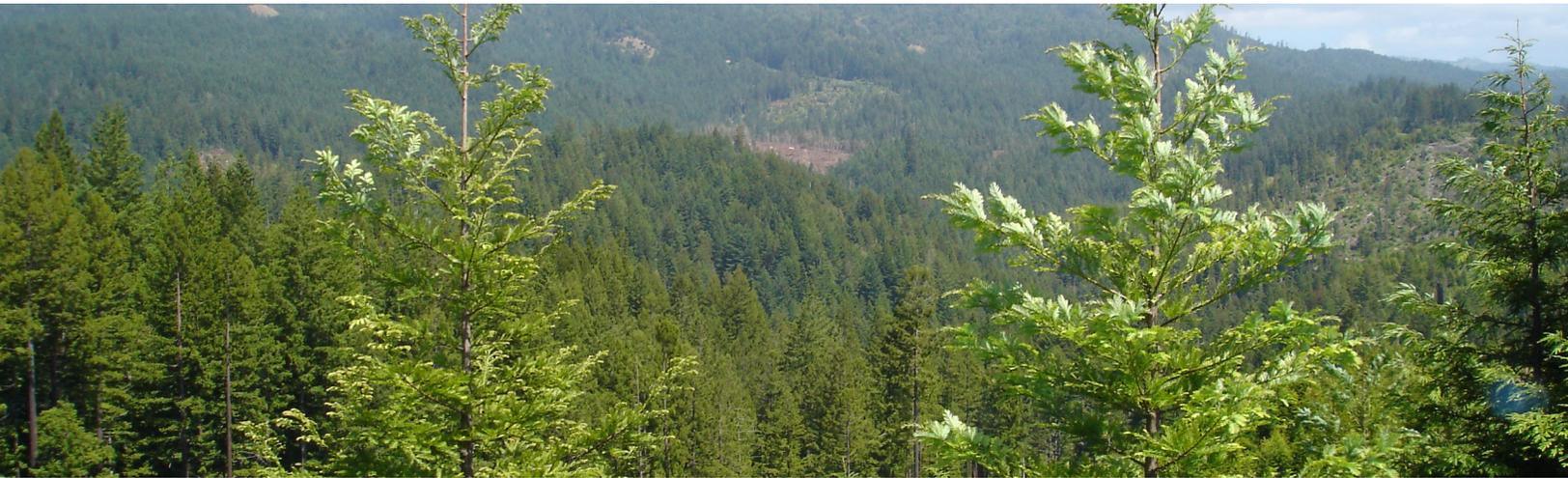


Introduction



California law requires periodic assessments and strategic plans be developed to inform policy decisions on the state's forest and rangeland resources. In addition, the U.S. Department of Agriculture's (USDA) Forest Service State and Private Forestry Redesign Program has provided states with funding and direction to take a focused and systematic approach to evaluate opportunities for state-federal agency partnering for stronger forest management. The California Department of Forestry and Fire Protection's (CAL FIRE) Fire and Resource Assessment Program (FRAP) is addressing both requirements with this document. This assessment highlights key issues, resource status and trends and priority landscapes for the subsequent strategy document, which will provide a framework for state and federal programs to support good forest and rangeland stewardship in California.

THE STATE MANDATE

By state law (Public Resource Code 4789) CAL FIRE must periodically assess California's forest and rangeland resources. The last assessment was completed in 2003 (<http://frap.fire.ca.gov/assessment2003/>) by the Fire and Resource Assessment Program (FRAP), a unit within CAL FIRE whose mission is to produce these periodic forest assessments. Results are used by the State Board of Forestry and Fire Protection (BOF) to develop and update a forest policy statement for California. The last BOF statement was finished in 2007 and reflects various strategies designed to address key issues defined by the 2003 assessment (http://www.bof.fire.ca.gov/board_joint_policies/board_policies/policy_statement_and_program_of_the_board/policyprogram_050107.pdf).

THE FEDERAL MANDATE

The 2008 federal Farm Bill amended the Cooperative Forestry Assistance Act to provide for development of state forest resource assessments and related resource strategies. Among other things, the intent of the amendments is to facilitate identification of priority forest landscape areas, to underscore work needed to address issues on these landscapes, and to frame and focus related strategies and actions.

The U.S. Forest Service State and Private Forestry Program (S&PF) in 2008 “redesigned” its approach to reflect these plans and funding strategies, and Program Redesign has strongly shaped the approach CAL FIRE has taken with the California 2010 Assessment.

The 2010 effort covers two components of the Redesign approach:

- Statewide Assessment of Forest Resources – provides an analysis of forest conditions and trends in the state and delineates priority rural and urban forest landscape areas.
- Statewide Forest Resource Strategy – provides long-term strategies for investing resources to address priority landscapes identified in this assessment, focusing where federal investment can most effectively stimulate or leverage desired action and engage multiple partners.

The Redesign approach emphasizes, where possible, use of available data and of a spatial framework for analysis and to delineate priority landscapes. The focus is on incorporating existing plans and information within states. Some categories of plans are specified, such as the state wildlife plan and community wildfire protection plans. Outreach to stakeholders is encouraged, though the outreach process and extent is left to the states. However, a requirement exists to seek input from specified stakeholder categories or entities such as federal management agencies, the state wildlife agency, the urban forest council and others.

MEETING BOTH MANDATES: ASSESSMENT TOPICS

This document presents the 2010 statewide assessment. It is intended to meet both the California and federal assessment requirements. A separate strategies document addresses approaches to dealing with issues raised in this assessment.

This assessment presents an analysis of trends, conditions and the development of priority landscapes.

It is organized around topics (themes) presented in related federal assessment and strategy Redesign guidance documents (<http://www.fs.fed.us/spf/redesign/index.shtml>). Three general themes and related subthemes are covered in both this assessment and the strategies document. They are:

- 1. Conserve Working Forest and Range Landscapes*
 - 1.1 Population Growth and Development Impacts
 - 1.2 Sustainable Working Forests and Rangelands
- 2. Protect Forests and Rangelands from Harm*
 - 2.1 Wildfire Threat to Ecosystem Health and Community Safety
 - 2.2 Forest Pests and Other Threats to Ecosystem Health and Community Safety
- 3. Enhance Public Benefits from Trees, Forests and Rangelands*
 - 3.1 Water Quality and Quantity Protection and Enhancement
 - 3.2 Urban Forestry for Energy Conservation and Air Quality
 - 3.3 Planning for and Reducing Wildfire Risks to Communities
 - 3.4 Emerging Markets for Forest and Rangeland Products and Services
 - 3.5 Plant, Wildlife and Fish Habitat Protection, Conservation and Enhancement
 - 3.6 Green Infrastructure for Connecting People to the Natural Environment
 - 3.7 Climate Change: Threats and Opportunities

There is an additional chapter relating to Bordering States and associated issues as well as an appendix that describes Data and Analytical Needs. Additional information is provided on the FRAP website regarding assessment methodologies and other background (<http://frap.fire.ca.gov/assessment2010.html>).

These themes and subthemes generally cover the same topics that were presented in the Forest and Range 2003 Assessment prepared by CAL FIRE. The last assessment was organized around seven general topics ranging from biological diversity to socio-economic benefits and governance. The 2003 assessment emphasized consistency with international work being done on possible indicators to measure sustainable forest and rangeland management in temperate forests (called the Montreal Process).

For a variety of reasons, little work has been done by CAL FIRE since that time to refine or focus these indicators. While it covers status and trends for each of the issues, the 2010 assessment does not delineate specific indicators; rather, the topic is covered in the strategies document.

RELATED EFFORTS AND SUPPORTING DOCUMENTS

Consistent with U.S. Forest Service Redesign instructions, the 2010 assessment takes into consideration various existing planning efforts; these range from local plans such as Community Wildfire Protection plans to statewide plans, like California's Wildlife Action Plan, the State Water Plan and the Outdoor Recreation Plan. In California, a large amount of work has been completed, and more is ongoing, that is related to the focus of various state programs on increased use of renewable energy and to climate change. To the extent feasible, this assessment uses results of these efforts, especially those of the California Energy Commission, the Air Resources Board, the Department of Fish and Game, the Department of Water Resources and various academic institutions.

Additionally, the content of the Forest Legacy Program's Assessment of Need was integrated into many chapters because of its focus on conservation easements, which is a proposed tool for the protection of many priority landscapes. Many other reports were used in the preparation of this assessment, including the most recent report from the Forest Inventory and Analysis (FIA) program "California's

Forest Resources, 2001–2005." For a complete list of sources used in this document, please refer to the References Section.

Finally this assessment and the strategies document reflect input taken from other agencies and stakeholders. The U.S. Forest Service, in particular, has provided ongoing support and review of draft documents. CAL FIRE has been holding outreach efforts since mid-2009. This has included focused interviews, webinars, public meetings, briefing sessions, presentations and other efforts. Information on the 2010 assessment, including general and issue-specific surveys, has been available at the Fire and Resource Assessment Program of CAL FIRE website. Draft results of both this assessment and strategies document were available for public comment for 30 days during March and part of April, 2010. As much as possible, the final documents seek to address agency and public comments.

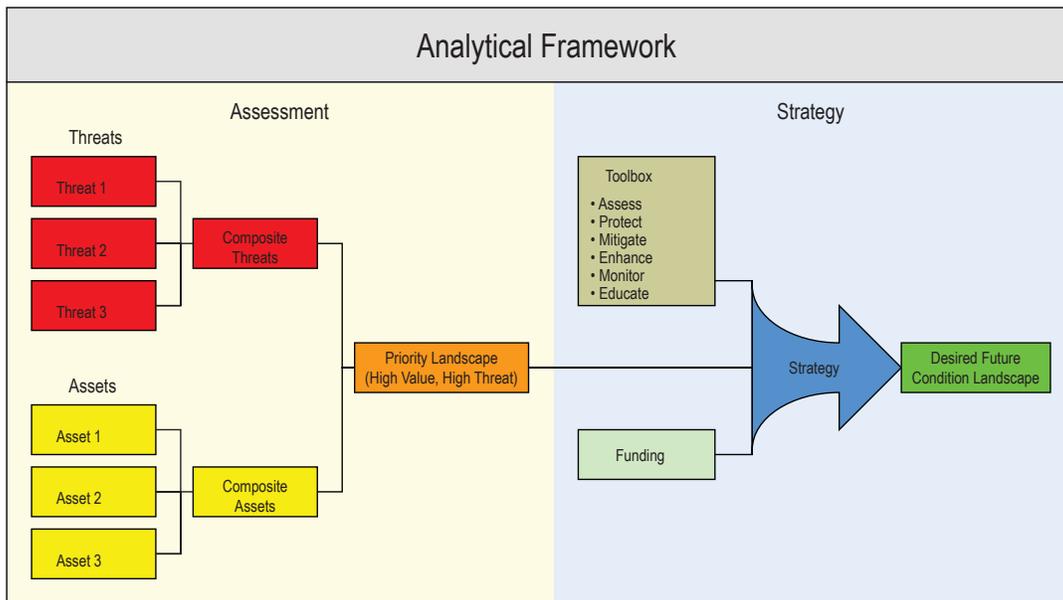
OVERALL ASSESSMENT AND STRATEGIES FRAMEWORK

As conceived by CAL FIRE, the relationship of this assessment to the strategy document is indicated in the Analytical Framework diagram below.

By delineating and comparing threats with assets for each subtheme, this assessment identifies priority landscapes. The strategies document then describes approaches (tools) and funding that define various strategies to address concerns reflected by the priority landscapes.

ASSESSMENT APPROACH

Each subtheme in this assessment contains two basic elements: a summary of statewide or regional status and trends on forests and rangelands across all ownerships, and one or more spatial analyses using geographic information systems (GIS) techniques, which suggest priority landscapes where additional resources are most likely needed. Prior to conducting the analysis, assets and threats were identified for each subtheme. The selection of assets and threats



was based on the results of extensive outreach to experts in the subject areas as well as the availability and completeness of data.

Assets and threats were represented in the analyses by GIS data layers assigned rankings of low, medium or high to delineate areas of varying asset value or threat level. The data layers were then combined in an overlay operation to highlight the pertinent priority landscapes.

The chapters in this assessment present 23 spatial analyses and their resultant priority landscapes, spread across 11 issues that correspond to Redesign subthemes (Table I.1). The number of priority landscapes presented reflects the diversity of issues, ecosystems, and values at work in California.

Priority landscapes are purposely kept separate to illustrate the particular issue being modeled. In reality, issues and priority landscapes cross over each other; multiple priority landscapes can be relevant to different landscapes and issues. This is explored in the strategies document.

RANKING ASSETS AND THREATS

GIS data inputs and their ranking methodology are described in detail in each chapter's methodology document (<http://frap.fire.ca.gov/assessment2010.html>). For purposes of illustration, an example follows for the Preventing Wildfire Threats for Community Safety analysis (Table I.2). This analysis identified human infrastructure potentially threatened by large damaging wildfires.

The assessment subthemes include a variety of assets such as commercial timber, watersheds that contribute to municipal water supplies, and wildlife habitat. Examples of subtheme threats include development, forest pests and climate change.

DATA AND ANALYTICAL LIMITATIONS

In some cases the most appropriate and definitive data on status and trends was not available. In other cases, statewide spatial information for assets and threats needed to develop priority landscapes was not available, was incomplete or could not be compiled into a statewide layer. Especially given short time frames for completion of required documents, the federal Redesign guidance documents recognized

Table I.1. Chapter topics/issues and priority landscapes

Chapter	Chapter Topics/Issues	Priority Landscapes (PL)
1.1	Population Growth and Development Impacts	PL 1 – Population Growth and Development Impacts
1.2	Sustainable Working Forests and Rangelands	PL 2 – Risk Reduction on Forestlands PL 3 – Risk Reduction on Rangelands PL 4 – Restoring Impacted Timberlands
2.1	Wildfire Threats to Ecosystem Health and Community Safety	PL 5 – Preventing Wildfire Threats to Maintain Ecosystem Health PL 6 – Restoring Wildfire Impacted Areas to Maintain Ecosystem Health PL 7 – Preventing Wildfire Threats for Community Safety
2.2	Forest Pests and Other Threats to Ecosystem Health	PL 8 – Restoring Forest Pest Impacted Areas to Maintain Ecosystem Health PL 9 – Restoring Forest Pest Impacted Communities for Public Safety PL 10 – Preventing Forest Pest Outbreaks to Maintain Ecosystem Health PL 11 – Preventing Forest Pest Outbreaks for Community Safety
3.1	Water Quality and Quantity Protection and Enhancement	PL 13 – Water Supply PL 13 – Water Quality
3.2	Urban Forestry for Energy Conservation and Air Quality	PL 14 – Urban Tree Planting PL 15 – Urban Tree Maintenance
3.3	Planning for and Reducing Wildfire Risks to Communities	PL 16 – Evaluating Communities for Wildfire Risk
3.4	Emerging Markets for Forest and Rangeland Products and Services	PL 17 – Biomass Energy for Ecosystem Health PL 18 – Biomass Energy for Community Safety
3.5	Plant, Wildlife and Fish Habitat Protection, Conservation, and Enhancement	PL 19 – Wildfire Threat to Areas Protected for Habitat
3.6	Green Infrastructure for Connecting People to the Natural Environment	PL 20 – Conserving Green Infrastructure PL 21 – Managing Green Infrastructure
3.7	Climate Change: Threats and Opportunities	PL 22 – Climate Change –Forest Carbon, Wildfire and Forest Pests * PL 23 – Climate Change –Forest Carbon and Development *

* includes PL for multiple years (2010, 2020, 2050, 2100)

Table I.2. Example of ranking methodology used in the preventing wildfire threats for community safety analysis in Chapter 2.1

GIS Input	General Definition	Example	Example Ranking Method
Asset	Provides societal value in terms of economic, environmental, or social benefit	Structures	High: > 1 HU/AC * Medium: 1 HU/AC to 1 HU/5 AC * Low: 1 HU/5 AC to 1 HU/40 AC * None: less than 1 HU/40 AC *
Threat	Change agent that can negatively impact the asset	Community Wildfire Threat	High: areas identified as Very High Fire Hazard Severity Zones (PRC 4201-4204 and Govt. Code 51175-89)

* HU/AC = housing unit (as defined by the U.S. Census) per acre

that this would be the case for all states and stressed the use of existing GIS data or of available federal GIS data layers. Issues with data found in California are treated in the Appendix under Data and Analytical Needs.

REPORTING UNITS

Reporting units are used to spatially summarize priority landscapes and are typically at the bioregion, county, watershed or community scale. Reporting units are chosen based upon what is most appropriate for the subtheme. For example, bioregions are an appropriate reporting unit for the impacts of climate change, while communities are more appropriate for urban forestry issues. Reporting units form the basis for building strategies that apply strategic tools to address one or more issues identified by priority landscapes. For example, communities with large areas of suggested highly ranked priority landscape are deemed focal places for additional investments to apply tools such as tree planting to address urban heat islands.

Bioregions

The California Biodiversity Council (CBC) has referred to ten unique bioregions (Figure I.1) defined by the Interagency Natural Areas Coordinating Committee. These bioregions were defined based on "...unique mixes of biodiversity and public agency responsibilities" (<http://biodiversity.ca.gov/Bioregions/INACC.pdf>).

Watersheds

Watershed boundaries are defined by hydrology and are used as a reporting unit for water quality and quantity issues. These boundaries, which are shown in Figure I.2, are defined using the Watershed Boundaries Database (WBD), which provides a national database of nested watershed units.

Varying WBD units were used for these analyses, depending on the nature and resolution of the data being summarized. For example, forest meadows are generally small in scale and affect localized

watersheds. Therefore, the appropriate unit of analysis is the smallest WBD unit, hydrologic unit 12, which averages around 34 square miles. Conversely, water storage facilities in California often collect water from an entire river system and the effects are spread across the entire system. For this reason, the appropriate unit of analysis is the WBD unit 8, which represents large river systems such as the North Fork of the Feather River, the Russian River or the Upper Consumnes, and average around 1,000 square miles.

Results of the analyses were also reported with varying WBD unit types. Combined threats and combined assets were reported at the WBD unit 8 scale representing large river systems. This is to facilitate understanding the health and challenges to easily identifiable watersheds. Priority landscapes were reported at a hydrologic region scale, such as the Sacramento, North California/Klamath and Lahontan.

Counties

County boundaries were determined to be the appropriate reporting unit for various issues such as development impacts, where county zoning policies guide future development. California's 58 counties are shown in Figure I.3.

Communities

Communities were used as the most appropriate reporting unit for issues such as urban tree planting and community wildfire planning. Communities were defined based on incorporated cities and unincorporated Census Designated Places from the 2000 census. Figure I.4 shows an example of communities for El Dorado County.

This county includes two incorporated cities, Placerville and South Lake Tahoe, unincorporated communities of moderately dense development such as Eldorado Hills and Cameron Park, as well as smaller, more rural communities such as Pollock Pines. The county also has other small clusters of development that were not captured as communities, such as Kyburz, Meeks Bay and Coloma.



Figure I.1.
 California bioregions as defined by the Interagency Natural Areas Coordinating Committee
 Data Source: *California Bioregions, FRAP (2004 v1)*

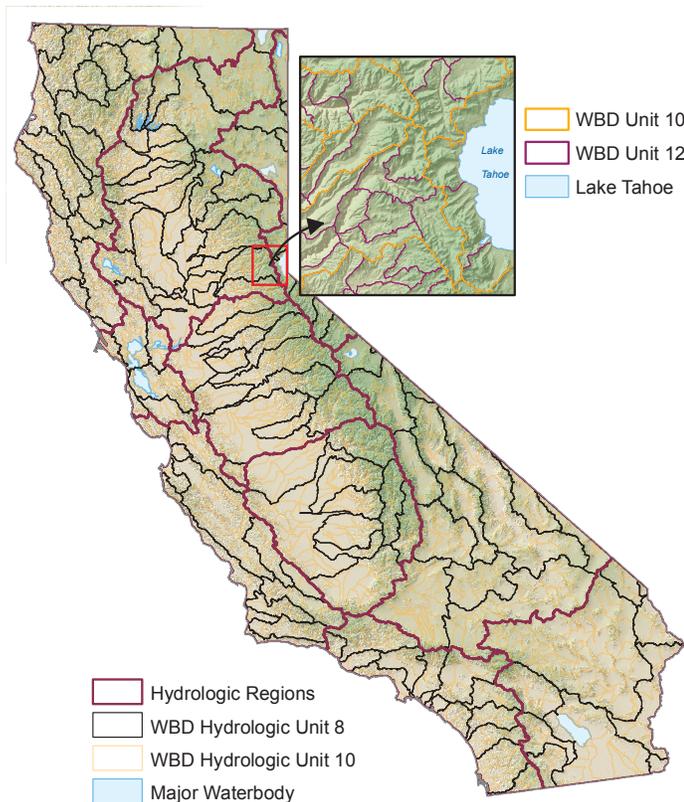


Figure I.2.
 Watershed boundaries
 Data Source: *Watershed Boundaries Database for California, NRCS (2009)*



Figure I.3.
 California counties
 Data Source: *County Boundaries, FRAP (2009 v1)*

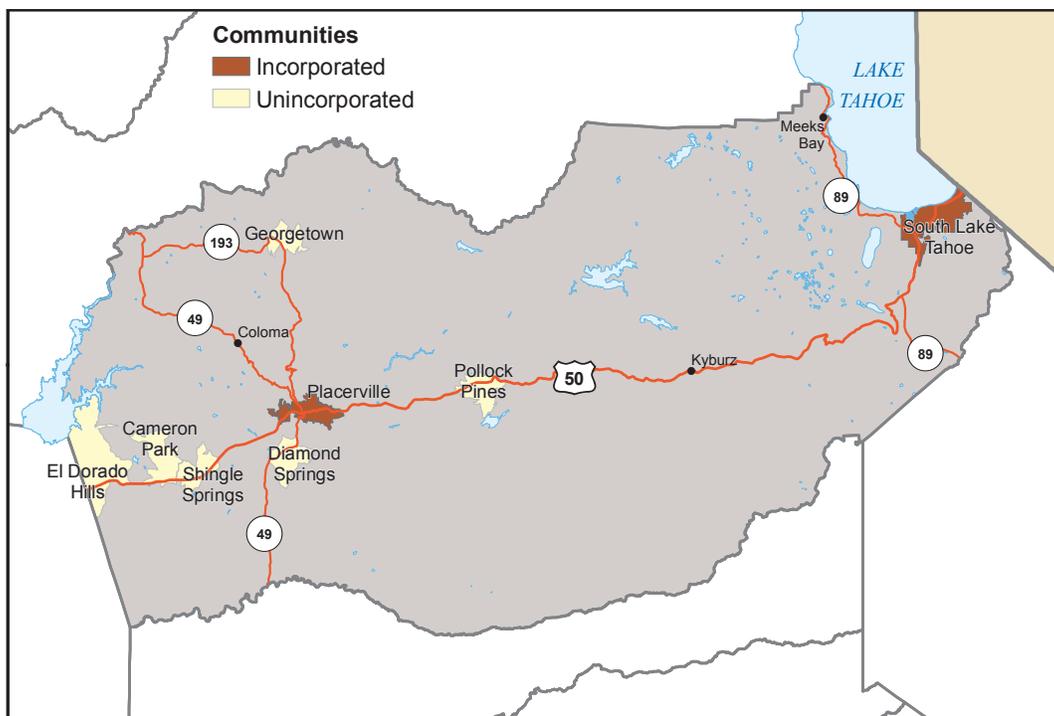


Figure I.4.
Communities in El Dorado County.
Data Source: Communities, FRAP (2009 v1)

GEOGRAPHIC SCOPE

California has a diverse natural landscape which ranges from conifer and hardwood forest and woodlands in the mountain and coastal areas, to shrub and herbaceous rangelands in the south coast, north interior and Central Valley, to desert habitats in the southeast (Figure I.5).

Forests (including woodlands) occupy almost one third of California (Figure I.6). This includes almost 20 million acres of timberlands, defined as lands capable of producing in excess of 20 cubic feet of commercial species per acre per year, where harvest is not legally prohibited (PNW-GTR-763). Together, forest and rangeland cover types occupy over 80 percent of California.

OWNERSHIP

Over half of California is publicly owned (52 percent) with the remaining lands owned by individuals, corporations or conservancies (Table I.3). Sixty percent of the 80 million acres of forests and rangelands

are publicly owned, including over 40 million acres owned by the federal government (Figure I.7). The pattern is similar when we examine the ownership of forestlands in California, where over 55 percent of forestlands are publicly owned, the vast majority of which are owned by the federal government, and only 45 percent are privately held.

BIOREGIONAL DIVERSITY

The great diversity of natural land cover in California varies by region of the state, which makes it difficult to use statewide averages to understand and prioritize issues in California. Table I.4 and Table I.5 quantify bioregional ownership patterns for California's forestlands, and forests and rangelands, respectively.

ONGOING ASSESSMENT EFFORTS

This is the fifth assessment of forest and rangeland resources done under the California mandate. While basic subjects treated in past state assessments are covered in this document, the analytical approach

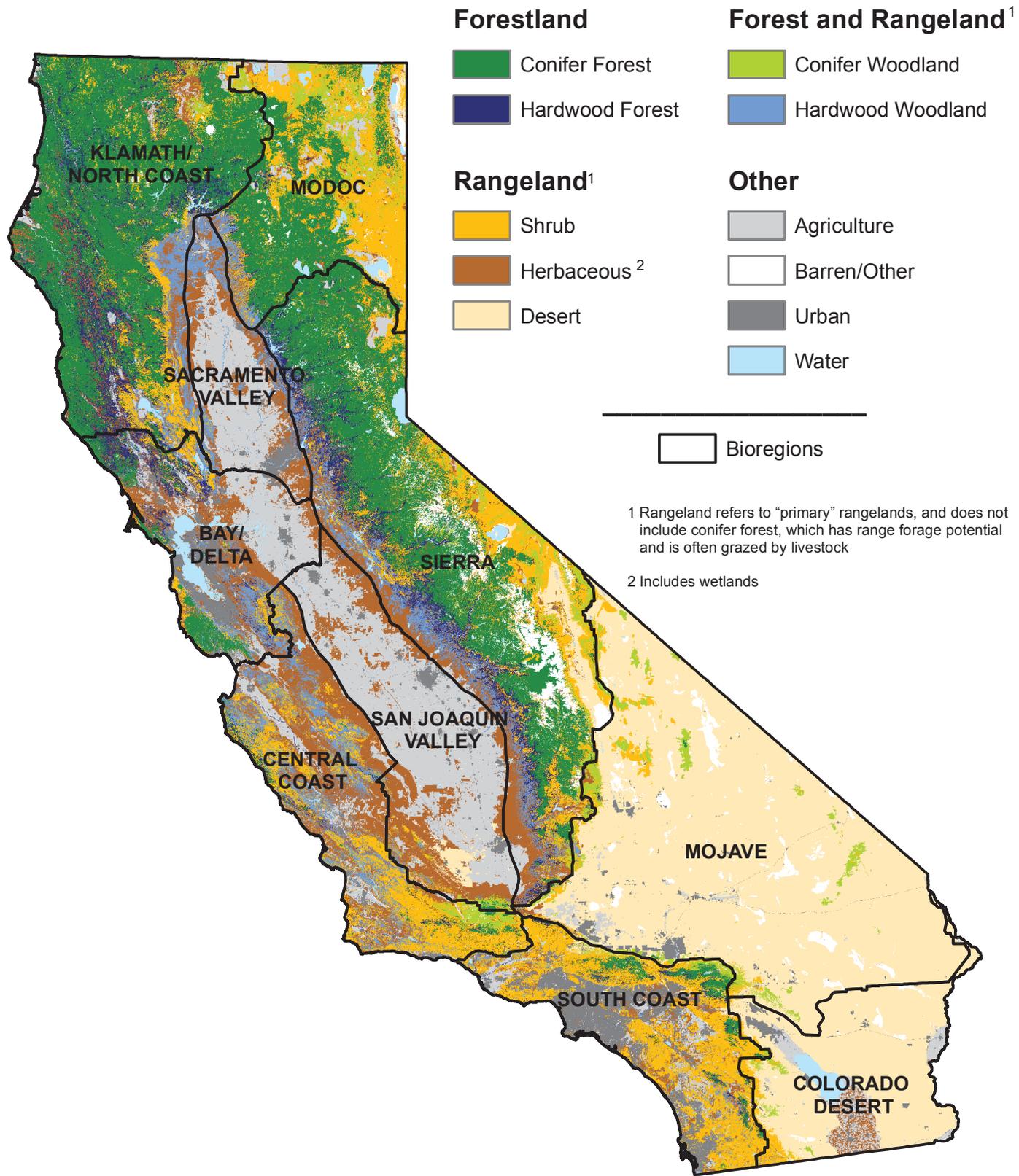


Figure I.5.
Forests and rangelands of California.
Data Sources: Statewide Land Use / Land Cover Mosaic, FRAP (2006)

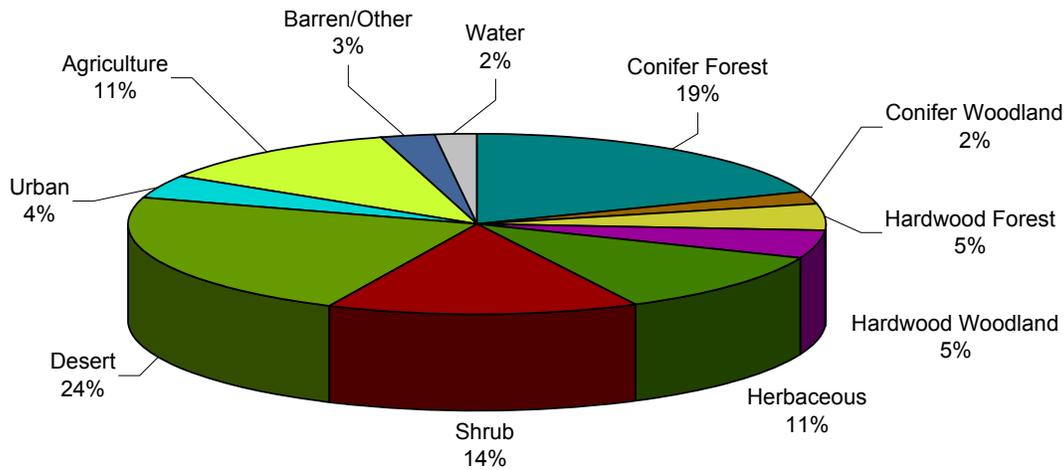


Figure I.6.
Percentage area of land cover classes, statewide.
Data Source: Statewide Land Use / Land Cover Mosaic, FRAP (2006)

Table I.3. Area of land cover type by owner group (acres in thousands)

WHR Vegetation Type	Private	USFS	BLM	NPS	Other Public	NGO	Total ¹
Forestland							
Conifer Forest	6,653	10,762	346	1,106	434	34	19,335
Hardwood Forest	2,828	1,305	194	104	151	12	4,594
Forest and Rangeland							
Conifer Woodland	466	989	469	317	137	21	2,399
Hardwood Woodland	4,296	284	193	19	456	45	5,292
Rangeland²							
Shrub	4,842	5,806	2,353	282	1,180	60	14,522
Herbaceous ³	9,525	376	433	82	831	159	11,407
Desert	3,540	137	10,450	4,772	4,325	27	23,251
Total Forest and Rangeland	32,151	19,658	14,438	6,682	7,512	358	80,799
Other							
Agriculture	11,336	3	39	1	237	24	11,639
Barren/Other	358	841	428	760	324	3	2,714
Urban	3,897	6	27	5	221	3	4,159
Water ⁴							1,916
All							
Total	47,742	20,508	14,932	7,449	8,294	387	10,1227

¹ Totals may not add up due to rounding

² Rangeland refers to "primary" rangeland, and does not include conifer forest, which has rangeland forage potential and is often grazed by livestock

³ Includes wetlands

⁴ Areas classified as water are not assigned an ownership

USFS – United States Forest Service, Department of Agriculture

BLM – Bureau of Lands Management, Department of the Interior

NPS – National Park Service, Department of the Interior

NGO – non-governmental organizations (e.g., The Nature Conservancy)

Data Sources: California Protected Areas Database, GreenInfo Network (2009); Statewide Land Use / Land Cover Mosaic, FRAP (2006)

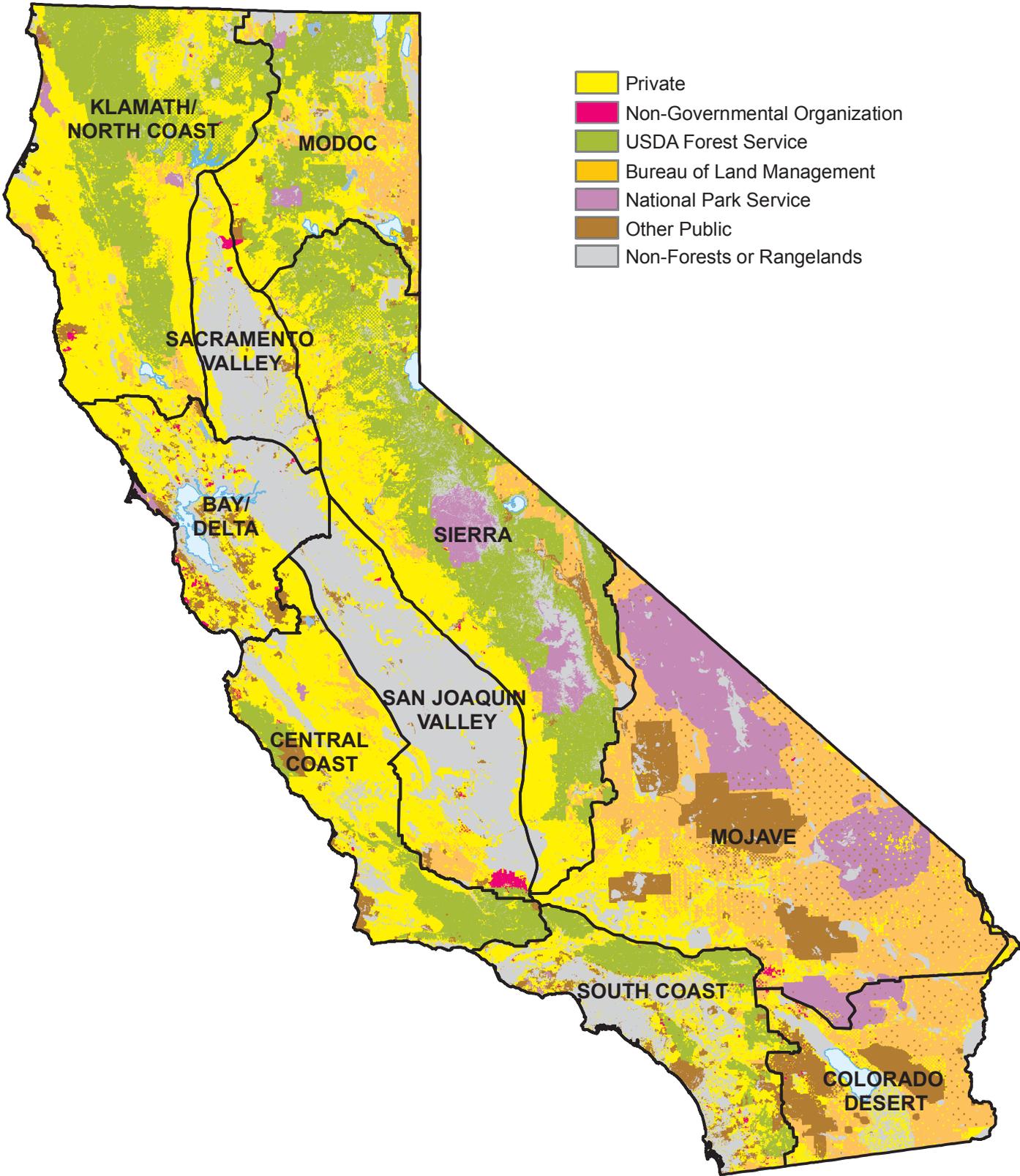


Figure I.7.

Major ownership of forests and rangelands in California.

Data Sources: Protected Areas, Department of Defense and Bureau of Indian Affairs lands from California Protected Areas Database (CPAD), GreenInfo Network (2010)

Table I.4. Forestland area by owner and bioregion (acres in thousands)*

Bioregion	BLM	NGO	NPS	Other Public	Private	USFS	Total
Bay/Delta	14	25	30	374	1,251	0	1,695
Central Coast	75	8	5	155	1,354	515	2,113
Colorado Desert	12	2	<1	74	20	2	110
Klamath/North Coast	352	18	108	224	5,415	4,941	11,058
Modoc	271	7	88	45	1,654	1,770	3,835
Mojave	450	13	760	105	214	30	1,571
Sacramento Valley	11	14	0	32	490	<1	547
San Joaquin Valley	23	13	0	10	77	60	183
Sierra	264	9	1,026	131	3,532	5,498	10,460
South Coast	8	6	2	91	309	527	942
Total	1,479	115	2,020	1,241	14,317	13,343	32,514

*Some lands are considered both forest and rangeland

Data Sources: California Protected Areas Database, GreenInfo Network (2009); Statewide Land Use / Land Cover Mosaic, FRAP (2006)

Table I.5. Forest and rangeland ownership by bioregion (acres in thousands)*

Bioregion	BLM	NGO	NPS	Other Public	Private	USFS	Total
Bay/Delta	48	76	83	826	3,685	0	4,719
Central Coast	297	15	25	496	4,728	1,663	7,224
Colorado Desert	2,741	22	338	1,609	1,375	9	6,094
Klamath/North Cost	602	20	120	284	7,220	5,724	13,970
Modoc	1,387	15	140	259	3,136	2,821	7,759
Mojave	7,820	27	4,812	3,083	3,035	83	18,860
Sacramento Valley	29	35	0	117	1,710	<1	1,891
San Joaquin Valley	314	106	0	141	2,242	73	2,875
Sierra	1,155	13	1,181	599	6,017	7,751	16,716
South Coast	108	31	23	815	3,809	1,724	6,511
Total	14,502	361	6,721	8,228	36,958	19,848	86,618

*Some lands are considered both forest and rangeland

Data Sources: California Protected Areas Database, GreenInfo Network (2009); Statewide Land Use / Land Cover Mosaic, FRAP (2006)

differs. This assessment represents the California piece of a larger ongoing effort by states under the federal 2008 Farm Bill to track condition and trends, develop priority landscapes, explore policy options and monitor the effectiveness of existing policies and programs. As such, for California, this document is a starting point for future refinements and related efforts over time to update assessments under the Farm Bill framework. It has inherent limitations, in large part due to data and analytical needs, and the fact that some issues cross state borders. In addition, a number of entities and stakeholders in California have jurisdictions or interests in forest and rangeland that may not be fully captured or represented in this assessment.

they are reviewed and used by a wider audience of stakeholders. This is an important part of the process of improving the assessment capacity over time. Towards this end, assessment materials such as the individual chapters in pdf format, methods documents, complete enumeration tables and GIS data and maps can be found on the FRAP website (<http://frap.fire.ca.gov/assessment2010.html>).

The limitations of the assessment data, methods, and results will no doubt be more fully explored as