	0.67	13.11	2.41	33.46	6.64	8.07	1.36	41.53	6.72	54.65	6.42
Private:														
Corporate	151.93	5.96	12.29	1.38	164.22	6.06	--	--	--	--	--	--	164.22	6.06
Noncorporate Private:														
Total, Noncorporate Private	135.92	6.72	58.05	2.57	193.98	6.93	--	--	--	--	--	--	193.98	6.93
All Private	287.85	7.24	70.34	2.83	358.20	7.21	--	--	--	--	--	--	358.20	7.21
All Owners	693.67	11.03	107.54	3.67	801.21	10.86	227.39	10.76	33.30	2.56	260.69	10.80	1,061.89	13.74

Note: Totals may be off because of rounding

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

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

Table C15: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: All California

**information duplicated in Table C28 in million metric tons C*

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	37,394	1,772	1,982	225	39,375	1,773	17,220	1,228	2,083	325	19,304	1,240	58,679	2,131
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	37,394	1,772	1,982	225	39,375	1,773	17,220	1,228	2,083	325	19,304	1,240	58,679	2,131
Other Federal Government:														
Bureau of Land Management	681	263	331	63	1,013	267	186	130	88	30	274	133	1,287	298
Department of Defense and Energy	--	--	17	9	17	9	--	--	--	--	--	--	17	9
National Park Service	--	--	--	--	--	--	8,159	976	572	136	8,731	983	8,731	983
U.S. Fish and Wildlife Service	--	--	--	--	--	--	8	8	--	--	8	8	8	8
Other Federal	--	--	51	43	51	43	--	--	1	1	1	1	52	43
Total	681	263	399	77	1,080	271	8,353	981	661	139	9,014	988	10,094	1,003
State and Local Government:														
Local	101	44	48	20	149	49	138	76	79	35	218	83	367	96
State	301	158	20	11	321	158	1,292	308	258	97	1,550	320	1,871	333
Other Public	--	--	--	--	--	--	2	2	1	1	3	2	3	2
Total	402	164	68	23	470	165	1,432	316	339	103	1,771	330	2,241	345
Private:														
Corporate	8,064	651	376	82	8,440	655	--	--	--	--	--	--	8,440	655
Noncorporate Private:														
Total, Noncorporate Private	4,792	435	1,759	159	6,551	459	--	--	--	--	--	--	6,551	459
All Private	12,856	753	2,135	178	14,991	768	--	--	--	--	--	--	14,991	768
All Owners	51,333	1,943	4,583	297	55,916	1,950	27,006	1,603	3,082	368	30,088	1,619	86,005	2,480

Note: Totals may be off because of rounding

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

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

Table C16: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>thousand metric tons C</i>														
USDA Forest Service:														
National Forest	6	5	78	37	83	37	2	2	533	257	535	257	618	260
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	6	5	78	37	83	37	2	2	533	257	535	257	618	260
Other Federal Government:														
Bureau of Land Management	--	--	12	8	12	8	--	--	--	--	--	--	12	8
Department of Defense and Energy	--	--	9	7	9	7	--	--	--	--	--	--	9	7
National Park Service	--	--	--	--	--	--	--	--	23	25	23	25	23	25
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	1		1		--	--	--	--	--	--	1	
Total	--	--	21	11	21	11	--	--	23	25	23	25	44	27
State and Local Government:														
Local	--	--	20	16	20	16	138	76	42	25	180	80	200	81
State	14	12	1	1	15	12	51	27	61	37	111	46	126	47
Other Public	--	--	--	--	--	--	2	2	1	1	3	2	3	2
Total	14	12	21	16	35	20	191	80	103	45	294	92	329	93
Private:														
Corporate	45	23	99	42	144	48	--	--	--	--	--	--	144	48
Noncorporate Private:														
Total, Noncorporate Private	474	143	386	95	860	170	--	--	--	--	--	--	860	170
All Private	518	145	485	104	1,003	177	--	--	--	--	--	--	1,003	177
All Owners	538	145	605	112	1,143	182	193	80	659	262	852	274	1,995	329

Note: Totals may be off because of rounding

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

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

Table C17: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Central Valley

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal Government:														
Bureau of Land Management	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
State and Local Government:														
Local	--	--	8	9	8	9	--	--	--	--	--	--	8	9
State	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	8	9	8	9	--	--	--	--	--	--	8	9
Private:														
Corporate	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Noncorporate Private:														
Total, Noncorporate Private	--	--	22	16	22	16	--	--	--	--	--	--	22	16
All Private	--	--	22	16	22	16	--	--	--	--	--	--	22	16
All Owners	--	--	31	18	31	18	--	--	--	--	--	--	31	18

Note: Totals may be off because of rounding

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

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

Table C18: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Eastside

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>thousand metric tons C</i>														
USDA Forest Service:														
National Forest	1,056	231	355	79	1,412	244	298	173	115	43	413	178	1,825	302
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	1,056	231	355	79	1,412	244	298	173	115	43	413	178	1,825	302
Other Federal Government:														
Bureau of Land Management	10	6	102	31	113	32	--	--	15	9	15	9	127	33
Department of Defense and Energy	--	--	8	5	8	5	--	--	--	--	--	--	8	5
National Park Service	--	--	--	--	--	--	--	--	11	7	11	7	11	7
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	10	6	110	31	121	32	--	--	26	12	26	12	147	34
State and Local Government:														
Local	--	--	--	--	--	--	--	--	--	--	--	--	--	--
State	--	--	--	--	--	--	39	44	--	--	39	44	39	44
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	39	44	--	--	39	44	39	44
Private:														
Corporate	175	86	1	1	176	86	--	--	--	--	--	--	176	86
Noncorporate Private:														
Total, Noncorporate Private	51	18	11	9	62	20	--	--	--	--	--	--	62	20
All Private	225	88	12	9	238	88	--	--	--	--	--	--	238	88
All Owners	1,292	248	478	85	1,770	261	337	178	141	44	478	184	2,248	320

Note: Totals may be off because of rounding

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

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

Table C19: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	12,786	1,222	468	109	13,253	1,224	9,616	1,042	350	98	9,966	1,042	23,219	1,600
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	12,786	1,222	468	109	13,253	1,224	9,616	1,042	350	98	9,966	1,042	23,219	1,600
Other Federal Government:														
Bureau of Land Management	246	83	72	37	318	90	6	6	--	--	6	6	323	91
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	323	142	22	16	345	143	345	143
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	1	1	1	1	1	1
Total	246	83	72	37	318	90	329	142	23	16	352	143	670	167
State and Local Government:														
Local	--	--	--	--	--	--	--	--	13	14	13	14	13	14
State	28	29	11	9	39	31	4	4	51	41	56	42	94	52
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	28	29	11	9	39	31	4	4	64	44	69	44	107	54
Private:														
Corporate	1,724	364	79	31	1,803	365	--	--	--	--	--	--	1,803	365
Noncorporate Private:														
Total, Noncorporate Private	1,160	232	364	68	1,523	241	--	--	--	--	--	--	1,523	241
All Private	2,884	429	443	75	3,326	435	--	--	--	--	--	--	3,326	435
All Owners	15,942	1,298	994	137	16,936	1,302	9,949	1,051	437	109	10,387	1,053	27,323	1,667

Note: Totals may be off because of rounding

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

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

Table C20: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: North Coast

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	133	79	9	9	142	79	91	75	--	--	91	75	233	109
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	133	79	9	9	142	79	91	75	--	--	91	75	233	109
Other Federal Government:														
Bureau of Land Management	330	245	--	--	330	245	180	129	--	--	180	129	510	277
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	682	394	--	--	682	394	682	394
U.S. Fish and Wildlife Service	--	--	--	--	--	--	8	8	--	--	8	8	8	8
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	330	245	--	--	330	245	870	414	--	--	870	414	1,199	481
State and Local Government:														
Local	12	13	4	4	16	13	--	--	5	3	5	3	21	14
State	92	42	--	--	92	42	860	270	17	14	877	270	969	265
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	104	43	4	4	108	44	860	270	21	14	882	270	989	266
Private:														
Corporate	3,633	474	24	16	3,657	474	--	--	--	--	--	--	3,657	474
Noncorporate Private:														
Total, Noncorporate Private	1,699	248	85	37	1,784	250	--	--	--	--	--	--	1,784	250
All Private	5,331	525	109	41	5,441	527	--	--	--	--	--	--	5,441	527
All Owners	5,898	587	122	42	6,020	588	1,821	500	21	14	1,843	500	7,863	768

Note: Totals may be off because of rounding

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

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

Table C21: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	22,831	1,403	776	165	23,607	1,408	6,411	739	850	155	7,261	747	30,868	1,578
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	22,831	1,403	776	165	23,607	1,408	6,411	739	850	155	7,261	747	30,868	1,578
Other Federal Government:														
Bureau of Land Management	96	45	129	40	225	61	--	--	69	28	70	28	295	67
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	7,154	906	485	132	7,639	914	7,639	914
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	3	2	3	2	--	--	--	--	--	--	3	2
Total	96	45	133	40	229	61	7,154	906	554	135	7,708	914	7,937	914
State and Local Government:														
Local	89	42	9	5	98	43	--	--	--	--	--	--	98	43
State	167	153	2	3	170	153	172	71	35	18	206	73	376	167
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	257	158	11	5	268	158	172	71	35	18	206	73	474	172
Private:														
Corporate	2,487	298	170	62	2,657	303	--	--	--	--	--	--	2,657	303
Noncorporate Private:														
Total, Noncorporate Private	1,221	221	749	90	1,970	239	--	--	--	--	--	--	1,970	239
All Private	3,708	366	919	109	4,627	380	--	--	--	--	--	--	4,627	380
All Owners	26,891	1,457	1,839	202	28,731	1,466	13,737	1,171	1,439	206	15,176	1,182	43,906	1,855

Note: Totals may be off because of rounding

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

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

Table C22: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	583	227	296	73	878	239	802	322	235	85	1,037	332	1,915	409
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	583	227	296	73	878	239	802	322	235	85	1,037	332	1,915	409
Other Federal Government:														
Bureau of Land Management	--	--	16	7	16	7	--	--	4	3	4	3	19	8
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	--	--	31	14	31	14	31	14
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	47	43	47	43	--	--	--	--	--	--	47	43
Total	--	--	63	43	63	43	--	--	35	14	35	14	98	46
State and Local Government:														
Local	--	--	7	6	7	6	--	--	20	19	20	19	26	20
State	--	--	5	5	5	5	166	162	95	76	261	179	267	179
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	12	8	12	8	166	162	115	78	281	180	293	180
Private:														
Corporate	--	--	3	3	3	3	--	--	--	--	--	--	3	3
Noncorporate Private:														
Total, Noncorporate Private	189	111	141	52	330	123	--	--	--	--	--	--	330	123
All Private	189	111	144	52	333	123	--	--	--	--	--	--	333	123
All Owners	771	253	514	100	1,285	272	968	361	385	116	1,353	378	2,638	466

Note: Totals may be off because of rounding

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

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

Table C23: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees Foliage (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2001-2010

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	33.61	1.64	2.45	0.29	36.06	1.65	14.83	1.21	1.87	0.29	16.71	1.24	52.76	1.93
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	33.61	1.64	2.45	0.29	36.06	1.65	14.83	1.21	1.87	0.29	16.71	1.24	52.76	1.93
Other Federal Government:														
Bureau of Land Management	0.56	0.21	--	--	0.97	0.22	--	--	--	--	--	--	1.29	0.26
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	7.61	0.95	0.57	0.14	8.18	0.95	8.18	0.95
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.56	0.21	--	--	0.99	0.22	7.86	0.96	0.78	0.16	8.65	0.96	9.63	0.98
State and Local Government:														
Local	--	--	--	--	--	--	--	--	--	--	--	--	--	--
State	--	--	--	--	--	--	1.47	0.35	--	--	1.68	0.35	1.99	0.38
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	0.53	0.20	1.58	0.35	--	--	1.86	0.36	2.40	0.41
Private:														
Corporate	7.24	0.68	--	--	7.42	0.68	--	--	--	--	--	--	7.42	0.68
Noncorporate Private:														
Total, Noncorporate Private	5.34	0.55	1.81	0.22	7.15	0.59	--	--	--	--	--	--	7.15	0.59
All Private	12.58	0.84	1.98	0.22	14.57	0.87	--	--	--	--	--	--	14.57	0.87
All Owners	47.22	1.86	4.92	0.37	52.14	1.89	24.27	1.58	2.94	0.34	27.22	1.59	79.36	2.35

Note: Totals may be off because of rounding

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

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

Table C24: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees Foliage (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2002-2011

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>million metric tons C</i>														
USDA Forest Service:														
National Forest	35.48	1.69	2.36	0.28	37.84	1.70	15.12	1.22	1.98	0.31	17.10	1.26	54.94	1.98
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	35.48	1.69	2.36	0.28	37.84	1.70	15.12	1.22	1.98	0.31	17.10	1.26	54.94	1.98
Other Federal Government:														
Bureau of Land Management	0.56	0.21	--	--	0.94	0.22	--	--	--	--	--	--	1.23	0.25
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	7.64	0.95	0.58	0.14	8.22	0.95	8.22	0.95
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.56	0.21	--	--	0.96	0.22	7.89	0.96	0.76	0.15	8.65	0.96	9.61	0.98
State and Local Government:														
Local	--	--	--	--	--	--	--	--	--	--	--	--	--	--
State	--	--	--	--	--	--	1.53	0.35	--	--	1.80	0.36	2.11	0.39
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	1.65	0.36	--	--	1.99	0.37	2.40	0.40
Private:														
Corporate	7.39	0.68	--	--	7.64	0.68	--	--	--	--	--	--	7.64	0.68
Noncorporate Private:														
Total, Noncorporate Private	5.48	0.56	1.62	0.15	7.10	0.58	--	--	--	--	--	--	7.10	0.58
All Private	12.88	0.85	1.87	0.16	14.75	0.86	--	--	--	--	--	--	14.75	0.86
All Owners	49.27	1.91	4.70	0.33	53.97	1.92	24.66	1.59	3.07	0.36	27.74	1.61	81.70	2.38

Note: Totals may be off because of rounding

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

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

Table C25: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees Foliage (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2003-2012

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	36.10	1.68	2.26	0.26	38.36	1.69	15.90	1.16	2.09	0.33	17.99	1.18	56.35	2.03
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	36.10	1.68	2.26	0.26	38.36	1.69	15.90	1.16	2.09	0.33	17.99	1.18	56.35	2.03
Other Federal Government:														
Bureau of Land Management	0.68	0.26	--	--	1.09	0.27	--	--	--	--	--	--	1.38	0.30
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	7.73	0.95	0.58	0.14	8.31	0.96	8.31	0.96
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.68	0.26	--	--	1.16	0.27	8.00	0.96	0.73	0.15	8.73	0.97	9.89	0.99
State and Local Government:														
Local	--	--	--	--	--	--	--	--	--	--	--	--	--	--
State	--	--	--	--	--	--	1.38	0.32	--	--	1.61	0.33	1.95	0.35
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	1.52	0.33	--	--	1.81	0.34	2.27	0.36
Private:														
Corporate	7.49	0.65	--	--	7.70	0.65	--	--	--	--	--	--	7.70	0.65
Noncorporate Private:														
Total, Noncorporate Private	5.44	0.55	1.58	0.15	7.02	0.57	--	--	--	--	--	--	7.02	0.57
All Private	12.93	0.83	1.79	0.15	14.72	0.84	--	--	--	--	--	--	14.72	0.84
All Owners	50.10	1.90	4.59	0.31	54.69	1.91	25.42	1.54	3.12	0.37	28.53	1.56	83.22	2.41

Note: Totals may be off because of rounding

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

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

Table C26: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees Foliage (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2004-2013

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	36.17	1.69	2.20	0.26	38.36	1.70	16.51	1.22	2.19	0.33	18.70	1.24	57.07	2.07
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	36.17	1.69	2.20	0.26	38.36	1.70	16.51	1.22	2.19	0.33	18.70	1.24	57.07	2.07
Other Federal Government:														
Bureau of Land Management	0.68	0.26	--	--	1.06	0.27	--	--	--	--	--	--	1.36	0.30
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	8.05	0.98	0.60	0.14	8.66	0.99	8.66	0.99
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.68	0.26	--	--	1.13	0.27	8.22	0.98	0.74	0.15	8.97	0.99	10.10	1.01
State and Local Government:														
Local	--	--	--	--	--	--	--	--	--	--	--	--	--	--
State	--	--	--	--	--	--	1.25	0.31	--	--	1.47	0.32	1.77	0.33
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	1.39	0.31	--	--	1.68	0.33	2.10	0.34
Private:														
Corporate	7.52	0.65	--	--	7.82	0.66	--	--	--	--	--	--	7.82	0.66
Noncorporate Private:														
Total, Noncorporate Private	4.82	0.44	1.64	0.15	6.46	0.46	--	--	--	--	--	--	6.46	0.46
All Private	12.34	0.76	1.95	0.17	14.28	0.77	--	--	--	--	--	--	14.28	0.77
All Owners	49.55	1.87	4.65	0.31	54.19	1.88	26.12	1.60	3.23	0.38	29.35	1.62	83.54	2.43

Note: Totals may be off because of rounding

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

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

Table C27: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees Foliage (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2005-2014

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	37.00	1.77	1.96	0.21	38.96	1.77	16.61	1.19	2.09	0.32	18.71	1.20	57.67	2.10
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	37.00	1.77	1.96	0.21	38.96	1.77	16.61	1.19	2.09	0.32	18.71	1.20	57.67	2.10
Other Federal Government:														
Bureau of Land Management	0.68	0.26	--	--	1.03	0.27	--	--	--	--	--	--	1.29	0.30
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	8.17	0.98	0.56	0.13	8.72	0.98	8.72	0.98
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.68	0.26	--	--	1.10	0.27	8.34	0.98	0.64	0.14	8.99	0.99	10.09	1.00
State and Local Government:														
Local	--	--	--	--	--	--	--	--	--	--	--	--	--	--
State	--	--	--	--	--	--	1.28	0.31	--	--	1.52	0.32	1.83	0.33
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	1.42	0.32	--	--	1.73	0.33	2.19	0.34
Private:														
Corporate	7.83	0.67	--	--	8.11	0.67	--	--	--	--	--	--	8.11	0.67
Noncorporate Private:														
Total, Noncorporate Private	4.75	0.43	1.63	0.15	6.38	0.45	--	--	--	--	--	--	6.38	0.45
All Private	12.58	0.77	1.91	0.16	14.49	0.78	--	--	--	--	--	--	14.49	0.78
All Owners	50.65	1.94	4.36	0.28	55.01	1.95	26.38	1.57	3.04	0.36	29.42	1.59	84.43	2.46

Note: Totals may be off because of rounding

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

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

Table C28: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees Foliage (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2006-2015

**information duplicated in Table C15 in thousand metric tons C*

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>million metric tons C</i>														
USDA Forest Service:														
National Forest	37.39	1.77	1.98	0.23	39.38	1.77	17.22	1.23	2.08	0.33	19.30	1.24	58.68	2.13
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	37.39	1.77	1.98	0.23	39.38	1.77	17.22	1.23	2.08	0.33	19.30	1.24	58.68	2.13
Other Federal Government:														
Bureau of Land Management	0.68	0.26	0.33	0.06	1.01	0.27	0.19	0.13	0.09	0.03	0.27	0.13	1.29	0.30
Department of Defense and Energy	--	--	0.02	0.01	0.02	0.01	--	--	--	--	--	--	0.02	0.01
National Park Service	--	--	--	--	--	--	8.16	0.98	0.57	0.14	8.73	0.98	8.73	0.98
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.01	0.01	--	--	0.01	0.01	0.01	0.01
Other Federal	--	--	0.05	0.04	0.05	0.04	--	--	0.00	0.00	0.00	0.00	0.05	0.04
Total	0.68	0.26	0.40	0.08	1.08	0.27	8.35	0.98	0.66	0.14	9.01	0.99	10.09	1.00
State and Local Government:														
Local	0.10	0.04	0.05	0.02	0.15	0.05	0.14	0.08	0.08	0.04	0.22	0.08	0.37	0.10
State	0.30	0.16	0.02	0.01	0.32	0.16	1.29	0.31	0.26	0.10	1.55	0.32	1.87	0.33
Other Public	--	--	--	--	--	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.40	0.16	0.07	0.02	0.47	0.17	1.43	0.32	0.34	0.10	1.77	0.33	2.24	0.35
Private:														
Corporate	8.06	0.65	0.38	0.08	8.44	0.66	--	--	--	--	--	--	8.44	0.66
Noncorporate Private:														
Total, Noncorporate Private	4.79	0.44	1.76	0.16	6.55	0.46	--	--	--	--	--	--	6.55	0.46
All Private	12.86	0.75	2.14	0.18	14.99	0.77	--	--	--	--	--	--	14.99	0.77
All Owners	51.33	1.94	4.58	0.30	55.92	1.95	27.01	1.60	3.08	0.37	30.09	1.62	86.01	2.48

Note: Totals may be off because of rounding

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

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

Table C29: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: All California

**information from Table C29 combined with information from Table C43 in Table C42*

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	7.88	0.17	4.29	0.20	12.17	0.22	2.36	0.10	1.69	0.12	4.06	0.13	16.22	0.24
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	7.88	0.17	4.29	0.20	12.17	0.22	2.36	0.10	1.69	0.12	4.06	0.13	16.22	0.24
Other Federal Government:														
Bureau of Land Management	0.34	0.05	1.80	0.15	2.14	0.16	0.06	0.02	0.34	0.06	0.40	0.06	2.54	0.16
Department of Defense and Energy	0.02	0.01	0.11	0.03	0.13	0.03	--	--	0.01	0.01	0.01	0.01	0.14	0.04
National Park Service	--	--	--	--	--	--	0.70	0.05	0.63	0.08	1.33	0.09	1.33	0.09
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00
Other Federal	--	--	0.18	0.04	0.18	0.04	--	--	0.02	0.01	0.02	0.01	0.20	0.05
Total	0.36	0.05	2.10	0.16	2.46	0.16	0.77	0.06	1.00	0.09	1.76	0.10	4.22	0.18
State and Local Government:														
Local	0.05	0.02	0.17	0.04	0.22	0.04	0.05	0.02	0.26	0.05	0.31	0.05	0.53	0.06
State	0.09	0.02	0.08	0.03	0.16	0.04	0.32	0.04	0.42	0.06	0.74	0.07	0.90	0.07
Other Public	--	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.03	0.02
Total	0.13	0.03	0.27	0.05	0.40	0.06	0.37	0.05	0.68	0.07	1.06	0.08	1.46	0.09
Private:														
Corporate	4.67	0.17	1.23	0.11	5.90	0.19	--	--	--	--	--	--	5.90	0.19
Noncorporate Private:														
Total, Noncorporate Private	3.33	0.14	6.97	0.22	10.30	0.25	--	--	--	--	--	--	10.30	0.25
All Private	8.00	0.18	8.19	0.23	16.20	0.26	--	--	--	--	--	--	16.20	0.26
All Owners	16.37	0.25	14.85	0.34	31.22	0.37	3.50	0.13	3.37	0.16	6.88	0.19	38.09	0.39

Note: Totals may be off because of rounding

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

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

Table C30: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	0.00	0.00	0.13	0.03	0.13	0.03	0.04	0.02	0.19	0.04	0.23	0.05	0.36	0.06
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.00	0.00	0.13	0.03	0.13	0.03	0.04	0.02	0.19	0.04	0.23	0.05	0.36	0.06
Other Federal Government:														
Bureau of Land Management	--	--	0.10	0.03	0.10	0.03	--	--	0.01	0.01	0.01	0.01	0.11	0.03
Department of Defense and Energy	--	--	0.07	0.02	0.07	0.02	--	--	--	--	--	--	0.07	0.02
National Park Service	--	--	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.04	0.02	0.04	0.02	--	--	--	--	--	--	0.04	0.02
Total	--	--	0.20	0.04	0.20	0.04	--	--	0.02	0.01	0.02	0.01	0.22	0.04
State and Local Government:														
Local	--	--	0.04	0.02	0.04	0.02	0.05	0.02	0.16	0.04	0.21	0.04	0.25	0.04
State	0.02	0.01	0.02	0.01	0.03	0.02	0.04	0.02	0.18	0.04	0.23	0.04	0.26	0.05
Other Public	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.01
Total	0.02	0.01	0.05	0.02	0.07	0.02	0.10	0.03	0.36	0.05	0.45	0.05	0.52	0.06
Private:														
Corporate	0.05	0.02	0.21	0.04	0.25	0.05	--	--	--	--	--	--	0.25	0.05
Noncorporate Private:														
Total, Noncorporate Private	0.17	0.03	1.17	0.09	1.34	0.10	--	--	--	--	--	--	1.34	0.10
All Private	0.21	0.04	1.38	0.10	1.59	0.11	--	--	--	--	--	--	1.59	0.11
All Owners	0.23	0.04	1.77	0.12	2.00	0.12	0.13	0.03	0.56	0.07	0.70	0.07	2.70	0.14

Note: Totals may be off because of rounding

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

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

Table C31: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: Central Valley

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal Government:														
Bureau of Land Management	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	0.00	0.00	0.00	0.00	0.00	0.00
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	0.00	0.00	0.00	0.00	0.00	0.00
State and Local Government:														
Local	--	--	0.01	0.00	0.01	0.00	--	--	--	--	--	--	0.01	0.00
State	--	--	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	0.01	0.00	0.01	0.00	--	--	0.01	0.01	0.01	0.01	0.01	0.01
Private:														
Corporate	--	--	0.01	0.01	0.01	0.01	--	--	--	--	--	--	0.01	0.01
Noncorporate Private:														
Total, Noncorporate Private	--	--	0.11	0.03	0.11	0.03	--	--	--	--	--	--	0.11	0.03
All Private	--	--	0.12	0.03	0.12	0.03	--	--	--	--	--	--	0.12	0.03
All Owners	--	--	0.13	0.03	0.13	0.03	--	--	0.01	0.01	0.01	0.01	0.14	0.03

Note: Totals may be off because of rounding

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

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

Table C32: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: Eastside

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	0.75	0.08	1.69	0.15	2.45	0.17	0.05	0.02	0.13	0.04	0.18	0.04	2.63	0.17
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.75	0.08	1.69	0.15	2.45	0.17	0.05	0.02	0.13	0.04	0.18	0.04	2.63	0.17
Other Federal Government:														
Bureau of Land Management	0.04	0.02	1.04	0.13	1.08	0.13	--	--	0.09	0.03	0.09	0.03	1.17	0.13
Department of Defense and Energy	--	--	0.05	0.02	0.05	0.02	--	--	--	--	--	--	0.05	0.02
National Park Service	--	--	--	--	--	--	--	--	0.11	0.03	0.11	0.03	0.11	0.03
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.02	0.02	0.02	0.02	--	--	--	--	--	--	0.02	0.02
Total	0.04	0.02	1.10	0.13	1.15	0.13	--	--	0.19	0.04	0.19	0.04	1.34	0.14
State and Local Government:														
Local	--	--	0.01	0.01	0.01	0.01	--	--	--	--	--	--	0.01	0.01
State	--	--	--	--	--	--	0.00	0.01	0.02	0.01	0.02	0.01	0.02	0.01
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	0.01	0.01	0.01	0.01	0.00	0.01	0.02	0.01	0.02	0.01	0.03	0.02
Private:														
Corporate	0.25	0.05	0.15	0.05	0.39	0.07	--	--	--	--	--	--	0.39	0.07
Noncorporate Private:														
Total, Noncorporate Private	0.13	0.03	0.41	0.09	0.54	0.09	--	--	--	--	--	--	0.54	0.09
All Private	0.37	0.06	0.56	0.10	0.94	0.12	--	--	--	--	--	--	0.94	0.12
All Owners	1.17	0.10	3.37	0.22	4.54	0.24	0.05	0.02	0.34	0.06	0.40	0.06	4.93	0.25

Note: Totals may be off because of rounding

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

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

Table C33: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	2.35	0.11	0.57	0.07	2.92	0.13	1.23	0.09	0.42	0.06	1.64	0.10	4.56	0.16
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	2.35	0.11	0.57	0.07	2.92	0.13	1.23	0.09	0.42	0.06	1.64	0.10	4.56	0.16
Other Federal Government:														
Bureau of Land Management	0.14	0.03	0.18	0.04	0.33	0.05	0.00	0.00	0.03	0.02	0.04	0.02	0.37	0.06
Department of Defense and Energy	--	--	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01
National Park Service	--	--	--	--	--	--	0.07	0.02	0.05	0.02	0.13	0.03	0.13	0.03
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.01	0.01	0.01	0.01	--	--	0.00	0.00	0.00	0.00	0.01	0.01
Total	0.14	0.03	0.19	0.04	0.34	0.05	0.08	0.02	0.10	0.03	0.18	0.04	0.52	0.06
State and Local Government:														
Local	0.00	0.00	0.02	0.01	0.02	0.01	--	--	0.01	0.01	0.01	0.01	0.03	0.01
State	0.01	0.01	0.02	0.01	0.04	0.02	0.00	0.00	0.03	0.02	0.03	0.02	0.07	0.02
Other Public	--	--	0.00	0.00	0.00	0.00	--	--	--	--	--	--	0.00	0.00
Total	0.02	0.01	0.04	0.02	0.06	0.02	0.00	0.00	0.04	0.02	0.04	0.02	0.10	0.03
Private:														
Corporate	1.01	0.09	0.33	0.05	1.34	0.10	--	--	--	--	--	--	1.34	0.10
Noncorporate Private:														
Total, Noncorporate Private	0.89	0.08	1.53	0.11	2.42	0.14	--	--	--	--	--	--	2.42	0.14
All Private	1.90	0.12	1.86	0.12	3.76	0.17	--	--	--	--	--	--	3.76	0.17
All Owners	4.42	0.17	2.66	0.15	7.08	0.22	1.31	0.09	0.55	0.07	1.86	0.11	8.93	0.24

Note: Totals may be off because of rounding

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

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

Table C34: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: North Coast

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	0.02	0.01	0.01	0.01	0.03	0.02	0.01	0.01	--	--	0.01	0.01	0.05	0.02
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.02	0.01	0.01	0.01	0.03	0.02	0.01	0.01	--	--	0.01	0.01	0.05	0.02
Other Federal Government:														
Bureau of Land Management	0.07	0.02	--	--	0.07	0.02	0.05	0.02	--	--	0.05	0.02	0.12	0.03
Department of Defense and Energy	0.02	0.01	--	--	0.02	0.01	--	--	--	--	--	--	0.02	0.01
National Park Service	--	--	--	--	--	--	0.05	0.02	0.01	0.01	0.06	0.02	0.06	0.02
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.00	0.00	--	--	0.00	0.00	0.00	0.00
Other Federal	--	--	0.00	0.00	0.00	0.00	--	--	--	--	--	--	0.00	0.00
Total	0.08	0.03	0.00	0.00	0.09	0.03	0.11	0.03	0.01	0.01	0.12	0.03	0.20	0.04
State and Local Government:														
Local	0.01	0.01	0.00	0.00	0.01	0.01	--	--	0.07	0.03	0.07	0.03	0.08	0.03
State	0.04	0.02	0.00	0.00	0.05	0.02	0.20	0.04	0.01	0.01	0.21	0.04	0.26	0.04
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.05	0.02	0.01	0.01	0.06	0.02	0.20	0.04	0.08	0.03	0.28	0.05	0.34	0.05
Private:														
Corporate	1.45	0.10	0.05	0.02	1.50	0.10	--	--	--	--	--	--	1.50	0.10
Noncorporate Private:														
Total, Noncorporate Private	1.07	0.09	0.24	0.04	1.32	0.10	--	--	--	--	--	--	1.32	0.10
All Private	2.53	0.12	0.29	0.05	2.82	0.13	--	--	--	--	--	--	2.82	0.13
All Owners	2.68	0.13	0.31	0.05	3.00	0.14	0.32	0.05	0.09	0.03	0.41	0.06	3.40	0.15

Note: Totals may be off because of rounding

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

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

Table C35: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	4.59	0.15	1.34	0.12	5.93	0.18	0.91	0.07	0.74	0.08	1.65	0.10	7.57	0.20
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	4.59	0.15	1.34	0.12	5.93	0.18	0.91	0.07	0.74	0.08	1.65	0.10	7.57	0.20
Other Federal Government:														
Bureau of Land Management	0.09	0.02	0.41	0.06	0.49	0.07	0.00	0.00	0.15	0.04	0.16	0.04	0.65	0.08
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	0.58	0.05	0.31	0.05	0.90	0.07	0.90	0.07
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.02	0.01	0.02	0.01	--	--	0.00	0.00	0.00	0.00	0.03	0.01
Total	0.09	0.02	0.43	0.07	0.52	0.07	0.58	0.05	0.47	0.07	1.05	0.08	1.57	0.10
State and Local Government:														
Local	0.04	0.02	0.07	0.03	0.11	0.03	--	--	0.01	0.01	0.01	0.01	0.12	0.03
State	0.01	0.01	0.03	0.02	0.04	0.02	0.06	0.02	0.10	0.03	0.15	0.04	0.19	0.04
Other Public	--	--	0.01	0.01	0.01	0.01	--	--	--	--	--	--	0.01	0.01
Total	0.05	0.02	0.11	0.03	0.16	0.04	0.06	0.02	0.11	0.03	0.16	0.04	0.32	0.05
Private:														
Corporate	1.90	0.13	0.42	0.06	2.32	0.14	--	--	--	--	--	--	2.32	0.14
Noncorporate Private:														
Total, Noncorporate Private	1.04	0.08	3.17	0.16	4.21	0.18	--	--	--	--	--	--	4.21	0.18
All Private	2.94	0.14	3.59	0.17	6.53	0.21	--	--	--	--	--	--	6.53	0.21
All Owners	7.66	0.21	5.47	0.22	13.13	0.29	1.55	0.08	1.32	0.11	2.87	0.13	16.00	0.31

Note: Totals may be off because of rounding

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

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

Table C36: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	0.16	0.04	0.55	0.07	0.71	0.08	0.14	0.03	0.21	0.04	0.35	0.06	1.05	0.09
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.16	0.04	0.55	0.07	0.71	0.08	0.14	0.03	0.21	0.04	0.35	0.06	1.05	0.09
Other Federal Government:														
Bureau of Land Management	--	--	0.07	0.03	0.07	0.03	--	--	0.05	0.02	0.05	0.02	0.13	0.03
Department of Defense and Energy	0.00	0.00	--	--	0.00	0.00	--	--	--	--	--	--	0.00	0.00
National Park Service	--	--	--	--	--	--	--	--	0.13	0.04	0.13	0.04	0.13	0.04
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.09	0.03	0.09	0.03	--	--	0.02	0.01	0.02	0.01	0.11	0.03
Total	0.00	0.00	0.16	0.04	0.16	0.04	--	--	0.20	0.04	0.20	0.04	0.37	0.06
State and Local Government:														
Local	--	--	0.03	0.01	0.03	0.01	--	--	0.01	0.01	0.01	0.01	0.04	0.02
State	--	--	0.01	0.01	0.01	0.01	0.01	0.01	0.07	0.03	0.08	0.03	0.09	0.03
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	0.04	0.02	0.04	0.02	0.01	0.01	0.08	0.03	0.09	0.03	0.13	0.03
Private:														
Corporate	0.00	0.00	0.07	0.03	0.07	0.03	--	--	--	--	--	--	0.07	0.03
Noncorporate Private:														
Total, Noncorporate Private	0.04	0.02	0.32	0.05	0.36	0.06	--	--	--	--	--	--	0.36	0.06
All Private	0.04	0.02	0.39	0.06	0.43	0.06	--	--	--	--	--	--	0.43	0.06
All Owners	0.21	0.04	1.14	0.10	1.34	0.11	0.15	0.04	0.49	0.07	0.64	0.08	1.99	0.13

Note: Totals may be off because of rounding

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

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

Table C37: Aboveground and Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, All California (10-year averages): 2001-2010

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	8.72	0.20	5.90	0.24	14.63	0.28	2.44	0.12	1.92	0.13	4.36	0.17	18.98	0.26
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	8.72	0.20	5.90	0.24	14.63	0.28	2.44	0.12	1.92	0.13	4.36	0.17	18.98	0.26
Other Federal Government:														
Bureau of Land Management	0.39	0.06	2.21	0.16	2.60	0.17	0.02	0.01	0.49	0.06	0.52	0.07	3.12	0.18
Department of Defense and Energy	0.01	0.01	0.12	0.03	0.13	0.04	--	--	--	--	--	--	0.13	0.04
National Park Service	--	--	--	--	--	--	0.76	0.06	0.76	0.08	1.52	0.10	1.52	0.10
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Other Federal	--	--	0.18	0.05	0.18	0.05	0.01	0.01	0.03	0.01	0.04	0.02	0.22	0.05
Total	0.40	0.06	2.51	0.17	2.91	0.17	0.80	0.06	1.29	0.10	2.09	0.11	5.00	0.20
State and Local Government:														
Local	0.05	0.02	0.19	0.04	0.23	0.05	0.04	0.02	0.33	0.06	0.36	0.06	0.60	0.07
State	0.11	0.03	0.08	0.03	0.19	0.04	0.40	0.06	0.49	0.07	0.89	0.09	1.08	0.10
Other Public	--	--	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.02	0.05	0.02
Total	0.15	0.03	0.28	0.05	0.43	0.06	0.45	0.06	0.84	0.09	1.29	0.11	1.72	0.12
Private:														
Corporate	4.98	0.18	0.89	0.09	5.87	0.20	--	--	--	--	--	--	5.87	0.20
Noncorporate Private:														
Total, Noncorporate Private	4.06	0.16	8.93	0.26	12.99	0.29	--	--	--	--	--	--	12.99	0.29
All Private	9.04	0.20	9.82	0.27	18.86	0.29	--	--	--	--	--	--	18.86	0.29
All Owners	18.32	0.28	18.51	0.40	36.83	0.43	3.68	0.15	4.05	0.19	7.73	0.23	44.56	0.43

Note: Totals may be off because of rounding

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

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

Table C38: Aboveground and Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, All California (10-year averages): 2002-2011

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	8.78	0.20	5.67	0.24	14.45	0.28	2.47	0.12	1.89	0.13	4.35	0.17	18.80	0.27
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	8.78	0.20	5.67	0.24	14.45	0.28	2.47	0.12	1.89	0.13	4.35	0.17	18.80	0.27
Other Federal Government:														
Bureau of Land Management	0.38	0.06	2.17	0.16	2.56	0.17	0.02	0.01	0.48	0.06	0.51	0.07	3.06	0.17
Department of Defense and Energy	0.01	0.01	0.14	0.04	0.16	0.04	--	--	--	--	--	--	0.16	0.04
National Park Service	--	--	--	--	--	--	0.76	0.06	0.76	0.08	1.53	0.10	1.53	0.10
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Other Federal	--	--	0.18	0.05	0.18	0.05	0.01	0.01	0.03	0.01	0.04	0.02	0.22	0.05
Total	0.40	0.06	2.49	0.17	2.89	0.17	0.80	0.06	1.28	0.10	2.08	0.11	4.97	0.20
State and Local Government:														
Local	0.03	0.01	0.19	0.04	0.22	0.04	0.04	0.02	0.32	0.06	0.36	0.06	0.58	0.07
State	0.11	0.03	0.08	0.03	0.19	0.04	0.41	0.06	0.52	0.07	0.93	0.09	1.11	0.10
Other Public	--	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.03	0.02
Total	0.14	0.03	0.28	0.05	0.42	0.06	0.46	0.06	0.85	0.09	1.30	0.11	1.73	0.12
Private:														
Corporate	4.92	0.18	1.04	0.10	5.97	0.21	--	--	--	--	--	--	5.97	0.21
Noncorporate Private:														
Total, Noncorporate Private	4.00	0.16	8.66	0.26	12.66	0.29	--	--	--	--	--	--	12.66	0.29
All Private	8.92	0.20	9.71	0.26	18.63	0.29	--	--	--	--	--	--	18.63	0.29
All Owners	18.24	0.29	18.15	0.39	36.39	0.43	3.72	0.15	4.01	0.19	7.74	0.23	44.13	0.43

Note: Totals may be off because of rounding

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

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

Table C39: Aboveground and Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, All California (10-year averages): 2003-2012

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	8.82	0.19	5.27	0.23	14.09	0.26	2.57	0.12	1.95	0.13	4.52	0.15	18.61	0.28
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	8.82	0.19	5.27	0.23	14.09	0.26	2.57	0.12	1.95	0.13	4.52	0.15	18.61	0.28
Other Federal Government:														
Bureau of Land Management	0.42	0.06	2.15	0.17	2.57	0.18	0.03	0.02	0.40	0.07	0.44	0.07	3.00	0.19
Department of Defense and Energy	0.02	0.01	0.13	0.04	0.15	0.04	--	--	0.01	0.01	0.01	0.01	0.16	0.04
National Park Service	--	--	--	--	--	--	0.78	0.06	0.72	0.09	1.51	0.10	1.51	0.10
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.21	0.05	0.21	0.05	0.00	0.00	0.03	0.02	0.04	0.02	0.24	0.05
Total	0.44	0.06	2.48	0.18	2.92	0.19	0.82	0.06	1.17	0.11	1.99	0.12	4.91	0.20
State and Local Government:														
Local	0.04	0.02	0.18	0.04	0.22	0.05	0.04	0.02	0.31	0.05	0.35	0.06	0.58	0.07
State	0.10	0.03	0.09	0.03	0.19	0.04	0.37	0.05	0.48	0.07	0.85	0.08	1.03	0.08
Other Public	--	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.03	0.02
Total	0.14	0.03	0.28	0.05	0.42	0.06	0.42	0.05	0.80	0.08	1.22	0.09	1.64	0.10
Private:														
Corporate	5.05	0.19	1.05	0.10	6.10	0.21	--	--	--	--	--	--	6.10	0.21
Noncorporate Private:														
Total, Noncorporate Private	3.99	0.16	8.50	0.26	12.48	0.29	--	--	--	--	--	--	12.48	0.29
All Private	9.03	0.20	9.55	0.27	18.58	0.30	--	--	--	--	--	--	18.58	0.30
All Owners	18.44	0.28	17.58	0.40	36.01	0.43	3.81	0.14	3.92	0.18	7.73	0.21	43.74	0.44

Note: Totals may be off because of rounding

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

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

Table C40: Aboveground and Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, All California (10-year averages): 2004-2013

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	8.70	0.19	5.13	0.23	13.82	0.25	2.55	0.11	1.90	0.13	4.46	0.15	18.28	0.27
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	8.70	0.19	5.13	0.23	13.82	0.25	2.55	0.11	1.90	0.13	4.46	0.15	18.28	0.27
Other Federal Government:														
Bureau of Land Management	0.41	0.06	2.07	0.17	2.48	0.18	0.04	0.02	0.43	0.07	0.47	0.07	2.95	0.19
Department of Defense and Energy	0.02	0.01	0.13	0.04	0.15	0.04	--	--	0.01	0.01	0.01	0.01	0.16	0.04
National Park Service	--	--	--	--	--	--	0.79	0.06	0.70	0.08	1.49	0.10	1.49	0.10
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01
Other Federal	--	--	0.20	0.05	0.20	0.05	--	--	0.02	0.02	0.02	0.02	0.22	0.05
Total	0.44	0.06	2.39	0.18	2.83	0.19	0.83	0.06	1.16	0.11	2.00	0.12	4.83	0.20
State and Local Government:														
Local	0.05	0.02	0.18	0.04	0.23	0.05	0.06	0.02	0.31	0.05	0.36	0.06	0.59	0.07
State	0.10	0.03	0.09	0.03	0.19	0.04	0.36	0.05	0.48	0.07	0.84	0.08	1.02	0.08
Other Public	--	--	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.03	0.02
Total	0.14	0.03	0.29	0.05	0.43	0.06	0.42	0.05	0.79	0.08	1.22	0.09	1.65	0.10
Private:														
Corporate	5.06	0.19	1.13	0.11	6.20	0.21	--	--	--	--	--	--	6.20	0.21
Noncorporate Private:														
Total, Noncorporate Private	3.85	0.16	8.22	0.25	12.07	0.28	--	--	--	--	--	--	12.07	0.28
All Private	8.92	0.20	9.35	0.26	18.27	0.29	--	--	--	--	--	--	18.27	0.29
All Owners	18.19	0.28	17.16	0.39	35.35	0.42	3.81	0.14	3.86	0.18	7.67	0.21	43.02	0.44

Note: Totals may be off because of rounding

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

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

Table C41: Aboveground and Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, All California (10-year averages): 2005-2014

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	8.74	0.18	4.95	0.22	13.69	0.25	2.61	0.12	1.84	0.13	4.45	0.15	18.14	0.27
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	8.74	0.18	4.95	0.22	13.69	0.25	2.61	0.12	1.84	0.13	4.45	0.15	18.14	0.27
Other Federal Government:														
Bureau of Land Management	0.40	0.06	1.99	0.16	2.39	0.17	0.06	0.02	0.39	0.06	0.44	0.07	2.83	0.18
Department of Defense and Energy	0.02	0.01	0.12	0.04	0.15	0.04	--	--	0.01	0.01	0.01	0.01	0.15	0.04
National Park Service	--	--	--	--	--	--	0.79	0.06	0.69	0.08	1.48	0.10	1.48	0.10
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01
Other Federal	--	--	0.20	0.05	0.20	0.05	--	--	0.02	0.02	0.02	0.02	0.22	0.05
Total	0.42	0.06	2.32	0.17	2.73	0.18	0.85	0.06	1.11	0.10	1.96	0.12	4.70	0.19
State and Local Government:														
Local	0.05	0.02	0.19	0.04	0.25	0.05	0.06	0.02	0.30	0.05	0.35	0.06	0.60	0.07
State	0.10	0.03	0.09	0.03	0.19	0.04	0.36	0.05	0.47	0.07	0.83	0.08	1.02	0.08
Other Public	--	--	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.03	0.02
Total	0.15	0.03	0.30	0.05	0.45	0.06	0.42	0.05	0.78	0.08	1.20	0.09	1.65	0.10
Private:														
Corporate	5.08	0.19	1.23	0.11	6.31	0.21	--	--	--	--	--	--	6.31	0.21
Noncorporate Private:														
Total, Noncorporate Private	3.77	0.16	8.04	0.25	11.81	0.28	--	--	--	--	--	--	11.81	0.28
All Private	8.85	0.20	9.28	0.26	18.13	0.29	--	--	--	--	--	--	18.13	0.29
All Owners	18.16	0.27	16.84	0.38	35.00	0.42	3.88	0.14	3.73	0.18	7.61	0.21	42.62	0.43

Note: Totals may be off because of rounding

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

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

Table C42: Aboveground Carbon, Dry Weight of Live Understory Vegetation by Owner Group and Forest Land Status, All California (10-year averages): 2006-2015

**information combined from Table C29 and Table C43*

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE				
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	7.88	0.17	4.29	0.20	12.17	0.22	2.36	0.10	1.69	0.12	4.06	0.13	16.22	0.24
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	7.88	0.17	4.29	0.20	12.17	0.22	2.36	0.10	1.69	0.12	4.06	0.13	16.22	0.24
Other Federal Government:														
Bureau of Land Management	0.34	0.05	1.80	0.15	2.14	0.16	0.06	0.02	0.34	0.06	0.40	0.06	2.54	0.16
Department of Defense and Energy	0.02	0.01	0.11	0.03	0.13	0.03	--	--	0.01	0.01	0.01	0.01	0.14	0.04
National Park Service	--	--	--	--	--	--	0.70	0.05	0.63	0.08	1.33	0.09	1.33	0.09
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00
Other Federal	--	--	0.18	0.04	0.18	0.04	--	--	0.02	0.01	0.02	0.01	0.20	0.05
Total	0.36	0.05	2.10	0.16	2.46	0.16	0.77	0.06	1.00	0.09	1.76	0.10	4.22	0.18
State and Local Government:														
Local	0.05	0.02	0.17	0.04	0.22	0.04	0.05	0.02	0.26	0.05	0.31	0.05	0.53	0.06
State	0.09	0.02	0.08	0.03	0.16	0.04	0.32	0.04	0.42	0.06	0.74	0.07	0.90	0.07
Other Public	--	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.03	0.02
Total	0.13	0.03	0.27	0.05	0.40	0.06	0.37	0.05	0.68	0.07	1.06	0.08	1.46	0.09
Private:														
Corporate	4.67	0.17	1.23	0.11	5.90	0.19	--	--	--	--	--	--	5.90	0.19
Noncorporate Private:														
Total, Noncorporate Private	3.33	0.14	6.97	0.22	10.30	0.25	--	--	--	--	--	--	10.30	0.25
All Private	8.00	0.18	8.19	0.23	16.20	0.26	--	--	--	--	--	--	16.20	0.26
All Owners	16.37	0.25	14.85	0.34	31.22	0.37	3.50	0.13	3.37	0.16	6.88	0.19	38.09	0.39

Note: Totals may be off because of rounding

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

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

Table C43: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: All California

**information from Table C43 combined with information from Table C29 in Table C42*

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	0.8753	0.0185	0.4765	0.0219	1.3518	0.0248	0.2627	0.0114	0.1882	0.0129	0.4509	0.0150	1.8027	0.0271
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.8753	0.0185	0.4765	0.0219	1.3518	0.0248	0.2627	0.0114	0.1882	0.0129	0.4509	0.0150	1.8027	0.0271
Other Federal Government:														
Bureau of Land Management	0.0377	0.0058	0.2005	0.0165	0.2382	0.0174	0.0066	0.0023	0.0376	0.0063	0.0441	0.0067	0.2823	0.0181
Department of Defense and Energy	0.0022	0.0015	0.0124	0.0035	0.0146	0.0038	--	--	0.0009	0.0009	0.0009	0.0009	0.0155	0.0039
National Park Service	--	--	--	--	--	--	0.0781	0.0058	0.0696	0.0084	0.1477	0.0099	0.1477	0.0099
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.0005	0.0005	0.0001	0.0001	0.0006	0.0005	0.0006	0.0005
Other Federal	--	--	0.0201	0.0048	0.0201	0.0048	--	--	0.0025	0.0015	0.0025	0.0015	0.0226	0.0050
Total	0.0399	0.0059	0.2329	0.0173	0.2729	0.0182	0.0851	0.0062	0.1106	0.0103	0.1957	0.0115	0.4686	0.0195
State and Local Government:														
Local	0.0052	0.0020	0.0194	0.0042	0.0246	0.0046	0.0052	0.0020	0.0287	0.0052	0.0339	0.0054	0.0585	0.0071
State	0.0096	0.0024	0.0087	0.0032	0.0183	0.0039	0.0356	0.0048	0.0463	0.0064	0.0819	0.0077	0.1002	0.0080
Other Public	--	--	0.0015	0.0013	0.0015	0.0013	0.0008	0.0009	0.0010	0.0011	0.0018	0.0014	0.0033	0.0019
Total	0.0148	0.0031	0.0296	0.0054	0.0444	0.0062	0.0415	0.0052	0.0760	0.0080	0.1175	0.0091	0.1620	0.0102
Private:														
Corporate	0.5187	0.0187	0.1366	0.0118	0.6553	0.0216	--	--	--	--	--	--	0.6553	0.0216
Noncorporate Private:														
Total, Noncorporate Private	0.3703	0.0157	0.7739	0.0246	1.1442	0.0276	--	--	--	--	--	--	1.1442	0.0276
All Private	0.8890	0.0200	0.9105	0.0260	1.7995	0.0291	--	--	--	--	--	--	1.7995	0.0291
All Owners	1.8191	0.0274	1.6495	0.0381	3.4686	0.0416	0.3894	0.0140	0.3748	0.0183	0.7642	0.0209	4.2327	0.0433

Note: Totals may be off because of rounding

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

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

Table C44: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	0.0003	0.0002	0.0145	0.0037	0.0147	0.0037	0.0041	0.0020	0.0214	0.0047	0.0255	0.0050	0.0402	0.0063
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.0003	0.0002	0.0145	0.0037	0.0147	0.0037	0.0041	0.0020	0.0214	0.0047	0.0255	0.0050	0.0402	0.0063
Other Federal Government:														
Bureau of Land Management	--	--	0.0115	0.0036	0.0115	0.0036	--	--	0.0008	0.0008	0.0008	0.0008	0.0124	0.0037
Department of Defense and Energy	--	--	0.0073	0.0025	0.0073	0.0025	--	--	--	--	--	--	0.0073	0.0025
National Park Service	--	--	--	--	--	--	--	--	0.0009	0.0011	0.0009	0.0011	0.0009	0.0011
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.0039	0.0020	0.0039	0.0020	--	--	0.0000	0.0000	0.0000	0.0000	0.0039	0.0020
Total	--	--	0.0227	0.0048	0.0227	0.0048	--	--	0.0018	0.0013	0.0018	0.0013	0.0245	0.0050
State and Local Government:														
Local	--	--	0.0042	0.0019	0.0042	0.0019	0.0052	0.0020	0.0183	0.0040	0.0235	0.0043	0.0277	0.0046
State	0.0019	0.0012	0.0018	0.0016	0.0037	0.0020	0.0050	0.0021	0.0201	0.0042	0.0251	0.0047	0.0288	0.0051
Other Public	--	--	--	--	--	--	0.0008	0.0009	0.0010	0.0011	0.0018	0.0014	0.0018	0.0014
Total	0.0019	0.0012	0.0060	0.0025	0.0079	0.0028	0.0109	0.0030	0.0395	0.0056	0.0504	0.0061	0.0583	0.0065
Private:														
Corporate	0.0053	0.0022	0.0230	0.0045	0.0283	0.0050	--	--	--	--	--	--	0.0283	0.0050
Noncorporate Private:														
Total, Noncorporate Private	0.0184	0.0036	0.1303	0.0105	0.1487	0.0111	--	--	--	--	--	--	0.1487	0.0111
All Private	0.0237	0.0042	0.1533	0.0114	0.1770	0.0120	--	--	--	--	--	--	0.1770	0.0120
All Owners	0.0259	0.0043	0.1965	0.0131	0.2223	0.0138	0.0150	0.0036	0.0627	0.0074	0.0777	0.0080	0.3000	0.0158

Note: Totals may be off because of rounding

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

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

Table C45: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: Central Valley

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal Government:														
Bureau of Land Management	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
State and Local Government:														
Local	--	--	0.0007	0.0005	0.0007	0.0005	--	--	--	--	--	--	0.0007	0.0005
State	--	--	--	--	--	--	--	--	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	0.0007	0.0005	0.0007	0.0005	--	--	0.0008	0.0008	0.0008	0.0008	0.0016	0.0009
Private:														
Corporate	--	--	0.0011	0.0010	0.0011	0.0010	--	--	--	--	--	--	0.0011	0.0010
Noncorporate Private:														
Total, Noncorporate Private	0.0000	0.0000	0.0124	0.0033	0.0124	0.0033	--	--	--	--	--	--	0.0124	0.0033
All Private	0.0000	0.0000	0.0135	0.0034	0.0135	0.0034	--	--	--	--	--	--	0.0135	0.0034
All Owners	0.0000	0.0000	0.0143	0.0035	0.0143	0.0035	--	--	0.0009	0.0008	0.0009	0.0008	0.0152	0.0036

Note: Totals may be off because of rounding

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

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

Table C46: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: Eastside

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	0.0838	0.0086	0.1882	0.0165	0.2720	0.0184	0.0052	0.0020	0.0149	0.0045	0.0201	0.0049	0.2920	0.0190
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.0838	0.0086	0.1882	0.0165	0.2720	0.0184	0.0052	0.0020	0.0149	0.0045	0.0201	0.0049	0.2920	0.0190
Other Federal Government:														
Bureau of Land Management	0.0048	0.0024	0.1154	0.0142	0.1202	0.0144	--	--	0.0098	0.0033	0.0098	0.0033	0.1299	0.0147
Department of Defense and Energy	--	--	0.0051	0.0024	0.0051	0.0024	--	--	--	--	--	--	0.0051	0.0024
National Park Service	--	--	--	--	--	--	--	--	0.0119	0.0036	0.0119	0.0036	0.0119	0.0036
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.0020	0.0020	0.0020	0.0020	--	--	--	--	--	--	0.0020	0.0020
Total	0.0048	0.0024	0.1225	0.0145	0.1273	0.0147	--	--	0.0216	0.0049	0.0216	0.0049	0.1489	0.0153
State and Local Government:														
Local	--	--	0.0011	0.0011	0.0011	0.0011	--	--	--	--	--	--	0.0011	0.0011
State	--	--	--	--	--	--	0.0006	0.0006	0.0018	0.0015	0.0023	0.0017	0.0023	0.0017
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	0.0011	0.0011	0.0011	0.0011	0.0006	0.0006	0.0018	0.0015	0.0023	0.0017	0.0034	0.0020
Private:														
Corporate	0.0276	0.0061	0.0162	0.0051	0.0438	0.0080	--	--	--	--	--	--	0.0438	0.0080
Noncorporate Private:														
Total, Noncorporate Private	0.0140	0.0034	0.0461	0.0099	0.0601	0.0105	--	--	--	--	--	--	0.0601	0.0105
All Private	0.0416	0.0069	0.0623	0.0111	0.1039	0.0131	--	--	--	--	--	--	0.1039	0.0131
All Owners	0.1302	0.0114	0.3740	0.0247	0.5042	0.0270	0.0057	0.0021	0.0383	0.0068	0.0440	0.0071	0.5483	0.0278

Note: Totals may be off because of rounding

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

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

Table C47: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	0.2613	0.0126	0.0630	0.0081	0.3243	0.0146	0.1363	0.0094	0.0461	0.0069	0.1824	0.0113	0.5067	0.0179
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.2613	0.0126	0.0630	0.0081	0.3243	0.0146	0.1363	0.0094	0.0461	0.0069	0.1824	0.0113	0.5067	0.0179
Other Federal Government:														
Bureau of Land Management	0.0161	0.0037	0.0203	0.0045	0.0364	0.0059	0.0005	0.0005	0.0039	0.0020	0.0044	0.0020	0.0408	0.0062
Department of Defense and Energy	--	--	--	--	--	--	--	--	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009
National Park Service	--	--	--	--	--	--	0.0082	0.0027	0.0059	0.0023	0.0141	0.0036	0.0141	0.0036
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.0013	0.0010	0.0013	0.0010	--	--	0.0002	0.0002	0.0002	0.0002	0.0015	0.0010
Total	0.0161	0.0037	0.0216	0.0046	0.0377	0.0059	0.0086	0.0027	0.0109	0.0032	0.0196	0.0042	0.0573	0.0071
State and Local Government:														
Local	0.0003	0.0003	0.0019	0.0013	0.0022	0.0013	--	--	0.0010	0.0010	0.0010	0.0010	0.0032	0.0016
State	0.0016	0.0010	0.0024	0.0016	0.0039	0.0019	0.0004	0.0003	0.0031	0.0018	0.0035	0.0018	0.0074	0.0026
Other Public	--	--	0.0001	0.0001	0.0001	0.0001	--	--	--	--	--	--	0.0001	0.0001
Total	0.0019	0.0010	0.0044	0.0020	0.0062	0.0023	0.0004	0.0003	0.0041	0.0020	0.0045	0.0021	0.0107	0.0031
Private:														
Corporate	0.1126	0.0099	0.0367	0.0061	0.1493	0.0116	--	--	--	--	--	--	0.1493	0.0116
Noncorporate Private:														
Total, Noncorporate Private	0.0990	0.0091	0.1696	0.0123	0.2687	0.0151	--	--	--	--	--	--	0.2687	0.0151
All Private	0.2116	0.0131	0.2064	0.0136	0.4180	0.0185	--	--	--	--	--	--	0.4180	0.0185
All Owners	0.4909	0.0185	0.2954	0.0166	0.7863	0.0244	0.1453	0.0098	0.0612	0.0079	0.2065	0.0123	0.9927	0.0268

Note: Totals may be off because of rounding

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

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

Table C48: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: North Coast

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	0.0026	0.0014	0.0011	0.0011	0.0037	0.0018	0.0014	0.0010	--	--	0.0014	0.0010	0.0051	0.0020
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.0026	0.0014	0.0011	0.0011	0.0037	0.0018	0.0014	0.0010	--	--	0.0014	0.0010	0.0051	0.0020
Other Federal Government:														
Bureau of Land Management	0.0073	0.0026	--	--	0.0073	0.0026	0.0060	0.0023	--	--	0.0060	0.0023	0.0133	0.0035
Department of Defense and Energy	0.0018	0.0014	--	--	0.0018	0.0014	--	--	--	--	--	--	0.0018	0.0014
National Park Service	--	--	--	--	--	--	0.0053	0.0021	0.0011	0.0011	0.0064	0.0023	0.0064	0.0023
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.0005	0.0005	--	--	0.0005	0.0005	0.0005	0.0005
Other Federal	--	--	0.0004	0.0004	0.0004	0.0004	--	--	--	--	--	--	0.0004	0.0004
Total	0.0091	0.0030	0.0004	0.0004	0.0095	0.0030	0.0118	0.0031	0.0011	0.0011	0.0129	0.0032	0.0224	0.0044
State and Local Government:														
Local	0.0007	0.0007	0.0005	0.0005	0.0012	0.0008	--	--	0.0073	0.0030	0.0073	0.0030	0.0085	0.0031
State	0.0049	0.0017	0.0003	0.0003	0.0052	0.0018	0.0220	0.0042	0.0016	0.0012	0.0236	0.0044	0.0288	0.0043
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.0056	0.0019	0.0008	0.0006	0.0064	0.0019	0.0220	0.0042	0.0089	0.0032	0.0309	0.0053	0.0373	0.0053
Private:														
Corporate	0.1616	0.0110	0.0053	0.0021	0.1669	0.0111	--	--	--	--	--	--	0.1669	0.0111
Noncorporate Private:														
Total, Noncorporate Private	0.1193	0.0099	0.0272	0.0047	0.1465	0.0109	--	--	--	--	--	--	0.1465	0.0109
All Private	0.2809	0.0139	0.0325	0.0052	0.3134	0.0146	--	--	--	--	--	--	0.3134	0.0146
All Owners	0.2982	0.0143	0.0348	0.0053	0.3330	0.0151	0.0351	0.0053	0.0100	0.0034	0.0452	0.0063	0.3781	0.0161

Note: Totals may be off because of rounding

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

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

Table C49: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	0.5095	0.0168	0.1490	0.0134	0.6585	0.0204	0.1007	0.0075	0.0824	0.0088	0.1831	0.0110	0.8416	0.0228
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.5095	0.0168	0.1490	0.0134	0.6585	0.0204	0.1007	0.0075	0.0824	0.0088	0.1831	0.0110	0.8416	0.0228
Other Federal Government:														
Bureau of Land Management	0.0096	0.0028	0.0452	0.0071	0.0547	0.0076	0.0001	0.0001	0.0172	0.0044	0.0173	0.0044	0.0720	0.0086
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	0.0646	0.0051	0.0349	0.0061	0.0996	0.0077	0.0996	0.0077
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.0027	0.0016	0.0027	0.0016	--	--	0.0003	0.0003	0.0003	0.0003	0.0030	0.0017
Total	0.0096	0.0028	0.0478	0.0073	0.0574	0.0077	0.0647	0.0051	0.0524	0.0074	0.1172	0.0087	0.1746	0.0110
State and Local Government:														
Local	0.0042	0.0019	0.0079	0.0028	0.0121	0.0034	--	--	0.0010	0.0009	0.0010	0.0009	0.0131	0.0035
State	0.0013	0.0007	0.0031	0.0019	0.0044	0.0020	0.0062	0.0021	0.0109	0.0034	0.0172	0.0040	0.0216	0.0044
Other Public	--	--	0.0014	0.0013	0.0014	0.0013	--	--	--	--	--	--	0.0014	0.0013
Total	0.0055	0.0020	0.0124	0.0036	0.0179	0.0041	0.0062	0.0021	0.0120	0.0035	0.0182	0.0041	0.0361	0.0058
Private:														
Corporate	0.2113	0.0140	0.0466	0.0068	0.2579	0.0154	--	--	--	--	--	--	0.2579	0.0154
Noncorporate Private:														
Total, Noncorporate Private	0.1152	0.0092	0.3522	0.0178	0.4674	0.0197	--	--	--	--	--	--	0.4674	0.0197
All Private	0.3265	0.0160	0.3988	0.0187	0.7253	0.0237	--	--	--	--	--	--	0.7253	0.0237
All Owners	0.8511	0.0233	0.6080	0.0243	1.4591	0.0322	0.1717	0.0093	0.1468	0.0120	0.3185	0.0145	1.7776	0.0346

Note: Totals may be off because of rounding

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

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

Table C50: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>million metric tons C</i>														
USDA Forest Service:														
National Forest	0.0179	0.0040	0.0606	0.0075	0.0785	0.0085	0.0151	0.0038	0.0234	0.0050	0.0385	0.0062	0.1170	0.0104
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.0179	0.0040	0.0606	0.0075	0.0785	0.0085	0.0151	0.0038	0.0234	0.0050	0.0385	0.0062	0.1170	0.0104
Other Federal Government:														
Bureau of Land Management	--	--	0.0081	0.0029	0.0081	0.0029	--	--	0.0059	0.0026	0.0059	0.0026	0.0140	0.0039
Department of Defense and Energy	0.0004	0.0004	--	--	0.0004	0.0004	--	--	--	--	--	--	0.0004	0.0004
National Park Service	--	--	--	--	--	--	--	--	0.0148	0.0040	0.0148	0.0040	0.0148	0.0040
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.0098	0.0033	0.0098	0.0033	--	--	0.0019	0.0015	0.0019	0.0015	0.0118	0.0036
Total	0.0004	0.0004	0.0179	0.0044	0.0183	0.0044	--	--	0.0226	0.0049	0.0226	0.0049	0.0409	0.0066
State and Local Government:														
Local	--	--	0.0032	0.0016	0.0032	0.0016	--	--	0.0011	0.0010	0.0011	0.0010	0.0043	0.0019
State	--	--	0.0011	0.0011	0.0011	0.0011	0.0014	0.0012	0.0079	0.0030	0.0093	0.0032	0.0104	0.0034
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	0.0042	0.0020	0.0042	0.0020	0.0014	0.0012	0.0090	0.0031	0.0104	0.0033	0.0146	0.0039
Private:														
Corporate	0.0003	0.0003	0.0076	0.0030	0.0079	0.0030	--	--	--	--	--	--	0.0079	0.0030
Noncorporate Private:														
Total, Noncorporate Private	0.0043	0.0020	0.0361	0.0059	0.0404	0.0062	--	--	--	--	--	--	0.0404	0.0062
All Private	0.0046	0.0020	0.0437	0.0066	0.0483	0.0069	--	--	--	--	--	--	0.0483	0.0069
All Owners	0.0229	0.0045	0.1265	0.0111	0.1494	0.0119	0.0165	0.0040	0.0550	0.0077	0.0715	0.0086	0.2208	0.0146

Note: Totals may be off because of rounding

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

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

Table C51: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: All California

**information from Table C51 combined with information from Table C65 in Table C64*

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	73,016	1,553	5,350	419	78,366	1,517	24,599	1,152	3,458	360	28,057	1,144	106,423	1,709
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	73,016	1,553	5,350	419	78,366	1,517	24,599	1,152	3,458	360	28,057	1,144	106,423	1,709
Other Federal Government:														
Bureau of Land Management	2,296	451	1,280	181	3,576	482	530	207	273	67	804	217	4,379	523
Department of Defense and Energy	48	38	163	57	211	69	--	--	24	25	24	25	235	73
National Park Service	--	--	--	--	--	--	10,938	1,005	1,281	235	12,219	1,021	12,219	1,021
U.S. Fish and Wildlife Service	--	--	--	--	--	--	5	5	3	3	8	6	8	6
Other Federal	--	--	92	29	92	29	--	--	15	10	15	10	108	31
Total	2,344	452	1,535	191	3,879	486	11,473	1,015	1,596	242	13,070	1,029	16,949	1,064
State and Local Government:														
Local	462	184	412	109	874	215	677	271	618	137	1,295	295	2,168	364
State	1,526	405	124	83	1,649	406	5,607	1,190	906	230	6,512	1,205	8,162	1,129
Other Public	--	--	5	4	5	4	69	77	8	9	77	77	82	77
Total	1,987	442	541	137	2,528	457	6,352	1,218	1,532	263	7,884	1,234	10,412	1,172
Private:														
Corporate	29,227	1,152	2,309	256	31,537	1,170	--	--	--	--	--	--	31,537	1,170
Noncorporate Private:														
Total, Noncorporate Private	26,710	1,311	11,265	502	37,975	1,353	--	--	--	--	--	--	37,975	1,353
All Private	55,938	1,406	13,574	547	69,512	1,399	--	--	--	--	--	--	69,512	1,399
All Owners	133,285	2,136	21,000	726	154,285	2,104	42,424	1,957	6,586	507	49,010	1,969	203,295	2,577

Note: Totals may be off because of rounding

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

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

Table C52: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Range

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>thousand metric tons C</i>														
USDA Forest Service:														
National Forest	1	1	126	62	127	62	626	404	346	123	971	425	1,098	429
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	1	1	126	62	127	62	626	404	346	123	971	425	1,098	429
Other Federal Government:														
Bureau of Land Management	--	--	48	18	48	18	--	--	2	2	2	2	49	18
Department of Defense and Energy	--	--	140	56	140	56	--	--	--	--	--	--	140	56
National Park Service	--	--	--	--	--	--	--	--	37	41	37	41	37	41
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	17	11	17	11	--	--	--	--	--	--	17	11
Total	--	--	205	59	205	59	--	--	38	41	38	41	243	72
State and Local Government:														
Local	--	--	129	63	129	63	677	271	470	125	1,147	290	1,276	296
State	281	185	15	11	295	188	991	438	366	94	1,357	447	1,652	480
Other Public	--	--	--	--	--	--	69	77	8	9	77	77	77	77
Total	281	185	143	63	424	198	1,736	517	845	152	2,581	532	3,005	557
Private:														
Corporate	491	219	612	148	1,103	264	--	--	--	--	--	--	1,103	264
Noncorporate Private:														
Total, Noncorporate Private	2,649	555	2,265	220	4,915	593	--	--	--	--	--	--	4,915	593
All Private	3,140	594	2,877	263	6,017	646	--	--	--	--	--	--	6,017	646
All Owners	3,422	626	3,351	284	6,773	684	2,362	656	1,229	198	3,590	681	10,363	965

Note: Totals may be off because of rounding

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

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

Table C53: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Central Valley

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal Government:														
Bureau of Land Management	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	3	3	3	3	3	3
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	3	3	3	3	3	3
State and Local Government:														
Local	--	--	16	14	16	14	--	--	--	--	--	--	16	14
State	--	--	--	--	--	--	--	--	25	25	25	25	25	25
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	16	14	16	14	--	--	25	25	25	25	41	29
Private:														
Corporate	--	--	22	20	22	20	--	--	--	--	--	--	22	20
Noncorporate Private:														
Total, Noncorporate Private	--	--	179	69	179	69	--	--	--	--	--	--	179	69
All Private	--	--	201	71	201	71	--	--	--	--	--	--	201	71
All Owners	--	--	217	73	217	73	--	--	27	25	27	25	244	77

Note: Totals may be off because of rounding

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

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

Table C54: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Eastside

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	2,470	268	908	131	3,377	298	315	140	292	100	607	172	3,985	344
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	2,470	268	908	131	3,377	298	315	140	292	100	607	172	3,985	344
Other Federal Government:														
Bureau of Land Management	79	39	343	51	421	64	--	--	69	28	69	28	490	69
Department of Defense and Energy	--	--	23	13	23	13	--	--	--	--	--	--	23	13
National Park Service	--	--	--	--	--	--	--	--	78	29	78	29	78	29
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	4	4	4	4	--	--	--	--	--	--	4	4
Total	79	39	370	53	448	66	--	--	147	40	147	40	596	75
State and Local Government:														
Local	--	--	12	12	12	12	--	--	--	--	--	--	12	12
State	--	--	--	--	--	--	28	31	8	7	36	32	36	32
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	12	12	12	12	28	31	8	7	36	32	48	34
Private:														
Corporate	499	111	47	18	546	113	--	--	--	--	--	--	546	113
Noncorporate Private:														
Total, Noncorporate Private	315	90	103	27	417	94	--	--	--	--	--	--	417	94
All Private	814	142	150	33	963	146	--	--	--	--	--	--	963	146
All Owners	3,362	309	1,439	145	4,801	341	343	144	448	108	791	179	5,592	385

Note: Totals may be off because of rounding

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

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

Table C55: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	27,573	1,415	1,733	283	29,307	1,429	12,623	876	982	226	13,605	886	42,912	1,635
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	27,573	1,415	1,733	283	29,307	1,429	12,623	876	982	226	13,605	886	42,912	1,635
Other Federal Government:														
Bureau of Land Management	1,025	270	444	124	1,469	298	94	95	77	49	172	106	1,641	316
Department of Defense and Energy	--	--	--	--	--	--	--	--	24	25	24	25	24	25
National Park Service	--	--	--	--	--	--	1,541	680	98	51	1,639	682	1,639	682
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	7	4	7	4	--	--	3	3	3	3	9	5
Total	1,025	270	450	124	1,476	298	1,635	685	202	74	1,837	689	3,313	744
State and Local Government:														
Local	66	56	27	18	93	59	--	--	21	21	21	21	114	62
State	177	114	10	8	187	114	115	101	87	57	202	128	389	171
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	243	127	37	20	280	128	115	101	108	61	223	130	503	182
Private:														
Corporate	5,797	550	657	131	6,454	569	--	--	--	--	--	--	6,454	569
Noncorporate Private:														
Total, Noncorporate Private	6,572	708	3,121	305	9,694	768	--	--	--	--	--	--	9,694	768
All Private	12,369	873	3,778	331	16,148	929	--	--	--	--	--	--	16,148	929
All Owners	41,211	1,694	5,999	455	47,210	1,739	14,373	1,116	1,292	245	15,665	1,129	62,876	2,030

Note: Totals may be off because of rounding

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

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

Table C56: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: North Coast

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	303	197	9	8	312	198	461	355	--	--	461	355	773	406
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	303	197	9	8	312	198	461	355	--	--	461	355	773	406
Other Federal Government:														
Bureau of Land Management	613	315	--	--	613	315	426	183	--	--	426	183	1,039	364
Department of Defense and Energy	48	38	--	--	48	38	--	--	--	--	--	--	48	38
National Park Service	--	--	--	--	--	--	1,055	465	25	19	1,080	465	1,080	465
U.S. Fish and Wildlife Service	--	--	--	--	--	--	5	5	--	--	5	5	5	5
Other Federal	--	--	3	3	3	3	--	--	--	--	--	--	3	3
Total	661	317	3	3	664	317	1,486	496	25	19	1,510	496	2,175	584
State and Local Government:														
Local	123	124	4	4	127	124	--	--	109	50	109	50	236	133
State	833	323	1	1	834	323	3,739	1,191	237	196	3,976	1,206	4,809	1,182
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	955	346	5	4	960	346	3,739	1,191	346	202	4,085	1,207	5,045	1,190
Private:														
Corporate	12,305	962	210	83	12,514	964	--	--	--	--	--	--	12,514	964
Noncorporate Private:														
Total, Noncorporate Private	10,051	945	1,025	230	11,077	969	--	--	--	--	--	--	11,077	969
All Private	22,356	1,270	1,235	244	23,591	1,286	--	--	--	--	--	--	23,591	1,286
All Owners	24,275	1,363	1,252	244	25,527	1,378	5,686	1,338	371	203	6,056	1,352	31,584	1,881

Note: Totals may be off because of rounding

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

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

Table C57: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	42,189	1,428	2,010	271	44,198	1,423	10,190	834	1,563	235	11,753	845	55,951	1,605
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	42,189	1,428	2,010	271	44,198	1,423	10,190	834	1,563	235	11,753	845	55,951	1,605
Other Federal Government:														
Bureau of Land Management	579	187	432	123	1,011	224	10	11	121	37	132	39	1,142	226
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	8,343	710	1,015	223	9,358	733	9,358	733
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	34	20	34	20	--	--	9	10	9	10	44	22
Total	579	187	466	125	1,045	224	8,353	711	1,146	226	9,498	733	10,543	748
State and Local Government:														
Local	273	124	196	83	469	151	--	--	--	--	--	--	469	151
State	236	146	96	81	332	165	711	272	156	54	867	276	1,199	309
Other Public	--	--	5	4	5	4	--	--	--	--	--	--	5	4
Total	508	192	297	117	806	224	711	272	156	54	867	276	1,672	343
Private:														
Corporate	10,102	687	744	141	10,846	698	--	--	--	--	--	--	10,846	698
Noncorporate Private:														
Total, Noncorporate Private	7,013	568	4,208	284	11,221	621	--	--	--	--	--	--	11,221	621
All Private	17,114	834	4,952	311	22,067	860	--	--	--	--	--	--	22,067	860
All Owners	60,390	1,657	7,726	445	68,116	1,670	19,254	1,128	2,865	330	22,118	1,151	90,234	1,935

Note: Totals may be off because of rounding

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

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

Table C58: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	481	137	565	101	1,045	171	383	114	275	88	659	143	1,704	222
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	481	137	565	101	1,045	171	383	114	275	88	659	143	1,704	222
Other Federal Government:														
Bureau of Land Management	--	--	14	8	14	8	--	--	4	3	4	3	17	8
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	--	--	28	12	28	12	28	12
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	27	17	27	17	--	--	3	3	3	3	30	17
Total	--	--	41	18	41	18	--	--	35	13	35	13	76	22
State and Local Government:														
Local	--	--	29	18	29	18	--	--	18	16	18	16	46	24
State	--	--	2	2	2	2	23	30	26	15	50	33	51	33
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	30	18	30	18	23	30	44	22	68	37	98	41
Private:														
Corporate	34	34	18	9	52	35	--	--	--	--	--	--	52	35
Noncorporate Private:														
Total, Noncorporate Private	110	62	363	92	473	113	--	--	--	--	--	--	473	113
All Private	144	71	381	92	525	118	--	--	--	--	--	--	525	118
All Owners	625	154	1,016	139	1,641	209	406	118	355	92	761	148	2,402	256

Note: Totals may be off because of rounding

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

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

Table C59: Belowground Carbon, Dry Weight of Live and Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2001-2010

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>million metric tons C</i>														
USDA Forest Service:														
National Forest	78.993	1.867	7.022	0.481	86.015	1.856	26.358	1.437	3.936	0.384	30.295	1.468	116.309	1.809
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	78.993	1.867	7.022	0.481	86.015	1.856	26.358	1.437	3.936	0.384	30.295	1.468	116.309	1.809
Other Federal Government:														
Bureau of Land Management	2.165	0.386	1.404	0.191	3.570	0.425	--	--	--	--	0.516	0.129	4.085	0.440
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	11.991	1.178	1.298	0.221	13.289	1.162	13.289	1.162
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	2.191	0.387	1.687	0.205	3.878	0.431	12.486	1.195	1.690	0.235	14.176	1.178	18.054	1.226
State and Local Government:														
Local	--	--	--	--	0.744	0.200	0.541	0.250	0.745	0.162	1.286	0.297	2.030	0.357
State	1.349	0.403	--	--	1.477	0.407	6.400	1.420	1.076	0.255	7.477	1.440	8.953	1.455
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	1.681	0.432	0.543	0.136	2.225	0.453	7.037	1.443	1.830	0.300	8.867	1.471	11.092	1.496
Private:														
Corporate	28.776	1.175	1.479	0.191	30.255	1.185	--	--	--	--	--	--	30.255	1.185
Noncorporate Private:														
Total, Noncorporate Private	27.870	1.345	13.231	0.570	41.101	1.404	--	--	--	--	--	--	41.101	1.404
All Private	56.646	1.471	14.710	0.589	71.356	1.475	--	--	--	--	--	--	71.356	1.475
All Owners	139.511	2.416	23.963	0.795	163.474	2.411	45.881	2.267	7.457	0.540	53.338	2.294	216.812	2.779

Note: Totals may be off because of rounding

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

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

Table C60: Belowground Carbon, Dry Weight of Live and Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2002-2011

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	80.560	1.900	6.911	0.485	87.471	1.890	26.827	1.461	3.982	0.392	30.809	1.493	118.280	1.846
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	80.560	1.900	6.911	0.485	87.471	1.890	26.827	1.461	3.982	0.392	30.809	1.493	118.280	1.846
Other Federal Government:														
Bureau of Land Management	2.167	0.388	1.373	0.189	3.540	0.428	--	--	--	--	0.521	0.135	4.062	0.445
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	12.215	1.190	1.315	0.223	13.530	1.174	13.530	1.174
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	2.196	0.389	1.662	0.203	3.858	0.433	12.717	1.208	1.705	0.237	14.422	1.191	18.280	1.240
State and Local Government:														
Local	--	--	--	--	0.723	0.197	0.551	0.256	0.753	0.165	1.304	0.303	2.027	0.360
State	1.346	0.401	--	--	1.493	0.409	6.499	1.425	1.129	0.260	7.627	1.447	9.120	1.462
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	1.649	0.429	0.571	0.146	2.220	0.453	7.148	1.450	1.889	0.306	9.037	1.478	11.257	1.504
Private:														
Corporate	28.322	1.177	1.840	0.226	30.162	1.191	--	--	--	--	--	--	30.162	1.191
Noncorporate Private:														
Total, Noncorporate Private	28.200	1.365	12.795	0.558	40.996	1.421	--	--	--	--	--	--	40.996	1.421
All Private	56.522	1.504	14.635	0.587	71.158	1.507	--	--	--	--	--	--	71.158	1.507
All Owners	140.927	2.443	23.780	0.797	164.707	2.438	46.693	2.295	7.575	0.550	54.268	2.323	218.974	2.801

Note: Totals may be off because of rounding

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

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

Table C61: Belowground Carbon, Dry Weight of Live and Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2003-2012

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	80.050	1.681	6.416	0.462	86.466	1.638	27.619	1.237	4.214	0.403	31.833	1.221	118.299	1.816
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	80.050	1.681	6.416	0.462	86.466	1.638	27.619	1.237	4.214	0.403	31.833	1.221	118.299	1.816
Other Federal Government:														
Bureau of Land Management	2.348	0.403	1.389	0.190	3.737	0.443	--	--	--	--	0.526	0.152	4.262	0.464
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	12.198	1.093	1.343	0.241	13.540	1.104	13.540	1.104
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	2.397	0.404	1.681	0.205	4.078	0.448	12.585	1.094	1.706	0.254	14.291	1.105	18.368	1.122
State and Local Government:														
Local	--	--	--	--	0.710	0.199	0.659	0.281	0.671	0.150	1.330	0.310	2.040	0.366
State	1.376	0.395	--	--	1.531	0.396	5.905	1.237	0.973	0.235	6.877	1.252	8.408	1.167
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	1.720	0.426	0.525	0.140	2.246	0.441	6.629	1.267	1.652	0.273	8.281	1.283	10.527	1.210
Private:														
Corporate	28.671	1.151	1.853	0.227	30.524	1.164	--	--	--	--	--	--	30.524	1.164
Noncorporate Private:														
Total, Noncorporate Private	28.739	1.385	12.303	0.532	41.041	1.429	--	--	--	--	--	--	41.041	1.429
All Private	57.410	1.462	14.155	0.566	71.565	1.457	--	--	--	--	--	--	71.565	1.457
All Owners	141.578	2.247	22.777	0.769	164.355	2.211	46.832	2.078	7.572	0.548	54.405	2.083	218.760	2.696

Note: Totals may be off because of rounding

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

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

Table C62: Belowground Carbon, Dry Weight of Live and Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2004-2013

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	80.751	1.692	6.202	0.456	86.954	1.648	27.806	1.248	4.204	0.409	32.010	1.228	118.964	1.833
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	80.751	1.692	6.202	0.456	86.954	1.648	27.806	1.248	4.204	0.409	32.010	1.228	118.964	1.833
Other Federal Government:														
Bureau of Land Management	2.353	0.409	1.390	0.191	3.743	0.448	--	--	--	--	0.623	0.166	4.366	0.473
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	12.442	1.113	1.440	0.254	13.882	1.128	13.882	1.128
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	2.401	0.410	1.646	0.199	4.048	0.451	12.790	1.114	1.764	0.259	14.554	1.128	18.602	1.144
State and Local Government:														
Local	--	--	--	--	0.750	0.204	0.694	0.279	0.665	0.147	1.359	0.308	2.109	0.367
State	1.395	0.400	--	--	1.550	0.401	5.830	1.236	0.960	0.235	6.790	1.250	8.340	1.165
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	1.752	0.433	0.553	0.142	2.305	0.448	6.595	1.264	1.633	0.272	8.228	1.280	10.533	1.208
Private:														
Corporate	29.487	1.179	2.038	0.245	31.525	1.194	--	--	--	--	--	--	31.525	1.194
Noncorporate Private:														
Total, Noncorporate Private	28.775	1.398	12.181	0.523	40.956	1.439	--	--	--	--	--	--	40.956	1.439
All Private	58.262	1.481	14.219	0.565	72.481	1.472	--	--	--	--	--	--	72.481	1.472
All Owners	143.166	2.270	22.621	0.763	165.788	2.231	47.191	2.094	7.602	0.555	54.792	2.098	220.580	2.721

Note: Totals may be off because of rounding

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

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

Table C63: Belowground Carbon, Dry Weight of Live and Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2005-2014

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	81.596	1.693	5.979	0.445	87.575	1.647	28.369	1.260	4.154	0.408	32.523	1.236	120.098	1.842
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	81.596	1.693	5.979	0.445	87.575	1.647	28.369	1.260	4.154	0.408	32.523	1.236	120.098	1.842
Other Federal Government:														
Bureau of Land Management	2.501	0.485	1.391	0.192	3.892	0.517	--	--	--	--	0.715	0.186	4.607	0.543
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	12.603	1.116	1.431	0.257	14.035	1.132	14.035	1.132
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	2.550	0.485	1.655	0.202	4.205	0.521	13.061	1.119	1.737	0.262	14.799	1.133	19.003	1.162
State and Local Government:														
Local	0.502	0.193	--	--	0.923	0.225	0.695	0.279	0.662	0.145	1.357	0.305	2.279	0.377
State	1.477	0.405	--	--	1.643	0.407	5.854	1.226	0.964	0.234	6.818	1.240	8.461	1.155
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	1.979	0.447	0.591	0.144	2.570	0.463	6.620	1.255	1.635	0.270	8.255	1.270	10.825	1.201
Private:														
Corporate	29.888	1.177	2.202	0.253	32.090	1.193	--	--	--	--	--	--	32.090	1.193
Noncorporate Private:														
Total, Noncorporate Private	28.345	1.378	12.183	0.524	40.529	1.420	--	--	--	--	--	--	40.529	1.420
All Private	58.233	1.457	14.385	0.567	72.619	1.447	--	--	--	--	--	--	72.619	1.447
All Owners	144.358	2.275	22.610	0.759	166.968	2.233	48.051	2.099	7.526	0.555	55.576	2.099	222.544	2.725

Note: Totals may be off because of rounding

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

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

Table C64: Belowground Carbon, Dry Weight of Live and Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, All California (10-year averages): 2006-2015

**information combined from Table C51 and Table C65 and converted from thousand metric tons C*

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>million metric tons C</i>														
USDA Forest Service:														
National Forest	81.911	1.954	5.853	0.474	87.764	1.918	28.636	1.433	3.975	0.435	32.612	1.427	120.376	2.192
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	81.911	1.954	5.853	0.474	87.764	1.918	28.636	1.433	3.975	0.435	32.612	1.427	120.376	2.192
Other Federal Government:														
Bureau of Land Management	2.478	0.519	1.368	0.199	3.847	0.551	0.583	0.240	0.294	0.074	0.878	0.251	4.723	0.600
Department of Defense and Energy	0.048	0.038	0.168	0.060	0.216	0.072	--	--	0.024	0.025	0.024	0.025	0.240	0.076
National Park Service	--	--	--	--	--	--	12.734	1.219	1.427	0.270	14.160	1.237	14.160	1.237
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.007	0.007	0.003	0.003	0.010	0.008	0.010	0.008
Other Federal	--	--	0.105	0.039	0.105	0.039	--	--	0.015	0.010	0.015	0.010	0.121	0.041
Total	2.526	0.520	1.641	0.212	4.167	0.556	13.324	1.231	1.763	0.278	15.088	1.247	19.255	1.287
State and Local Government:														
Local	0.489	0.196	0.428	0.117	0.916	0.229	0.730	0.299	0.639	0.146	1.368	0.325	2.283	0.397
State	1.590	0.431	0.130	0.087	1.719	0.432	5.945	1.268	0.966	0.253	6.910	1.286	8.630	1.208
Other Public	--	--	0.005	0.004	0.005	0.004	0.070	0.078	0.009	0.010	0.078	0.078	0.083	0.078
Total	2.078	0.470	0.562	0.145	2.640	0.487	6.743	1.301	1.613	0.287	8.357	1.320	10.997	1.257
Private:														
Corporate	31.432	1.344	2.403	0.276	33.836	1.363	--	--	--	--	--	--	33.836	1.363
Noncorporate Private:														
Total, Noncorporate Private	27.939	1.418	11.738	0.543	39.678	1.467	--	--	--	--	--	--	39.678	1.467
All Private	59.372	1.619	14.141	0.592	73.514	1.615	--	--	--	--	--	--	73.514	1.615
All Owners	145.888	2.594	22.197	0.801	168.085	2.564	48.703	2.321	7.352	0.593	56.055	2.336	224.140	3.152

Note: Totals may be off because of rounding

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

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

Table C65: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: All California

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	8,895	401	503	55	9,398	401	4,037	281	517	75	4,555	283	13,953	483
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	8,895	401	503	55	9,398	401	4,037	281	517	75	4,555	283	13,953	483
Other Federal Government:														
Bureau of Land Management	182	68	88	18	271	69	53	33	21	7	74	34	344	77
Department of Defense and Energy	--	--	5	3	5	3	--	--	--	--	--	--	5	3
National Park Service	--	--	--	--	--	--	1,796	214	146	35	1,941	216	1,941	216
U.S. Fish and Wildlife Service	--	--	--	--	--	--	2	2	--	--	2	2	2	2
Other Federal	--	--	13	10	13	10	--	--	--	--	--	--	13	10
Total	182	68	106	21	288	70	1,851	216	167	36	2,018	218	2,306	223
State and Local Government:														
Local	27	12	16	8	42	14	53	28	21	9	73	30	115	33
State	64	26	6	4	70	26	338	78	60	23	398	81	468	79
Other Public	--	--	--	--	--	--	1	1	1	1	1	1	1	1
Total	91	28	21	8	112	30	391	83	81	24	473	86	585	85
Private:														
Corporate	2,205	192	94	20	2,299	193	--	--	--	--	--	--	2,299	193
Noncorporate Private:														
Total, Noncorporate Private	1,229	107	473	41	1,703	114	--	--	--	--	--	--	1,703	114
All Private	3,434	213	567	45	4,002	216	--	--	--	--	--	--	4,002	216
All Owners	12,603	458	1,197	75	13,800	460	6,279	364	766	86	7,045	367	20,845	575

Note: Totals may be off because of rounding

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

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

Table C66: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	1	1	18	8	19	8	1	1	118	55	119	55	138	55
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	1	1	18	8	19	8	1	1	118	55	119	55	138	55
Other Federal Government:														
Bureau of Land Management	--	--	3	2	3	2	--	--	--	--	--	--	3	2
Department of Defense and Energy	--	--	3	3	3	3	--	--	--	--	--	--	3	3
National Park Service	--	--	--	--	--	--	--	--	7	8	7	8	7	8
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	7	3	7	3	--	--	7	8	7	8	14	9
State and Local Government:														
Local	--	--	9	7	9	7	53	28	10	6	63	29	71	30
State	3	2	--	--	3	2	11	7	16	10	27	12	30	12
Other Public	--	--	--	--	--	--	1	1	1	1	1	1	1	1
Total	3	2	9	7	12	7	65	29	27	11	91	31	103	32
Private:														
Corporate	9	5	22	9	31	11	--	--	--	--	--	--	31	11
Noncorporate Private:														
Total, Noncorporate Private	117	33	105	24	222	40	--	--	--	--	--	--	222	40
All Private	127	33	127	26	254	42	--	--	--	--	--	--	254	42
All Owners	131	33	160	28	291	43	65	29	152	56	217	63	508	77

Note: Totals may be off because of rounding

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

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

Table C67: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Central Valley

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal Government:														
Bureau of Land Management	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
State and Local Government:														
Local	--	--	2	2	2	2	--	--	--	--	--	--	2	2
State	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	2	2	2	2	--	--	--	--	--	--	2	2
Private:														
Corporate	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Noncorporate Private:														
Total, Noncorporate Private	--	--	6	5	6	5	--	--	--	--	--	--	6	5
All Private	--	--	6	5	6	5	--	--	--	--	--	--	6	5
All Owners	--	--	8	5	8	5	--	--	--	--	--	--	8	5

Note: Totals may be off because of rounding

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

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

Table C68: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Eastside

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	236	48	84	19	319	52	66	38	28	11	94	40	413	65
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	236	48	84	19	319	52	66	38	28	11	94	40	413	65
Other Federal Government:														
Bureau of Land Management	3	1	23	7	25	7	--	--	3	2	3	2	28	7
Department of Defense and Energy	--	--	2	1	2	1	--	--	--	--	--	--	2	1
National Park Service	--	--	--	--	--	--	--	--	3	2	3	2	3	2
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	3	1	24	7	27	7	--	--	6	3	6	3	33	7
State and Local Government:														
Local	--	--	--	--	--	--	--	--	--	--	--	--	--	--
State	--	--	--	--	--	--	8	9	--	--	8	9	8	9
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	8	9	--	--	8	9	8	9
Private:														
Corporate	38	18	--	--	38	18	--	--	--	--	--	--	38	18
Noncorporate Private:														
Total, Noncorporate Private	12	4	3	2	15	5	--	--	--	--	--	--	15	5
All Private	51	19	3	2	53	19	--	--	--	--	--	--	53	19
All Owners	289	52	111	20	399	55	75	39	34	11	108	41	508	69

Note: Totals may be off because of rounding

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

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

Table C69: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	3,292	300	124	26	3,416	301	2,320	244	90	24	2,410	244	5,826	385
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	3,292	300	124	26	3,416	301	2,320	244	90	24	2,410	244	5,826	385
Other Federal Government:														
Bureau of Land Management	70	23	27	14	97	27	4	4	--	--	4	4	101	27
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	89	39	6	4	95	39	95	39
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	70	23	27	14	97	27	93	39	6	4	99	39	196	47
State and Local Government:														
Local	--	--	--	--	--	--	--	--	4	4	4	4	4	4
State	7	7	3	3	10	7	1	1	6	5	7	5	17	9
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	7	7	3	3	10	7	1	1	9	6	11	6	21	10
Private:														
Corporate	430	80	24	9	453	81	--	--	--	--	--	--	453	81
Noncorporate Private:														
Total, Noncorporate Private	319	65	99	18	418	67	--	--	--	--	--	--	418	67
All Private	749	102	123	20	872	104	--	--	--	--	--	--	872	104
All Owners	4,118	318	276	36	4,395	319	2,414	247	105	25	2,519	247	6,914	402

Note: Totals may be off because of rounding

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

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

Table C70: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: North Coast

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	37	22	2	2	39	22	24	21	--	--	24	21	63	31
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	37	22	2	2	39	22	24	21	--	--	24	21	63	31
Other Federal Government:														
Bureau of Land Management	85	63	--	--	85	63	49	33	--	--	49	33	133	71
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	188	114	--	--	188	114	188	114
U.S. Fish and Wildlife Service	--	--	--	--	--	--	2	2	--	--	2	2	2	2
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	85	63	--	--	85	63	239	118	--	--	239	118	324	134
State and Local Government:														
Local	3	3	1	1	4	3	--	--	2	1	2	1	6	3
State	30	15	--	--	30	15	237	70	5	4	242	70	272	69
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	33	15	1	1	34	15	237	70	7	4	243	70	277	69
Private:														
Corporate	1,142	166	7	5	1,149	167	--	--	--	--	--	--	1,149	167
Noncorporate Private:														
Total, Noncorporate Private	455	64	23	9	478	64	--	--	--	--	--	--	478	64
All Private	1,597	176	30	10	1,627	176	--	--	--	--	--	--	1,627	176
All Owners	1,752	189	33	10	1,785	189	501	139	7	4	507	139	2,292	233

Note: Totals may be off because of rounding

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

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

Table C71: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	5,197	301	206	42	5,403	302	1,440	159	217	39	1,657	162	7,060	339
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	5,197	301	206	42	5,403	302	1,440	159	217	39	1,657	162	7,060	339
Other Federal Government:														
Bureau of Land Management	24	11	32	10	57	15	--	--	17	7	17	7	74	16
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	1,518	185	123	34	1,641	187	1,641	187
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	1	1	1	1	--	--	--	--	--	--	1	1
Total	24	11	33	10	57	15	1,518	185	139	34	1,658	187	1,715	187
State and Local Government:														
Local	24	12	3	2	27	12	--	--	--	--	--	--	27	12
State	24	22	1	1	25	22	41	17	10	6	51	18	76	27
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	48	24	4	2	52	25	41	17	10	6	51	18	103	30
Private:														
Corporate	586	68	40	15	627	69	--	--	--	--	--	--	627	69
Noncorporate Private:														
Total, Noncorporate Private	283	46	203	24	486	51	--	--	--	--	--	--	486	51
All Private	869	81	243	28	1,113	85	--	--	--	--	--	--	1,113	85
All Owners	6,138	312	486	51	6,624	315	3,000	244	367	52	3,367	248	9,991	394

Note: Totals may be off because of rounding

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

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

Table C72: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>thousand metric tons C</i>														
USDA Forest Service:														
National Forest	133	52	70	17	203	55	185	75	65	23	250	78	453	95
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	133	52	70	17	203	55	185	75	65	23	250	78	453	95
Other Federal Government:														
Bureau of Land Management	--	--	4	2	4	2	--	--	1	1	1	1	5	2
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	--	--	8	3	8	3	8	3
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	12	10	12	10	--	--	--	--	--	--	12	10
Total	--	--	15	11	15	11	--	--	9	4	9	4	24	11
State and Local Government:														
Local	--	--	1	1	1	1	--	--	5	5	5	5	7	5
State	--	--	2	2	2	2	39	39	23	19	62	43	64	43
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	3	2	3	2	39	39	29	19	68	44	71	44
Private:														
Corporate	--	--	1	1	1	1	--	--	--	--	--	--	1	1
Noncorporate Private:														
Total, Noncorporate Private	42	25	34	13	76	28	--	--	--	--	--	--	76	28
All Private	42	25	35	13	77	28	--	--	--	--	--	--	77	28
All Owners	175	57	123	24	298	62	224	84	102	31	326	90	624	109

Note: Totals may be off because of rounding

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

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

Table C73: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: All California

**information duplicated in Table C86*

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	159.17	2.26	33.41	1.45	192.57	2.22	48.81	1.61	17.43	1.13	66.25	1.61	258.82	2.29
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	159.17	2.26	33.41	1.45	192.57	2.22	48.81	1.61	17.43	1.13	66.25	1.61	258.82	2.29
Other Federal Government:														
Bureau of Land Management	4.77	0.69	13.25	1.04	18.02	1.24	0.74	0.26	2.50	0.43	3.24	0.50	21.26	1.30
Department of Defense and Energy	0.15	0.10	0.79	0.22	0.94	0.24	--	--	0.06	0.06	0.06	0.06	0.99	0.25
National Park Service	--	--	--	--	--	--	18.38	1.18	6.65	0.77	25.03	1.36	25.03	1.36
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.05	0.05	0.01	0.01	0.06	0.05	0.06	0.05
Other Federal	--	--	1.22	0.29	1.22	0.29	--	--	0.15	0.09	0.15	0.09	1.37	0.30
Total	4.92	0.70	15.26	1.08	20.17	1.28	19.17	1.18	9.36	0.86	28.54	1.39	48.71	1.66
State and Local Government:														
Local	0.81	0.29	1.27	0.27	2.08	0.40	0.56	0.22	1.95	0.36	2.51	0.40	4.59	0.56
State	1.71	0.42	0.58	0.22	2.29	0.47	4.69	0.57	3.22	0.46	7.91	0.70	10.20	0.70
Other Public	--	--	0.09	0.08	0.09	0.08	0.15	0.17	0.07	0.07	0.22	0.19	0.31	0.20
Total	2.52	0.50	1.94	0.36	4.46	0.62	5.40	0.61	5.24	0.56	10.64	0.78	15.10	0.86
Private:														
Corporate	75.57	2.29	9.26	0.80	84.83	2.39	--	--	--	--	--	--	84.83	2.39
Noncorporate Private:														
Total, Noncorporate Private	46.67	1.89	51.76	1.63	98.43	2.36	--	--	--	--	--	--	98.43	2.36
All Private	122.25	2.21	61.01	1.73	183.26	2.44	--	--	--	--	--	--	183.26	2.44
All Owners	288.85	3.14	111.62	2.50	400.47	3.39	73.39	2.09	32.04	1.52	105.43	2.25	505.89	3.42

Note: Totals may be off because of rounding

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

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

Table C74: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	0.02	0.02	0.91	0.23	0.92	0.23	0.50	0.24	1.40	0.30	1.90	0.38	2.82	0.45
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.02	0.02	0.91	0.23	0.92	0.23	0.50	0.24	1.40	0.30	1.90	0.38	2.82	0.45
Other Federal Government:														
Bureau of Land Management	--	--	0.72	0.23	0.72	0.23	--	--	0.05	0.05	0.05	0.05	0.77	0.23
Department of Defense and Energy	--	--	0.49	0.17	0.49	0.17	--	--	--	--	--	--	0.49	0.17
National Park Service	--	--	--	--	--	--	--	--	0.06	0.07	0.06	0.07	0.06	0.07
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.24	0.13	0.24	0.13	--	--	0.00	0.00	0.00	0.00	0.25	0.13
Total	--	--	1.45	0.31	1.45	0.31	--	--	0.11	0.09	0.11	0.09	1.57	0.32
State and Local Government:														
Local	--	--	0.28	0.13	0.28	0.13	0.56	0.22	1.25	0.27	1.81	0.33	2.09	0.35
State	0.23	0.15	0.12	0.11	0.36	0.19	0.55	0.24	1.34	0.28	1.89	0.36	2.25	0.41
Other Public	--	--	--	--	--	--	0.15	0.17	0.07	0.07	0.22	0.19	0.22	0.19
Total	0.23	0.15	0.41	0.17	0.64	0.23	1.26	0.37	2.66	0.37	3.92	0.50	4.56	0.54
Private:														
Corporate	0.47	0.20	1.57	0.31	2.04	0.37	--	--	--	--	--	--	2.04	0.37
Noncorporate Private:														
Total, Noncorporate Private	2.87	0.57	8.61	0.70	11.48	0.89	--	--	--	--	--	--	11.48	0.89
All Private	3.34	0.60	10.17	0.75	13.51	0.95	--	--	--	--	--	--	13.51	0.95
All Owners	3.60	0.62	12.94	0.86	16.53	1.05	1.77	0.44	4.17	0.49	5.94	0.63	22.47	1.22

Note: Totals may be off because of rounding

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

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

Table C75: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: Central Valley

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>million metric tons C</i>														
USDA Forest Service:														
National Forest	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal Government:														
Bureau of Land Management	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01
State and Local Government:														
Local	--	--	0.05	0.03	0.05	0.03	--	--	--	--	--	--	0.05	0.03
State	--	--	--	--	--	--	--	--	0.12	0.11	0.12	0.11	0.12	0.11
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	0.05	0.03	0.05	0.03	--	--	0.12	0.11	0.12	0.11	0.16	0.11
Private:														
Corporate	--	--	0.08	0.07	0.08	0.07	--	--	--	--	--	--	0.08	0.07
Noncorporate Private:														
Total, Noncorporate Private	0.00	0.00	0.89	0.25	0.90	0.25	--	--	--	--	--	--	0.90	0.25
All Private	0.00	0.00	0.97	0.26	0.97	0.26	--	--	--	--	--	--	0.97	0.26
All Owners	0.00	0.00	1.02	0.26	1.02	0.26	--	--	0.12	0.11	0.12	0.11	1.14	0.28

Note: Totals may be off because of rounding

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

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

Table C76: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: Eastside

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	12.26	1.09	13.05	1.06	25.31	1.50	0.94	0.32	1.67	0.43	2.62	0.53	27.93	1.59
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	12.26	1.09	13.05	1.06	25.31	1.50	0.94	0.32	1.67	0.43	2.62	0.53	27.93	1.59
Other Federal Government:														
Bureau of Land Management	0.58	0.25	7.50	0.86	8.09	0.90	--	--	0.60	0.20	0.60	0.20	8.68	0.91
Department of Defense and Energy	--	--	0.30	0.14	0.30	0.14	--	--	--	--	--	--	0.30	0.14
National Park Service	--	--	--	--	--	--	--	--	0.71	0.21	0.71	0.21	0.71	0.21
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.13	0.13	0.13	0.13	--	--	--	--	--	--	0.13	0.13
Total	0.58	0.25	7.94	0.88	8.52	0.91	--	--	1.30	0.30	1.30	0.30	9.82	0.94
State and Local Government:														
Local	--	--	0.06	0.07	0.06	0.07	--	--	--	--	--	--	0.06	0.07
State	--	--	--	--	--	--	0.11	0.12	0.18	0.15	0.29	0.20	0.29	0.20
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	0.06	0.07	0.06	0.07	0.11	0.12	0.18	0.15	0.29	0.20	0.35	0.21
Private:														
Corporate	3.39	0.61	1.29	0.39	4.68	0.73	--	--	--	--	--	--	4.68	0.73
Noncorporate Private:														
Total, Noncorporate Private	1.92	0.44	3.15	0.62	5.07	0.76	--	--	--	--	--	--	5.07	0.76
All Private	5.32	0.75	4.43	0.73	9.75	1.05	--	--	--	--	--	--	9.75	1.05
All Owners	18.16	1.35	25.48	1.56	43.65	2.05	1.05	0.35	3.15	0.54	4.20	0.64	47.85	2.14

Note: Totals may be off because of rounding

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

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

Table C77: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	44.54	1.88	4.75	0.59	49.29	1.94	22.76	1.28	3.71	0.58	26.47	1.37	75.76	2.29
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	44.54	1.88	4.75	0.59	49.29	1.94	22.76	1.28	3.71	0.58	26.47	1.37	75.76	2.29
Other Federal Government:														
Bureau of Land Management	2.23	0.50	1.37	0.31	3.60	0.60	0.10	0.10	0.32	0.17	0.43	0.21	4.03	0.63
Department of Defense and Energy	--	--	--	--	--	--	--	--	0.06	0.06	0.06	0.06	0.06	0.06
National Park Service	--	--	--	--	--	--	1.40	0.47	0.39	0.15	1.78	0.49	1.78	0.49
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.08	0.06	0.08	0.06	--	--	0.01	0.01	0.01	0.01	0.09	0.06
Total	2.23	0.50	1.46	0.31	3.69	0.60	1.50	0.48	0.78	0.24	2.28	0.54	5.97	0.79
State and Local Government:														
Local	0.13	0.11	0.12	0.09	0.26	0.14	--	--	0.07	0.07	0.07	0.07	0.33	0.16
State	0.23	0.15	0.13	0.09	0.35	0.17	0.16	0.12	0.21	0.12	0.37	0.18	0.72	0.25
Other Public	--	--	0.01	0.01	0.01	0.01	--	--	--	--	--	--	0.01	0.01
Total	0.36	0.19	0.26	0.12	0.62	0.22	0.16	0.12	0.28	0.14	0.44	0.19	1.06	0.29
Private:														
Corporate	15.50	1.24	2.42	0.40	17.92	1.30	--	--	--	--	--	--	17.92	1.30
Noncorporate Private:														
Total, Noncorporate Private	11.08	1.02	11.52	0.84	22.60	1.31	--	--	--	--	--	--	22.60	1.31
All Private	26.57	1.55	13.95	0.92	40.52	1.78	--	--	--	--	--	--	40.52	1.78
All Owners	73.70	2.49	20.41	1.15	94.11	2.70	24.42	1.38	4.77	0.64	29.19	1.48	123.30	3.01

Note: Totals may be off because of rounding

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

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

Table C78: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: North Coast

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	0.48	0.26	0.07	0.07	0.55	0.27	0.19	0.14	--	--	0.19	0.14	0.75	0.30
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.48	0.26	0.07	0.07	0.55	0.27	0.19	0.14	--	--	0.19	0.14	0.75	0.30
Other Federal Government:														
Bureau of Land Management	0.64	0.23	--	--	0.64	0.23	0.61	0.24	--	--	0.61	0.24	1.25	0.34
Department of Defense and Energy	0.12	0.10	--	--	0.12	0.10	--	--	--	--	--	--	0.12	0.10
National Park Service	--	--	--	--	--	--	0.82	0.34	0.07	0.07	0.90	0.34	0.90	0.34
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.05	0.05	--	--	0.05	0.05	0.05	0.05
Other Federal	--	--	0.03	0.03	0.03	0.03	--	--	--	--	--	--	0.03	0.03
Total	0.76	0.25	0.03	0.03	0.79	0.25	1.48	0.41	0.07	0.07	1.56	0.41	2.35	0.48
State and Local Government:														
Local	0.13	0.13	0.03	0.03	0.16	0.13	--	--	0.50	0.21	0.50	0.21	0.67	0.25
State	0.84	0.30	0.02	0.02	0.86	0.30	2.26	0.42	0.16	0.13	2.42	0.43	3.28	0.45
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.97	0.33	0.05	0.04	1.02	0.33	2.26	0.42	0.66	0.24	2.92	0.48	3.95	0.51
Private:														
Corporate	21.26	1.54	0.38	0.14	21.64	1.54	--	--	--	--	--	--	21.64	1.54
Noncorporate Private:														
Total, Noncorporate Private	12.28	1.04	1.95	0.36	14.24	1.10	--	--	--	--	--	--	14.24	1.10
All Private	33.54	1.76	2.34	0.38	35.88	1.79	--	--	--	--	--	--	35.88	1.79
All Owners	35.75	1.82	2.49	0.39	38.24	1.85	3.93	0.60	0.74	0.25	4.67	0.64	42.91	1.93

Note: Totals may be off because of rounding

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

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

Table C79: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	99.65	2.51	10.59	0.90	110.25	2.56	22.54	1.43	9.01	0.88	31.55	1.55	141.79	2.89
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	99.65	2.51	10.59	0.90	110.25	2.56	22.54	1.43	9.01	0.88	31.55	1.55	141.79	2.89
Other Federal Government:														
Bureau of Land Management	1.32	0.36	3.17	0.50	4.49	0.61	0.03	0.03	1.13	0.29	1.16	0.29	5.65	0.67
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	16.16	1.10	4.50	0.69	20.66	1.26	20.66	1.26
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.18	0.11	0.18	0.11	--	--	0.02	0.02	0.02	0.02	0.20	0.11
Total	1.32	0.36	3.34	0.51	4.66	0.62	16.19	1.11	5.66	0.74	21.85	1.28	26.51	1.36
State and Local Government:														
Local	0.54	0.23	0.51	0.18	1.06	0.30	--	--	0.06	0.05	0.06	0.05	1.12	0.30
State	0.41	0.23	0.25	0.16	0.66	0.27	1.42	0.40	0.70	0.22	2.13	0.45	2.79	0.52
Other Public	--	--	0.08	0.08	0.08	0.08	--	--	--	--	--	--	0.08	0.08
Total	0.95	0.33	0.85	0.25	1.80	0.41	1.42	0.40	0.76	0.22	2.19	0.46	3.99	0.60
Private:														
Corporate	34.87	1.83	3.07	0.44	37.94	1.87	--	--	--	--	--	--	37.94	1.87
Noncorporate Private:														
Total, Noncorporate Private	18.11	1.30	23.35	1.18	41.46	1.72	--	--	--	--	--	--	41.46	1.72
All Private	52.98	2.08	26.42	1.23	79.40	2.32	--	--	--	--	--	--	79.40	2.32
All Owners	154.90	3.26	41.21	1.63	196.11	3.49	40.15	1.85	15.43	1.17	55.58	2.05	251.69	3.86

Note: Totals may be off because of rounding

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

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

Table C80: Soil Organic Carbon by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	2.22	0.47	4.03	0.50	6.25	0.69	1.87	0.45	1.65	0.34	3.52	0.56	9.77	0.88
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	2.22	0.47	4.03	0.50	6.25	0.69	1.87	0.45	1.65	0.34	3.52	0.56	9.77	0.88
Other Federal Government:														
Bureau of Land Management	--	--	0.48	0.18	0.48	0.18	--	--	0.40	0.17	0.40	0.17	0.88	0.25
Department of Defense and Energy	0.02	0.02	--	--	0.02	0.02	--	--	--	--	--	--	0.02	0.02
National Park Service	--	--	--	--	--	--	--	--	0.91	0.25	0.91	0.25	0.91	0.25
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.56	0.19	0.56	0.19	--	--	0.12	0.09	0.12	0.09	0.67	0.21
Total	0.02	0.02	1.04	0.26	1.07	0.26	--	--	1.43	0.31	1.43	0.31	2.49	0.40
State and Local Government:														
Local	--	--	0.20	0.10	0.20	0.10	--	--	0.07	0.06	0.07	0.06	0.28	0.12
State	--	--	0.06	0.06	0.06	0.06	0.19	0.15	0.51	0.19	0.70	0.24	0.76	0.25
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	0.26	0.12	0.26	0.12	0.19	0.15	0.59	0.20	0.78	0.25	1.04	0.28
Private:														
Corporate	0.09	0.08	0.45	0.18	0.54	0.20	--	--	--	--	--	--	0.54	0.20
Noncorporate Private:														
Total, Noncorporate Private	0.40	0.18	2.29	0.37	2.69	0.42	--	--	--	--	--	--	2.69	0.42
All Private	0.49	0.20	2.74	0.41	3.23	0.46	--	--	--	--	--	--	3.23	0.46
All Owners	2.74	0.51	8.07	0.71	10.80	0.87	2.06	0.47	3.66	0.51	5.72	0.69	16.53	1.11

Note: Totals may be off because of rounding

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

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

Table C81: Soil Organic Carbon by Owner Group and Forest Land Status, All California (10-year averages): 2001-2010

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	155.90	2.47	41.26	1.58	197.15	2.52	45.37	1.96	17.32	1.16	62.70	2.18	259.85	1.92
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	155.90	2.47	41.26	1.58	197.15	2.52	45.37	1.96	17.32	1.16	62.70	2.18	259.85	1.92
Other Federal Government:														
Bureau of Land Management	4.57	0.67	14.57	1.01	19.13	1.17	0.35	0.18	3.14	0.41	3.50	0.45	22.63	1.23
Department of Defense and Energy	0.07	0.07	0.77	0.21	0.83	0.23	--	--	--	--	--	--	0.83	0.23
National Park Service	--	--	--	--	--	--	17.20	1.12	6.89	0.74	24.10	1.16	24.10	1.16
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.08	0.09	0.06	0.06	0.14	0.11	0.14	0.11
Other Federal	--	--	1.08	0.28	1.08	0.28	0.23	0.17	0.22	0.12	0.45	0.21	1.53	0.34
Total	4.63	0.67	16.42	1.06	21.05	1.21	17.87	1.14	10.31	0.84	28.18	1.22	49.23	1.61
State and Local Government:														
Local	0.51	0.19	1.21	0.27	1.73	0.33	0.42	0.18	2.20	0.38	2.62	0.42	4.35	0.53
State	1.62	0.42	0.54	0.20	2.15	0.47	5.24	0.71	3.41	0.48	8.65	0.85	10.80	0.93
Other Public	--	--	0.09	0.07	0.09	0.07	0.21	0.19	0.13	0.10	0.34	0.21	0.43	0.23
Total	2.13	0.46	1.84	0.34	3.97	0.58	5.87	0.76	5.75	0.61	11.61	0.96	15.58	1.08
Private:														
Corporate	72.01	2.25	6.07	0.64	78.08	2.31	--	--	--	--	--	--	78.08	2.31
Noncorporate Private:														
Total, Noncorporate Private	51.45	1.99	59.20	1.69	110.64	2.44	--	--	--	--	--	--	110.64	2.44
All Private	123.46	2.22	65.26	1.73	188.72	2.41	--	--	--	--	--	--	188.72	2.41
All Owners	286.12	3.36	124.77	2.56	410.89	3.61	69.11	2.37	33.38	1.55	102.49	2.64	513.38	3.31

Note: Totals may be off because of rounding

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

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

Table C82: Soil Organic Carbon by Owner Group and Forest Land Status, All California (10-year averages): 2002-2011

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	157.12	2.53	39.36	1.57	196.47	2.60	45.65	1.97	17.12	1.15	62.77	2.18	259.24	2.04
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	157.12	2.53	39.36	1.57	196.47	2.60	45.65	1.97	17.12	1.15	62.77	2.18	259.24	2.04
Other Federal Government:														
Bureau of Land Management	4.53	0.66	14.32	1.00	18.85	1.16	0.35	0.18	3.16	0.43	3.51	0.47	22.36	1.23
Department of Defense and Energy	0.09	0.08	0.90	0.23	1.00	0.24	--	--	--	--	--	--	1.00	0.24
National Park Service	--	--	--	--	--	--	17.42	1.13	6.98	0.75	24.40	1.16	24.40	1.16
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.08	0.09	0.06	0.06	0.14	0.11	0.14	0.11
Other Federal	--	--	1.08	0.28	1.08	0.28	0.23	0.17	0.22	0.12	0.45	0.21	1.53	0.34
Total	4.62	0.67	16.30	1.05	20.93	1.21	18.08	1.15	10.41	0.85	28.49	1.23	49.42	1.62
State and Local Government:														
Local	0.49	0.20	1.22	0.27	1.71	0.34	0.41	0.18	2.17	0.37	2.58	0.41	4.29	0.53
State	1.62	0.42	0.53	0.20	2.15	0.47	5.32	0.72	3.58	0.49	8.90	0.85	11.06	0.94
Other Public	--	--	0.09	0.08	0.09	0.08	0.22	0.19	0.06	0.06	0.27	0.20	0.36	0.22
Total	2.11	0.47	1.84	0.34	3.95	0.58	5.95	0.76	5.81	0.61	11.75	0.96	15.70	1.08
Private:														
Corporate	70.63	2.25	7.09	0.69	77.73	2.31	--	--	--	--	--	--	77.73	2.31
Noncorporate Private:														
Total, Noncorporate Private	50.85	1.99	57.48	1.67	108.33	2.43	--	--	--	--	--	--	108.33	2.43
All Private	121.48	2.27	64.57	1.73	186.05	2.46	--	--	--	--	--	--	186.05	2.46
All Owners	285.33	3.38	122.07	2.54	407.40	3.62	69.67	2.38	33.34	1.55	103.01	2.65	510.42	3.31

Note: Totals may be off because of rounding

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

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

Table C83: Soil Organic Carbon by Owner Group and Forest Land Status, All California (10-year averages): 2003-2012

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	158.59	2.26	36.96	1.50	195.56	2.23	47.64	1.62	18.01	1.11	65.65	1.61	261.21	2.25
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	158.59	2.26	36.96	1.50	195.56	2.23	47.64	1.62	18.01	1.11	65.65	1.61	261.21	2.25
Other Federal Government:														
Bureau of Land Management	4.99	0.71	13.95	1.07	18.93	1.27	0.41	0.20	2.63	0.43	3.04	0.48	21.97	1.33
Department of Defense and Energy	0.15	0.10	0.80	0.22	0.95	0.24	--	--	0.06	0.06	0.06	0.06	1.01	0.25
National Park Service	--	--	--	--	--	--	18.08	1.16	6.70	0.77	24.78	1.34	24.78	1.34
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	1.25	0.30	1.25	0.30	0.12	0.13	0.25	0.13	0.37	0.19	1.62	0.35
Total	5.13	0.71	16.00	1.12	21.14	1.31	18.61	1.16	9.64	0.86	28.25	1.38	49.39	1.68
State and Local Government:														
Local	0.56	0.22	1.16	0.26	1.71	0.35	0.47	0.19	2.08	0.37	2.55	0.40	4.26	0.53
State	1.53	0.40	0.60	0.22	2.13	0.45	4.85	0.60	3.25	0.44	8.10	0.71	10.22	0.71
Other Public	--	--	0.09	0.08	0.09	0.08	0.15	0.17	0.07	0.07	0.21	0.18	0.30	0.20
Total	2.08	0.45	1.84	0.35	3.93	0.57	5.46	0.63	5.40	0.55	10.86	0.79	14.79	0.84
Private:														
Corporate	72.22	2.27	7.13	0.70	79.35	2.34	--	--	--	--	--	--	79.35	2.34
Noncorporate Private:														
Total, Noncorporate Private	51.24	1.98	56.20	1.68	107.44	2.44	--	--	--	--	--	--	107.44	2.44
All Private	123.46	2.21	63.33	1.75	186.79	2.45	--	--	--	--	--	--	186.79	2.45
All Owners	289.27	3.14	118.14	2.56	407.41	3.41	71.71	2.08	33.05	1.51	104.76	2.25	512.17	3.40

Note: Totals may be off because of rounding

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

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

Table C84: Soil Organic Carbon by Owner Group and Forest Land Status, All California (10-year averages): 2004-2013

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	158.33	2.26	35.82	1.48	194.15	2.22	47.72	1.62	17.77	1.13	65.49	1.61	259.64	2.26
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	158.33	2.26	35.82	1.48	194.15	2.22	47.72	1.62	17.77	1.13	65.49	1.61	259.64	2.26
Other Federal Government:														
Bureau of Land Management	4.86	0.70	13.50	1.05	18.36	1.25	0.49	0.21	2.77	0.44	3.26	0.49	21.62	1.31
Department of Defense and Energy	0.15	0.10	0.81	0.22	0.96	0.25	--	--	0.06	0.06	0.06	0.06	1.02	0.25
National Park Service	--	--	--	--	--	--	18.15	1.18	6.66	0.77	24.81	1.35	24.81	1.35
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.05	0.05	0.01	0.01	0.06	0.05	0.06	0.05
Other Federal	--	--	1.20	0.29	1.20	0.29	--	--	0.15	0.09	0.15	0.09	1.35	0.30
Total	5.01	0.70	15.51	1.09	20.53	1.29	18.68	1.18	9.65	0.87	28.33	1.39	48.85	1.67
State and Local Government:														
Local	0.57	0.23	1.20	0.27	1.78	0.35	0.50	0.18	2.08	0.37	2.57	0.39	4.35	0.52
State	1.53	0.40	0.60	0.22	2.13	0.45	4.70	0.57	3.29	0.46	8.00	0.70	10.12	0.70
Other Public	--	--	0.10	0.08	0.10	0.08	0.16	0.18	0.07	0.07	0.22	0.19	0.32	0.20
Total	2.10	0.46	1.90	0.35	4.00	0.57	5.36	0.61	5.44	0.57	10.79	0.78	14.79	0.83
Private:														
Corporate	72.93	2.28	7.61	0.73	80.54	2.36	--	--	--	--	--	--	80.54	2.36
Noncorporate Private:														
Total, Noncorporate Private	49.92	1.96	54.53	1.66	104.46	2.42	--	--	--	--	--	--	104.46	2.42
All Private	122.86	2.21	62.14	1.74	185.00	2.44	--	--	--	--	--	--	185.00	2.44
All Owners	288.30	3.14	115.38	2.53	403.67	3.40	71.76	2.09	32.85	1.53	104.61	2.25	508.29	3.41

Note: Totals may be off because of rounding

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

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

Table C85: Soil Organic Carbon by Owner Group and Forest Land Status, All California (10-year averages): 2005-2014

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	158.89	2.26	34.83	1.47	193.72	2.22	48.42	1.62	17.30	1.13	65.73	1.60	259.45	2.28
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	158.89	2.26	34.83	1.47	193.72	2.22	48.42	1.62	17.30	1.13	65.73	1.60	259.45	2.28
Other Federal Government:														
Bureau of Land Management	4.77	0.69	13.42	1.04	18.19	1.24	0.67	0.25	2.55	0.43	3.23	0.50	21.42	1.30
Department of Defense and Energy	0.15	0.10	0.79	0.22	0.93	0.24	--	--	0.06	0.06	0.06	0.06	0.99	0.25
National Park Service	--	--	--	--	--	--	18.36	1.18	6.59	0.77	24.95	1.35	24.95	1.35
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.05	0.05	0.01	0.01	0.06	0.05	0.06	0.05
Other Federal	--	--	1.20	0.29	1.20	0.29	--	--	0.15	0.09	0.15	0.09	1.35	0.30
Total	4.92	0.70	15.40	1.09	20.32	1.28	19.08	1.19	9.36	0.86	28.44	1.39	48.76	1.66
State and Local Government:														
Local	0.85	0.29	1.27	0.27	2.12	0.40	0.50	0.18	2.02	0.36	2.51	0.39	4.63	0.55
State	1.61	0.40	0.61	0.22	2.23	0.46	4.70	0.57	3.27	0.46	7.97	0.70	10.20	0.70
Other Public	--	--	0.09	0.08	0.09	0.08	0.16	0.18	0.07	0.07	0.22	0.19	0.32	0.20
Total	2.46	0.50	1.97	0.36	4.44	0.61	5.35	0.60	5.36	0.57	10.71	0.78	15.14	0.85
Private:														
Corporate	73.57	2.28	8.35	0.76	81.92	2.37	--	--	--	--	--	--	81.92	2.37
Noncorporate Private:														
Total, Noncorporate Private	48.21	1.92	53.56	1.65	101.77	2.39	--	--	--	--	--	--	101.77	2.39
All Private	121.78	2.21	61.91	1.74	183.69	2.43	--	--	--	--	--	--	183.69	2.43
All Owners	288.06	3.14	114.11	2.52	402.17	3.40	72.85	2.09	32.02	1.53	104.87	2.25	507.04	3.42

Note: Totals may be off because of rounding

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

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

Table C86: Soil Organic Carbon by Owner Group and Forest Land Status, All California (10-year averages): 2006-2015

**information duplicated in Table C73*

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
USDA Forest Service:														
National Forest	159.17	2.26	33.41	1.45	192.57	2.22	48.81	1.61	17.43	1.13	66.25	1.61	258.82	2.29
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	159.17	2.26	33.41	1.45	192.57	2.22	48.81	1.61	17.43	1.13	66.25	1.61	258.82	2.29
Other Federal Government:														
Bureau of Land Management	4.77	0.69	13.25	1.04	18.02	1.24	0.74	0.26	2.50	0.43	3.24	0.50	21.26	1.30
Department of Defense and Energy	0.15	0.10	0.79	0.22	0.94	0.24	--	--	0.06	0.06	0.06	0.06	0.99	0.25
National Park Service	--	--	--	--	--	--	18.38	1.18	6.65	0.77	25.03	1.36	25.03	1.36
U.S. Fish and Wildlife Service	--	--	--	--	--	--	0.05	0.05	0.01	0.01	0.06	0.05	0.06	0.05
Other Federal	--	--	1.22	0.29	1.22	0.29	--	--	0.15	0.09	0.15	0.09	1.37	0.30
Total	4.92	0.70	15.26	1.08	20.17	1.28	19.17	1.18	9.36	0.86	28.54	1.39	48.71	1.66
State and Local Government:														
Local	0.81	0.29	1.27	0.27	2.08	0.40	0.56	0.22	1.95	0.36	2.51	0.40	4.59	0.56
State	1.71	0.42	0.58	0.22	2.29	0.47	4.69	0.57	3.22	0.46	7.91	0.70	10.20	0.70
Other Public	--	--	0.09	0.08	0.09	0.08	0.15	0.17	0.07	0.07	0.22	0.19	0.31	0.20
Total	2.52	0.50	1.94	0.36	4.46	0.62	5.40	0.61	5.24	0.56	10.64	0.78	15.10	0.86
Private:														
Corporate	75.57	2.29	9.26	0.80	84.83	2.39	--	--	--	--	--	--	84.83	2.39
Noncorporate Private:														
Total, Noncorporate Private	46.67	1.89	51.76	1.63	98.43	2.36	--	--	--	--	--	--	98.43	2.36
All Private	122.25	2.21	61.01	1.73	183.26	2.44	--	--	--	--	--	--	183.26	2.44
All Owners	288.85	3.14	111.62	2.50	400.47	3.39	73.39	2.09	32.04	1.52	105.43	2.25	505.89	3.42

Note: Totals may be off because of rounding

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

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

Table C87: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2006-2015: All California

**information duplicated in Table C100*

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	39,587.68	1,145.21	4,114.04	348.71	43,701.72	1,157.93	12,978.35	819.16	2,621.00	284.33	15,599.35	835.78	59,301.07	1,382.12
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	39,587.68	1,145.21	4,114.04	348.71	43,701.72	1,157.93	12,978.35	819.16	2,621.00	284.33	15,599.35	835.78	59,301.07	1,382.12
Other Federal Government:														
Bureau of Land Management	912.04	180.77	1,040.74	152.41	1,952.78	234.23	189.68	92.41	410.81	124.35	600.49	154.92	2,553.27	278.36
Department of Defense and Energy	16.78	12.66	35.60	15.73	52.39	20.17	--	--	3.97	4.00	3.97	4.00	56.36	20.52
National Park Service	--	--	--	--	--	--	6,429.64	674.52	1,055.74	237.67	7,485.38	707.27	7,485.38	707.27
U.S. Fish and Wildlife Service	--	--	--	--	--	--	1.58	1.61	--	--	1.58	1.61	1.58	1.61
Other Federal	--	--	63.87	25.49	63.87	25.49	--	--	3.79	3.28	3.79	3.28	67.66	25.69
Total	928.82	181.11	1,140.21	154.74	2,069.04	235.77	6,620.90	679.08	1,474.31	266.48	8,095.21	720.34	10,164.25	731.92
State and Local Government:														
Local	316.65	203.82	245.01	97.11	561.66	225.76	87.26	38.79	195.05	59.31	282.31	70.77	843.97	235.58
State	418.01	133.45	38.63	17.62	456.64	134.15	2,166.12	396.36	539.34	141.58	2,705.46	415.31	3,162.09	418.39
Other Public	--	--	0.24	0.21	0.24	0.21	18.22	19.20	9.18	9.02	27.40	21.21	27.64	21.21
Total	734.65	239.27	283.88	98.62	1,018.53	258.33	2,271.60	393.78	743.57	153.06	3,015.17	415.32	4,033.70	463.70
Private:														
Corporate	24,554.41	1,199.75	1,012.28	151.62	25,566.69	1,203.99	--	--	--	--	--	--	25,566.69	1,203.99
Noncorporate Private:														
Total, Noncorporate Private	12,456.16	784.60	5,473.46	355.61	17,929.62	851.73	--	--	--	--	--	--	17,929.62	851.73
All Private	37,010.56	1,290.59	6,485.74	382.31	43,496.30	1,315.83	--	--	--	--	--	--	43,496.30	1,315.83
All Owners	78,261.72	1,737.26	12,023.87	546.17	90,285.59	1,768.33	21,870.85	1,133.82	4,838.88	418.41	26,709.73	1,176.85	116,995.32	2,044.93

Note: Totals may be off because of rounding

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

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

Table C88: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	0.01	0.01	76.11	38.32	76.11	38.32	148.08	92.23	202.75	80.07	350.82	146.25	426.94	151.19
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.01	0.01	76.11	38.32	76.11	38.32	148.08	92.23	202.75	80.07	350.82	146.25	426.94	151.19
Other Federal Government:														
Bureau of Land Management	--	--	102.77	81.44	102.77	81.44	--	--	0.01	0.01	0.01	0.01	102.77	81.44
Department of Defense and Energy	--	--	24.09	13.06	24.09	13.06	--	--	--	--	--	--	24.09	13.06
National Park Service	--	--	--	--	--	--	--	--	101.59	114.33	101.59	114.33	101.59	114.33
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	26.86	19.32	26.86	19.32	--	--	--	--	--	--	26.86	19.32
Total	--	--	153.72	84.69	153.72	84.69	--	--	101.60	114.33	101.60	114.33	255.32	142.28
State and Local Government:														
Local	--	--	135.18	90.57	135.18	90.57	87.26	38.79	130.17	55.52	217.43	67.75	352.61	112.99
State	89.34	72.38	3.70	3.34	93.04	72.46	219.17	119.18	221.52	101.92	440.69	156.09	533.73	171.29
Other Public	--	--	--	--	--	--	18.22	19.20	9.18	9.02	27.40	21.21	27.40	21.21
Total	89.34	72.38	138.88	90.63	228.22	115.99	324.65	125.58	360.87	116.26	685.52	170.17	913.74	204.49
Private:														
Corporate	298.22	167.40	189.33	56.67	487.55	176.73	--	--	--	--	--	--	487.55	176.73
Noncorporate Private:														
Total, Noncorporate Private	934.95	257.12	1,020.89	145.79	1,955.84	295.06	--	--	--	--	--	--	1,955.84	295.06
All Private	1,233.17	305.53	1,210.22	155.94	2,443.39	342.45	--	--	--	--	--	--	2,443.39	342.45
All Owners	1,322.52	313.88	1,578.93	202.55	2,901.44	373.01	472.73	155.81	665.21	181.13	1,137.94	250.29	4,039.38	448.17

Note: Totals may be off because of rounding

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

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

Table C89: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2006-2015: Central Valley

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal Government:														
Bureau of Land Management	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
State and Local Government:														
Local	--	--	6.68	6.89	6.68	6.89	--	--	--	--	--	--	6.68	6.89
State	--	--	--	--	--	--	--	--	6.56	6.76	6.56	6.76	6.56	6.76
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	6.68	6.89	6.68	6.89	--	--	6.56	6.76	6.56	6.76	13.24	9.65
Private:														
Corporate	--	--	1.38	1.25	1.38	1.25	--	--	--	--	--	--	1.38	1.25
Noncorporate Private:														
Total, Noncorporate Private	--	--	78.57	40.38	78.57	40.38	--	--	--	--	--	--	78.57	40.38
All Private	--	--	79.96	40.40	79.96	40.40	--	--	--	--	--	--	79.96	40.40
All Owners	--	--	86.64	40.98	86.64	40.98	--	--	6.56	6.76	6.56	6.76	93.20	41.53

Note: Totals may be off because of rounding

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

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

Table C90: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2006-2015: Eastside

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	1,818.91	234.76	1,091.79	159.72	2,910.70	282.29	211.76	97.58	253.60	80.98	465.36	126.54	3,376.07	308.98
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	1,818.91	234.76	1,091.79	159.72	2,910.70	282.29	211.76	97.58	253.60	80.98	465.36	126.54	3,376.07	308.98
Other Federal Government:														
Bureau of Land Management	202.86	126.67	367.09	72.40	569.95	145.26	--	--	51.03	25.03	51.03	25.03	620.98	146.96
Department of Defense and Energy	--	--	11.51	8.85	11.51	8.85	--	--	--	--	--	--	11.51	8.85
National Park Service	--	--	--	--	--	--	--	--	64.17	23.92	64.17	23.92	64.17	23.92
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.55	0.56	0.55	0.56	--	--	--	--	--	--	0.55	0.56
Total	202.86	126.67	379.15	72.72	582.01	145.42	--	--	115.20	34.15	115.20	34.15	697.21	148.55
State and Local Government:														
Local	--	--	10.61	11.37	10.61	11.37	--	--	--	--	--	--	10.61	11.37
State	--	--	--	--	--	--	17.28	19.44	0.50	0.39	17.78	19.45	17.78	19.45
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	10.61	11.37	10.61	11.37	17.28	19.44	0.50	0.39	17.78	19.45	28.39	22.53
Private:														
Corporate	661.51	148.04	55.98	28.88	717.49	150.94	--	--	--	--	--	--	717.49	150.94
Noncorporate Private:														
Total, Noncorporate Private	284.78	99.69	37.64	11.56	322.42	100.39	--	--	--	--	--	--	322.42	100.39
All Private	946.29	177.06	93.62	31.11	1,039.91	179.87	--	--	--	--	--	--	1,039.91	179.87
All Owners	2,968.05	321.22	1,575.18	178.57	4,543.23	365.94	229.04	99.50	369.31	87.89	598.35	132.50	5,141.58	388.52

Note: Totals may be off because of rounding

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

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

Table C91: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	12,657.16	786.13	982.57	226.27	13,639.73	812.34	6,291.30	565.12	545.03	157.89	6,836.33	583.34	20,476.06	989.11
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	12,657.16	786.13	982.57	226.27	13,639.73	812.34	6,291.30	565.12	545.03	157.89	6,836.33	583.34	20,476.06	989.11
Other Federal Government:														
Bureau of Land Management	386.74	101.73	141.29	53.60	528.03	116.01	16.62	16.53	36.57	23.23	53.19	28.51	581.22	119.31
Department of Defense and Energy	--	--	--	--	--	--	--	--	3.97	4.00	3.97	4.00	3.97	4.00
National Park Service	--	--	--	--	--	--	806.76	341.13	52.40	31.18	859.16	342.55	859.16	342.55
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	0.02	0.02	0.02	0.02	--	--	--	--	--	--	0.02	0.02
Total	386.74	101.73	141.31	53.60	528.05	116.01	823.38	341.38	92.94	39.03	916.32	343.60	1,444.37	361.01
State and Local Government:														
Local	22.68	19.81	4.09	3.03	26.77	20.04	--	--	6.69	7.25	6.69	7.25	33.46	21.31
State	61.15	39.05	12.01	7.77	73.16	39.81	25.61	27.00	88.65	58.82	114.26	64.70	187.42	75.97
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	83.83	43.79	16.10	8.34	99.94	44.57	25.61	27.00	95.34	59.26	120.95	65.11	220.89	78.90
Private:														
Corporate	5,280.12	599.68	268.19	84.43	5,548.32	604.77	--	--	--	--	--	--	5,548.32	604.77
Noncorporate Private:														
Total, Noncorporate Private	2,834.43	370.79	1,461.65	214.79	4,296.08	427.56	--	--	--	--	--	--	4,296.08	427.56
All Private	8,114.55	693.44	1,729.84	230.37	9,844.40	728.41	--	--	--	--	--	--	9,844.40	728.41
All Owners	21,242.29	1,052.98	2,869.83	326.97	24,112.11	1,096.62	7,140.29	660.42	733.31	173.10	7,873.60	679.78	31,985.71	1,279.94

Note: Totals may be off because of rounding

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

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

Table C92: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2006-2015: North Coast

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	49.87	33.18	1.62	1.65	51.49	33.22	87.82	77.81	--	--	87.82	77.81	139.31	84.60
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	49.87	33.18	1.62	1.65	51.49	33.22	87.82	77.81	--	--	87.82	77.81	139.31	84.60
Other Federal Government:														
Bureau of Land Management	109.14	47.53	--	--	109.14	47.53	169.67	90.85	--	--	169.67	90.85	278.82	102.60
Department of Defense and Energy	10.23	10.78	--	--	10.23	10.78	--	--	--	--	--	--	10.23	10.78
National Park Service	--	--	--	--	--	--	446.35	223.02	3.67	2.99	450.02	223.04	450.02	223.04
U.S. Fish and Wildlife Service	--	--	--	--	--	--	1.58	1.61	--	--	1.58	1.61	1.58	1.61
Other Federal	--	--	0.01	0.01	0.01	0.01	--	--	--	--	--	--	0.01	0.01
Total	119.38	48.73	0.01	0.01	119.39	48.73	617.60	240.82	3.67	2.99	621.27	240.84	740.65	245.03
State and Local Government:														
Local	208.37	199.16	1.85	1.88	210.22	199.17	--	--	40.15	15.41	40.15	15.41	250.37	199.76
State	199.85	99.77	--	--	199.85	99.77	1,384.60	364.46	55.56	40.50	1,440.16	366.13	1,640.01	372.50
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	408.22	219.95	1.85	1.88	410.07	219.96	1,384.60	364.46	95.71	43.33	1,480.31	366.45	1,890.38	416.77
Private:														
Corporate	10,028.69	994.36	95.33	72.48	10,124.02	995.93	--	--	--	--	--	--	10,124.02	995.93
Noncorporate Private:														
Total, Noncorporate Private	4,440.27	535.30	332.78	74.86	4,773.05	539.94	--	--	--	--	--	--	4,773.05	539.94
All Private	14,468.96	1,100.32	428.11	104.13	14,897.07	1,102.86	--	--	--	--	--	--	14,897.07	1,102.86
All Owners	15,046.43	1,122.74	431.58	104.16	15,478.02	1,125.23	2,090.02	443.71	99.38	43.44	2,189.40	445.35	17,667.41	1,203.54

Note: Totals may be off because of rounding

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

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

Table C93: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2006-2015: Sierra Cascades

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	24,641.22	1,027.68	1,355.88	200.21	25,997.10	1,035.59	5,893.87	667.28	1,202.27	183.90	7,096.14	681.76	33,093.24	1,225.54
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	24,641.22	1,027.68	1,355.88	200.21	25,997.10	1,035.59	5,893.87	667.28	1,202.27	183.90	7,096.14	681.76	33,093.24	1,225.54
Other Federal Government:														
Bureau of Land Management	213.30	68.31	370.99	88.83	584.30	111.39	3.39	3.57	305.16	119.31	308.54	119.36	892.84	162.73
Department of Defense and Energy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
National Park Service	--	--	--	--	--	--	5,176.54	582.81	741.94	199.31	5,918.47	608.84	5,918.47	608.84
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	14.17	10.29	14.17	10.29	--	--	0.66	0.68	0.66	0.68	14.83	10.31
Total	213.30	68.31	385.16	89.21	598.46	111.67	5,179.92	582.81	1,047.75	230.97	6,227.68	619.13	6,826.14	618.09
State and Local Government:														
Local	85.59	38.54	60.32	27.63	145.92	47.47	--	--	0.53	0.43	0.53	0.43	146.44	47.47
State	67.66	44.18	17.29	14.35	84.95	46.08	456.13	167.04	98.63	50.61	554.76	173.03	639.71	178.03
Other Public	--	--	0.24	0.21	0.24	0.21	--	--	--	--	--	--	0.24	0.21
Total	153.26	58.63	77.85	31.13	231.10	66.15	456.13	167.04	99.16	50.61	555.29	173.03	786.39	184.19
Private:														
Corporate	8,282.97	579.12	383.80	81.19	8,666.77	584.29	--	--	--	--	--	--	8,666.77	584.29
Noncorporate Private:														
Total, Noncorporate Private	3,763.50	409.55	2,183.90	216.02	5,947.40	458.82	--	--	--	--	--	--	5,947.40	458.82
All Private	12,046.47	681.13	2,567.70	229.32	14,614.17	709.74	--	--	--	--	--	--	14,614.17	709.74
All Owners	37,054.24	1,232.49	4,386.59	317.72	41,440.83	1,256.60	11,529.92	901.62	2,349.19	299.54	13,879.11	936.91	55,319.94	1,532.15

Note: Totals may be off because of rounding

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

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

Table C94: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>thousand metric tons C</i>														
USDA Forest Service:														
National Forest	420.52	132.75	606.07	104.06	1,026.59	168.37	345.53	117.98	417.34	125.01	762.87	170.50	1,789.46	239.20
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	420.52	132.75	606.07	104.06	1,026.59	168.37	345.53	117.98	417.34	125.01	762.87	170.50	1,789.46	239.20
Other Federal Government:														
Bureau of Land Management	--	--	58.60	32.84	58.60	32.84	--	--	18.04	10.90	18.04	10.90	76.64	34.60
Department of Defense and Energy	6.55	6.64	--	--	6.55	6.64	--	--	--	--	--	--	6.55	6.64
National Park Service	--	--	--	--	--	--	--	--	91.97	48.07	91.97	48.07	91.97	48.07
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	22.26	13.05	22.26	13.05	--	--	3.13	3.22	3.13	3.22	25.39	13.44
Total	6.55	6.64	80.86	35.33	87.41	35.95	--	--	113.15	49.40	113.15	49.40	200.56	61.07
State and Local Government:														
Local	--	--	26.27	18.30	26.27	18.30	--	--	17.51	12.44	17.51	12.44	43.78	22.05
State	--	--	5.64	5.78	5.64	5.78	63.33	43.79	67.92	46.75	131.25	64.01	136.89	64.27
Other Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	31.91	19.19	31.91	19.19	63.33	43.79	85.43	48.37	148.76	65.15	180.67	67.88
Private:														
Corporate	2.89	2.74	18.27	9.38	21.16	9.77	--	--	--	--	--	--	21.16	9.77
Noncorporate Private:														
Total, Noncorporate Private	198.23	101.90	358.01	110.73	556.24	188.77	--	--	--	--	--	--	556.24	188.77
All Private	201.12	101.94	376.29	111.13	577.41	189.02	--	--	--	--	--	--	577.41	189.02
All Owners	628.19	167.51	1,095.13	157.29	1,723.32	256.27	408.86	125.84	615.92	142.86	1,024.78	189.09	2,748.10	318.11

Note: Totals may be off because of rounding

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

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

Table C95: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, All California (10-year averages): 2001-2010

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	39,111.51	1,048.82	4,993.82	363.54	44,105.33	1,063.48	11,677.14	677.05	2,566.96	248.95	14,244.10	688.09	58,349.43	1,212.01
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	39,111.51	1,048.82	4,993.82	363.54	44,105.33	1,063.48	11,677.14	677.05	2,566.96	248.95	14,244.10	688.09	58,349.43	1,212.01
Other Federal Government:														
Bureau of Land Management	731.54	124.60	1,001.27	121.47	1,732.81	172.33	46.46	23.90	317.39	90.21	363.85	93.31	2,096.66	193.60
Department of Defense and Energy	11.50	11.31	45.13	19.74	56.63	22.71	--	--	--	--	--	--	56.63	22.71
National Park Service	--	--	--	--	--	--	6,190.06	690.44	857.35	163.65	7,047.41	702.91	7,047.41	702.91
U.S. Fish and Wildlife Service	--	--	--	--	--	--	12.75	13.87	--	--	12.75	13.87	12.75	13.87
Other Federal	--	--	56.57	24.49	56.57	24.49	127.29	111.02	27.90	23.97	155.20	113.58	211.77	116.04
Total	743.04	124.98	1,102.98	124.77	1,846.02	174.50	6,376.57	693.63	1,202.64	186.66	7,579.21	709.89	9,425.23	709.03
State and Local Government:														
Local	180.78	72.87	167.26	65.71	348.04	98.05	103.81	52.09	237.34	64.23	341.15	81.97	689.19	126.67
State	464.78	148.05	35.31	18.59	500.10	148.74	2,012.80	369.13	393.88	94.30	2,406.68	376.74	2,906.78	383.22
Other Public	--	--	0.24	0.21	0.24	0.21	16.36	17.80	11.38	9.07	27.74	19.98	27.98	19.98
Total	645.56	162.66	202.81	68.23	848.37	175.86	2,132.97	368.76	642.61	113.43	2,775.58	378.11	3,623.95	389.09
Private:														
Corporate	24,640.27	1,148.53	666.01	113.67	25,306.28	1,152.36	--	--	--	--	--	--	25,306.28	1,152.36
Noncorporate Private:														
Total, Noncorporate Private	13,351.19	779.32	5,698.24	308.85	19,049.44	820.04	--	--	--	--	--	--	19,049.44	820.04
All Private	37,991.46	1,222.80	6,364.25	326.17	44,355.71	1,229.70	--	--	--	--	--	--	44,355.71	1,229.70
All Owners	78,491.57	1,609.59	12,663.86	506.83	91,155.43	1,626.26	20,186.67	1,035.98	4,412.21	330.73	24,598.89	1,056.62	115,754.32	1,859.36

Note: Totals may be off because of rounding

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

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

Table C96: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, All California (10-year averages): 2002-2011

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	39,167.98	1,062.40	4,828.11	360.99	43,996.09	1,075.49	11,725.41	683.38	2,525.87	255.18	14,251.27	696.42	58,247.37	1,225.65
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	39,167.98	1,062.40	4,828.11	360.99	43,996.09	1,075.49	11,725.41	683.38	2,525.87	255.18	14,251.27	696.42	58,247.37	1,225.65
Other Federal Government:														
Bureau of Land Management	734.84	124.51	969.22	122.40	1,704.06	173.06	43.30	22.65	363.36	104.14	406.67	106.56	2,110.72	200.60
Department of Defense and Energy	17.39	13.00	42.42	19.23	59.81	23.16	--	--	--	--	--	--	59.81	23.16
National Park Service	--	--	--	--	--	--	6,400.85	708.40	862.75	167.75	7,263.59	720.40	7,263.59	720.40
U.S. Fish and Wildlife Service	--	--	--	--	--	--	12.47	13.77	--	--	12.47	13.77	12.47	13.77
Other Federal	--	--	56.84	24.59	56.84	24.59	128.13	111.47	28.09	24.15	156.22	114.06	213.06	116.51
Total	752.22	125.04	1,068.48	125.62	1,820.70	175.25	6,584.75	711.37	1,254.20	196.89	7,838.95	728.75	9,659.65	727.73
State and Local Government:														
Local	350.47	238.02	187.04	85.04	537.51	252.74	113.38	54.12	230.06	64.74	343.44	83.64	880.96	263.61
State	457.23	146.49	37.17	19.04	494.40	147.73	2,010.98	366.51	412.43	95.97	2,423.41	374.94	2,917.82	381.09
Other Public	--	--	0.24	0.22	0.24	0.22	16.00	17.66	8.14	8.43	24.14	19.57	24.38	19.57
Total	807.70	278.89	224.46	87.09	1,032.16	290.04	2,140.36	366.55	650.63	115.05	2,790.99	377.04	3,823.15	450.23
Private:														
Corporate	24,089.98	1,185.57	769.08	128.48	24,859.06	1,188.85	--	--	--	--	--	--	24,859.06	1,188.85
Noncorporate Private:														
Total, Noncorporate Private	13,548.07	797.44	5,735.36	329.56	19,283.43	844.63	--	--	--	--	--	--	19,283.43	844.63
All Private	37,638.05	1,268.38	6,504.44	350.16	44,142.49	1,281.20	--	--	--	--	--	--	44,142.49	1,281.20
All Owners	78,365.96	1,669.48	12,625.49	523.70	90,991.44	1,690.20	20,450.52	1,051.17	4,430.70	341.86	24,881.21	1,074.30	115,872.66	1,919.72

Note: Totals may be off because of rounding

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

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

Table C97: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, All California (10-year averages): 2003-2012

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>thousand metric tons C</i>														
USDA Forest Service:														
National Forest	38,922.11	1,066.19	4,589.46	354.12	43,511.57	1,078.58	12,015.32	709.85	2,615.47	258.49	14,630.79	722.53	58,142.36	1,244.71
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	38,922.11	1,066.19	4,589.46	354.12	43,511.57	1,078.58	12,015.32	709.85	2,615.47	258.49	14,630.79	722.53	58,142.36	1,244.71
Other Federal Government:														
Bureau of Land Management	764.48	126.33	996.07	126.39	1,760.55	177.43	100.62	48.76	346.17	102.10	446.78	113.14	2,207.33	208.07
Department of Defense and Energy	17.49	12.93	45.21	19.72	62.69	23.53	--	--	4.64	4.36	4.64	4.36	67.33	23.93
National Park Service	--	--	--	--	--	--	6,280.35	708.09	963.18	214.54	7,243.54	731.18	7,243.54	731.18
U.S. Fish and Wildlife Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Federal	--	--	70.79	27.90	70.79	27.90	105.98	108.27	27.13	23.67	133.11	110.83	203.91	114.13
Total	781.96	126.86	1,112.08	130.22	1,894.04	180.10	6,486.95	712.23	1,341.11	236.69	7,828.06	740.26	9,722.10	738.36
State and Local Government:														
Local	281.92	205.77	191.51	85.87	473.43	222.97	114.37	55.00	237.82	66.29	352.19	85.37	825.62	237.80
State	485.02	153.49	35.57	17.43	520.59	154.29	2,091.17	380.78	412.23	100.02	2,503.39	389.36	3,023.98	395.24
Other Public	--	--	0.24	0.22	0.24	0.22	17.19	18.40	7.54	8.12	24.73	20.11	24.97	20.11
Total	766.94	254.32	227.32	87.58	994.27	268.33	2,222.73	380.14	657.58	119.35	2,880.31	390.97	3,874.57	444.71
Private:														
Corporate	23,832.98	1,173.78	754.95	128.07	24,587.93	1,177.37	--	--	--	--	--	--	24,587.93	1,177.37
Noncorporate Private:														
Total, Noncorporate Private	13,473.21	813.47	5,755.70	346.27	19,228.91	866.43	--	--	--	--	--	--	19,228.91	866.43
All Private	37,306.18	1,270.73	6,510.66	365.61	43,816.84	1,288.87	--	--	--	--	--	--	43,816.84	1,288.87
All Owners	77,777.20	1,667.47	12,439.52	530.24	90,216.72	1,692.43	20,725.00	1,074.21	4,614.16	370.18	25,339.16	1,104.79	115,555.88	1,939.22

Note: Totals may be off because of rounding

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

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

Table C98: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, All California (10-year averages): 2004-2013

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
<i>thousand metric tons C</i>														
USDA Forest Service:														
National Forest	39,280.55	1,086.60	4,501.06	352.79	43,781.61	1,099.44	12,456.10	782.71	2,605.64	257.55	15,061.74	794.09	58,843.35	1,307.04
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	39,280.55	1,086.60	4,501.06	352.79	43,781.61	1,099.44	12,456.10	782.71	2,605.64	257.55	15,061.74	794.09	58,843.35	1,307.04
Other Federal Government:														
Bureau of Land Management	740.67	122.69	954.45	126.13	1,695.12	174.60	93.69	44.29	367.01	104.74	460.69	113.71	2,155.81	206.06
Department of Defense and Energy	16.66	12.54	38.78	15.70	55.44	20.04	--	--	3.91	3.98	3.91	3.98	59.35	20.39
National Park Service	--	--	--	--	--	--	6,063.18	624.25	947.44	208.68	7,010.63	648.95	7,010.63	648.95
U.S. Fish and Wildlife Service	--	--	--	--	--	--	1.60	1.62	--	--	1.60	1.62	1.60	1.62
Other Federal	--	--	67.17	26.21	67.17	26.21	--	--	3.82	3.28	3.82	3.28	70.98	26.41
Total	757.34	123.21	1,060.39	128.98	1,817.73	176.62	6,158.47	624.31	1,322.17	231.76	7,480.65	654.97	9,298.37	653.34
State and Local Government:														
Local	283.68	202.75	204.87	91.96	488.55	222.63	103.20	48.03	223.54	64.32	326.74	79.79	815.29	235.17
State	478.09	148.71	35.79	17.30	513.88	149.24	2,072.01	380.79	413.20	102.82	2,485.21	389.62	2,999.10	395.83
Other Public	--	--	0.24	0.22	0.24	0.22	17.99	18.93	7.62	8.17	25.61	20.62	25.86	20.62
Total	761.77	246.58	240.90	93.52	1,002.68	263.10	2,193.20	380.17	644.37	120.72	2,837.57	391.22	3,840.24	443.72
Private:														
Corporate	23,722.02	1,171.85	842.73	138.26	24,564.75	1,175.30	--	--	--	--	--	--	24,564.75	1,175.30
Noncorporate Private:														
Total, Noncorporate Private	13,167.55	800.31	5,643.50	353.37	18,811.05	857.69	--	--	--	--	--	--	18,811.05	857.69
All Private	36,889.57	1,265.55	6,486.23	375.79	43,375.79	1,286.38	--	--	--	--	--	--	43,375.79	1,286.38
All Owners	77,689.23	1,677.15	12,288.58	536.76	89,977.81	1,704.15	20,807.77	1,070.24	4,572.18	366.83	25,379.95	1,100.20	115,357.76	1,952.59

Note: Totals may be off because of rounding

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

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

Table C99: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, All California (10-year averages): 2005-2014

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	39,515.60	1,124.51	4,266.22	344.61	43,781.82	1,136.47	12,729.44	779.79	2,677.25	279.68	15,406.70	794.51	59,188.51	1,340.78
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	39,515.60	1,124.51	4,266.22	344.61	43,781.82	1,136.47	12,729.44	779.79	2,677.25	279.68	15,406.70	794.51	59,188.51	1,340.78
Other Federal Government:														
Bureau of Land Management	756.52	127.20	1,015.07	149.39	1,771.58	194.96	121.80	51.14	403.69	122.53	525.49	132.76	2,297.07	233.42
Department of Defense and Energy	16.70	12.62	35.55	15.84	52.25	20.23	--	--	4.00	4.01	4.00	4.01	56.25	20.57
National Park Service	--	--	--	--	--	--	6,162.20	630.10	922.85	203.31	7,085.04	653.03	7,085.04	653.03
U.S. Fish and Wildlife Service	--	--	--	--	--	--	1.60	1.62	--	--	1.60	1.62	1.60	1.62
Other Federal	--	--	65.56	25.78	65.56	25.78	--	--	3.74	3.25	3.74	3.25	69.30	25.98
Total	773.21	127.68	1,116.18	151.75	1,889.39	196.75	6,285.59	630.39	1,334.28	235.44	7,619.87	662.41	9,509.26	665.49
State and Local Government:														
Local	306.65	199.08	218.15	94.36	524.80	220.31	100.86	47.25	196.34	58.47	297.20	74.78	822.00	231.59
State	456.05	146.98	36.57	17.15	492.62	147.60	2,167.91	396.55	433.81	104.92	2,601.72	404.81	3,094.34	410.07
Other Public	--	--	0.24	0.21	0.24	0.21	18.77	19.45	8.20	8.49	26.97	21.23	27.21	21.23
Total	762.70	243.42	254.95	95.84	1,017.65	261.16	2,287.54	395.25	638.35	119.68	2,925.90	406.01	3,943.55	454.98
Private:														
Corporate	23,632.49	1,165.45	911.13	139.94	24,543.63	1,168.56	--	--	--	--	--	--	24,543.63	1,168.56
Noncorporate Private:														
Total, Noncorporate Private	13,102.66	820.77	5,472.60	348.93	18,575.26	874.78	--	--	--	--	--	--	18,575.26	874.78
All Private	36,735.16	1,276.74	6,383.73	372.13	43,118.89	1,295.38	--	--	--	--	--	--	43,118.89	1,295.38
All Owners	77,786.67	1,710.45	12,021.08	535.34	89,807.74	1,737.02	21,302.58	1,077.09	4,649.88	384.60	25,952.46	1,110.24	115,760.21	1,986.36

Note: Totals may be off because of rounding

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

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

Table C100: Aboveground Carbon Mass of Down Dead Wood, by Owner Group and Forest Land Status, All California (10-year averages): 2006-2015

**information duplicated in Table C87*

Ownership Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
USDA Forest Service:														
National Forest	39,587.68	1,145.21	4,114.04	348.71	43,701.72	1,157.93	12,978.35	819.16	2,621.00	284.33	15,599.35	835.78	59,301.07	1,382.12
National Grasslands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Forest Service	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	39,587.68	1,145.21	4,114.04	348.71	43,701.72	1,157.93	12,978.35	819.16	2,621.00	284.33	15,599.35	835.78	59,301.07	1,382.12
Other Federal Government:														
Bureau of Land Management	912.04	180.77	1,040.74	152.41	1,952.78	234.23	189.68	92.41	410.81	124.35	600.49	154.92	2,553.27	278.36
Department of Defense and Energy	16.78	12.66	35.60	15.73	52.39	20.17	--	--	3.97	4.00	3.97	4.00	56.36	20.52
National Park Service	--	--	--	--	--	--	6,429.64	674.52	1,055.74	237.67	7,485.38	707.27	7,485.38	707.27
U.S. Fish and Wildlife Service	--	--	--	--	--	--	1.58	1.61	--	--	1.58	1.61	1.58	1.61
Other Federal	--	--	63.87	25.49	63.87	25.49	--	--	3.79	3.28	3.79	3.28	67.66	25.69
Total	928.82	181.11	1,140.21	154.74	2,069.04	235.77	6,620.90	679.08	1,474.31	266.48	8,095.21	720.34	10,164.25	731.92
State and Local Government:														
Local	316.65	203.82	245.01	97.11	561.66	225.76	87.26	38.79	195.05	59.31	282.31	70.77	843.97	235.58
State	418.01	133.45	38.63	17.62	456.64	134.15	2,166.12	396.36	539.34	141.58	2,705.46	415.31	3,162.09	418.39
Other Public	--	--	0.24	0.21	0.24	0.21	18.22	19.20	9.18	9.02	27.40	21.21	27.64	21.21
Total	734.65	239.27	283.88	98.62	1,018.53	258.33	2,271.60	393.78	743.57	153.06	3,015.17	415.32	4,033.70	463.70
Private:														
Corporate	24,554.41	1,199.75	1,012.28	151.62	25,566.69	1,203.99	--	--	--	--	--	--	25,566.69	1,203.99
Noncorporate Private:														
Total, Noncorporate Private	12,456.16	784.60	5,473.46	355.61	17,929.62	851.73	--	--	--	--	--	--	17,929.62	851.73
All Private	37,010.56	1,290.59	6,485.74	382.31	43,496.30	1,315.83	--	--	--	--	--	--	43,496.30	1,315.83
All Owners	78,261.72	1,737.26	12,023.87	546.17	90,285.59	1,768.33	21,870.85	1,133.82	4,838.88	418.41	26,709.73	1,176.85	116,995.32	2,044.93

Note: Totals may be off because of rounding

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

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

Table D1: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: All California

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	300,589	8,807	301	181	300,891	8,808	82,852	5,640	665	535	83,517	5,657	384,408	10,121
Douglas-Fir	51,080	4,727	330	297	51,411	4,736	17,831	3,425	343	176	18,173	3,430	69,584	5,800
Fir / Spruce / Mountain Hemlock	76,233	5,544	886	515	77,119	5,566	39,695	4,811	1,259	565	40,955	4,837	118,074	7,340
Western Hemlock / Sitka Spruce	2,208	982	--	--	2,208	982	117	118	--	--	117	118	2,325	989
Lodgepole Pine	8,538	1,388	1,556	592	10,094	1,503	16,478	2,148	4,655	986	21,133	2,283	31,227	2,717
Pinyon / Juniper	81	63	4,016	436	4,096	441	87	97	2,250	347	2,337	357	6,434	561
Ponderosa Pine	43,331	2,775	494	223	43,825	2,783	5,662	1,129	330	164	5,992	1,140	49,817	2,998
Redwood	53,416	5,671	--	--	53,416	5,671	29,269	8,336	--	--	29,269	8,336	82,685	9,978
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	485	273	61	63	546	280	2,512	747	599	255	3,111	789	3,657	836
Other Western Softwoods	4,377	1,108	6,081	526	10,457	1,223	2,522	650	4,535	826	7,056	1,040	17,514	1,602
Total	540,339	11,050	13,725	1,100	554,064	11,045	197,025	10,706	14,636	1,525	211,661	10,721	765,725	14,452
Hardwoods:														
Alder / Maple	5,981	1,296	538	266	6,519	1,323	2,288	979	81	90	2,369	983	8,888	1,648
Aspen / Birch	504	241	85	38	588	244	322	242	56	32	378	244	966	345
Elm / Ash / Cottonwood	--	--	487	291	487	291	--	--	173	144	173	144	659	325
Tanoak / Laurel	71,921	5,319	5,794	1,408	77,714	5,477	17,700	3,012	3,232	1,340	20,932	3,273	98,646	6,345
Western Oak	63,610	4,070	85,170	3,261	148,780	5,041	7,816	1,387	14,641	1,591	22,457	2,093	171,236	5,401
Woodland Hardwoods	281	116	805	197	1,086	228	--	--	289	125	289	125	1,375	260
Exotic Hardwoods	3	3	--	--	3	3	--	--	--	--	--	--	3	3
Other Hardwoods	10,073	1,977	911	210	10,984	1,987	2,115	1,040	176	151	2,291	1,051	13,274	2,235
Total	152,372	6,808	93,789	3,537	246,161	7,375	30,241	3,537	18,646	2,095	48,887	4,037	295,048	8,257
Nonstocked	959	206	22	18	982	207	123	75	16	13	140	76	1,122	221
All Forest Types	693,670	11,033	107,536	3,673	801,206	10,858	227,389	10,763	33,299	2,563	260,688	10,801	1,061,894	13,735

Note: Totals may be off because of rounding

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

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

Table D2: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	1,094	747	--	--	1,094	747	--	--	--	--	--	--	1,094	747
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	167	55	167	55	--	--	11	9	11	9	178	56
Ponderosa Pine	--	--	41	29	41	29	--	--	50	49	50	49	91	57
Redwood	11,105	2,871	--	--	11,105	2,871	8,046	3,254	--	--	8,046	3,254	19,151	4,414
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	543	438	--	--	543	438	--	--	--	--	--	--	543	438
Total	12,741	2,994	208	63	12,949	2,994	8,046	3,254	61	50	8,108	3,255	21,057	4,495
Hardwoods:														
Alder / Maple	--	--	31	30	31	30	326	363	--	--	326	363	357	364
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	38	36	38	36	--	--	5	6	5	6	42	36
Tanoak / Laurel	3,348	1,236	1,762	569	5,110	1,358	2,892	1,574	1,113	586	4,005	1,680	9,115	2,160
Western Oak	693	407	15,718	1,438	16,411	1,495	234	194	5,507	929	5,741	938	22,151	1,754
Woodland Hardwoods	--	--	--	--	--	--	--	--	8	8	8	8	8	8
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	1,416	924	249	116	1,666	930	1,294	881	16	13	1,310	881	2,975	1,259
Total	5,457	1,594	17,798	1,548	23,255	2,205	4,745	1,807	6,649	1,104	11,395	2,078	34,650	2,988
Nonstocked	--	--	18	18	18	18	--	--	--	--	--	--	18	18
All Forest Types	18,198	3,372	18,024	1,550	36,222	3,691	12,792	3,650	6,710	1,105	19,502	3,792	55,724	5,295

Note: Totals may be off because of rounding

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

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

Table D3: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Central Valley

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	252	259	252	259	--	--	134	136	134	136	386	292
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	--	--	853	280	853	280	--	--	14	14	14	14	867	280
Woodland Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	1,105	381	1,105	381	--	--	148	137	148	137	1,253	405
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All Forest Types	--	--	1,105	381	1,105	381	--	--	148	137	148	137	1,253	405

Note: Totals may be off because of rounding
 Forest land that is capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.
 Forest land that is not capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.

Table D4: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Eastside

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	6,210	936	199	167	6,410	950	--	--	--	--	--	--	6,410	950
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	3,288	1,038	--	--	3,288	1,038	1,524	832	--	--	1,524	832	4,813	1,331
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	456	244	762	480	1,219	539	--	--	--	--	--	--	1,219	539
Pinyon / Juniper	22	21	2,046	286	2,068	287	--	--	936	218	936	218	3,003	356
Ponderosa Pine	5,834	825	104	70	5,937	827	454	250	--	--	454	250	6,392	864
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	997	243	4,092	413	5,090	476	--	--	1,117	430	1,117	430	6,207	641
Total	16,808	1,643	7,204	712	24,012	1,791	1,979	869	2,053	481	4,031	991	28,044	2,044
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aspen / Birch	330	174	55	33	386	177	22	24	--	--	22	24	407	179
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	81	65	92	78	174	102	--	--	--	--	--	--	174	102
Woodland Hardwoods	198	99	246	99	444	140	--	--	--	--	--	--	444	140
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	61	51	1	1	62	51	--	--	--	--	--	--	62	51
Total	671	217	394	130	1,065	251	22	24	--	--	22	24	1,087	252
Nonstocked	75	28	5	3	80	29	--	--	--	--	--	--	80	29
All Forest Types	17,554	1,660	7,603	722	25,158	1,808	2,000	874	2,053	481	4,053	996	29,211	2,061

Note: Totals may be off because of rounding
 Forest land that is capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.
 Forest land that is not capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.

Table D5: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total			
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	107,651	6,291	66	62	107,717	6,292	33,468	3,468	--	--	33,468	3,468	141,185	7,147
Douglas-Fir	20,748	2,996	330	297	21,078	3,009	10,387	2,488	343	176	10,729	2,494	31,808	3,888
Fir / Spruce / Mountain Hemlock	6,415	1,689	282	231	6,697	1,702	8,411	2,097	240	200	8,651	2,105	15,348	2,706
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	117	118	--	--	117	118	117	118
Lodgepole Pine	135	129	--	--	135	129	88	63	71	72	159	95	293	161
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	3,902	853	--	--	3,902	853	1,574	680	128	126	1,702	691	5,605	1,097
Redwood	1,023	779	--	--	1,023	779	6,075	3,738	--	--	6,075	3,738	7,098	3,818
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	208	214	61	63	269	223	292	141	49	34	341	145	610	266
Other Western Softwoods	94	76	376	178	470	194	62	55	27	27	89	61	559	202
Total	140,174	7,078	1,116	425	141,290	7,080	60,475	5,698	858	306	61,332	5,702	202,622	8,965
Hardwoods:														
Alder / Maple	1,806	616	247	193	2,053	646	1,316	721	81	90	1,396	726	3,449	972
Aspen / Birch	--	--	--	--	--	--	--	--	12	12	12	12	12	12
Elm / Ash / Cottonwood	--	--	65	63	65	63	--	--	--	--	--	--	65	63
Tanoak / Laurel	24,959	3,532	1,749	843	26,708	3,629	9,068	2,040	895	741	9,964	2,158	36,672	4,209
Western Oak	32,519	3,075	26,524	2,045	59,043	3,657	3,506	930	4,618	959	8,125	1,333	67,168	3,881
Woodland Hardwoods	--	--	34	31	34	31	--	--	28	25	28	25	62	40
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	4,824	1,347	53	33	4,877	1,347	78	77	145	150	222	168	5,100	1,357
Total	64,109	4,837	28,672	2,213	92,780	5,273	13,968	2,333	5,779	1,224	19,747	2,615	112,527	5,850
Nonstocked	121	51	--	--	121	51	102	74	--	--	102	74	223	90
All Forest Types	204,404	8,303	29,788	2,250	234,191	8,529	74,545	5,924	6,637	1,263	81,181	5,986	315,373	10,204

Note: Totals may be off because of rounding

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

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

Table D6: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: North Coast

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	68	64	--	--	68	64	--	--	--	--	--	--	68	64
Douglas-Fir	29,239	3,650	--	--	29,239	3,650	7,444	2,407	--	--	7,444	2,407	36,683	4,342
Fir / Spruce / Mountain Hemlock	421	287	--	--	421	287	--	--	--	--	--	--	421	287
Western Hemlock / Sitka Spruce	2,208	982	--	--	2,208	982	--	--	--	--	--	--	2,208	982
Lodgepole Pine	--	--	--	--	--	--	28	28	--	--	28	28	28	28
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	41,261	4,922	--	--	41,261	4,922	15,147	6,852	--	--	15,147	6,852	56,408	8,302
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	1,168	896	--	--	1,168	896	--	--	139	183	139	183	1,307	914
Total	74,365	6,137	--	--	74,365	6,137	22,618	7,160	139	183	22,757	7,163	97,122	9,222
Hardwoods:														
Alder / Maple	3,085	974	80	79	3,165	978	646	554	--	--	646	554	3,811	1,123
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	40,678	3,777	2,254	981	42,932	3,888	5,740	1,618	1,170	949	6,911	1,872	49,843	4,294
Western Oak	4,115	964	4,167	795	8,282	1,250	--	--	462	252	462	252	8,744	1,276
Woodland Hardwoods	--	--	--	--	--	--	--	--	94	85	94	85	94	85
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	2,437	857	58	55	2,495	859	744	564	--	--	744	564	3,239	1,028
Total	50,315	4,058	6,559	1,264	56,874	4,225	7,130	1,774	1,726	985	8,856	2,024	65,730	4,658
Nonstocked	18	18	--	--	18	18	--	--	--	--	--	--	18	18
All Forest Types	124,698	7,002	6,559	1,264	131,257	7,080	29,749	7,257	1,865	1,002	31,614	7,322	162,870	9,935

Note: Totals may be off because of rounding

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

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

Table D7: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	185,424	7,603	36	29	185,460	7,603	48,180	4,666	665	535	48,845	4,687	234,305	8,698
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	65,585	5,224	604	460	66,189	5,245	29,760	4,322	1,019	529	30,779	4,353	96,968	6,789
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	7,947	1,361	793	347	8,741	1,403	16,363	2,147	4,313	972	20,675	2,279	29,416	2,659
Pinyon / Juniper	59	59	1,136	282	1,195	288	87	97	988	253	1,075	269	2,270	394
Ponderosa Pine	33,165	2,541	348	210	33,513	2,550	3,036	834	152	94	3,188	838	36,701	2,679
Redwood	28	26	--	--	28	26	--	--	--	--	--	--	28	26
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	278	168	--	--	278	168	2,220	733	550	253	2,770	775	3,048	793
Other Western Softwoods	1,389	389	1,495	255	2,884	464	2,459	648	3,252	683	5,711	933	8,595	1,041
Total	293,874	8,830	4,413	720	298,288	8,845	102,105	6,367	10,939	1,410	113,044	6,436	411,332	10,568
Hardwoods:														
Alder / Maple	1,090	605	--	--	1,090	605	--	--	--	--	--	--	1,090	605
Aspen / Birch	173	167	29	20	203	168	300	241	44	30	344	243	546	295
Elm / Ash / Cottonwood	--	--	132	113	132	113	--	--	--	--	--	--	132	113
Tanoak / Laurel	2,935	1,139	29	16	2,964	1,139	--	--	2	2	2	2	2,966	1,139
Western Oak	25,129	2,523	33,681	2,092	58,810	3,204	3,509	973	3,033	800	6,542	1,256	65,352	3,414
Woodland Hardwoods	83	61	112	54	195	81	--	--	91	72	91	72	286	108
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	1,334	718	465	153	1,799	734	--	--	15	16	15	16	1,814	734
Total	30,744	2,914	34,448	2,098	65,192	3,513	3,809	1,002	3,185	803	6,994	1,278	72,185	3,711
Nonstocked	740	197	--	--	740	197	21	11	16	13	37	17	777	198
All Forest Types	325,358	8,976	38,861	2,213	364,219	9,018	105,935	6,404	14,140	1,619	120,075	6,492	484,294	10,605

Note: Totals may be off because of rounding

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

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

Table D8: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Live Trees Including Foliage (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	1,236	594	--	--	1,236	594	1,204	620	--	--	1,204	620	2,440	859
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	524	392	--	--	524	392	--	--	--	--	--	--	524	392
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	272	167	272	167	272	167
Pinyon / Juniper	--	--	667	202	667	202	--	--	315	115	315	115	982	233
Ponderosa Pine	431	242	--	--	431	242	598	276	--	--	598	276	1,028	368
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	186	135	117	120	303	181	--	--	--	--	--	--	303	181
Total	2,377	763	783	234	3,160	798	1,801	671	587	202	2,388	701	5,548	1,062
Hardwoods:														
Alder / Maple	--	--	181	162	181	162	--	--	--	--	--	--	181	162
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	34	47	34	47	34	47
Tanoak / Laurel	--	--	--	--	--	--	--	--	50	49	50	49	50	49
Western Oak	1,073	427	4,135	688	5,208	823	567	298	1,006	404	1,573	499	6,781	961
Woodland Hardwoods	--	--	413	159	413	159	--	--	68	49	68	49	481	166
Exotic Hardwoods	3	3	--	--	3	3	--	--	--	--	--	--	3	3
Other Hardwoods	--	--	84	54	84	54	--	--	--	--	--	--	84	54
Total	1,076	427	4,813	725	5,889	854	567	298	1,159	412	1,726	506	7,615	991
Nonstocked	6	6	--	--	6	6	--	--	--	--	--	--	6	6
All Forest Types	3,459	874	5,596	762	9,055	1,167	2,368	734	1,746	459	4,115	861	13,169	1,449

Note: Totals may be off because of rounding

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

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

Table D9: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inches) by Forest Type and Forest Land Status, 2006-2015: All California

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	21,659	1,120	17	10	21,676	1,120	10,484	976	19	12	10,503	976	32,178	1,468
Douglas-Fir	2,678	421	35	31	2,713	422	1,430	368	20	14	1,450	369	4,163	559
Fir / Spruce / Mountain Hemlock	7,687	773	79	42	7,766	774	6,220	970	124	60	6,344	971	14,110	1,240
Western Hemlock / Sitka Spruce	292	181	--	--	292	181	--	--	--	--	--	--	292	181
Lodgepole Pine	947	205	96	41	1,043	209	1,797	314	491	115	2,287	331	3,330	390
Pinyon / Juniper	11	12	361	64	373	65	1	1	149	29	150	29	522	71
Ponderosa Pine	1,410	205	24	17	1,433	206	254	90	54	28	308	95	1,742	226
Redwood	2,212	364	--	--	2,212	364	1,025	417	--	--	1,025	417	3,237	552
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	149	86	--	--	149	86	345	101	94	63	439	119	588	146
Other Western Softwoods	221	78	310	85	531	115	310	103	479	122	789	159	1,320	196
Total	37,265	1,426	923	126	38,187	1,428	21,864	1,438	1,430	191	23,294	1,444	61,481	1,992
Hardwoods:														
Alder / Maple	455	139	22	17	477	140	193	127	25	19	218	128	695	189
Aspen / Birch	13	9	7	6	20	10	17	12	--	--	17	12	37	16
Elm / Ash / Cottonwood	--	--	18	15	18	15	--	--	1	2	1	2	19	15
Tanoak / Laurel	3,597	541	201	83	3,798	547	1,632	518	263	170	1,895	544	5,693	771
Western Oak	4,782	846	3,021	241	7,803	877	1,429	458	1,193	253	2,621	520	10,424	1,018
Woodland Hardwoods	89	57	179	62	269	84	--	--	40	24	40	24	309	87
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	628	144	38	22	666	146	267	170	3	3	270	170	936	224
Total	9,564	1,020	3,487	263	13,052	1,049	3,536	719	1,526	306	5,062	777	18,114	1,301
Nonstocked	4,504	1,059	173	66	4,677	1,061	1,606	493	127	78	1,732	499	6,410	1,173
All Forest Types	51,333	1,943	4,583	297	55,916	1,950	27,006	1,603	3,082	368	30,088	1,619	86,005	2,480

Note: Totals may be off because of rounding

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

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

Table D10: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inches) by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	5	3	--	--	5	3	--	--	--	--	--	--	5	3
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	11	5	11	5	--	--	--	--	--	--	11	5
Ponderosa Pine	--	--	1	1	1	1	--	--	4	4	4	4	5	4
Redwood	329	125	--	--	329	125	110	71	--	--	110	71	439	144
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	46	37	--	--	46	37	--	--	--	--	--	--	46	37
Total	380	131	12	5	392	131	110	71	4	4	114	71	506	149
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	2	2	--	--	2	2	2	2
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	59	27	99	72	158	76	55	31	203	167	257	170	415	186
Western Oak	12	11	492	85	504	86	1	1	428	200	429	200	934	218
Woodland Hardwoods	--	--	--	--	--	--	--	--	21	21	21	21	21	21
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	86	59	2	1	88	59	26	28	3	3	29	28	117	65
Total	158	66	593	111	751	129	84	41	654	262	738	265	1,489	295
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All Forest Types	538	145	605	112	1,143	182	193	80	659	262	852	274	1,995	329

Note: Totals may be off because of rounding
 Forest land that is capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.
 Forest land that is not capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.

Table D11: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inches) by Forest Type and Forest Land Status, 2006-2015: Central Valley

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	15	15	15	15	--	--	--	--	--	--	15	15
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	--	--	16	10	16	10	--	--	--	--	--	--	16	10
Woodland Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	31	18	31	18	--	--	--	--	--	--	31	18
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All Forest Types	--	--	31	18	31	18	--	--	--	--	--	--	31	18

Note: Totals may be off because of rounding

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

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

Table D12: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inches) by Forest Type and Forest Land Status, 2006-2015: Eastside

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	356	80	5	5	362	80	--	--	--	--	--	--	362	80
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	486	198	--	--	486	198	125	70	--	--	125	70	611	210
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	12	7	31	23	43	24	--	--	--	--	--	--	43	24
Pinyon / Juniper	--	--	166	39	166	39	--	--	47	16	47	16	214	42
Ponderosa Pine	155	49	1	1	156	49	17	11	--	--	17	11	173	50
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	34	23	142	39	177	45	--	--	93	41	93	41	270	61
Total	1,044	220	346	60	1,390	228	142	71	141	44	283	84	1,672	243
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aspen / Birch	13	9	1	1	14	9	3	3	--	--	3	3	17	9
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	6	5	--	--	6	5	--	--	--	--	--	--	6	5
Woodland Hardwoods	81	56	115	59	196	82	--	--	--	--	--	--	196	82
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	18	15	--	--	18	15	193	163	--	--	193	163	211	163
Total	117	59	117	59	234	84	196	163	--	--	196	163	429	183
Nonstocked	131	89	16	15	146	91	--	--	--	--	--	--	146	91
All Forest Types	1,292	248	478	85	1,770	261	337	178	141	44	478	184	2,248	320

Note: Totals may be off because of rounding

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

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

Table D13: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inches) by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	7,957	710	8	8	7,965	710	4,165	638	--	--	4,165	638	12,130	953
Douglas-Fir	1,433	359	35	31	1,468	360	895	282	20	14	915	282	2,383	457
Fir / Spruce / Mountain Hemlock	771	236	27	18	798	236	1,611	488	21	20	1,631	488	2,430	542
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	1	1	--	--	1	1	7	7	2	2	10	8	11	8
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	218	95	--	--	218	95	63	41	30	23	93	47	311	106
Redwood	90	66	--	--	90	66	159	112	--	--	159	112	249	130
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	44	46	--	--	44	46	76	35	5	4	80	35	124	58
Other Western Softwoods	22	17	23	11	44	20	1	1	--	--	1	1	45	20
Total	10,535	829	93	38	10,629	829	6,977	818	77	35	7,055	818	17,683	1,160
Hardwoods:														
Alder / Maple	68	27	18	17	86	32	82	51	25	19	107	54	193	63
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	3	3	3	3	--	--	--	--	--	--	3	3
Tanoak / Laurel	1,564	389	37	23	1,601	390	1,168	485	48	30	1,215	485	2,816	622
Western Oak	2,605	762	830	128	3,436	772	770	405	283	88	1,053	415	4,488	876
Woodland Hardwoods	--	--	--	--	--	--	--	--	4	4	4	4	4	4
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	395	119	1	1	396	119	44	40	--	--	44	40	440	126
Total	4,633	863	888	132	5,521	871	2,063	632	360	95	2,423	638	7,945	1,080
Nonstocked	774	553	12	10	786	553	908	377	--	--	908	377	1,694	669
All Forest Types	15,942	1,298	994	137	16,936	1,302	9,949	1,051	437	109	10,387	1,053	27,323	1,667

Note: Totals may be off because of rounding

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

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

Table D14: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inches) by Forest Type and Forest Land Status, 2006-2015: North Coast

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	4	4	--	--	4	4	--	--	--	--	--	--	4	4
Douglas-Fir	1,240	221	--	--	1,240	221	536	239	--	--	536	239	1,775	325
Fir / Spruce / Mountain Hemlock	36	37	--	--	36	37	--	--	--	--	--	--	36	37
Western Hemlock / Sitka Spruce	292	181	--	--	292	181	--	--	--	--	--	--	292	181
Lodgepole Pine	--	--	--	--	--	--	8	8	--	--	8	8	8	8
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	1,793	337	--	--	1,793	337	756	397	--	--	756	397	2,549	519
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	55	51	--	--	55	51	--	--	8	9	8	9	64	52
Total	3,421	444	--	--	3,421	444	1,300	457	8	9	1,308	457	4,729	635
Hardwoods:														
Alder / Maple	301	122	2	2	303	122	109	116	--	--	109	116	412	168
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	1,940	376	60	36	2,000	377	410	181	11	10	421	181	2,420	418
Western Oak	168	60	61	22	229	64	--	--	2	2	2	2	231	64
Woodland Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	57	28	--	--	57	28	3	3	--	--	3	3	59	28
Total	2,466	399	122	42	2,589	401	522	214	13	11	535	214	3,124	454
Nonstocked	10	10	--	--	10	10	--	--	--	--	--	--	10	10
All Forest Types	5,898	587	122	42	6,020	588	1,821	500	21	14	1,843	500	7,863	768

Note: Totals may be off because of rounding

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

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

Table D15: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inches) by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	13,290	928	4	3	13,293	928	6,016	747	19	12	6,035	747	19,328	1,175
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	6,352	715	52	37	6,404	716	4,485	845	103	56	4,588	847	10,991	1,108
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	934	205	65	34	999	207	1,781	314	412	106	2,194	327	3,193	386
Pinyon / Juniper	11	12	81	33	92	35	1	1	64	22	64	22	156	41
Ponderosa Pine	1,005	173	22	17	1,027	174	156	80	20	15	177	81	1,204	192
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	104	73	--	--	104	73	269	95	90	62	359	113	463	135
Other Western Softwoods	33	17	138	75	171	77	308	103	378	115	686	154	856	172
Total	21,730	1,163	361	98	22,091	1,166	13,016	1,155	1,086	177	14,101	1,165	36,192	1,624
Hardwoods:														
Alder / Maple	86	60	--	--	86	60	--	--	--	--	--	--	86	60
Aspen / Birch	--	--	6	6	6	6	14	11	--	--	14	11	20	13
Elm / Ash / Cottonwood	--	--	1	1	1	1	--	--	--	--	--	--	1	1
Tanoak / Laurel	33	15	6	5	39	16	--	--	--	--	--	--	39	16
Western Oak	1,605	323	1,291	164	2,896	361	430	155	226	74	655	172	3,551	399
Woodland Hardwoods	1	1	26	12	28	12	--	--	4	4	4	4	32	13
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	71	47	36	22	107	52	--	--	1	1	1	1	108	52
Total	1,797	332	1,366	166	3,163	370	444	156	231	74	675	172	3,838	407
Nonstocked	3,364	886	112	61	3,477	888	278	173	122	78	400	189	3,877	908
All Forest Types	26,891	1,457	1,839	202	28,731	1,466	13,737	1,171	1,439	206	15,176	1,182	43,906	1,855

Note: Totals may be off because of rounding

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

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

Table D16: Aboveground Carbon, Dry Weight (Regional Biomass Method) of Dead Trees (≥ 1 inches) by Forest Type and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	51	28	--	--	51	28	302	190	--	--	302	190	354	192
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	41	37	--	--	41	37	--	--	--	--	--	--	41	37
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	76	48	76	48	76	48
Pinyon / Juniper	--	--	103	39	103	39	--	--	37	12	37	12	141	40
Ponderosa Pine	31	30	--	--	31	30	18	9	--	--	18	9	49	31
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	31	32	7	8	38	33	--	--	--	--	--	--	38	33
Total	154	63	111	39	265	74	320	190	114	50	434	196	699	210
Hardwoods:														
Alder / Maple	--	--	2	2	2	2	--	--	--	--	--	--	2	2
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	1	2	1	2	1	2
Tanoak / Laurel	--	--	--	--	--	--	--	--	1	1	1	1	1	1
Western Oak	386	178	330	90	716	199	228	147	254	105	482	181	1,198	269
Woodland Hardwoods	7	7	38	13	45	15	--	--	11	11	11	11	56	18
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	--	--	1	1	1	1	--	--	--	--	--	--	1	1
Total	393	178	370	91	763	200	228	147	267	105	495	181	1,258	269
Nonstocked	224	169	33	18	257	170	420	274	4	3	424	274	681	322
All Forest Types	771	253	514	100	1,285	272	968	361	385	116	1,353	378	2,638	466

Note: Totals may be off because of rounding
 Forest land that is capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.
 Forest land that is not capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.

Table D17: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: All California

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	4.2788	0.1419	0.0167	0.0076	4.2955	0.1420	0.8211	0.0531	0.0155	0.0118	0.8366	0.0542	5.1321	0.1502
Douglas-Fir	0.9539	0.0754	0.0075	0.0066	0.9613	0.0757	0.2103	0.0362	0.0391	0.0176	0.2494	0.0403	1.2107	0.0853
Fir / Spruce / Mountain Hemlock	1.0001	0.0632	0.0342	0.0150	1.0343	0.0647	0.4435	0.0447	0.0400	0.0142	0.4836	0.0466	1.5178	0.0795
Western Hemlock / Sitka Spruce	0.0401	0.0168	--	--	0.0401	0.0168	0.0018	0.0018	--	--	0.0018	0.0018	0.0419	0.0169
Lodgepole Pine	0.2365	0.0401	0.0255	0.0089	0.2620	0.0410	0.2601	0.0343	0.1829	0.0339	0.4430	0.0473	0.7050	0.0625
Pinyon / Juniper	0.0170	0.0122	1.6931	0.1210	1.7101	0.1216	0.0093	0.0104	0.7697	0.0859	0.7790	0.0863	2.4891	0.1467
Ponderosa Pine	2.1412	0.1315	0.0646	0.0277	2.2057	0.1341	0.1614	0.0294	0.0298	0.0134	0.1912	0.0322	2.3970	0.1378
Redwood	0.6032	0.0565	--	--	0.6032	0.0565	0.1181	0.0293	--	--	0.1181	0.0293	0.7212	0.0632
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	0.0101	0.0049	0.0048	0.0049	0.0149	0.0069	0.0880	0.0256	0.0600	0.0259	0.1480	0.0364	0.1629	0.0371
Other Western Softwoods	0.3595	0.0665	3.2681	0.2371	3.6276	0.2451	0.1371	0.0339	0.4983	0.0768	0.6354	0.0833	4.2630	0.2576
Total	9.6402	0.2054	5.1144	0.2601	14.7546	0.3213	2.2507	0.0920	1.6354	0.1220	3.8861	0.1455	18.6408	0.3424
Hardwoods:														
Alder / Maple	0.2260	0.0417	0.0311	0.0121	0.2571	0.0434	0.0500	0.0208	0.0176	0.0134	0.0676	0.0248	0.3247	0.0500
Aspen / Birch	0.0397	0.0175	0.0384	0.0173	0.0781	0.0246	0.0130	0.0094	0.0336	0.0170	0.0466	0.0194	0.1247	0.0313
Elm / Ash / Cottonwood	--	--	0.0328	0.0143	0.0328	0.0143	--	--	0.0132	0.0089	0.0132	0.0089	0.0460	0.0169
Tanoak / Laurel	1.8973	0.1212	0.2501	0.0452	2.1474	0.1282	0.4084	0.0595	0.1421	0.0362	0.5505	0.0691	2.6980	0.1447
Western Oak	3.0986	0.1587	8.6104	0.2343	11.7090	0.2718	0.4681	0.0647	1.3237	0.1026	1.7918	0.1189	13.5008	0.2920
Woodland Hardwoods	0.0636	0.0232	0.3039	0.0514	0.3675	0.0563	--	--	0.0533	0.0194	0.0533	0.0194	0.4208	0.0595
Exotic Hardwoods	0.0038	0.0038	0.0044	0.0037	0.0083	0.0053	--	--	--	--	--	--	0.0083	0.0053
Other Hardwoods	0.4452	0.0610	0.2387	0.0457	0.6839	0.0760	0.1082	0.0336	0.0411	0.0197	0.1493	0.0388	0.8332	0.0853
Total	5.7742	0.2033	9.5099	0.2455	15.2841	0.2994	1.0477	0.0950	1.6246	0.1139	2.6723	0.1432	17.9564	0.3238
Nonstocked	0.9573	0.0895	0.2210	0.0435	1.1783	0.0989	0.2057	0.0446	0.1135	0.0316	0.3192	0.0546	1.4975	0.1129
All Forest Types	16.3717	0.2470	14.8453	0.3432	31.2171	0.3743	3.5042	0.1256	3.3735	0.1649	6.8776	0.1878	38.0947	0.3898

Note: Totals may be off because of rounding

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

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

Table D18: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	0.0142	0.0094	--	--	0.0142	0.0094	--	--	--	--	--	--	0.0142	0.0094
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	0.1418	0.0363	0.1418	0.0363	--	--	0.0177	0.0129	0.0177	0.0129	0.1595	0.0385
Ponderosa Pine	--	--	0.0288	0.0205	0.0288	0.0205	--	--	0.0030	0.0029	0.0030	0.0029	0.0318	0.0208
Redwood	0.0854	0.0205	--	--	0.0854	0.0205	0.0369	0.0137	--	--	0.0369	0.0137	0.1223	0.0249
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	0.0039	0.0032	--	--	0.0039	0.0032	--	--	--	--	--	--	0.0039	0.0032
Total	0.1035	0.0227	0.1706	0.0417	0.2741	0.0475	0.0369	0.0137	0.0207	0.0132	0.0575	0.0190	0.3317	0.0512
Hardwoods:														
Alder / Maple	--	--	0.0026	0.0026	0.0026	0.0026	0.0070	0.0078	--	--	0.0070	0.0078	0.0096	0.0082
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	0.0034	0.0025	0.0034	0.0025	--	--	0.0006	0.0008	0.0006	0.0008	0.0040	0.0026
Tanoak / Laurel	0.0705	0.0236	0.0938	0.0274	0.1643	0.0360	0.0337	0.0172	0.0523	0.0213	0.0860	0.0274	0.2503	0.0453
Western Oak	0.0335	0.0164	1.4496	0.1049	1.4830	0.1061	0.0198	0.0137	0.4550	0.0585	0.4748	0.0590	1.9578	0.1206
Woodland Hardwoods	--	--	--	--	--	--	--	--	0.0051	0.0036	0.0051	0.0036	0.0051	0.0036
Exotic Hardwoods	--	--	0.0044	0.0037	0.0044	0.0037	--	--	--	--	--	--	0.0044	0.0037
Other Hardwoods	0.0252	0.0139	0.0360	0.0180	0.0612	0.0224	0.0376	0.0200	0.0264	0.0163	0.0640	0.0256	0.1252	0.0339
Total	0.1291	0.0319	1.5899	0.1102	1.7190	0.1143	0.0981	0.0301	0.5393	0.0650	0.6374	0.0694	2.3565	0.1326
Nonstocked	--	--	0.0077	0.0077	0.0077	0.0077	--	--	0.0040	0.0034	0.0040	0.0034	0.0117	0.0084
All Forest Types	0.2327	0.0391	1.7682	0.1180	2.0009	0.1238	0.1350	0.0325	0.5640	0.0666	0.6990	0.0716	2.6998	0.1418

Note: Totals may be off because of rounding

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

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

Table D19: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Central Valley

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	0.0107	0.0092	0.0107	0.0092	--	--	0.0076	0.0069	0.0076	0.0069	0.0183	0.0115
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	--	--	0.1177	0.0299	0.1177	0.0299	--	--	0.0008	0.0008	0.0008	0.0008	0.1185	0.0299
Woodland Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Exotic Hardwoods	0.0001	0.0001	--	--	0.0001	0.0001	--	--	--	--	--	--	0.0001	0.0001
Other Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.0001	0.0001	0.1284	0.0313	0.1285	0.0313	--	--	0.0084	0.0069	0.0084	0.0069	0.1369	0.0321
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All Forest Types	0.0001	0.0001	0.1284	0.0313	0.1285	0.0313	--	--	0.0084	0.0069	0.0084	0.0069	0.1369	0.0321

Note: Totals may be off because of rounding
 Forest land that is capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.
 Forest land that is not capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.

Table D20: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Eastside

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	0.2123	0.0319	0.0052	0.0038	0.2175	0.0321	--	--	--	--	--	--	0.2175	0.0321
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	0.0629	0.0172	--	--	0.0629	0.0172	0.0178	0.0085	--	--	0.0178	0.0085	0.0807	0.0192
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	0.0164	0.0088	0.0081	0.0048	0.0245	0.0100	--	--	--	--	--	--	0.0245	0.0100
Pinyon / Juniper	0.0097	0.0097	0.7907	0.0847	0.8004	0.0853	--	--	0.2664	0.0518	0.2664	0.0518	1.0668	0.0983
Ponderosa Pine	0.4150	0.0673	0.0047	0.0035	0.4197	0.0674	0.0154	0.0082	--	--	0.0154	0.0082	0.4350	0.0679
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	0.1765	0.0444	2.3628	0.2047	2.5393	0.2091	--	--	0.0698	0.0312	0.0698	0.0312	2.6091	0.2113
Total	0.8928	0.0890	3.1714	0.2187	4.0643	0.2351	0.0332	0.0118	0.3362	0.0607	0.3694	0.0617	4.4336	0.2418
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Aspen / Birch	0.0315	0.0165	0.0290	0.0163	0.0605	0.0232	0.0016	0.0018	0.0002	0.0002	0.0018	0.0018	0.0623	0.0233
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	0.0108	0.0094	0.0201	0.0138	0.0309	0.0167	--	--	--	--	--	--	0.0309	0.0167
Woodland Hardwoods	0.0444	0.0198	0.0835	0.0270	0.1278	0.0335	--	--	--	--	--	--	0.1278	0.0335
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	0.0358	0.0181	0.0063	0.0064	0.0421	0.0192	0.0168	0.0142	--	--	0.0168	0.0142	0.0589	0.0239
Total	0.1226	0.0329	0.1389	0.0349	0.2614	0.0478	0.0184	0.0143	0.0002	0.0002	0.0187	0.0143	0.2801	0.0499
Nonstocked	0.1567	0.0368	0.0558	0.0221	0.2125	0.0429	--	--	0.0081	0.0082	0.0081	0.0082	0.2206	0.0436
All Forest Types	1.1721	0.1024	3.3661	0.2221	4.5382	0.2429	0.0516	0.0189	0.3445	0.0615	0.3961	0.0642	4.9343	0.2499

Note: Totals may be off because of rounding

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

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

Table D21: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	1.3193	0.0788	0.0078	0.0059	1.3271	0.0791	0.3000	0.0318	--	--	0.3000	0.0318	1.6271	0.0850
Douglas-Fir	0.3574	0.0465	0.0075	0.0066	0.3648	0.0469	0.1241	0.0273	0.0391	0.0176	0.1632	0.0325	0.5280	0.0568
Fir / Spruce / Mountain Hemlock	0.1135	0.0247	0.0140	0.0088	0.1275	0.0262	0.1344	0.0267	0.0096	0.0069	0.1440	0.0274	0.2715	0.0379
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	0.0018	0.0018	--	--	0.0018	0.0018	0.0018	0.0018
Lodgepole Pine	0.0051	0.0049	--	--	0.0051	0.0049	0.0190	0.0135	0.0062	0.0064	0.0252	0.0149	0.0303	0.0157
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	0.1657	0.0307	--	--	0.1657	0.0307	0.0152	0.0062	0.0064	0.0043	0.0216	0.0076	0.1873	0.0316
Redwood	0.0115	0.0081	--	--	0.0115	0.0081	0.0205	0.0125	--	--	0.0205	0.0125	0.0320	0.0148
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	0.0024	0.0024	0.0048	0.0049	0.0072	0.0055	0.0532	0.0233	0.0329	0.0230	0.0861	0.0327	0.0933	0.0331
Other Western Softwoods	0.0156	0.0116	0.1083	0.0437	0.1238	0.0452	0.0047	0.0041	0.0088	0.0090	0.0135	0.0099	0.1374	0.0463
Total	1.9904	0.0993	0.1424	0.0457	2.1327	0.1091	0.6728	0.0549	0.1031	0.0326	0.7759	0.0636	2.9086	0.1248
Hardwoods:														
Alder / Maple	0.0812	0.0250	0.0113	0.0071	0.0925	0.0260	0.0316	0.0168	0.0175	0.0134	0.0491	0.0215	0.1416	0.0337
Aspen / Birch	--	--	--	--	--	--	--	--	0.0069	0.0070	0.0069	0.0070	0.0069	0.0070
Elm / Ash / Cottonwood	--	--	0.0037	0.0036	0.0037	0.0036	--	--	0.0009	0.0009	0.0009	0.0009	0.0046	0.0037
Tanoak / Laurel	0.5822	0.0692	0.0584	0.0221	0.6407	0.0726	0.2413	0.0458	0.0425	0.0204	0.2838	0.0500	0.9244	0.0877
Western Oak	1.4453	0.1108	2.4120	0.1396	3.8573	0.1763	0.2155	0.0448	0.3610	0.0568	0.5765	0.0719	4.4338	0.1894
Woodland Hardwoods	--	--	0.0035	0.0020	0.0035	0.0020	--	--	0.0106	0.0089	0.0106	0.0089	0.0140	0.0091
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	0.1808	0.0393	0.0061	0.0034	0.1869	0.0395	0.0350	0.0188	0.0080	0.0083	0.0431	0.0206	0.2300	0.0445
Total	2.2895	0.1365	2.4949	0.1413	4.7845	0.1938	0.5234	0.0679	0.4474	0.0632	0.9709	0.0916	5.7553	0.2126
Nonstocked	0.1378	0.0334	0.0215	0.0124	0.1593	0.0356	0.1113	0.0324	--	--	0.1113	0.0324	0.2707	0.0481
All Forest Types	4.4177	0.1668	2.6588	0.1492	7.0766	0.2193	1.3076	0.0885	0.5505	0.0711	1.8581	0.1106	8.9346	0.2414

Note: Totals may be off because of rounding

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

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

Table D22: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: North Coast

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	0.0023	0.0022	--	--	0.0023	0.0022	--	--	--	--	--	--	0.0023	0.0022
Douglas-Fir	0.5823	0.0601	--	--	0.5823	0.0601	0.0862	0.0242	--	--	0.0862	0.0242	0.6684	0.0645
Fir / Spruce / Mountain Hemlock	0.0062	0.0042	--	--	0.0062	0.0042	--	--	--	--	--	--	0.0062	0.0042
Western Hemlock / Sitka Spruce	0.0401	0.0168	--	--	0.0401	0.0168	--	--	--	--	--	--	0.0401	0.0168
Lodgepole Pine	--	--	--	--	--	--	0.0045	0.0046	--	--	0.0045	0.0046	0.0045	0.0046
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	0.5019	0.0526	--	--	0.5019	0.0526	0.0607	0.0232	--	--	0.0607	0.0232	0.5626	0.0571
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	0.0066	0.0043	--	--	0.0066	0.0043	0.0013	0.0016	0.0243	0.0199	0.0256	0.0199	0.0322	0.0204
Total	1.1394	0.0799	--	--	1.1394	0.0799	0.1527	0.0329	0.0243	0.0199	0.1770	0.0384	1.3164	0.0876
Hardwoods:														
Alder / Maple	0.1111	0.0294	0.0093	0.0077	0.1204	0.0304	0.0114	0.0096	--	--	0.0114	0.0096	0.1318	0.0318
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	1.1597	0.0970	0.0669	0.0236	1.2266	0.0994	0.1335	0.0343	0.0336	0.0180	0.1671	0.0385	1.3938	0.1060
Western Oak	0.1890	0.0407	0.2344	0.0409	0.4234	0.0577	--	--	0.0302	0.0149	0.0302	0.0149	0.4536	0.0601
Woodland Hardwoods	--	--	--	--	--	--	--	--	0.0020	0.0018	0.0020	0.0018	0.0020	0.0018
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	0.0747	0.0242	0.0027	0.0024	0.0774	0.0243	0.0187	0.0136	--	--	0.0187	0.0136	0.0961	0.0278
Total	1.5346	0.1100	0.3133	0.0478	1.8479	0.1190	0.1636	0.0379	0.0658	0.0234	0.2294	0.0441	2.0773	0.1264
Nonstocked	0.0096	0.0068	--	--	0.0096	0.0068	--	--	--	--	--	--	0.0096	0.0068
All Forest Types	2.6836	0.1287	0.3133	0.0478	2.9970	0.1359	0.3163	0.0479	0.0901	0.0307	0.4064	0.0564	3.4033	0.1451

Note: Totals may be off because of rounding

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

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

Table D23: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	2.7194	0.1241	0.0037	0.0030	2.7230	0.1241	0.4929	0.0431	0.0155	0.0118	0.5084	0.0446	3.2314	0.1306
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	0.8107	0.0563	0.0201	0.0122	0.8309	0.0575	0.2913	0.0361	0.0305	0.0124	0.3218	0.0382	1.1526	0.0688
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	0.2149	0.0388	0.0175	0.0075	0.2324	0.0395	0.2366	0.0313	0.1672	0.0329	0.4038	0.0445	0.6362	0.0594
Pinyon / Juniper	0.0073	0.0073	0.3385	0.0569	0.3458	0.0573	0.0093	0.0104	0.2182	0.0466	0.2275	0.0477	0.5733	0.0743
Ponderosa Pine	1.5424	0.1118	0.0311	0.0183	1.5734	0.1131	0.1041	0.0248	0.0204	0.0124	0.1245	0.0276	1.6979	0.1164
Redwood	0.0043	0.0040	--	--	0.0043	0.0040	--	--	--	--	--	--	0.0043	0.0040
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	0.0078	0.0042	--	--	0.0078	0.0042	0.0348	0.0107	0.0271	0.0120	0.0619	0.0160	0.0696	0.0166
Other Western Softwoods	0.1462	0.0475	0.7925	0.1167	0.9387	0.1256	0.1311	0.0336	0.3908	0.0667	0.5219	0.0740	1.4606	0.1455
Total	5.4529	0.1754	1.2033	0.1311	6.6563	0.2153	1.3002	0.0729	0.8696	0.0884	2.1698	0.1097	8.8260	0.2388
Hardwoods:														
Alder / Maple	0.0337	0.0165	--	--	0.0337	0.0165	--	--	--	--	--	--	0.0337	0.0165
Aspen / Birch	0.0082	0.0059	0.0093	0.0058	0.0175	0.0083	0.0114	0.0092	0.0265	0.0155	0.0379	0.0180	0.0554	0.0198
Elm / Ash / Cottonwood	--	--	0.0149	0.0100	0.0149	0.0100	--	--	--	--	--	--	0.0149	0.0100
Tanoak / Laurel	0.0849	0.0262	0.0310	0.0165	0.1158	0.0309	--	--	0.0032	0.0029	0.0032	0.0029	0.1190	0.0311
Western Oak	1.3212	0.1060	3.9137	0.1717	5.2349	0.1977	0.1655	0.0371	0.3231	0.0541	0.4886	0.0658	5.7235	0.2070
Woodland Hardwoods	0.0171	0.0119	0.0836	0.0269	0.1007	0.0294	--	--	0.0213	0.0132	0.0213	0.0132	0.1220	0.0322
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	0.1287	0.0331	0.1263	0.0332	0.2549	0.0469	--	--	0.0067	0.0073	0.0067	0.0073	0.2616	0.0474
Total	1.5936	0.1153	4.1788	0.1770	5.7724	0.2067	0.1769	0.0382	0.3808	0.0583	0.5577	0.0698	6.3301	0.2168
Nonstocked	0.6130	0.0727	0.0901	0.0284	0.7031	0.0778	0.0682	0.0260	0.0708	0.0255	0.1390	0.0363	0.8420	0.0858
All Forest Types	7.6596	0.2100	5.4721	0.2187	13.1317	0.2895	1.5452	0.0841	1.3212	0.1083	2.8664	0.1308	15.9982	0.3112

Note: Totals may be off because of rounding

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

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

Table D24: Aboveground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	0.0255	0.0117	--	--	0.0255	0.0117	0.0282	0.0139	--	--	0.0282	0.0139	0.0536	0.0182
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	0.0068	0.0050	--	--	0.0068	0.0050	--	--	--	--	--	--	0.0068	0.0050
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	0.0095	0.0059	0.0095	0.0059	0.0095	0.0059
Pinyon / Juniper	--	--	0.4221	0.0633	0.4221	0.0633	--	--	0.2675	0.0524	0.2675	0.0524	0.6896	0.0821
Ponderosa Pine	0.0182	0.0111	--	--	0.0182	0.0111	0.0268	0.0126	--	--	0.0268	0.0126	0.0449	0.0168
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	0.0107	0.0074	0.0046	0.0047	0.0153	0.0087	--	--	0.0046	0.0057	0.0046	0.0057	0.0199	0.0104
Total	0.0611	0.0184	0.4267	0.0635	0.4878	0.0660	0.0550	0.0186	0.2817	0.0530	0.3366	0.0562	0.8244	0.0866
Hardwoods:														
Alder / Maple	--	--	0.0080	0.0056	0.0080	0.0056	--	--	--	--	--	--	0.0080	0.0056
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	0.0001	0.0001	0.0001	0.0001	--	--	0.0041	0.0055	0.0041	0.0055	0.0042	0.0055
Tanoak / Laurel	--	--	--	--	--	--	--	--	0.0105	0.0103	0.0105	0.0103	0.0105	0.0103
Western Oak	0.0989	0.0295	0.4629	0.0599	0.5618	0.0671	0.0672	0.0263	0.1537	0.0390	0.2209	0.0465	0.7827	0.0814
Woodland Hardwoods	0.0021	0.0020	0.1334	0.0346	0.1355	0.0346	--	--	0.0144	0.0104	0.0144	0.0104	0.1499	0.0361
Exotic Hardwoods	0.0037	0.0038	--	--	0.0037	0.0038	--	--	--	--	--	--	0.0037	0.0038
Other Hardwoods	--	--	0.0614	0.0245	0.0614	0.0245	--	--	--	--	--	--	0.0614	0.0245
Total	0.1047	0.0298	0.6658	0.0741	0.7705	0.0801	0.0672	0.0263	0.1826	0.0420	0.2498	0.0490	1.0202	0.0936
Nonstocked	0.0401	0.0200	0.0459	0.0198	0.0860	0.0281	0.0262	0.0171	0.0306	0.0167	0.0569	0.0239	0.1428	0.0369
All Forest Types	0.2059	0.0403	1.1384	0.0995	1.3443	0.1072	0.1484	0.0360	0.4948	0.0692	0.6432	0.0773	1.9875	0.1316

Note: Totals may be off because of rounding

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

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

Table D25: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: All California

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	0.4754	0.0158	0.0019	0.0008	0.4773	0.0158	0.0912	0.0059	0.0017	0.0013	0.0930	0.0060	0.5702	0.0167
Douglas-Fir	0.1060	0.0084	0.0008	0.0007	0.1068	0.0084	0.0234	0.0040	0.0043	0.0020	0.0277	0.0045	0.1345	0.0095
Fir / Spruce / Mountain Hemlock	0.1111	0.0070	0.0038	0.0017	0.1149	0.0072	0.0493	0.0050	0.0044	0.0016	0.0537	0.0052	0.1686	0.0088
Western Hemlock / Sitka Spruce	0.0045	0.0019	--	--	0.0045	0.0019	0.0002	0.0002	--	--	0.0002	0.0002	0.0047	0.0019
Lodgepole Pine	0.0263	0.0045	0.0028	0.0010	0.0291	0.0046	0.0289	0.0038	0.0203	0.0038	0.0492	0.0053	0.0783	0.0069
Pinyon / Juniper	0.0019	0.0014	0.1881	0.0134	0.1900	0.0135	0.0010	0.0012	0.0855	0.0095	0.0866	0.0096	0.2766	0.0163
Ponderosa Pine	0.2379	0.0146	0.0072	0.0031	0.2451	0.0149	0.0179	0.0033	0.0033	0.0015	0.0212	0.0036	0.2663	0.0153
Redwood	0.0670	0.0063	--	--	0.0670	0.0063	0.0131	0.0033	--	--	0.0131	0.0033	0.0801	0.0070
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	0.0011	0.0005	0.0005	0.0005	0.0017	0.0008	0.0098	0.0028	0.0067	0.0029	0.0164	0.0040	0.0181	0.0041
Other Western Softwoods	0.0399	0.0074	0.3631	0.0263	0.4031	0.0272	0.0152	0.0038	0.0554	0.0085	0.0706	0.0093	0.4737	0.0286
Total	1.0711	0.0228	0.5683	0.0289	1.6394	0.0357	0.2501	0.0102	0.1817	0.0136	0.4318	0.0162	2.0712	0.0380
Hardwoods:														
Alder / Maple	0.0251	0.0046	0.0035	0.0013	0.0286	0.0048	0.0056	0.0023	0.0020	0.0015	0.0075	0.0028	0.0361	0.0056
Aspen / Birch	0.0044	0.0019	0.0043	0.0019	0.0087	0.0027	0.0014	0.0010	0.0037	0.0019	0.0052	0.0022	0.0139	0.0035
Elm / Ash / Cottonwood	--	--	0.0036	0.0016	0.0036	0.0016	--	--	0.0015	0.0010	0.0015	0.0010	0.0051	0.0019
Tanoak / Laurel	0.2108	0.0135	0.0278	0.0050	0.2386	0.0142	0.0454	0.0066	0.0158	0.0040	0.0612	0.0077	0.2998	0.0161
Western Oak	0.3443	0.0176	0.9567	0.0260	1.3010	0.0302	0.0520	0.0072	0.1471	0.0114	0.1991	0.0132	1.5001	0.0324
Woodland Hardwoods	0.0071	0.0026	0.0338	0.0057	0.0408	0.0063	--	--	0.0059	0.0022	0.0059	0.0022	0.0468	0.0066
Exotic Hardwoods	0.0004	0.0004	0.0005	0.0004	0.0009	0.0006	--	--	--	--	--	--	0.0009	0.0006
Other Hardwoods	0.0495	0.0068	0.0265	0.0051	0.0760	0.0084	0.0120	0.0037	0.0046	0.0022	0.0166	0.0043	0.0926	0.0095
Total	0.6416	0.0226	1.0567	0.0273	1.6982	0.0333	0.1164	0.0106	0.1805	0.0127	0.2969	0.0159	1.9952	0.0360
Nonstocked	0.1064	0.0099	0.0246	0.0048	0.1309	0.0110	0.0229	0.0050	0.0126	0.0035	0.0355	0.0061	0.1664	0.0125
All Forest Types	1.8191	0.0274	1.6495	0.0381	3.4686	0.0416	0.3894	0.0140	0.3748	0.0183	0.7642	0.0209	4.2327	0.0433

Note: Totals may be off because of rounding

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

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

Table D26: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	0.0016	0.0010	--	--	0.0016	0.0010	--	--	--	--	--	--	0.0016	0.0010
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	0.0158	0.0040	0.0158	0.0040	--	--	0.0020	0.0014	0.0020	0.0014	0.0177	0.0043
Ponderosa Pine	--	--	0.0032	0.0023	0.0032	0.0023	--	--	0.0003	0.0003	0.0003	0.0003	0.0035	0.0023
Redwood	0.0095	0.0023	--	--	0.0095	0.0023	0.0041	0.0015	--	--	0.0041	0.0015	0.0136	0.0028
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	0.0004	0.0004	--	--	0.0004	0.0004	--	--	--	--	--	--	0.0004	0.0004
Total	0.0115	0.0025	0.0190	0.0046	0.0305	0.0053	0.0041	0.0015	0.0023	0.0015	0.0064	0.0021	0.0369	0.0057
Hardwoods:														
Alder / Maple	--	--	0.0003	0.0003	0.0003	0.0003	0.0008	0.0009	--	--	0.0008	0.0009	0.0011	0.0009
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	0.0004	0.0003	0.0004	0.0003	--	--	0.0001	0.0001	0.0001	0.0001	0.0004	0.0003
Tanoak / Laurel	0.0078	0.0026	0.0104	0.0030	0.0183	0.0040	0.0037	0.0019	0.0058	0.0024	0.0096	0.0030	0.0278	0.0050
Western Oak	0.0037	0.0018	0.1611	0.0117	0.1648	0.0118	0.0022	0.0015	0.0506	0.0065	0.0528	0.0066	0.2175	0.0134
Woodland Hardwoods	--	--	--	--	--	--	--	--	0.0006	0.0004	0.0006	0.0004	0.0006	0.0004
Exotic Hardwoods	--	--	0.0005	0.0004	0.0005	0.0004	--	--	--	--	--	--	0.0005	0.0004
Other Hardwoods	0.0028	0.0015	0.0040	0.0020	0.0068	0.0025	0.0042	0.0022	0.0029	0.0018	0.0071	0.0028	0.0139	0.0038
Total	0.0143	0.0035	0.1767	0.0122	0.1910	0.0127	0.0109	0.0033	0.0599	0.0072	0.0708	0.0077	0.2618	0.0147
Nonstocked	--	--	0.0009	0.0009	0.0009	0.0009	--	--	0.0004	0.0004	0.0004	0.0004	0.0013	0.0009
All Forest Types	0.0259	0.0043	0.1965	0.0131	0.2223	0.0138	0.0150	0.0036	0.0627	0.0074	0.0777	0.0080	0.3000	0.0158

Note: Totals may be off because of rounding

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

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

Table D27: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Central Valley

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	0.0012	0.0010	0.0012	0.0010	--	--	0.0008	0.0008	0.0008	0.0008	0.0020	0.0013
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	--	--	0.0131	0.0033	0.0131	0.0033	--	--	0.0001	0.0001	0.0001	0.0001	0.0132	0.0033
Woodland Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Exotic Hardwoods	0.0000	0.0000	--	--	0.0000	0.0000	--	--	--	--	--	--	0.0000	0.0000
Other Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.0000	0.0000	0.0143	0.0035	0.0143	0.0035	--	--	0.0009	0.0008	0.0009	0.0008	0.0152	0.0036
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All Forest Types	0.0000	0.0000	0.0143	0.0035	0.0143	0.0035	--	--	0.0009	0.0008	0.0009	0.0008	0.0152	0.0036

Note: Totals may be off because of rounding
 Forest land that is capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.
 Forest land that is not capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.

Table D28: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Eastside

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	0.0236	0.0035	0.0006	0.0004	0.0242	0.0036	--	--	--	--	--	--	0.0242	0.0036
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	0.0070	0.0019	--	--	0.0070	0.0019	0.0020	0.0009	--	--	0.0020	0.0009	0.0090	0.0021
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	0.0018	0.0010	0.0009	0.0005	0.0027	0.0011	--	--	--	--	--	--	0.0027	0.0011
Pinyon / Juniper	0.0011	0.0011	0.0878	0.0094	0.0889	0.0095	--	--	0.0296	0.0058	0.0296	0.0058	0.1185	0.0109
Ponderosa Pine	0.0461	0.0075	0.0005	0.0004	0.0466	0.0075	0.0017	0.0009	--	--	0.0017	0.0009	0.0483	0.0075
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	0.0196	0.0049	0.2625	0.0227	0.2821	0.0232	--	--	0.0078	0.0035	0.0078	0.0035	0.2899	0.0235
Total	0.0992	0.0099	0.3524	0.0243	0.4516	0.0261	0.0037	0.0013	0.0374	0.0067	0.0410	0.0069	0.4926	0.0269
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Aspen / Birch	0.0035	0.0018	0.0032	0.0018	0.0067	0.0026	0.0002	0.0002	0.0000	0.0000	0.0002	0.0002	0.0069	0.0026
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	0.0012	0.0010	0.0022	0.0015	0.0034	0.0019	--	--	--	--	--	--	0.0034	0.0019
Woodland Hardwoods	0.0049	0.0022	0.0093	0.0030	0.0142	0.0037	--	--	--	--	--	--	0.0142	0.0037
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	0.0040	0.0020	0.0007	0.0007	0.0047	0.0021	0.0019	0.0016	--	--	0.0019	0.0016	0.0065	0.0027
Total	0.0136	0.0037	0.0154	0.0039	0.0290	0.0053	0.0020	0.0016	0.0000	0.0000	0.0021	0.0016	0.0311	0.0055
Nonstocked	0.0174	0.0041	0.0062	0.0025	0.0236	0.0048	--	--	0.0009	0.0009	0.0009	0.0009	0.0245	0.0048
All Forest Types	0.1302	0.0114	0.3740	0.0247	0.5042	0.0270	0.0057	0.0021	0.0383	0.0068	0.0440	0.0071	0.5483	0.0278

Note: Totals may be off because of rounding
 Forest land that is capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.
 Forest land that is not capable of producing in excess of 20 cubic feet per acre per year of wood at culmination of mean annual increment.

Table D29: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	0.1466	0.0088	0.0009	0.0007	0.1475	0.0088	0.0333	0.0035	--	--	0.0333	0.0035	0.1808	0.0094
Douglas-Fir	0.0397	0.0052	0.0008	0.0007	0.0405	0.0052	0.0138	0.0030	0.0043	0.0020	0.0181	0.0036	0.0587	0.0063
Fir / Spruce / Mountain Hemlock	0.0126	0.0027	0.0016	0.0010	0.0142	0.0029	0.0149	0.0030	0.0011	0.0008	0.0160	0.0030	0.0302	0.0042
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	0.0002	0.0002	--	--	0.0002	0.0002	0.0002	0.0002
Lodgepole Pine	0.0006	0.0005	--	--	0.0006	0.0005	0.0021	0.0015	0.0007	0.0007	0.0028	0.0017	0.0034	0.0017
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	0.0184	0.0034	--	--	0.0184	0.0034	0.0017	0.0007	0.0007	0.0005	0.0024	0.0008	0.0208	0.0035
Redwood	0.0013	0.0009	--	--	0.0013	0.0009	0.0023	0.0014	--	--	0.0023	0.0014	0.0036	0.0016
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	0.0003	0.0003	0.0005	0.0005	0.0008	0.0006	0.0059	0.0026	0.0037	0.0026	0.0096	0.0036	0.0104	0.0037
Other Western Softwoods	0.0017	0.0013	0.0120	0.0049	0.0138	0.0050	0.0005	0.0005	0.0010	0.0010	0.0015	0.0011	0.0153	0.0051
Total	0.2212	0.0110	0.0158	0.0051	0.2370	0.0121	0.0748	0.0061	0.0115	0.0036	0.0862	0.0071	0.3232	0.0139
Hardwoods:														
Alder / Maple	0.0090	0.0028	0.0013	0.0008	0.0103	0.0029	0.0035	0.0019	0.0019	0.0015	0.0055	0.0024	0.0157	0.0037
Aspen / Birch	--	--	--	--	--	--	--	--	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Elm / Ash / Cottonwood	--	--	0.0004	0.0004	0.0004	0.0004	--	--	0.0001	0.0001	0.0001	0.0001	0.0005	0.0004
Tanoak / Laurel	0.0647	0.0077	0.0065	0.0025	0.0712	0.0081	0.0268	0.0051	0.0047	0.0023	0.0315	0.0056	0.1027	0.0097
Western Oak	0.1606	0.0123	0.2680	0.0155	0.4286	0.0196	0.0239	0.0050	0.0401	0.0063	0.0641	0.0080	0.4926	0.0210
Woodland Hardwoods	--	--	0.0004	0.0002	0.0004	0.0002	--	--	0.0012	0.0010	0.0012	0.0010	0.0016	0.0010
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	0.0201	0.0044	0.0007	0.0004	0.0208	0.0044	0.0039	0.0021	0.0009	0.0009	0.0048	0.0023	0.0256	0.0049
Total	0.2544	0.0152	0.2772	0.0157	0.5316	0.0215	0.0582	0.0075	0.0497	0.0070	0.1079	0.0102	0.6395	0.0236
Nonstocked	0.0153	0.0037	0.0024	0.0014	0.0177	0.0040	0.0124	0.0036	--	--	0.0124	0.0036	0.0301	0.0053
All Forest Types	0.4909	0.0185	0.2954	0.0166	0.7863	0.0244	0.1453	0.0098	0.0612	0.0079	0.2065	0.0123	0.9927	0.0268

Note: Totals may be off because of rounding

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

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

Table D30: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: North Coast

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	0.0003	0.0002	--	--	0.0003	0.0002	--	--	--	--	--	--	0.0003	0.0002
Douglas-Fir	0.0647	0.0067	--	--	0.0647	0.0067	0.0096	0.0027	--	--	0.0096	0.0027	0.0743	0.0072
Fir / Spruce / Mountain Hemlock	0.0007	0.0005	--	--	0.0007	0.0005	--	--	--	--	--	--	0.0007	0.0005
Western Hemlock / Sitka Spruce	0.0045	0.0019	--	--	0.0045	0.0019	--	--	--	--	--	--	0.0045	0.0019
Lodgepole Pine	--	--	--	--	--	--	0.0005	0.0005	--	--	0.0005	0.0005	0.0005	0.0005
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	0.0558	0.0058	--	--	0.0558	0.0058	0.0067	0.0026	--	--	0.0067	0.0026	0.0625	0.0063
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	0.0007	0.0005	--	--	0.0007	0.0005	0.0001	0.0002	0.0027	0.0022	0.0028	0.0022	0.0036	0.0023
Total	0.1266	0.0089	--	--	0.1266	0.0089	0.0170	0.0037	0.0027	0.0022	0.0197	0.0043	0.1463	0.0097
Hardwoods:														
Alder / Maple	0.0123	0.0033	0.0010	0.0009	0.0134	0.0034	0.0013	0.0011	--	--	0.0013	0.0011	0.0146	0.0035
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	0.1289	0.0108	0.0074	0.0026	0.1363	0.0110	0.0148	0.0038	0.0037	0.0020	0.0186	0.0043	0.1549	0.0118
Western Oak	0.0210	0.0045	0.0260	0.0045	0.0470	0.0064	--	--	0.0034	0.0017	0.0034	0.0017	0.0504	0.0067
Woodland Hardwoods	--	--	--	--	--	--	--	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	0.0083	0.0027	0.0003	0.0003	0.0086	0.0027	0.0021	0.0015	--	--	0.0021	0.0015	0.0107	0.0031
Total	0.1705	0.0122	0.0348	0.0053	0.2053	0.0132	0.0182	0.0042	0.0073	0.0026	0.0255	0.0049	0.2308	0.0140
Nonstocked	0.0011	0.0008	--	--	0.0011	0.0008	--	--	--	--	--	--	0.0011	0.0008
All Forest Types	0.2982	0.0143	0.0348	0.0053	0.3330	0.0151	0.0351	0.0053	0.0100	0.0034	0.0452	0.0063	0.3781	0.0161

Note: Totals may be off because of rounding

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

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

Table D31: Belowground Carbon, Dry Weight of Live Understory Vegetation, by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	0.3022	0.0138	0.0004	0.0003	0.3026	0.0138	0.0548	0.0048	0.0017	0.0013	0.0565	0.0050	0.3590	0.0145
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	0.0901	0.0063	0.0022	0.0014	0.0923	0.0064	0.0324	0.0040	0.0034	0.0014	0.0358	0.0042	0.1281	0.0076
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	0.0239	0.0043	0.0019	0.0008	0.0258	0.0044	0.0263	0.0035	0.0186	0.0037	0.0449	0.0049	0.0707	0.0066
Pinyon / Juniper	0.0008	0.0008	0.0376	0.0063	0.0384	0.0064	0.0010	0.0012	0.0242	0.0052	0.0253	0.0053	0.0637	0.0083
Ponderosa Pine	0.1714	0.0124	0.0035	0.0020	0.1748	0.0126	0.0116	0.0028	0.0023	0.0014	0.0138	0.0031	0.1887	0.0129
Redwood	0.0005	0.0004	--	--	0.0005	0.0004	--	--	--	--	--	--	0.0005	0.0004
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	0.0009	0.0005	--	--	0.0009	0.0005	0.0039	0.0012	0.0030	0.0013	0.0069	0.0018	0.0077	0.0018
Other Western Softwoods	0.0162	0.0053	0.0881	0.0130	0.1043	0.0140	0.0146	0.0037	0.0434	0.0074	0.0580	0.0082	0.1623	0.0162
Total	0.6059	0.0195	0.1337	0.0146	0.7396	0.0239	0.1445	0.0081	0.0966	0.0098	0.2411	0.0122	0.9807	0.0265
Hardwoods:														
Alder / Maple	0.0037	0.0018	--	--	0.0037	0.0018	--	--	--	--	--	--	0.0037	0.0018
Aspen / Birch	0.0009	0.0007	0.0010	0.0006	0.0019	0.0009	0.0013	0.0010	0.0029	0.0017	0.0042	0.0020	0.0062	0.0022
Elm / Ash / Cottonwood	--	--	0.0017	0.0011	0.0017	0.0011	--	--	--	--	--	--	0.0017	0.0011
Tanoak / Laurel	0.0094	0.0029	0.0034	0.0018	0.0129	0.0034	--	--	0.0004	0.0003	0.0004	0.0003	0.0132	0.0035
Western Oak	0.1468	0.0118	0.4349	0.0191	0.5817	0.0220	0.0184	0.0041	0.0359	0.0060	0.0543	0.0073	0.6359	0.0230
Woodland Hardwoods	0.0019	0.0013	0.0093	0.0030	0.0112	0.0033	--	--	0.0024	0.0015	0.0024	0.0015	0.0136	0.0036
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	0.0143	0.0037	0.0140	0.0037	0.0283	0.0052	--	--	0.0007	0.0008	0.0007	0.0008	0.0291	0.0053
Total	0.1771	0.0128	0.4643	0.0197	0.6414	0.0230	0.0197	0.0042	0.0423	0.0065	0.0620	0.0078	0.7033	0.0241
Nonstocked	0.0681	0.0081	0.0100	0.0032	0.0781	0.0086	0.0076	0.0029	0.0079	0.0028	0.0154	0.0040	0.0936	0.0095
All Forest Types	0.8511	0.0233	0.6080	0.0243	1.4591	0.0322	0.1717	0.0093	0.1468	0.0120	0.3185	0.0145	1.7776	0.0346

Note: Totals may be off because of rounding

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

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

Table D33: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: All California

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	57,305	1,702	63	38	57,368	1,703	15,253	1,025	110	89	15,363	1,028	72,731	1,926
Douglas-Fir	10,487	977	62	55	10,549	978	3,724	717	60	31	3,784	717	14,333	1,203
Fir / Spruce / Mountain Hemlock	12,782	942	162	96	12,944	946	6,605	808	227	106	6,832	814	19,776	1,242
Western Hemlock / Sitka Spruce	482	214	--	--	482	214	23	23	--	--	23	23	505	215
Lodgepole Pine	1,663	270	326	125	1,989	296	3,436	444	982	211	4,418	475	6,407	556
Pinyon / Juniper	17	14	853	91	870	92	20	22	469	71	488	74	1,358	117
Ponderosa Pine	9,224	599	106	50	9,329	601	1,213	240	72	36	1,285	243	10,614	646
Redwood	10,103	1,064	--	--	10,103	1,064	5,223	1,491	--	--	5,223	1,491	15,325	1,811
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	91	51	14	14	105	53	486	146	117	50	604	155	708	164
Other Western Softwoods	869	227	1,046	94	1,915	245	458	120	955	187	1,413	220	3,328	329
Total	103,022	2,124	2,631	217	105,653	2,124	36,440	1,940	2,993	318	39,433	1,946	145,086	2,701
Hardwoods:														
Alder / Maple	1,147	248	97	48	1,244	253	457	195	14	16	471	196	1,715	320
Aspen / Birch	84	42	14	6	99	42	60	46	10	6	70	46	169	62
Elm / Ash / Cottonwood	--	--	85	52	85	52	--	--	32	27	32	27	117	59
Tanoak / Laurel	13,829	1,035	1,143	276	14,972	1,066	3,452	592	608	256	4,060	640	19,032	1,237
Western Oak	12,852	823	16,700	646	29,552	1,012	1,578	280	2,838	307	4,415	412	33,967	1,082
Woodland Hardwoods	62	26	142	34	204	43	--	--	59	26	59	26	263	50
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	2,097	412	184	42	2,281	414	414	208	30	25	444	209	2,726	462
Total	30,072	1,349	18,364	699	48,437	1,461	5,961	699	3,590	402	9,552	792	57,989	1,633
Nonstocked	191	42	5	4	195	43	22	13	3	2	25	14	220	45
All Forest Types	133,285	2,136	21,000	726	154,285	2,104	42,424	1,957	6,586	507	49,010	1,969	203,295	2,577

Note: Totals may be off because of rounding

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

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

Table D34: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	232	161	--	--	232	161	--	--	--	--	--	--	232	161
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	32	10	32	10	--	--	2	2	2	2	35	10
Ponderosa Pine	--	--	8	6	8	6	--	--	11	10	11	10	19	12
Redwood	2,021	521	--	--	2,021	521	1,412	565	--	--	1,412	565	3,433	782
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	125	101	--	--	125	101	--	--	--	--	--	--	125	101
Total	2,378	554	40	12	2,419	554	1,412	565	13	11	1,425	565	3,844	804
Hardwoods:														
Alder / Maple	--	--	5	5	5	5	69	77	--	--	69	77	74	77
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	7	6	7	6	--	--	1	1	1	1	8	6
Tanoak / Laurel	639	235	352	111	991	259	573	312	202	105	775	330	1,767	419
Western Oak	131	78	2,888	260	3,019	272	47	39	1,009	167	1,056	169	4,075	317
Woodland Hardwoods	--	--	--	--	--	--	--	--	1	1	1	1	1	1
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	273	174	55	26	328	175	261	178	2	2	263	178	591	245
Total	1,043	302	3,307	284	4,350	411	950	361	1,216	198	2,165	404	6,516	568
Nonstocked	--	--	4	4	4	4	--	--	--	--	--	--	4	4
All Forest Types	3,422	626	3,351	284	6,773	684	2,362	656	1,229	198	3,590	681	10,363	965

Note: Totals may be off because of rounding

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

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

Table D35: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Central Valley

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	46	48	46	48	--	--	25	25	25	25	71	54
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	--	--	170	55	170	55	--	--	3	3	3	3	173	55
Woodland Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	217	73	217	73	--	--	27	25	27	25	244	77
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All Forest Types	--	--	217	73	217	73	--	--	27	25	27	25	244	77

Note: Totals may be off because of rounding

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

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

Table D36: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Eastside

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	1,153	174	42	35	1,194	177	--	--	--	--	--	--	1,194	177
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	534	169	--	--	534	169	240	132	--	--	240	132	773	214
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	101	54	157	101	258	114	--	--	--	--	--	--	258	114
Pinyon / Juniper	5	5	439	61	443	61	--	--	196	45	196	45	639	75
Ponderosa Pine	1,244	177	19	13	1,263	177	100	54	--	--	100	54	1,363	185
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	193	47	698	74	892	87	--	--	252	99	252	99	1,143	132
Total	3,229	306	1,355	143	4,584	337	339	143	448	108	787	179	5,371	381
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aspen / Birch	54	30	9	5	63	31	4	4	--	--	4	4	67	31
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	18	14	23	19	41	24	--	--	--	--	--	--	41	24
Woodland Hardwoods	35	17	52	22	87	28	--	--	--	--	--	--	87	28
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	9	8	--	--	9	8	--	--	--	--	--	--	9	8
Total	117	38	83	30	200	48	4	4	--	--	4	4	204	48
Nonstocked	17	6	1	1	17	6	--	--	--	--	--	--	17	6
All Forest Types	3,362	309	1,439	145	4,801	341	343	144	448	108	791	179	5,592	385

Note: Totals may be off because of rounding

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

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

Table D37: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	21,812	1,291	14	13	21,826	1,292	6,542	682	--	--	6,542	682	28,368	1,453
Douglas-Fir	4,310	626	62	55	4,372	628	2,157	517	60	31	2,217	518	6,589	810
Fir / Spruce / Mountain Hemlock	1,065	283	49	41	1,114	286	1,389	353	40	33	1,429	355	2,543	455
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	23	23	--	--	23	23	23	23
Lodgepole Pine	22	21	--	--	22	21	16	12	12	13	29	17	51	27
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	812	179	--	--	812	179	339	148	27	27	367	150	1,179	234
Redwood	191	143	--	--	191	143	1,073	659	--	--	1,073	659	1,264	674
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	40	41	14	14	54	44	44	22	7	5	51	22	105	49
Other Western Softwoods	19	17	60	29	79	33	14	12	6	6	19	13	98	35
Total	28,273	1,446	198	77	28,471	1,446	11,597	1,070	153	55	11,750	1,070	40,221	1,773
Hardwoods:														
Alder / Maple	362	124	43	34	405	129	255	139	14	16	269	140	674	190
Aspen / Birch	--	--	--	--	--	--	--	--	2	2	2	2	2	2
Elm / Ash / Cottonwood	--	--	11	11	11	11	--	--	--	--	--	--	11	11
Tanoak / Laurel	4,915	706	349	167	5,264	725	1,781	402	161	134	1,942	422	7,206	836
Western Oak	6,609	629	5,384	417	11,994	747	713	189	932	195	1,645	271	13,639	793
Woodland Hardwoods	--	--	1	1	1	1	--	--	6	5	6	5	7	5
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	1,031	290	12	7	1,043	290	9	9	24	25	33	26	1,076	291
Total	12,917	982	5,801	449	18,718	1,070	2,758	461	1,140	239	3,897	515	22,615	1,181
Nonstocked	21	9	--	--	21	9	18	13	--	--	18	13	40	16
All Forest Types	41,211	1,694	5,999	455	47,210	1,739	14,373	1,116	1,292	245	15,665	1,129	62,876	2,030

Note: Totals may be off because of rounding

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

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

Table D38: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: North Coast

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	9	8	--	--	9	8	--	--	--	--	--	--	9	8
Douglas-Fir	5,945	748	--	--	5,945	748	1,567	507	--	--	1,567	507	7,512	897
Fir / Spruce / Mountain Hemlock	76	52	--	--	76	52	--	--	--	--	--	--	76	52
Western Hemlock / Sitka Spruce	482	214	--	--	482	214	--	--	--	--	--	--	482	214
Lodgepole Pine	--	--	--	--	--	--	5	5	--	--	5	5	5	5
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	7,884	934	--	--	7,884	934	2,738	1,239	--	--	2,738	1,239	10,622	1,526
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	242	182	--	--	242	182	--	--	33	45	33	45	276	187
Total	14,638	1,202	--	--	14,638	1,202	4,310	1,317	33	45	4,343	1,318	18,982	1,742
Hardwoods:														
Alder / Maple	580	184	16	16	597	185	133	113	--	--	133	113	730	217
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	7,726	721	434	191	8,159	743	1,098	313	234	191	1,332	366	9,491	825
Western Oak	824	193	790	152	1,614	246	--	--	84	48	84	48	1,698	251
Woodland Hardwoods	--	--	--	--	--	--	--	--	20	18	20	18	20	18
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	503	178	12	12	516	179	144	111	--	--	144	111	660	210
Total	9,634	780	1,252	244	10,886	812	1,376	345	337	198	1,713	397	12,599	899
Nonstocked	3	4	--	--	3	4	--	--	--	--	--	--	3	4
All Forest Types	24,275	1,363	1,252	244	25,527	1,378	5,686	1,338	371	203	6,056	1,352	31,584	1,881

Note: Totals may be off because of rounding

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

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

Table D39: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	34,120	1,408	8	6	34,128	1,408	8,544	814	110	89	8,655	817	42,783	1,586
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	11,024	890	112	87	11,137	894	4,976	727	187	100	5,163	733	16,300	1,152
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	1,540	264	169	74	1,710	274	3,414	444	913	208	4,327	474	6,037	544
Pinyon / Juniper	13	13	242	60	255	61	20	22	202	51	222	55	476	82
Ponderosa Pine	7,077	550	78	48	7,155	552	644	174	34	21	678	175	7,833	578
Redwood	6	5	--	--	6	5	--	--	--	--	--	--	6	5
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	51	30	--	--	51	30	442	145	110	50	553	153	603	156
Other Western Softwoods	257	74	266	47	523	87	444	119	664	152	1,108	192	1,632	211
Total	54,087	1,623	875	145	54,963	1,626	18,484	1,118	2,222	292	20,706	1,137	75,669	1,918
Hardwoods:														
Alder / Maple	205	113	--	--	205	113	--	--	--	--	--	--	205	113
Aspen / Birch	30	29	6	4	35	29	56	45	8	5	64	46	99	54
Elm / Ash / Cottonwood	--	--	20	18	20	18	--	--	--	--	--	--	20	18
Tanoak / Laurel	549	210	8	4	557	210	--	--	1	1	1	1	557	210
Western Oak	5,063	504	6,706	420	11,769	642	709	196	607	155	1,316	249	13,085	683
Woodland Hardwoods	27	19	25	11	52	22	--	--	21	16	21	16	73	27
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	281	156	86	28	367	158	--	--	4	4	4	4	371	158
Total	6,155	577	6,851	421	13,005	699	765	201	640	156	1,405	253	14,411	738
Nonstocked	148	41	--	--	148	41	4	2	3	2	7	3	154	41
All Forest Types	60,390	1,657	7,726	445	68,116	1,670	19,254	1,128	2,865	330	22,118	1,151	90,234	1,935

Note: Totals may be off because of rounding

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

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

Table D40: Belowground Carbon, Dry Weight of Live Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	211	101	--	--	211	101	167	83	--	--	167	83	378	131
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	83	62	--	--	83	62	--	--	--	--	--	--	83	62
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	56	35	56	35	56	35
Pinyon / Juniper	--	--	140	39	140	39	--	--	68	25	68	25	208	47
Ponderosa Pine	91	52	--	--	91	52	130	62	--	--	130	62	221	81
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	32	26	22	22	54	34	--	--	--	--	--	--	54	34
Total	417	132	162	45	579	139	297	103	124	43	422	111	1,001	178
Hardwoods:														
Alder / Maple	--	--	33	29	33	29	--	--	--	--	--	--	33	29
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	6	8	6	8	6	8
Tanoak / Laurel	--	--	--	--	--	--	--	--	11	10	11	10	11	10
Western Oak	206	81	739	125	945	151	109	58	202	80	312	98	1,256	180
Woodland Hardwoods	--	--	64	24	64	24	--	--	11	8	11	8	75	25
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	--	--	19	12	19	12	--	--	--	--	--	--	19	12
Total	207	81	854	131	1,061	156	109	58	230	82	339	100	1,400	185
Nonstocked	1	1	--	--	1	1	--	--	--	--	--	--	1	1
All Forest Types	625	154	1,016	139	1,641	209	406	118	355	92	761	148	2,402	256

Note: Totals may be off because of rounding

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

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

Table D41: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: All California

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	5,245	255	5	3	5,250	255	2,413	226	4	2	2,417	226	7,667	337
Douglas-Fir	724	111	8	7	732	111	366	89	5	4	371	89	1,103	142
Fir / Spruce / Mountain Hemlock	1,674	166	18	9	1,692	167	1,289	199	29	14	1,318	199	3,010	259
Western Hemlock / Sitka Spruce	85	60	--	--	85	60	--	--	--	--	--	--	85	60
Lodgepole Pine	229	50	24	10	253	51	434	75	126	29	560	79	813	94
Pinyon / Juniper	3	3	82	14	85	14	--	--	36	7	36	7	121	16
Ponderosa Pine	363	53	5	4	368	53	66	23	13	7	80	24	448	58
Redwood	726	135	--	--	726	135	334	130	--	--	334	130	1,060	187
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	26	16	--	--	26	16	86	25	22	15	109	29	134	33
Other Western Softwoods	64	24	77	21	140	32	76	25	129	33	205	41	345	52
Total	9,138	344	219	30	9,357	344	5,065	329	364	49	5,429	332	14,786	468
Hardwoods:														
Alder / Maple	180	56	6	5	187	56	43	25	6	5	50	25	237	61
Aspen / Birch	3	2	1	1	5	3	6	4	--	--	6	4	11	5
Elm / Ash / Cottonwood	--	--	5	5	5	5	--	--	--	--	--	--	6	5
Tanoak / Laurel	877	124	56	22	933	125	403	118	59	35	462	123	1,395	176
Western Oak	1,235	205	815	62	2,050	214	332	98	295	59	626	114	2,676	241
Woodland Hardwoods	19	12	44	15	64	19	--	--	9	5	9	5	72	20
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	163	38	8	5	171	38	62	38	1	1	63	38	234	54
Total	2,479	248	936	67	3,414	255	846	159	370	68	1,216	172	4,630	307
Nonstocked	986	233	43	17	1,029	233	369	112	32	20	400	114	1,429	260
All Forest Types	12,603	458	1,197	75	13,800	460	6,279	364	766	86	7,045	367	20,845	575

Note: Totals may be off because of rounding

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

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

Table D42: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	1	1	--	--	1	1	--	--	--	--	--	--	1	1
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	3	1	3	1	--	--	--	--	--	--	3	1
Ponderosa Pine	--	--	--	--	--	--	--	--	1	1	1	1	1	1
Redwood	74	26	--	--	74	26	44	27	--	--	44	27	118	38
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	16	13	--	--	16	13	--	--	--	--	--	--	16	13
Total	91	29	3	1	94	29	44	27	1	1	46	28	139	40
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	1	1	--	--	1	1	1	1
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	16	7	25	18	41	19	13	8	42	33	55	34	96	39
Western Oak	2	2	132	22	134	22	--	--	104	45	104	45	238	50
Woodland Hardwoods	--	--	--	--	--	--	--	--	4	4	4	4	4	4
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	22	15	--	--	23	15	7	7	1	1	7	7	30	17
Total	40	17	157	28	197	33	21	11	151	56	172	57	369	66
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All Forest Types	131	33	160	28	291	43	65	29	152	56	217	63	508	77

Note: Totals may be off because of rounding

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

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

Table D43: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Central Valley

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	4	5	4	5	--	--	--	--	--	--	4	5
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	--	--	4	2	4	2	--	--	--	--	--	--	4	2
Woodland Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	8	5	8	5	--	--	--	--	--	--	8	5
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All Forest Types	--	--	8	5	8	5	--	--	--	--	--	--	8	5

Note: Totals may be off because of rounding

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

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

Table D44: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Eastside

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	83	19	1	1	84	19	--	--	--	--	--	--	84	19
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	101	40	--	--	101	40	28	16	--	--	28	16	128	43
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	3	2	8	6	11	6	--	--	--	--	--	--	11	6
Pinyon / Juniper	--	--	38	9	38	9	--	--	11	4	11	4	49	9
Ponderosa Pine	39	12	--	--	40	12	4	3	--	--	4	3	44	13
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	9	6	32	9	41	11	--	--	23	10	23	10	64	15
Total	235	46	80	14	314	48	32	16	34	11	66	20	380	52
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aspen / Birch	3	2	--	--	4	2	1	1	--	--	1	1	4	2
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	3	2	--	--	3	2	--	--	--	--	--	--	3	2
Woodland Hardwoods	17	12	28	14	45	18	--	--	--	--	--	--	45	18
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	3	3	--	--	3	3	42	36	--	--	42	36	46	36
Total	26	12	28	14	54	19	43	36	--	--	43	36	97	40
Nonstocked	27	19	4	3	31	19	--	--	--	--	--	--	31	19
All Forest Types	289	52	111	20	399	55	75	39	34	11	108	41	508	69

Note: Totals may be off because of rounding

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

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

Table D45: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	2,101	184	3	3	2,104	184	1,050	165	--	--	1,050	165	3,154	247
Douglas-Fir	381	93	8	7	389	93	231	70	5	4	236	70	625	116
Fir / Spruce / Mountain Hemlock	167	50	7	4	174	50	353	109	5	4	358	109	532	120
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	2	2	1	1	2	2	3	2
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	61	27	--	--	61	27	17	11	8	6	25	12	86	30
Redwood	35	28	--	--	35	28	46	32	--	--	46	32	80	42
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	6	6	--	--	6	6	20	9	1	1	21	9	26	11
Other Western Softwoods	6	5	6	3	12	5	--	--	--	--	--	--	12	5
Total	2,756	213	24	9	2,780	213	1,720	204	19	8	1,738	204	4,518	293
Hardwoods:														
Alder / Maple	24	10	5	5	29	11	24	15	6	5	30	16	60	19
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	1	1	1	1	--	--	--	--	--	--	1	1
Tanoak / Laurel	369	82	16	10	385	83	290	111	13	8	303	111	688	139
Western Oak	679	186	228	33	907	188	179	85	66	20	245	88	1,152	208
Woodland Hardwoods	--	--	--	--	--	--	--	--	1	1	1	1	1	1
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	105	31	--	--	106	31	12	11	--	--	12	11	117	33
Total	1,178	205	250	35	1,428	208	505	140	86	22	591	142	2,019	251
Nonstocked	184	131	3	2	187	131	190	78	--	--	190	78	377	153
All Forest Types	4,118	318	276	36	4,395	319	2,414	247	105	25	2,519	247	6,914	402

Note: Totals may be off because of rounding

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

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

Table D46: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: North Coast

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	2	2	--	--	2	2	--	--	--	--	--	--	2	2
Douglas-Fir	342	61	--	--	342	61	135	55	--	--	135	55	477	82
Fir / Spruce / Mountain Hemlock	10	9	--	--	10	9	--	--	--	--	--	--	10	9
Western Hemlock / Sitka Spruce	85	60	--	--	85	60	--	--	--	--	--	--	85	60
Lodgepole Pine	--	--	--	--	--	--	2	2	--	--	2	2	2	2
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	617	130	--	--	617	130	244	123	--	--	244	123	861	179
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	19	17	--	--	19	17	--	--	2	3	2	3	21	18
Total	1,075	156	--	--	1,075	156	381	133	2	3	383	133	1,458	205
Hardwoods:														
Alder / Maple	140	54	--	--	140	54	18	19	--	--	18	19	159	57
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	477	92	13	8	490	93	100	40	3	3	103	40	593	101
Western Oak	44	15	19	7	63	16	--	--	1	1	1	1	64	17
Woodland Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	14	6	--	--	14	6	1	1	--	--	1	1	15	7
Total	674	108	33	10	707	108	119	44	4	3	124	44	831	117
Nonstocked	3	2	--	--	3	2	--	--	--	--	--	--	3	2
All Forest Types	1,752	189	33	10	1,785	189	501	139	7	4	507	139	2,292	233

Note: Totals may be off because of rounding

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

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

Table D47: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	3,047	195	1	1	3,048	195	1,299	158	4	2	1,303	158	4,351	247
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	1,389	155	12	8	1,400	155	908	168	24	13	932	168	2,333	228
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	226	50	16	9	242	51	430	75	103	26	532	78	775	93
Pinyon / Juniper	3	3	18	7	21	8	--	--	16	5	16	5	36	9
Ponderosa Pine	255	43	5	4	260	43	40	20	5	4	44	20	304	48
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	20	15	--	--	20	15	67	24	21	15	88	28	108	32
Other Western Softwoods	10	5	37	19	46	19	76	25	104	32	179	40	226	45
Total	4,949	248	88	24	5,037	249	2,819	239	276	45	3,096	242	8,133	342
Hardwoods:														
Alder / Maple	17	12	--	--	17	12	--	--	--	--	--	--	17	12
Aspen / Birch	--	--	1	1	1	1	5	4	--	--	5	4	6	4
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	15	7	1	1	17	7	--	--	--	--	--	--	17	7
Western Oak	420	79	353	43	773	89	101	36	58	18	159	40	932	97
Woodland Hardwoods	--	--	7	3	7	3	--	--	1	1	1	1	8	3
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	19	13	7	4	26	14	--	--	--	--	--	--	26	14
Total	471	81	370	43	841	91	106	36	59	18	165	40	1,006	99
Nonstocked	718	188	28	15	746	189	75	46	31	20	106	50	852	195
All Forest Types	6,138	312	486	51	6,624	315	3,000	244	367	52	3,367	248	9,991	394

Note: Totals may be off because of rounding

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

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

Table D48: Belowground Carbon, Dry Weight of Dead Trees (≥ 1 inch) by Forest Type and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons C</i>													
Softwoods:														
California Mixed Conifer	11	7	--	--	11	7	64	40	--	--	64	40	75	40
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	7	6	--	--	7	6	--	--	--	--	--	--	7	6
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	23	14	23	14	23	14
Pinyon / Juniper	--	--	23	9	23	9	--	--	9	3	9	3	32	9
Ponderosa Pine	8	8	--	--	8	8	5	3	--	--	5	3	14	8
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	5	5	2	2	7	6	--	--	--	--	--	--	7	6
Total	32	13	25	9	57	16	69	40	32	15	101	42	158	45
Hardwoods:														
Alder / Maple	--	--	1	1	1	1	--	--	--	--	--	--	1	1
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	87	40	79	22	166	46	51	33	66	27	118	42	284	62
Woodland Hardwoods	2	2	10	4	12	4	--	--	3	3	3	3	14	5
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	89	40	90	22	179	46	51	33	70	27	121	42	300	62
Nonstocked	54	39	8	4	62	39	104	68	1		105	68	167	78
All Forest Types	175	57	123	24	298	62	224	84	102	31	326	90	624	109

Note: Totals may be off because of rounding

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

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

Table D49: Soil Organic Carbon by Forest Type and Forest Land Status, 2006-2015: All California

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	130.07	3.16	0.38	0.19	130.45	3.16	30.09	1.69	0.33	0.21	30.42	1.70	160.87	3.49
Douglas-Fir	14.28	1.12	0.12	0.11	14.40	1.12	3.40	0.58	0.47	0.21	3.87	0.62	18.27	1.28
Fir / Spruce / Mountain Hemlock	28.94	1.79	0.75	0.30	29.69	1.81	12.37	1.21	1.07	0.37	13.44	1.25	43.13	2.19
Western Hemlock / Sitka Spruce	1.70	0.71	--	--	1.70	0.71	0.09	0.09	--	--	0.09	0.09	1.78	0.71
Lodgepole Pine	4.36	0.60	0.73	0.25	5.09	0.64	6.29	0.71	3.20	0.53	9.49	0.85	14.59	1.06
Pinyon / Juniper	0.11	0.08	11.19	0.80	11.30	0.80	0.06	0.07	5.09	0.57	5.15	0.57	16.45	0.97
Ponderosa Pine	34.84	1.68	0.70	0.25	35.54	1.70	3.60	0.59	0.50	0.21	4.09	0.62	39.64	1.80
Redwood	14.16	1.29	--	--	14.16	1.29	2.42	0.55	--	--	2.42	0.55	16.58	1.40
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	0.35	0.18	0.12	0.12	0.47	0.22	1.96	0.48	0.97	0.35	2.93	0.59	3.40	0.63
Other Western Softwoods	5.16	0.76	25.95	1.69	31.11	1.84	2.81	0.60	7.38	0.93	10.18	1.09	41.29	2.12
Total	233.97	3.49	39.93	1.88	273.90	3.83	63.09	2.08	18.99	1.29	82.08	2.28	355.98	4.14
Hardwoods:														
Alder / Maple	4.80	0.89	0.65	0.25	5.45	0.92	1.09	0.46	0.34	0.25	1.43	0.52	6.88	1.06
Aspen / Birch	0.26	0.11	0.24	0.11	0.49	0.16	0.09	0.06	0.20	0.10	0.29	0.12	0.78	0.20
Elm / Ash / Cottonwood	--	--	0.48	0.21	0.48	0.21	--	--	0.20	0.14	0.20	0.14	0.68	0.25
Tanoak / Laurel	14.59	0.93	1.88	0.34	16.47	0.98	3.13	0.46	1.05	0.27	4.18	0.52	20.65	1.11
Western Oak	23.30	1.19	63.05	1.72	86.35	2.00	3.48	0.48	9.66	0.75	13.13	0.87	99.48	2.15
Woodland Hardwoods	0.43	0.16	1.96	0.33	2.39	0.37	--	--	0.35	0.13	0.35	0.13	2.74	0.39
Exotic Hardwoods	0.02	0.02	0.03	0.02	0.05	0.03	--	--	--	--	--	--	0.05	0.03
Other Hardwoods	3.04	0.42	1.55	0.30	4.60	0.51	0.71	0.22	0.26	0.13	0.97	0.25	5.57	0.57
Total	46.46	1.71	69.83	1.81	116.28	2.35	8.50	0.82	12.06	0.86	20.55	1.15	136.84	2.55
Nonstocked	8.42	0.79	1.86	0.37	10.28	0.86	1.81	0.39	0.99	0.28	2.80	0.48	13.07	0.99
All Forest Types	288.85	3.14	111.62	2.50	400.47	3.39	73.39	2.09	32.04	1.52	105.43	2.25	505.89	3.42

Note: Totals may be off because of rounding

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

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

Table D50: Soil Organic Carbon by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	0.24	0.16	--	--	0.24	0.16	--	--	--	--	--	--	0.24	0.16
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	0.94	0.24	0.94	0.24	--	--	0.12	0.09	0.12	0.09	1.05	0.25
Ponderosa Pine	--	--	0.21	0.15	0.21	0.15	--	--	0.06	0.06	0.06	0.06	0.27	0.16
Redwood	2.17	0.52	--	--	2.17	0.52	0.95	0.35	--	--	0.95	0.35	3.12	0.63
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	0.21	0.17	--	--	0.21	0.17	--	--	--	--	--	--	0.21	0.17
Total	2.62	0.57	1.15	0.28	3.76	0.63	0.95	0.35	0.18	0.10	1.13	0.37	4.89	0.74
Hardwoods:														
Alder / Maple	--	--	0.05	0.05	0.05	0.05	0.15	0.17	--	--	0.15	0.17	0.21	0.18
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	0.05	0.03	0.05	0.03	--	--	0.01	0.01	0.01	0.01	0.06	0.04
Tanoak / Laurel	0.55	0.18	0.71	0.21	1.25	0.28	0.27	0.14	0.39	0.16	0.65	0.21	1.91	0.35
Western Oak	0.25	0.12	10.65	0.77	10.90	0.78	0.15	0.10	3.36	0.43	3.51	0.43	14.41	0.89
Woodland Hardwoods	--	--	--	--	--	--	--	--	0.03	0.02	0.03	0.02	0.03	0.02
Exotic Hardwoods	--	--	0.03	0.02	0.03	0.02	--	--	--	--	--	--	0.03	0.02
Other Hardwoods	0.18	0.10	0.25	0.12	0.43	0.16	0.25	0.14	0.16	0.10	0.42	0.17	0.85	0.23
Total	0.98	0.24	11.73	0.81	12.71	0.84	0.82	0.27	3.95	0.47	4.78	0.53	17.49	0.99
Nonstocked	--	--	0.05	0.05	0.05	0.05	--	--	0.04	0.03	0.04	0.03	0.09	0.06
All Forest Types	3.60	0.62	12.94	0.86	16.53	1.05	1.77	0.44	4.17	0.49	5.94	0.63	22.47	1.22

Note: Totals may be off because of rounding

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

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

Table D51: Soil Organic Carbon by Forest Type and Forest Land Status, 2006-2015: Central Valley

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	0.16	0.14	0.16	0.14	--	--	0.12	0.11	0.12	0.11	0.28	0.18
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	--	--	0.86	0.22	0.86	0.22	--	--	0.01	0.01	0.01	0.01	0.86	0.22
Woodland Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Exotic Hardwoods	0.00	0.00	--	--	0.00	0.00	--	--	--	--	--	--	0.00	0.00
Other Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	0.00	0.00	1.02	0.26	1.02	0.26	--	--	0.12	0.11	0.12	0.11	1.14	0.28
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All Forest Types	0.00	0.00	1.02	0.26	1.02	0.26	--	--	0.12	0.11	0.12	0.11	1.14	0.28

Note: Totals may be off because of rounding

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

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

Table D52: Soil Organic Carbon by Forest Type and Forest Land Status, 2006-2015: Eastside

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	5.75	0.82	0.17	0.13	5.92	0.83	--	--	--	--	--	--	5.92	0.83
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	1.68	0.44	--	--	1.68	0.44	0.56	0.27	--	--	0.56	0.27	2.24	0.52
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	0.30	0.16	0.26	0.15	0.57	0.22	--	--	--	--	--	--	0.57	0.22
Pinyon / Juniper	0.06	0.06	5.22	0.56	5.29	0.56	--	--	1.76	0.34	1.76	0.34	7.05	0.65
Ponderosa Pine	6.03	0.74	0.10	0.07	6.13	0.74	0.38	0.19	--	--	0.38	0.19	6.51	0.76
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	2.15	0.50	18.31	1.43	20.46	1.51	--	--	1.32	0.41	1.32	0.41	21.78	1.56
Total	15.97	1.28	24.07	1.53	40.05	1.99	0.94	0.33	3.08	0.53	4.02	0.62	44.07	2.08
Hardwoods:														
Alder / Maple	--	--	--	--	--	--	--	--	0.00	0.00	0.00	0.00	0.00	0.00
Aspen / Birch	0.21	0.11	0.18	0.10	0.38	0.15	0.01	0.01	0.00	0.00	0.01	0.01	0.40	0.15
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Oak	0.08	0.07	0.14	0.10	0.23	0.12	--	--	--	--	--	--	0.23	0.12
Woodland Hardwoods	0.30	0.13	0.55	0.18	0.85	0.22	--	--	--	--	--	--	0.85	0.22
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	0.22	0.11	0.04	0.04	0.26	0.12	0.10	0.09	--	--	0.10	0.09	0.36	0.15
Total	0.81	0.22	0.91	0.23	1.72	0.32	0.11	0.09	0.00	0.00	0.11	0.09	1.84	0.33
Nonstocked	1.38	0.32	0.50	0.20	1.88	0.38	--	--	0.07	0.07	0.07	0.07	1.95	0.39
All Forest Types	18.16	1.35	25.48	1.56	43.65	2.05	1.05	0.35	3.15	0.54	4.20	0.64	47.85	2.14

Note: Totals may be off because of rounding

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

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

Table D53: Soil Organic Carbon by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	42.11	2.07	0.14	0.12	42.25	2.08	11.63	1.07	--	--	11.63	1.07	53.88	2.32
Douglas-Fir	5.44	0.70	0.12	0.11	5.56	0.71	2.03	0.44	0.47	0.21	2.50	0.49	8.06	0.86
Fir / Spruce / Mountain Hemlock	2.94	0.61	0.32	0.20	3.26	0.64	3.52	0.67	0.24	0.18	3.77	0.69	7.03	0.94
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	0.09	0.09	--	--	0.09	0.09	0.09	0.09
Lodgepole Pine	0.09	0.08	--	--	0.09	0.08	0.19	0.13	0.08	0.08	0.27	0.16	0.35	0.18
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	2.88	0.50	--	--	2.88	0.50	0.56	0.23	0.12	0.09	0.68	0.25	3.56	0.55
Redwood	0.29	0.20	--	--	0.29	0.20	0.40	0.24	--	--	0.40	0.24	0.69	0.31
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	0.11	0.12	0.12	0.12	0.23	0.17	0.61	0.26	0.25	0.18	0.86	0.31	1.09	0.35
Other Western Softwoods	0.24	0.17	0.95	0.33	1.19	0.37	0.09	0.08	0.12	0.13	0.21	0.15	1.40	0.40
Total	54.10	2.29	1.65	0.44	55.75	2.33	19.11	1.28	1.29	0.38	20.40	1.33	76.15	2.64
Hardwoods:														
Alder / Maple	1.72	0.53	0.24	0.15	1.96	0.55	0.69	0.37	0.33	0.25	1.02	0.44	2.98	0.71
Aspen / Birch	--	--	--	--	--	--	--	--	0.04	0.04	0.04	0.04	0.04	0.04
Elm / Ash / Cottonwood	--	--	0.06	0.05	0.06	0.05	--	--	0.01	0.01	0.01	0.01	0.07	0.06
Tanoak / Laurel	4.48	0.53	0.45	0.17	4.93	0.56	1.83	0.35	0.31	0.15	2.14	0.38	7.07	0.67
Western Oak	10.93	0.84	17.77	1.03	28.70	1.31	1.60	0.33	2.66	0.42	4.25	0.53	32.95	1.41
Woodland Hardwoods	--	--	0.02	0.01	0.02	0.01	--	--	0.07	0.06	0.07	0.06	0.09	0.06
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	1.26	0.27	0.04	0.02	1.30	0.27	0.22	0.12	0.06	0.06	0.27	0.13	1.57	0.30
Total	18.39	1.14	18.57	1.05	36.96	1.53	4.33	0.61	3.48	0.52	7.81	0.79	44.77	1.71
Nonstocked	1.21	0.29	0.19	0.11	1.40	0.31	0.98	0.28	--	--	0.98	0.28	2.38	0.42
All Forest Types	73.70	2.49	20.41	1.15	94.11	2.70	24.42	1.38	4.77	0.64	29.19	1.48	123.30	3.01

Note: Totals may be off because of rounding

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

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

Table D54: Soil Organic Carbon by Forest Type and Forest Land Status, 2006-2015: North Coast

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	0.05	0.05	--	--	0.05	0.05	--	--	--	--	--	--	0.05	0.05
Douglas-Fir	8.60	0.88	--	--	8.60	0.88	1.37	0.38	--	--	1.37	0.38	9.97	0.95
Fir / Spruce / Mountain Hemlock	0.20	0.13	--	--	0.20	0.13	--	--	--	--	--	--	0.20	0.13
Western Hemlock / Sitka Spruce	1.70	0.71	--	--	1.70	0.71	--	--	--	--	--	--	1.70	0.71
Lodgepole Pine	--	--	--	--	--	--	0.05	0.05	--	--	0.05	0.05	0.05	0.05
Pinyon / Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	11.62	1.19	--	--	11.62	1.19	1.08	0.37	--	--	1.08	0.37	12.70	1.24
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	0.25	0.16	--	--	0.25	0.16	0.01	0.02	0.24	0.18	0.26	0.18	0.51	0.24
Total	22.42	1.61	--	--	22.42	1.61	2.51	0.52	0.24	0.18	2.76	0.55	25.18	1.68
Hardwoods:														
Alder / Maple	2.36	0.63	0.19	0.16	2.55	0.65	0.25	0.21	--	--	0.25	0.21	2.80	0.68
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / Laurel	8.92	0.75	0.51	0.18	9.43	0.76	1.03	0.26	0.25	0.13	1.29	0.30	10.72	0.81
Western Oak	1.44	0.31	1.77	0.31	3.21	0.44	--	--	0.23	0.11	0.23	0.11	3.44	0.46
Woodland Hardwoods	--	--	--	--	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	0.53	0.17	0.02	0.02	0.55	0.17	0.13	0.10	--	--	0.13	0.10	0.69	0.20
Total	13.25	1.02	2.49	0.39	15.74	1.08	1.42	0.35	0.50	0.18	1.92	0.39	17.65	1.15
Nonstocked	0.08	0.06	--	--	0.08	0.06	--	--	--	--	--	--	0.08	0.06
All Forest Types	35.75	1.82	2.49	0.39	38.24	1.85	3.93	0.60	0.74	0.25	4.67	0.64	42.91	1.93

Note: Totals may be off because of rounding

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

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

Table D55: Soil Organic Carbon by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	81.39	2.76	0.06	0.05	81.45	2.76	17.68	1.39	0.33	0.21	18.01	1.40	99.46	3.03
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	23.91	1.63	0.42	0.23	24.33	1.65	8.29	1.00	0.82	0.33	9.11	1.06	33.44	1.95
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	3.97	0.57	0.47	0.20	4.44	0.60	6.05	0.69	2.87	0.50	8.92	0.82	13.36	1.02
Pinyon / Juniper	0.05	0.05	2.24	0.38	2.28	0.38	0.06	0.07	1.44	0.31	1.50	0.31	3.79	0.49
Ponderosa Pine	25.56	1.48	0.39	0.19	25.95	1.49	2.08	0.44	0.32	0.19	2.40	0.48	28.35	1.56
Redwood	0.07	0.07	--	--	0.07	0.07	--	--	--	--	--	--	0.07	0.07
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	0.24	0.14	--	--	0.24	0.14	1.35	0.40	0.72	0.30	2.07	0.50	2.31	0.52
Other Western Softwoods	2.05	0.48	6.57	0.88	8.62	0.99	2.71	0.59	5.64	0.81	8.35	0.99	16.97	1.40
Total	137.24	3.23	10.15	1.01	147.39	3.35	38.22	1.84	12.13	1.08	50.35	2.03	197.74	3.78
Hardwoods:														
Alder / Maple	0.73	0.35	--	--	0.73	0.35	--	--	--	--	--	--	0.73	0.35
Aspen / Birch	0.05	0.04	0.06	0.04	0.11	0.05	0.08	0.06	0.16	0.09	0.23	0.11	0.35	0.12
Elm / Ash / Cottonwood	--	--	0.21	0.14	0.21	0.14	--	--	--	--	--	--	0.21	0.14
Tanoak / Laurel	0.65	0.20	0.21	0.11	0.86	0.23	--	--	0.02	0.02	0.02	0.02	0.88	0.23
Western Oak	9.88	0.79	28.49	1.25	38.38	1.45	1.25	0.28	2.32	0.39	3.57	0.48	41.95	1.52
Woodland Hardwoods	0.12	0.08	0.54	0.17	0.65	0.19	--	--	0.14	0.09	0.14	0.09	0.80	0.21
Exotic Hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Hardwoods	0.85	0.22	0.83	0.22	1.67	0.31	--	--	0.04	0.05	0.04	0.05	1.72	0.31
Total	12.27	0.91	30.34	1.29	42.61	1.54	1.33	0.29	2.69	0.41	4.02	0.50	46.63	1.61
Nonstocked	5.39	0.64	0.71	0.22	6.11	0.68	0.60	0.23	0.61	0.22	1.21	0.32	7.32	0.75
All Forest Types	154.90	3.26	41.21	1.63	196.11	3.49	40.15	1.85	15.43	1.17	55.58	2.05	251.69	3.86

Note: Totals may be off because of rounding

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

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

Table D56: Soil Organic Carbon by Forest Type and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Forest Type Group	Unreserved Forests						Reserved Forests						All Forest Land	
	Timberland		Other Forest		Total		Productive		Other Forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>million metric tons C</i>													
Softwoods:														
California Mixed Conifer	0.77	0.31	--	--	0.77	0.31	0.78	0.33	--	--	0.78	0.33	1.55	0.45
Douglas-Fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / Spruce / Mountain Hemlock	0.22	0.16	--	--	0.22	0.16	--	--	--	--	--	--	0.22	0.16
Western Hemlock / Sitka Spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole Pine	--	--	--	--	--	--	--	--	0.26	0.16	0.26	0.16	0.26	0.16
Pinyon / Juniper	--	--	2.79	0.42	2.79	0.42	--	--	1.77	0.35	1.77	0.35	4.56	0.54
Ponderosa Pine	0.37	0.19	--	--	0.37	0.19	0.57	0.25	--	--	0.57	0.25	0.94	0.31
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western White Pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other Western Softwoods	0.26	0.18	0.12	0.12	0.38	0.22	--	--	0.05	0.07	0.05	0.07	0.43	0.23
Total	1.62	0.43	2.91	0.43	4.53	0.61	1.35	0.41	2.08	0.38	3.43	0.56	7.96	0.83
Hardwoods:														
Alder / Maple	--	--	0.16	0.12	0.16	0.12	--	--	--	--	--	--	0.16	0.12
Aspen / Birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / Ash / Cottonwood	--	--	0.00	0.00	0.00	0.00	--	--	0.06	0.08	0.06	0.08	0.06	0.08
Tanoak / Laurel	--	--	--	--	--	--	--	--	0.08	0.07	0.08	0.07	0.08	0.07
Western Oak	0.72	0.22	3.36	0.43	4.09	0.49	0.48	0.19	1.08	0.27	1.56	0.33	5.65	0.59
Woodland Hardwoods	0.01	0.01	0.85	0.22	0.86	0.22	--	--	0.09	0.07	0.09	0.07	0.96	0.23
Exotic Hardwoods	0.02	0.02	--	--	0.02	0.02	--	--	--	--	--	--	0.02	0.02
Other Hardwoods	--	--	0.38	0.15	0.38	0.15	--	--	--	--	--	--	0.38	0.15
Total	0.76	0.22	4.76	0.53	5.52	0.57	0.48	0.19	1.31	0.30	1.80	0.35	7.31	0.67
Nonstocked	0.35	0.18	0.40	0.17	0.76	0.25	0.23	0.15	0.27	0.15	0.50	0.21	1.26	0.32
All Forest Types	2.74	0.51	8.07	0.71	10.80	0.87	2.06	0.47	3.66	0.51	5.72	0.69	16.53	1.11

Note: Totals may be off because of rounding

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

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

Table D57: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: All California

Forest type group	Unreserved forests						Reserved forests						All forest land	
	Timberland		Other forest		Total		Productive		Other forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
Thousand metric tons C														
Softwoods:														
California mixed conifer	32,695.84	1,190.62	58.02	41.93	32,753.86	1,191.04	8,783.88	710.80	14.40	14.51	8,798.28	710.89	41,552.14	1,364.84
Douglas-fir	5,963.47	686.30	12.57	11.01	5,976.04	686.34	1,334.83	381.80	13.15	7.64	1,347.97	381.88	7,324.02	784.05
Fir / spruce / mountain hemlock	7,480.57	587.51	72.64	37.81	7,553.21	588.44	3,469.06	582.30	86.11	36.50	3,555.17	583.31	11,108.38	826.17
Western Hemlock / Sitka spruce	262.55	132.74	--	--	262.55	132.74	2.44	2.51	--	--	2.44	2.51	264.99	132.76
Lodgepole pine	1,550.69	283.20	190.41	87.66	1,741.10	295.35	2,115.98	435.79	661.60	145.07	2,777.58	455.54	4,518.68	541.54
Pinyon / juniper	13.13	12.98	1,211.56	161.96	1,224.68	162.48	6.63	7.02	585.08	121.10	591.72	121.21	1,816.40	201.59
Ponderosa pine	5,037.79	411.56	43.05	19.45	5,080.84	411.94	816.49	201.90	32.51	19.64	849.00	202.83	5,929.84	457.92
Redwood	5,998.11	870.14	--	--	5,998.11	870.14	1,379.45	419.91	--	--	1,379.45	419.91	7,377.56	964.68
Western larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western white pine	95.33	52.06	24.64	23.92	119.96	57.24	205.85	73.71	50.46	27.47	256.31	78.39	376.27	97.05
Other western softwoods	598.94	153.25	1,047.82	137.73	1,646.76	205.51	565.82	172.73	967.80	216.26	1,533.62	275.75	3,180.38	343.22
Total	59,696.40	1,639.34	2,660.71	233.91	62,357.12	1,646.80	18,680.44	1,104.12	2,411.11	284.71	21,091.55	1,127.15	83,448.67	1,951.04
Hardwoods:														
Alder / maple	877.21	221.51	112.78	74.94	990.00	233.85	346.92	188.19	107.92	106.42	454.83	216.20	1,444.83	318.41
Aspen / birch	92.68	55.81	60.06	31.48	152.74	64.08	76.14	70.03	13.43	8.35	89.58	70.53	242.32	95.29
Elm / ash / cottonwood	--	--	45.58	24.92	45.58	24.92	--	--	8.53	6.97	8.53	6.97	54.11	25.88
Tanoak / laurel	7,671.15	715.38	555.74	152.96	8,226.90	729.82	1,477.38	300.03	279.11	101.79	1,756.49	315.02	9,983.38	792.08
Western oak	6,905.87	547.07	7,991.44	455.21	14,897.31	707.79	754.05	161.06	1,671.00	248.51	2,425.05	293.90	17,322.37	762.29
Woodland hardwoods	34.16	13.50	193.31	54.10	227.48	55.68	--	--	75.24	34.53	75.24	34.53	302.71	65.52
Exotic hardwoods	6.50	6.59	0.03	0.03	6.53	6.59	--	--	--	--	--	--	6.53	6.59
Other hardwoods	1,457.70	275.17	140.21	38.24	1,597.90	277.64	186.40	77.52	15.46	8.90	201.86	78.01	1,799.76	287.99
Total	17,045.28	947.59	9,099.16	488.28	26,144.44	1,050.32	2,840.89	404.99	2,170.68	291.80	5,011.58	493.08	31,156.01	1,150.80
Nonstocked	1,727.95	247.64	173.23	55.78	1,901.17	253.71	630.81	208.01	296.82	121.05	927.63	240.59	2,828.80	349.59
All forest types	78,469.63	1,742.43	11,933.10	538.39	90,402.73	1,770.90	22,152.14	1,145.67	4,878.61	419.83	27,030.75	1,188.08	117,433.48	2,054.93

Note: Totals may be off because of rounding

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

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

Table D58: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: Central Coast and Interior Ranges

Forest type group	Unreserved forests						Reserved forests						All forest land	
	Timberland		Other forest		Total		Productive		Other forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	Thousand metric tons C													
Softwoods:														
California mixed conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-fir	46.88	32.35	--	--	46.88	32.35	--	--	--	--	--	--	46.88	32.35
Fir / spruce / mountain hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / juniper	--	--	37.76	20.65	37.76	20.65	--	--	0.21	0.21	0.21	0.21	37.97	20.65
Ponderosa pine	--	--	7.44	5.31	7.44	5.31	--	--	0.53	0.47	0.53	0.47	7.97	5.33
Redwood	745.53	263.42	--	--	745.53	263.42	301.58	145.13	--	--	301.58	145.13	1,047.10	300.96
Western larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western white pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other western softwoods	29.73	25.96	--	--	29.73	25.96	--	--	--	--	--	--	29.73	25.96
Total	822.14	266.60	45.20	21.32	867.33	267.45	301.58	145.13	0.74	0.51	302.32	145.13	1,169.65	304.50
Hardwoods:														
Alder / maple	--	--	0.36	0.36	0.36	0.36	17.95	18.92	--	--	17.95	18.92	18.30	18.92
Aspen / birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / ash / cottonwood	--	--	10.05	8.70	10.05	8.70	--	--	0.21	0.22	0.21	0.22	10.26	8.71
Tanoak / laurel	288.04	133.74	213.21	94.92	501.25	163.89	57.78	36.38	186.88	92.10	244.66	99.00	745.91	191.44
Western oak	42.01	26.72	1,204.06	154.61	1,246.08	156.88	21.68	17.40	441.04	143.66	462.72	144.36	1,708.80	212.72
Woodland hardwoods	--	--	--	--	--	--	--	--	9.85	9.19	9.85	9.19	9.85	9.19
Exotic hardwoods	--	--	0.03	0.03	0.03	0.03	--	--	--	--	--	--	0.03	0.03
Other hardwoods	180.86	108.31	34.95	22.91	215.81	110.55	70.33	40.38	10.91	7.92	81.24	41.13	297.05	117.16
Total	510.91	174.05	1,462.66	183.36	1,973.57	252.45	167.74	58.60	648.89	174.12	816.62	182.95	2,790.20	310.62
Nonstocked	--	--	2.34	2.29	2.34	2.29	--	--	1.89	2.05	1.89	2.05	4.24	3.08
All forest types	1,333.05	317.67	1,510.20	184.55	2,843.25	366.83	469.32	155.86	651.52	174.28	1,120.84	246.38	3,964.09	440.87

Note: Totals may be off because of rounding

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

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

Table D59: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: Central Valley

Forest type group	Unreserved forests						Reserved forests						All forest land	
	Timberland		Other forest		Total		Productive		Other forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	Thousand metric tons C													
Softwoods:														
California mixed conifer	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Douglas-fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / spruce / mountain hemlock	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western Hemlock / Sitka spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon / juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western white pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other western softwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardwoods:														
Alder / maple	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aspen / birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / ash / cottonwood	--	--	20.28	20.91	20.28	20.91	--	--	6.49	6.70	6.49	6.70	26.77	21.95
Tanoak / laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western oak	--	--	56.82	27.33	56.82	27.33	--	--	--	--	--	--	56.82	27.33
Woodland hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Exotic hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	77.09	34.40	77.09	34.40	--	--	6.49	6.70	6.49	6.70	83.59	35.05
Nonstocked	--	--	--	--	--	--	--	--	--	--	--	--	--	--
All forest types	--	--	77.09	34.40	77.09	34.40	--	--	6.49	6.70	6.49	6.70	83.59	35.05

Note: Totals may be off because of rounding

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

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

Table D60: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: Eastside

Forest type group	Unreserved forests						Reserved forests						All forest land	
	Timberland		Other forest		Total		Productive		Other forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
Thousand metric tons C														
Softwoods:														
California mixed conifer	1,092.49	205.15	38.84	39.66	1,131.33	208.69	--	--	--	--	--	--	1,131.33	208.69
Douglas-fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / spruce / mountain hemlock	475.29	135.44	--	--	475.29	135.44	105.90	70.80	--	--	105.90	70.80	581.19	152.83
Western Hemlock / Sitka spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole pine	75.76	46.98	110.86	79.72	186.63	92.08	--	--	--	--	--	--	186.63	92.08
Pinyon / juniper	0.26	0.26	604.70	101.84	604.96	101.84	--	--	165.31	45.69	165.31	45.69	770.27	110.94
Ponderosa pine	930.49	185.17	9.48	7.85	939.98	185.32	93.19	65.38	--	--	93.19	65.38	1,033.17	196.47
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western white pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other western softwoods	119.55	39.87	652.74	109.45	772.29	116.31	--	--	190.53	69.43	190.53	69.43	962.83	135.46
Total	2,693.84	312.91	1,416.64	171.78	4,110.48	355.70	199.09	96.37	355.84	82.76	554.93	126.83	4,665.41	377.06
Hardwoods:														
Alder / maple	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aspen / birch	76.36	54.54	39.81	27.22	116.17	60.95	2.61	2.93	--	--	2.61	2.93	118.77	61.03
Elm / ash / cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / laurel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western oak	25.02	18.02	30.34	23.01	55.36	29.22	--	--	--	--	--	--	55.36	29.22
Woodland hardwoods	26.86	12.80	75.86	35.16	102.73	37.40	--	--	--	--	--	--	102.73	37.40
Exotic hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods	72.10	38.44	0.37	0.33	72.47	38.44	33.74	33.40	--	--	33.74	33.40	106.21	50.92
Total	200.34	70.28	146.38	50.06	346.72	86.21	36.35	33.53	--	--	36.35	33.53	383.07	92.50
Nonstocked	125.95	47.47	24.08	15.21	150.02	49.81	--	--	9.12	8.68	9.12	8.68	159.14	50.56
All forest types	3,020.13	324.28	1,587.10	179.21	4,607.22	368.95	235.44	102.53	364.96	84.88	600.40	132.84	5,207.63	391.46

Note: Totals may be off because of rounding

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

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

Table D61: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: Klamath Interior Coast Ranges

Forest type group	Unreserved forests						Reserved forests						All forest land	
	Timberland		Other forest		Total		Productive		Other forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
Thousand metric tons C														
Softwoods:														
California mixed conifer	10,462.69	707.89	5.13	5.12	10,467.82	707.91	3,332.91	431.94	--	--	3,332.91	431.94	13,800.73	827.01
Douglas-fir	2,170.60	445.75	12.57	11.01	2,183.18	445.81	551.48	211.17	13.15	7.64	564.63	211.30	2,747.81	493.19
Fir / spruce / mountain hemlock	611.06	162.14	12.68	11.10	623.74	162.35	565.27	188.44	29.40	22.81	594.67	189.54	1,218.41	249.46
Western Hemlock / Sitka spruce	--	--	--	--	--	--	2.44	2.51	--	--	2.44	2.51	2.44	2.51
Lodgepole pine	7.90	8.07	--	--	7.90	8.07	9.20	6.44	2.45	2.47	11.65	6.90	19.56	10.62
Pinyon / juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa pine	444.92	119.42	--	--	444.92	119.42	73.77	41.71	18.55	15.10	92.33	44.36	537.24	127.39
Redwood	77.96	60.29	--	--	77.96	60.29	483.35	300.84	--	--	483.35	300.84	561.31	306.83
Western larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western white pine	33.66	34.87	24.64	23.92	58.30	42.29	48.85	21.55	7.35	5.97	56.20	22.36	114.50	47.83
Other western softwoods	97.28	65.52	66.43	28.55	163.70	71.39	50.79	49.15	21.33	21.64	72.13	53.71	235.83	89.33
Total	13,906.07	852.54	121.45	40.72	14,027.51	853.08	5,118.07	579.14	92.24	36.73	5,210.30	579.90	19,237.82	1,026.80
Hardwoods:														
Alder / maple	253.91	90.92	89.43	73.23	343.34	116.75	287.07	184.55	107.92	106.42	394.99	213.04	738.33	242.93
Aspen / birch	--	--	--	--	--	--	--	--	3.11	3.07	3.11	3.07	3.11	3.07
Elm / ash / cottonwood	--	--	6.67	6.31	6.67	6.31	--	--	--	--	--	--	6.67	6.31
Tanoak / laurel	2,451.49	408.41	142.39	80.48	2,593.89	416.20	820.16	238.45	32.59	17.42	852.75	239.08	3,446.64	479.35
Western oak	3,415.13	400.24	2,464.14	307.19	5,879.27	501.94	477.69	145.56	482.89	127.91	960.58	193.45	6,839.85	537.11
Woodland hardwoods	--	--	2.06	1.86	2.06	1.86	--	--	2.32	1.68	2.32	1.68	4.38	2.51
Exotic hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods	658.34	192.41	3.54	2.50	661.88	192.43	65.42	55.47	3.97	4.00	69.39	55.61	731.27	200.30
Total	6,778.87	614.52	2,708.24	325.01	9,487.10	692.43	1,650.34	337.92	632.81	166.12	2,283.15	375.78	11,770.25	785.32
Nonstocked	398.61	128.84	25.83	23.50	424.44	130.97	463.23	182.78	--	--	463.23	182.78	887.67	224.86
All forest types	21,083.54	1,035.62	2,855.51	328.28	23,939.06	1,080.32	7,231.64	669.70	725.04	170.39	7,956.69	688.06	31,895.74	1,270.74

Note: Totals may be off because of rounding

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

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

Table D62: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: North Coast

Forest type group	Unreserved forests						Reserved forests						All forest land	
	Timberland		Other forest		Total		Productive		Other forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	Thousand metric tons C													
Softwoods:														
California mixed conifer	21.81	20.88	--	--	21.81	20.88	--	--	--	--	--	--	21.81	20.88
Douglas-fir	3,745.98	527.55	--	--	3,745.98	527.55	783.35	318.51	--	--	783.35	318.51	4,529.33	615.19
Fir / spruce / mountain hemlock	19.77	12.64	--	--	19.77	12.64	--	--	--	--	--	--	19.77	12.64
Western Hemlock / Sitka spruce	262.55	132.74	--	--	262.55	132.74	--	--	--	--	--	--	262.55	132.74
Lodgepole pine	--	--	--	--	--	--	1.58	1.61	--	--	1.58	1.61	1.58	1.61
Pinyon / juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ponderosa pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood	5,132.54	831.72	--	--	5,132.54	831.72	594.53	258.98	--	--	594.53	258.98	5,727.06	870.06
Western larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western white pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other western softwoods	153.59	116.58	--	--	153.59	116.58	3.44	3.62	18.38	12.62	21.82	13.13	175.41	117.32
Total	9,336.23	986.53	--	--	9,336.23	986.53	1,382.89	402.52	18.38	12.62	1,401.27	402.29	10,737.50	1,063.13
Hardwoods:														
Alder / maple	507.57	192.02	17.65	15.42	525.22	192.64	41.90	31.61	--	--	41.90	31.61	567.12	195.21
Aspen / birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / ash / cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tanoak / laurel	4,518.22	547.54	189.70	88.87	4,707.92	553.69	599.44	179.43	54.45	39.34	653.89	183.69	5,361.80	581.68
Western oak	533.96	208.73	214.56	51.63	748.52	215.30	--	--	19.42	10.12	19.42	10.12	767.94	215.72
Woodland hardwoods	--	--	--	--	--	--	--	--	6.46	5.87	6.46	5.87	6.46	5.87
Exotic hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods	175.45	65.79	0.25	0.27	175.70	65.79	16.91	14.22	--	--	16.91	14.22	192.61	67.15
Total	5,735.20	614.23	422.15	103.61	6,157.35	621.45	658.24	193.91	80.33	41.05	738.58	198.20	6,895.92	650.38
Nonstocked	38.37	30.59	--	--	38.37	30.59	--	--	--	--	--	--	38.37	30.59
All forest types	15,109.80	1,135.21	422.15	103.61	15,531.95	1,137.57	2,041.13	439.02	98.72	42.94	2,139.85	440.61	17,671.80	1,213.65

Note: Totals may be off because of rounding

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

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

Table D63: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: Sierra Cascades

Forest type group	Unreserved forests						Reserved forests						All forest land	
	Timberland		Other forest		Total		Productive		Other forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	Thousand metric tons C													
Softwoods:														
California mixed conifer	20,887.99	1,026.74	14.05	12.61	20,902.05	1,026.95	5,239.80	583.94	14.40	14.51	5,254.20	584.05	26,156.25	1,164.25
Douglas-fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / spruce / mountain hemlock	6,329.74	552.98	59.96	36.14	6,389.70	553.97	2,797.89	548.56	56.71	28.52	2,854.60	549.30	9,244.30	778.01
Western Hemlock / Sitka spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole pine	1,467.02	279.78	79.55	37.04	1,546.57	281.93	2,105.21	435.74	563.01	131.51	2,668.21	451.94	4,214.78	531.38
Pinyon / juniper	12.87	12.97	332.61	112.95	345.48	113.70	6.63	7.02	253.09	84.73	259.73	84.93	605.21	141.82
Ponderosa pine	3,646.47	353.81	26.13	16.99	3,672.60	354.19	508.47	165.36	13.42	12.55	521.89	165.82	4,194.50	390.25
Redwood	42.09	39.01	--	--	42.09	39.01	--	--	--	--	--	--	42.09	39.01
Western larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western white pine	61.66	38.66	--	--	61.66	38.66	157.00	70.51	43.11	26.82	200.11	75.16	261.77	84.52
Other western softwoods	166.27	53.12	312.38	77.81	478.64	93.94	511.59	165.55	731.80	203.86	1,243.39	262.13	1,722.04	278.32
Total	32,614.11	1,190.10	824.68	147.62	33,438.79	1,196.07	11,326.59	906.81	1,675.55	256.75	13,002.14	934.35	46,440.93	1,491.62
Hardwoods:														
Alder / maple	115.74	64.64	--	--	115.74	64.64	--	--	--	--	--	--	115.74	64.64
Aspen / birch	16.32	11.86	20.25	15.83	36.57	19.78	73.54	69.97	10.32	7.76	83.86	70.40	120.43	73.13
Elm / ash / cottonwood	--	--	8.58	8.28	8.58	8.28	--	--	--	--	--	--	8.58	8.28
Tanoak / laurel	413.41	213.49	10.44	6.68	423.85	213.60	--	--	--	--	--	--	423.85	213.60
Western oak	2,643.84	302.48	3,327.68	273.66	5,971.52	402.98	203.22	61.16	401.87	121.59	605.08	135.44	6,576.60	423.40
Woodland hardwoods	6.09	4.14	19.41	9.24	25.50	10.12	--	--	24.33	20.42	24.33	20.42	49.83	22.79
Exotic hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other hardwoods	370.95	145.83	90.70	29.99	461.65	148.74	--	--	0.58	0.62	0.58	0.62	462.23	148.74
Total	3,566.35	401.87	3,477.07	276.42	7,043.42	482.48	276.75	92.81	437.09	123.40	713.84	153.74	7,757.26	504.84
Nonstocked	1,118.71	202.19	77.49	40.46	1,196.20	206.16	153.46	98.64	279.38	120.63	432.84	155.78	1,629.04	258.40
All forest types	37,299.17	1,242.57	4,379.24	314.79	41,678.40	1,266.07	11,756.80	914.42	2,392.02	306.98	14,148.82	951.14	55,827.23	1,548.74

Note: Totals may be off because of rounding

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

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

Table D64: Aboveground Carbon Mass of Down Dead Wood, by Forest Type and Forest Land Status, 2006-2015: South Coast Mountains and Deserts

Forest type group	Unreserved forests						Reserved forests						All forest land	
	Timberland		Other forest		Total		Productive		Other forest		Total		Total	SE
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	Thousand metric tons C													
Softwoods:														
California mixed conifer	230.86	118.10	--	--	230.86	118.10	211.17	89.91	--	--	211.17	89.91	442.02	148.43
Douglas-fir	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fir / spruce / mountain hemlock	44.72	40.96	--	--	44.72	40.96	--	--	--	--	--	--	44.72	40.96
Western Hemlock / Sitka spruce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lodgepole pine	--	--	--	--	--	--	--	--	96.14	65.34	96.14	65.34	96.14	65.34
Pinyon / juniper	--	--	236.48	64.01	236.48	64.01	--	--	166.47	75.44	166.47	75.44	402.95	98.90
Ponderosa pine	15.91	9.18	--	--	15.91	9.18	141.06	87.54	--	--	141.06	87.54	156.96	88.02
Redwood	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western larch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Western white pine	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other western softwoods	32.53	23.94	16.28	15.81	48.81	28.69	--	--	5.75	6.05	5.75	6.05	54.55	29.32
Total	324.01	127.54	252.76	65.86	576.77	143.54	352.22	125.49	268.35	99.29	620.58	160.00	1,197.35	214.93
Hardwoods:														
Alder / maple	--	--	5.35	4.01	5.35	4.01	--	--	--	--	--	--	5.35	4.01
Aspen / birch	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Elm / ash / cottonwood	--	--	--	--	--	--	--	--	1.82	1.92	1.82	1.92	1.82	1.92
Tanoak / laurel	--	--	--	--	--	--	--	--	5.19	5.19	5.19	5.19	5.19	5.19
Western oak	245.91	100.60	693.83	134.32	939.75	199.94	51.47	28.98	325.78	103.03	377.25	106.62	1,317.00	226.32
Woodland hardwoods	1.21	1.14	95.98	40.10	97.18	40.12	--	--	32.28	25.57	32.28	25.57	129.46	47.57
Exotic hardwoods	6.50	6.59	--	--	6.50	6.59	--	--	--	--	--	--	6.50	6.59
Other hardwoods	--	--	10.40	5.65	10.40	5.65	--	--	--	--	--	--	10.40	5.65
Total	253.62	100.82	805.56	140.30	1,059.18	204.11	51.47	28.98	365.07	106.30	416.54	109.77	1,475.72	231.46
Nonstocked	46.32	32.47	43.49	26.49	89.81	41.90	14.12	13.64	6.42	4.92	20.54	14.50	110.35	44.34
All forest types	623.95	165.77	1,101.81	156.80	1,725.75	252.64	417.81	128.99	639.85	145.18	1,057.66	192.87	2,783.41	317.47

Note: Totals may be off because of rounding

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

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

Table E1: Annual Change in Forest Land Area To and From Other IPCC Land-Use Classes in California, 2001-2005 to 2011-2015

	Timberland		Other Forest		Reserved		All Forest Land	
	Total	SE	Total	SE	Total	SE	Total	SE
<i>acres per year</i>								
Forest to Nonforest:								
Cropland	--	--	3,639	1,722	--	--	3,639	1,722
Developed	9,065	2,385	7,686	2,370	451	322	17,202	3,375
Grassland	1,841	1,510	3,839	1,900	56	68	5,735	2,428
Water	806	685	235	244	218	181	1,259	749
Total	11,711	2,887	15,398	3,524	726	388	27,835	4,569
Nonforest to Forest:								
Cropland	261	195	--	--	--	--	261	195
Developed	4,683	1,363	705	389	100	79	5,487	1,420
Grassland	2,695	1,571	4,255	1,952	--	--	6,951	2,503
Other	--	--	168	175	--	--	168	175
Water	52	55	353	269	--	--	405	275
Total	7,691	2,094	5,481	2,015	100	79	13,272	2,904
Net Change to Forest Land:								
Cropland	261	195	-3,639	1,722	--	--	-3,378	1,733
Developed	-4,382	2,757	-6,981	2,401	-351	331	-11,715	3,675
Grassland	854	2,179	417	2,715	-56	68	1,215	3,481
Other	--	--	168	175	--	--	168	175
Water	-754	687	118	363	-218	181	-854	798
Total	-4,021	3,590	-9,917	4,054	-626	396	-14,563	5,431

Note: Totals may be off because of rounding

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

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

Table E2: Annual Change in Carbon Pools Due to Change in Land-Use Between Forest and Non-forest in California, 2001-2005 to 2011-2015

Carbon Pool	Forest to Nonforest		Nonforest to Forest		Net Change	
	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons CO2e per year</i>					
Live Tree	-1,845	352	1,101	269	-744	446
Standing Dead	-222	148	36	13	-187	149
Down Wood	-173	43	54	27	-118	51
Understory Veg	-262	44	135	29	-127	53
Soil*	0		0		0	
All Pools	-2,502	462	1,326	298	-1,176	553

* No changes in landuse involved cultivated land so soil organic carbon change was assumed to be zero (Ogle et al. 2003)

Table F1: Combined Annual Net Emissions of CO2 and non-CO2 Greenhouse Gasses From Fire, 2001-2005 to 2011-2015

	Public						Private				Total		Total	
	National forest		Other Federal		State and Local govt.		Corporate		Non Corporate					
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	<i>thousand metric tons CO2 equivalent per year</i>													
Cut and Fire														
CO2	-215	164	--	--	--	--	-1,457	612	-72	72	-1,529	616	-1,744	638
CH4	-7	5	--	--	--	--	-47	20	-2	2	-49	20	-56	20
N2O	-5	3	--	--	--	--	-31	13	-2	2	-32	13	-37	13
Fire														
CO2	-5,027	936	-384	262	-169	133	-312	182	-54	130	-365	223	-5,946	1,006
CH4	-161	30	-12	8	-5	4	-10	6	-2	4	-12	7	-190	32
N2O	-106	20	-8	6	-4	3	-7	4	-1	3	-8	5	-126	21
Total Fire														
CO2	-5,242	950	-384	262	-169	133	-1,769	638	-126	149	-1,894	655	-7,690	1,191
CH4	-168	30	-12	8	-5	4	-57	20	-4	5	-61	21	-246	38
N2O	-111	20	-8	6	-4	3	-37	13	-3	3	-40	14	-162	25

* Note: negative numbers are a net emission to the atmosphere