



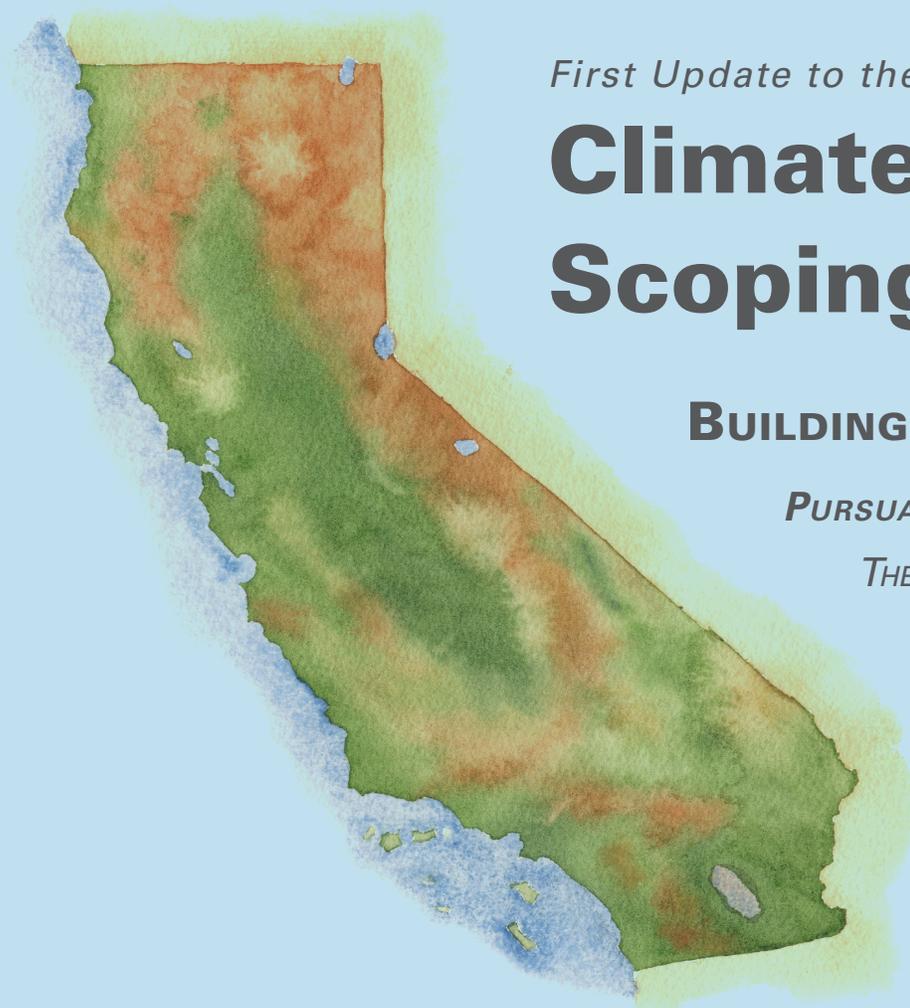
First Update to the

Climate Change Scoping Plan

BUILDING ON THE FRAMEWORK

PURSUANT TO AB 32

*THE CALIFORNIA GLOBAL WARMING
SOLUTIONS ACT OF 2006*





6. Natural and Working Lands (Formerly Referred to as Forest Sector)

Three-quarters of California's landmass comprises biologically diverse landscapes such as forests, woodlands, shrublands, grasslands and wetlands. In this section's discussion, working lands includes rangelands but not agricultural croplands which are addressed in the Agriculture Sector. The initial Scoping Plan included a measure on sustainable forests and also identified additional strategies such as urban forestry and fuels management. This Scoping Plan update recognizes the key role that forests and all natural and working lands must play in meeting California's GHG emission reduction goals.

Natural and working lands act as both a source of GHG emissions and a carbon sink that removes CO₂ from the atmosphere. For example, vegetation growth and associated carbon sequestration in response to favorable growing conditions in one year can be followed by reduced growth or mortality during extended periods of drought. Emissions from wildfire, pest, and disease, are all natural ecosystem processes that can fluctuate from year to year and greatly influence the relationship between source and sink. However, when sustainably managed, the potential for natural and working lands to reduce GHG emissions and sequester carbon is significant and will be critical to reaching California's long-term climate goals.

Efforts to reduce GHG emissions and enhance carbon sequestration on natural and working lands also have significant economic, social, and environmental co-benefits, and can aid progress on efforts to prepare for climate change risks. A few key co benefits include protection of water supply and water quality, air quality, species habitat, recreation, jobs, wood and related products, flood protection, nutrient cycling and soil productivity, reduced heat-island effect, and reduced energy use. However, to ensure resilience, carbon management of these lands must be integrated with a broader suite of resource management objectives for those lands.

The initial Scoping Plan included a Sustainable Forest Target. The goal of this target was to maintain net carbon sequestration on forest lands. This was to be achieved using the mechanisms provided by the Forest Practice Rules, timberland conversion regulations, fire safety requirements, forest improvement assistance programs, and the California Environmental Quality Act (CEQA), which requires avoidance or mitigation of impacts affecting forest site productivity or forest carbon losses to conversion. The initial Scoping Plan also identified other opportunities to realize additional GHG emission reductions and increase sequestration, including the following:

- Preventing the conversion of forestlands through publicly and privately funded land acquisitions.
- Maintaining and enhancing forest stocks on timberlands through forest management practices subject to the Forest Practice Act.
- Planting trees on lands that were historically covered with native forests.
- Establishing forest areas where the preceding vegetation was not forest.
- Planting trees in urban areas.
- Using urban forest wood waste for bioenergy.
- Reducing vegetative fuels that could feed wildfires and using this waste for bioenergy.

The Board of Forestry and Fire Protection (BoF) has been evaluating the adequacy of existing forest regulations and programs for achieving GHG emission reductions and ensuring carbon sequestration on forest lands. In 2010, amendments to CEQA guidelines led to the requirement that timber harvest proponents subject to State regulations must analyze GHG emissions when applying for CAL FIRE permits.

The initial Scoping Plan recognized the need for continued research to improve estimates of ecosystem carbon stocks and GHG flux associated with stock change on forests and other natural lands. In 2011, ARB contracted with researchers from UC Berkeley to develop a new

methodology for assessing carbon stock changes for all California’s lands except agricultural and urban areas. The researchers have developed a new emissions assessment approach based on field measurements (Forest Inventory and Analysis data) and satellite remote sensing data and methods. The methodology includes an emissions assessment of forests, woodlands, grasslands, shrublands, and wetlands.⁸⁹

Healthy forests and lands returning to forest are an important source of carbon sequestration. The UC Berkeley research is showing, however, that loss of forests and other natural lands through fire, natural ecosystem succession and conversion of forests and woodlands to other uses represent significant CO₂ release, potentially significantly greater than previously estimated and may outpace carbon sequestration, possibly by substantial amounts. This information underscores the importance of managing our forests and other natural and working lands to maximize the net benefits—increasing sequestration while reducing conversion and carbon stock losses, and maximizing associated co-benefits.

Application of the new research methodology will enable the monitoring of changes on the land over time and periodic quantification of the GHG flux associated with changes in ecosystem carbon stocks. As source data improves and methods are refined, ARB’s GHG inventory for forests and other lands will be updated. This new inventory information can help identify the steps needed to reverse adverse trends and inform efforts to manage natural and working lands for net climate benefits.

The methodology developed by UC Berkeley does not include tree-covered urban areas. However, CAL FIRE, in conjunction with the U.S. Forest Service and researchers at UC Davis, is also developing GHG inventory data for urban forests and is continuing to refine and update those data over time. Improvements to ongoing GHG reporting systems will include refinements to methods and incorporation of additional relevant data sets (such as information on vegetation, forest stand treatments, and other activities) that are collected by CAL FIRE and other agencies.

On September 11, 2012, Governor Brown signed Assembly Bill 1492 (AB 1492; Blumenfeld, Chapter 289, Statutes of 2012), with the first major changes in forest sector legislation in ten years. Among other things, AB 1492 set into motion a fee on certain types of lumber and wood products in California that now help fund forest management programs related to timberlands. One of the provisions of this new law is the requirement for the State to evaluate ecological performance measures, which are likely to include an evaluation of practices that may directly or indirectly affect GHG emissions.

Maintaining Momentum

While ongoing efforts are being made to reduce GHG emissions and increase carbon sequestration in California’s forests, additional work is necessary, and incorporating other land types into our planning will become increasingly important as we move beyond 2020. With appropriate investments and sound science-based policy, natural and working lands in California can provide a tremendous opportunity to meet the State’s climate goals. Over time, efforts in the Natural and Working Lands Sector will achieve many other important public and environmental benefits, such as protection of water supply and quality, air quality, and species habitat, as well as providing recreational opportunities and jobs.

Timing is critical for actions in this sector. Activities to enhance carbon storage on natural and working lands, such as reforestation or restoration, will require time to fully realize carbon benefits. For example, planting trees today will maximize their sequestration capacity in 20 to 50 years. In addition, trees in urban environments, or “urban forests,” provide significant shading

89 Battles, J., Gonzalez, P., Robards, T., Collins, B., Saah, D., Jan 2014, California Forest and Rangeland Greenhouse Gas Inventory Development, Final Report, California Air Resources Board Agreement 10-778; www.arb.ca.gov/cc/inventory/sectors/forest/forest.htm

and other cooling benefits. As the trees mature they reduce urban temperatures and energy needs. Near-term investments in activities such as planting trees will help us reach our 2020 limit, but will also play a greater role in reaching our mid-term and longer-term 2050 targets especially if action is taken in the near-term.

Some actions to reduce emissions and enhance carbon storage in the long-term may result in temporary, short-term reductions in carbon sequestration. For instance, actions taken to address forest health concerns or to reduce wildfire risks may result in temporary reductions in carbon stock, but they are necessary to maintain healthy forests that are more efficient at GHG sequestration and more resilient to future climate conditions. It's important to manage our forests to maximize net climate benefits, increasing sequestration while reducing losses due to fire or other processes, while also considering the broader range of environmental services that forests and other natural lands provide.

There may also be additional benefits beyond carbon that can only be realized if actions are taken early enough. For instance, in some cases restoring tidal wetland can offer flood protection that is able to keep pace with sea level rise through the growth of root mass over time, but such naturally growing flood protection enhancements are only possible if restoration activities are initiated early.

Through implementation of GHG policies, actions, and strategic investments identified below, efforts to enhance, protect, and conserve natural and working lands in California can result in important climate benefits, as well as a more resilient California that is better prepared for climate risks such as more frequent and severe wildfires, changing water availability, and stressors on species and natural communities.

Research and Emission Inventory Updates

Inventory development and improvement are critical for informing carbon management activities in California. Recently developed tools will enable ARB to generate geospatially explicit estimates of ecosystem carbon stocks and GHG flux associated with stock change across a variety of land categories. Though additional work is needed, these tools, along with regularly updated input datasets will allow tracking of changes over time and provide a new method to update the GHG inventory.

The sources and methods for quantifying ecosystem carbon and GHG flux in this sector are complex. Additional work is needed to evaluate the data provided by the UC Berkeley research, to incorporate additional new data, and to identify further research needed to expand use of these tools. Continued refinements will advance carbon quantification, attribution of GHG flux by disturbance process, and reduce uncertainty, all of which will help inform effective carbon management activities. There is also a need to prioritize and conduct additional research on outcomes of specific practices to maximize carbon uptake on natural and working lands in California.

Integrating Biological Systems

Natural and working landscapes in California are composed of widely varied, vibrant, and often interconnected biological systems. Moving forward, it is important to begin looking at these lands in a more holistic and integrated way to ensure that we maximize opportunities to achieve biological carbon benefits across the range of California's natural lands, while also ensuring the health and resiliency of these lands to provide ongoing ecosystem services.

Forest Planning and Actions

California forests must be managed to ensure that they provide net carbon storage even in the face of increased threats from wildfire, pests, disease, and conversion pressures. Quantitative planning targets must be set to increase net forest carbon storage in California in the near-term, mid-term, and by 2050, while ensuring forest resilience, health, and continued ecosystem

services. Forest carbon inventory and assessments should be continually maintained and refined to support this effort, and appropriate measures, funding, and incentives must also be established.

Specific actions to meet these planning targets for increasing carbon storage in California forests will be laid out in a “Forest Carbon Plan” (Plan). The Plan will be developed by a joint inter-agency workgroup and will necessitate engaging our federal partners with respect to federal lands in the State. The Plan should also include input from expert resources and stakeholders such as academia, non-governmental organizations, working forest owners, and local planning groups, to inform policy decisions. Additionally, the Plan should work synergistically with other State planning policies where GHG emission reduction strategies and co-benefits intertwine such as in the Water Action Plan, State Wildlife Adaptation Plan, and Safeguarding California. A resource economics study may be necessary to support the development of the Forest Carbon Plan; funding for such a study would be needed.

The Forest Carbon Plan will, at a minimum, set mid-term and long-term planning targets; identify actions to meet those targets; and provide recommendations on funding those actions. Development of the Plan should include a review of Forest Practice Regulations and recommendations for best management practices and potential additional regulatory measures or amendments needed to minimize GHG emissions and enhance carbon storage associated with silvicultural treatments. For example, a requirement for Sustained Yield Plans to demonstrate that activities not only maintain the current level of carbon sequestration, but actually increase carbon sequestration over the 100-year planning horizon.

Funding recommendations in the Plan should include but not be limited to the following:

- Recommendations regarding the development and implementation of market-based mechanisms applicable to large forest land owners for the purpose of ensuring that forests in California provide net carbon storage.
- Recommendations regarding the development and implementation of a competitive grant program.
- Recommendations regarding types of climate investments that might be supported by varying levels of funding support from Cap-and-Trade auction revenues or other sources.
- Recommendations regarding the process for dedicating a portion of Yield Tax Revenue to fund forest climate investments.
- Recommendations pertaining to property tax restructuring or other financial incentives to attract more interest in active forest management by nonindustrial timberland owners.

Another forest action is to incentivize the sustainable use of biomass obtained from forest management practices to produce energy. This strategy diverts raw materials from being burned in open piles, and reduces criteria and GHG pollutant emissions. Open burn piles create particulate emissions, which can exacerbate health problems and interfere with attaining State and federal ambient air quality standards. In addition, open burning contains black carbon, which is a short-lived climate pollutant (SLCP). As discussed in Chapter II, SLCPs have a shorter lifetime in the atmosphere and have a higher pound-for-pound warming potential than CO₂, and as such, during these shorter lifetimes they are very potent. Because SLCPs are removed from the atmosphere rather quickly, reducing their emissions results in immediate climate and air quality benefits. Cross-sector coordination is needed between the energy, waste, water, natural and working lands, and agriculture focus groups to develop recommendations for addressing economic, infrastructure, and regulatory hurdles regarding the input of bioenergy into the electricity grid from both small-scale and utility-scale biomass energy facilities.

Development of a carbon life cycle analysis for wood products could also be considered. When utilizing wood products for construction, manufacturing, and sale of goods in California, the location of the initial raw wood should be considered along with an analysis of the associated

carbon emissions from the processing and transport of wood products through the various steps of the supply chain. Guidelines could be established that would identify and incentivize wood products that reduce carbon emissions—taking into account GHG emissions from transportation to the mill, from the mill to the production facility, and finally to the retailer. For example, wood harvested in California and transported and utilized locally for construction and manufacturing would have a lower carbon impact than wood that has been harvested and manufactured outside the State, shipped from overseas, or processed and reintroduced within California as a finished wood product.

Rangelands and Wetlands Planning and Actions

In the absence of comprehensive California rangeland and wetland carbon data, these lands should be protected from conversion pressures and degradation that could result in significant carbon emissions. In addition, restoration and improved management practices to increase carbon storage should be incentivized. This is true particularly where such enhancement, protection, and conservation action provide other important climate benefits, such as improving watershed conditions and flood protection, and providing habitat and connectivity for climate-stressed species.

Land Use Planning to Enhance, Protect, and Conserve Lands in California

As described under the Agricultural Sector, an integrated and coordinated approach to local land use planning that considers all land types is important in meeting the State's GHG reduction goals. Urban, natural and working lands, and agricultural croplands within and across jurisdictions must all be considered to create interconnected land areas and ecosystems. Local and regional land use planning actions and policies need to more fully integrate and emphasize land conservation and avoided conversion of croplands, forests, rangelands, and wetlands—as well as expansion and promotion of urban forestry, urban agriculture, and green infrastructure.

Urban Forests

Expansion and support is needed for urban forest programs, particularly in environmental justice communities. Urban forests can significantly reduce the disproportionate environmental impacts on California's environmental justice communities through increased green infrastructure investments that reduce GHG emissions. These investments benefit communities and result in environmental benefits such as reduced storm water runoff and clean air; health benefits from motivating active transportation and reducing urban heat island effects; and economic benefits such as reduced energy demand through cooling and increased land values. Utilizing local groups, such as the Local Conservation Corps, to implement urban forest and urban greening projects in these areas can provide dual benefits by also providing experience, training, and opportunity for at-risk youth.

Funding Needs

Funding is critical to address the needs in this sector, yet it is far below historic levels and in some cases does not exist. Outcomes of actions on natural and working lands often occur on a decadal scale. Action within the next ten years is critical so long-term benefits can be fully realized in the 2050 time frame. Funding sources must be identified, particularly where funds from existing sources can be leveraged effectively.

Funding across the sector is needed for further inventory improvements, research on effective GHG reduction and sequestration practices, and direct on-the-ground activities known to reduce GHG emissions and increase sequestration.

To further define and describe these needs, a natural and working lands climate investment working group will be convened to produce a report that outlines funding needs and opportunities for the Natural and Working Lands Sector as a whole. The GHG inventory, Forest Carbon Plan, local land use planning efforts, and other statewide efforts should be considered in development of the report.

To the extent feasible, the report should include strategic prioritization guidelines for investments in forests, rangeland, or wetlands. As different governmental entities and stakeholders actively manage forest, rangelands, and wetlands, separate prioritization guidelines should be developed for each land type and for the sector as a whole, if possible.

Key Recommended Actions for Natural and Working Lands



- The California Natural Resources Agency (CNRA) and CalEPA will convene an inter-agency forest climate workgroup to prepare and publish a “Forest Carbon Plan” in 2016. The Forest Carbon Plan will:
 - Set quantitative near-term, mid-term, and long-term planning targets to ensure an increase in net forest carbon storage in California commensurate with the State’s long-term GHG reduction goals, and in light of recent research that suggest that forests in California may be a source of GHG emissions rather than a carbon sink.
 - Identify near-term and long-term actions necessary to meet quantitative planning targets while ensuring forest resilience and health, ecosystem services, conservation of the forest land base, and continued economic opportunities.
 - Evaluate GHG emission and carbon sequestration trends for different forest land ownership types and consider sector sub-targets for each type.
 - Develop specific recommendations regarding approaches for funding actions to ensure that forests in California provide net long-term carbon storage.
- In 2016, through AB 1504, CAL FIRE and BOF will evaluate methods to develop a life cycle analysis to track carbon in wood products; this work should be coordinated with ARB’s forest inventory and support the Forest Carbon Plan.
- The Bioenergy Interagency Working Group will continue to work with stakeholders and relevant agencies to:
 - Strengthen, refine, and implement actions contained in its Bioenergy Action Plan related to use of forest biomass.
 - Evaluate the potential biomass energy generation capacity.
 - Develop methods to quantify biomass life-cycle GHG flux.
- In 2015, OPR, CNRA, CalEPA, CDFA, California Department of Fish and Wildlife (CDFW), CAL FIRE, and ARB will convene an inter-agency workgroup to engage local and regional land use planning agencies in establishing a coordinated local land use program. The program will set planning targets that identify, prioritize, and incentivize land conservation; increase urban forestry canopy cover; bolster development of green infrastructure; and limit the conversion of both agricultural croplands and natural and working lands.
- In 2015, CNRA, CalEPA, CDFA, CDFW, CAL FIRE and ARB will convene a natural and working lands climate investment working group to draft a report outlining funding needs, opportunities, and priorities for the Natural and Working Lands Sector.
- Expand urban forestry and green infrastructure programs and investments, particularly in California’s environmental justice communities.
- Continue to analyze the UC Berkeley research methodology and data to develop GHG inventory updates, incorporate more recent data into the newly developed tools for carbon quantification, and invest in and expand monitoring and research to reduce uncertainty in carbon quantification and attribution of GHG flux by disturbance process.