



March 17, 2017

Re: Forest Carbon Plan Draft

Dear Forest Carbon Action Team,

Thank you for this opportunity to comment on the Forest Carbon Plan (FCP) draft. We appreciate the work that has gone into this document, particularly in the science snapshot section, and the incorporation of conservation easements to ensure enduring gains. Our comments are structured around four key foci:

1. **The “protect” and “enhance” goals should be linked to achieve enduring carbon gains. These are synergistic, linked goals.** Conservation easements can and should include provisions that increase resilient carbon stores on forestlands, such as requiring the recruitment and retention of larger, older trees to achieve both carbon and climate goals. Similarly, the enhancement strategies should be nested so that the gains made on private lands with the enhancement strategies are not reversed by changes in management or through conversion. Conservation plans should also be considered at the watershed scale, with priority given to large landscapes that provide critical habitat linkages, water supplies, or other co-benefits. This helps prevent fragmentation before it occurs rather than focusing on the bleeding edge of development.
2. **Complement the carbon focus with explicit climate goals.** This involves a broader definition of resilience, one that goes beyond fuels reduction alone to include actions that benefit and restore more natural diversity of tree species, stand structures, and age classes. It also entails prioritizing actions that provide co-benefits such as securing water supplies and creating greater habitat connectivity instead of siloing these co-benefits in other state plans.
3. **Reducing fire emissions through suppression is not a viable end goal in a fire-adapted system.** The FCP has described the history of fire suppression in California’s forests, but falls short of making the logical conclusion that our forests are adapted to and need more frequent, low-intensity fire across more acres. The goals should be framed in terms of restoring more natural and managed fire regimes (lower intensity) rather than in terms of decreasing the total acres burned.
4. **Ensure responsibility for implementation at the state level for greater consistency and accountability in carbon gains.** The FCP is not an implementation document. We agree that implementation needs to be tailored to both eco-regional and community contexts. It must also be consistent, meet clear standards, and have standardized reporting at equivalent levels of accuracy and quality, with transparent reporting for the public to feel trust in this work. This

would be best accomplished with state agency oversight and administration of the implementation and with statewide guidelines and standards for regional implementation. There is certainly a role for the conservancies or other regional bodies as partners in implementation, recognizing the conservancies' expertise and regional limitations.

We attach more detailed comments on the draft plan and welcome the opportunity to answer any questions that these raise. We look forward to working with you further to complete this document and move to implementation. Please do not hesitate to reach out if you have any questions about these comments.

Sincerely yours,

A handwritten signature in black ink that reads "Laurie A. Wayburn" with a long horizontal flourish extending to the right.

Laurie Wayburn
President

Detailed Comments:

1. The “protect” and “enhance” goals should be linked to achieve enduring carbon gains. These are synergistic, linked goals.

The FCP draft recognizes that restoration goals for wildland forests will take time, yet provides no mechanism for ensuring that these forests will be protected and managed for these long-term goals. The FCP draft takes an important first step in recognizing that measurement for carbon gains will need to occur over longer time scales (see page 24), but measurement alone will not ensure that these gains are met.

Without a plan for securing the forest over time, many of the activities described in Section 3.2.2 may result in emissions rather than increased carbon sequestration and resilience. In some cases, it can take as long as 50 to 60 years to achieve carbon benefits from fuel reduction treatments.¹ If the land is not protected for at least that time frame, then the emissions from fuels reduction may not be balanced by the anticipated long-term climate benefits, and the project could have a net negative impact. Instead, nesting the enhance and protect strategies ensures that these gains are not reversed by a change in management practices or conversion.

Linking the enhance and protect strategies also has broader benefits as the protection, obtained through a working forest conservation easement that contains management requirements, provides the time necessary for trees to grow older and become more resilient stores of carbon. Long-term commitments allow for the recruitment and maintenance of large, fire-resilient trees and the other forest characteristics that require a long time to develop. As the FCP notes, “redistributing the total carbon storage among fewer, larger, and more fire resilient trees has the highest chance of safeguarding the most carbon in the long term” (page 48).

Conservation easements are a valuable tool to protect the forest land base, prevent fragmentation, and ensure that future management develops certain desired conditions. Easements are one of the most cost-effective ways to protect land. For instance, in CA between 1998 and 2008, only 15% of the funding for conservation went towards easements, but easements accounted for 25% of the land conserved – saving an average of \$750/ acre compared to other methods of conservation such as fee title purchase.¹

However, the goal of a 10% increase above the current level is actually *below the current rate that forest lands are being conserved* according to the analysis by the Land Trust Alliance (included in their comment letter). There are 243,000 acres of forestland in California currently under conservation easement, so a 10% increase by 2030 would conserve under 2,000 acres per year. To put that in perspective, The Forest Legacy Program put over 91,000 acres of forestland under conservation easements between 1997

¹ The Trust for Public Land, Conservation Almanac, 2016. Available at: www.conservation Almanac.org

and 2016.² That's an average of over 4,800 acres per year – from just one of California's many conservation programs. A more appropriate goal would be to increase conservation easements by 10% of current levels *each year* through 2030. The goal of 24,300 acres under conservation easements for the first year is both forward thinking and realistic – for instance, the Pacific Forest Trust alone conserved over 12,000 acres in 2016.³ This goal has the additional advantage of growing over time as the conserved land base increases. This would result in more than tripling the amount of forestland under conservation easements by 2030.

One of the reasons that conservation easements are such a valuable tool is that they can be used for more than just avoided conversion. As the FCP recognizes briefly, "Incentives for long-term management changes may include conservation easements (see Section 3.1) that contain forest improvement terms (e.g., requirements to grow large trees and retain some or all of them over time)" (page 31). Conservation easements are a graceful tool for improving management to increase carbon stores and resilience, while maintaining private ownership and active resource management. We recommend that the FCP reinforce the value of using easements to require management practices that increase carbon and habitat structure over time. This would help solve one of the most serious shortcomings in the current draft FCP – the lack of a mechanism to ensure that the forest has the time needed to grow older, more resilient trees.

The FCP appropriately recognizes that working at a watershed or landscape level is necessary to achieve restoration goals. We note that reaching the desired forest function, including large old trees, will take many decades and a mechanism to ensure future management continues to retain those key features is vital. We strongly urge that landscape restoration activities be coupled with working forest conservation easements that ensure the development of these desired forest characteristics.

While there are certainly situations where it is appropriate to use conservation easements to protect forests under development pressure, these tend to be the most expensive transactions because you pay for the development value. The forest adjacent to developed areas has often already lost much ecological function. A more cost effective and ecologically rewarding approach would use working forest conservation easements in important areas to secure desired future conditions. These transactions tend to be far cheaper per acre, as the cost is often limited to the changes in management. As an example, a recent 12,000+ acre working forest conservation easement near Mount Shasta, which will double the carbon over the next 50 years while practicing outstanding commercial forestry, cost about \$800/acre based almost entirely on the costs to the landowner to make permanent commitments to exemplary management.

² A Request to the Board of Forestry for approval a Resolution supporting a grant from the Wildlife Conservation Board for the purchase of three working forest Conservation Easements on the second phase of the Eel River Peninsula project of the Forest Legacy Program, 2016. Available at: http://bofdata.fire.ca.gov/board_business/binder_materials/2016/april_2016/full/full_15.0_eel_river_peninsula_bof_background_.pdf

³ <https://www.pacificforest.org/conservation-project/mccloud-dogwood-butte/>

Recommendations:

- The goal for land protection should drive increases in the current rates of conservation, adding 10% of the current acreage *each year* instead of over the next 13 years.
- Link the enhance and protect goals. Conservation easements can and should require improved management practices to ensure the retention of older trees and other actions to increase public benefits. Similarly, restoration activities should be paired with permanent protection so there is enough time for carbon gains to be realized.
- Landscape-scale conservation should focus on ecologically functional forestlands in strategic areas. Reduce the focus on areas under imminent threat, as they are disproportionately expensive and generally less ecologically important. The factors that guide regional prioritization (on page 35) should include areas where large forest landscapes can be protected and enhanced to increase habitat connectivity and adaptation in the face of climate change.
- The research to, “identify areas with the most forest carbon at the greatest risk to loss” (page 117) could be expanded to include the areas that have the greatest potential to increase carbon stores and the present the best opportunities for landscape conservation and restoration.

2. Complement the carbon focus with explicit climate goals.

Focusing solely on carbon as the single metric of success in the FCP could have unintended consequences and result in missed opportunities to holistically manage forests for multiple climate benefits. It is easy to imagine the unintended consequences that could result from a plan focused purely on carbon. For instance, eucalyptus groves store significant amounts of carbon and grow quickly – yet we would hope that the FCP would not inadvertently encourage the replacement of native forests with these non-native species. Similarly, carbon stores could be increased by cutting down large swaths of forest and burying these trees in a landfill where they will take centuries to decompose – but clearly, this is not a viable nor desirable outcome. While these outcomes may be unlikely, it is nevertheless important to place clear guidelines about native species, increasing the carbon *in the forest* rather than taking the carbon out of it, and managing holistically for the numerous ecosystem services that forests provide.

One of the ways that the FCP can become more of a forest climate plan is to clarify and broaden the definition of resilience used. The FCP currently lacks an explicit definition of *resilience*, with the result being that the term is mostly used to describe managing forests with fuels reduction treatments. However, the term resilience, as defined by Walker and Salt, is “the capacity of a system to absorb disturbance and still retain its basic function and structure.”⁴ We recommend including this or a similar definition in the FCP and setting actions for the broad range of techniques that can increase resilience.

⁴ Walker, B., Salt, D., 2006. Resilience thinking: sustaining ecosystems and people in a changing world. Island Press, Washington, D.C.

As the FCP recognizes, "A strong indicator of resilience is biodiversity: higher rates of diversity across a landscape (within individual stands and up to the bioregional scale) and within individual landscape elements (species, genes, etcetera) result in greater resilience" (page 100). However, the actions to increase resilience presented in the FCP are largely limited to fuels reduction treatments. There is a much broader suite of actions that can improve resilience such as increasing the diversity of species and seral stages within a stand and on the landscape. Increasing diversity also has the benefit of being more responsive to multiple types of disturbance. For instance, "stands with similar species closer together are within easier reach to bark beetles, compared to a more open stand with a more diverse species makeup¹²⁸" (page 56). The FCP should include specific actions and targets around a broader definition of resilience, such as reforestation with a diverse mix of native species and the provision for conservation easements to include the retention of older trees as discussed above.

In tandem with a clear definition of resilience, it is also necessary to clearly define the *treatments* and *management activities* that lead to resilient forests. There is a great deal of nuance in forest management activities, and some may be detrimental to the goals of the FCP. The science snapshot recognizes that many of our current forest vulnerabilities are a result of the "Logging [that] removed many of the larger old growth species, which not only removed much of the live forest carbon from the forest but also reduced canopy height, making it easier for fire to enter the canopy" (page 9). Given this history, the FCP should clearly define the words *treatment* and *managed*, instead of making broad generalizations such as, "in addition to fuels reduction and prescribed fire treatments, commercial timber harvesting can play a beneficial role" (page 26). For instance, a recent study found that thinning from below and retaining older larger trees resulted in a much quicker recovery of carbon stores than overstory thinning of larger trees.⁵

Furthermore, as Walker and Salt note, resilience is not always desirable. A barren rock may be a very resilient system, tolerating droughts and floods, yet providing few ecosystem services. Therefore, it is essential to consider resilience in the broader context of the larger ecosystem goals, and not as a stand-alone objective. Unlike other sources of emissions that ARB regulates, forests and other natural lands are complex, interdependent, ecological systems that cannot be managed for one single metric or outcome in isolation.

The co-benefits that forests supply should not be siloed in other state plans. Giving priority to actions that provide co-benefits such as securing water supplies and creating greater habitat connectivity can increase ecological and economic efficiencies. The Scoping Plan suggests that the FCP should have this broader mandate, stating (as quoted in the introduction of the FCP): "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" (page 1).

⁵ Wiechmann, M.L., Hurteau, M.D., North, M.P., Koch, G.W., Jerabkova, L., 2015. The carbon balance of reducing wildfire risk and restoring process: an analysis of 10-year post-treatment carbon dynamics in a mixed-conifer forest. *Climatic Change* 132, 709–719. doi:10.1007/s10584-015-1450-y

However, "The Forest Carbon Plan does not include targets or propose direct protocols for the co-benefits that are expected to be impacted through activities leading to improved forest health, or from healthy forests." While it is understandable that the FCP might leave the goal setting for co-benefits to other state plans such as the State Wildlife Action Plan, there will be many opportunities to prioritize projects that include these co-benefits as the FCP moves to regional implementation.

Recommendations:

- Clear definitions of "resilience", "treatment", and "management" should be included in the FCP.
- Actions to improve resilience must go beyond just fuels reduction to include a broader suite of activities that will increase diversity at the stand and landscape scale.
- The multiple benefits that forests provide should not be siloed into disparate state plans. The next implementation phase will need to more fully integrate and balance benefits to climate mitigation and adaptation, wildlife habitat, water supplies, and other values.

3. Reducing fire emissions through suppression is not a viable end goal in a fire-adapted system.

The FCP draft has made great strides in recognizing the legacy of fire suppression and how it has increased the vulnerability of our forests, particularly within the Science Snapshot. This understanding of the history of fire is a critical foundation upon which to build the FCP. It was especially heartening to see the analysis around the departure from the historic fire regime for the state (Figure 1) and the acknowledgment that indiscriminate fire suppression is not a viable path forward. The following quote included in the FCP is very apt and applies to California's forests as well, "fire exclusion is not a sustainable option for forests of the Interior West. The inevitable result is that more area is burned in fewer, more unmanageable events with greater consequences, including higher carbon emissions, greater losses to biodiversity, and larger threats to communities and homes"⁴⁰ (page 18).

Despite this review of the science, the conclusion that the state needs more fire, not less, is still largely missing from the FCP. For instance, statements such as "successful fuel reduction and forest management activities will result in reduced area of forest land impacted by wildfire statewide" (page 30) imply that there is still a goal of reducing the total area burned by wildfires. Instead, the goals should be to *increase the areas burned by low and moderate severity fires* which can both restore ecological processes and improve public health outcomes by avoiding stand-destroying fires.⁶

Building on the excellent scientific literature, some of which is thoughtfully reviewed in the FCP, there needs to be a clear resolution to restore fire to California's forests at

⁶ Long, J.W., Tarney, L.W., and North, M.P. *Under Review*. Aligning smoke management with ecological and public health goals.

ecologically appropriate scales. References throughout the document about the reducing the total acreage of fire should be removed, though it may be appropriate to discuss shifting the severity of fire from high severity fires to mixed severity. References to recent increases in fire severity, though accurate, should be put in the context of historic fire regimes lest they inadvertently imply a need to reduce fire on the landscape.

We recommend that one of the research needs identified by the FCP is to study the historic emissions (including black carbon) from fire to provide a benchmark for current emissions. Initial analysis based on Stephens et al. (2007)⁷ results reveals that historic black carbon emissions may have been 3.5 to 9.5 times greater than they are today,⁸ corroborating other research suggesting that the state is in a fire deficit.⁹ Such analyses can provide a valuable frame for comparison and understanding of current emissions within the larger context of GHG fluxes in forest ecosystems.

Recommendations:

- Statements about reducing the total acreage burned by fire should be removed in light of the current fire deficit, and replaced with statements describing the needed restoration of mixed severity fire.
- A baseline of natural, historical fire emissions (including black carbon) needs to be researched to provide an appropriate comparison and reference point for goal-setting.
- Managed natural fires should be included alongside prescribed burns as an important management tool, such as in the factors to guide regional prioritization on page 35.

4. Ensure responsibility for implementation at the state level for greater consistency and accountability in carbon gains.

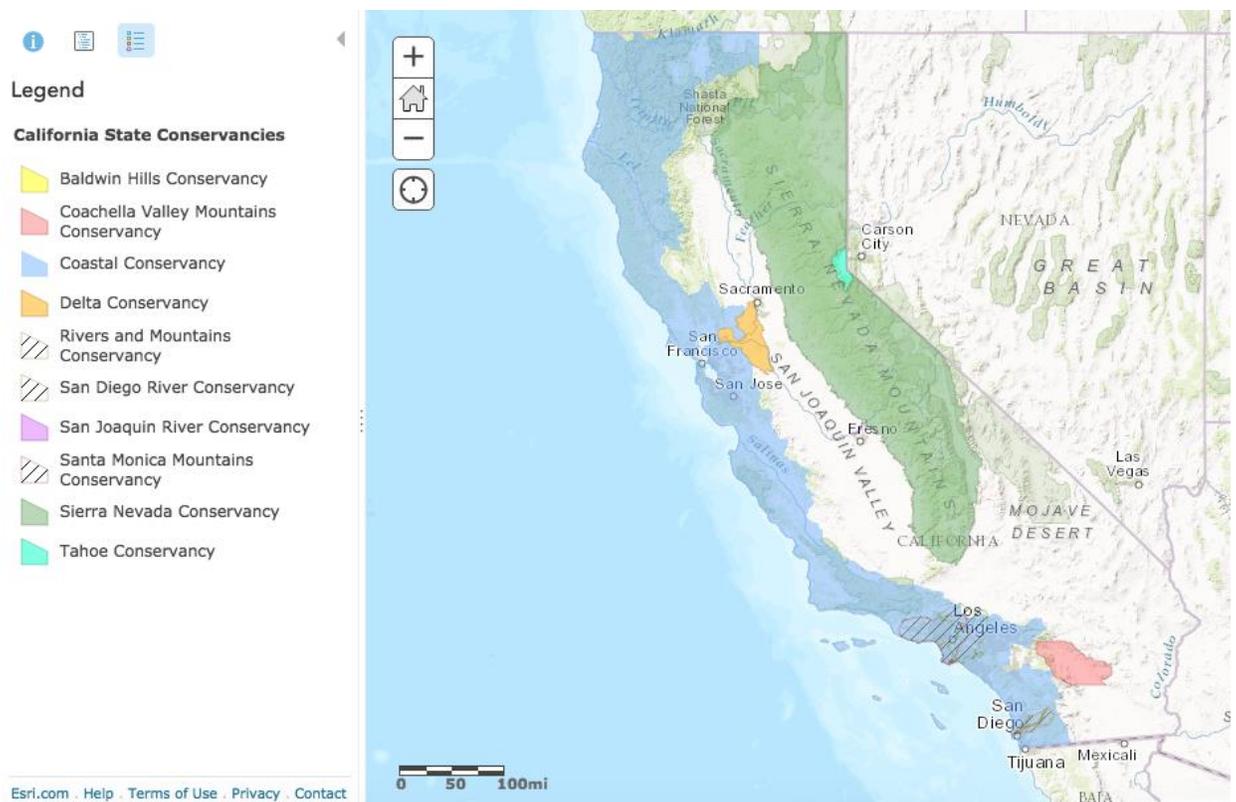
It would be helpful to clarify that the FCP is not a “detailed implementation plan” as it is currently described (page 1), but rather an assessment of current and historic conditions that sets forth broad state-wide goals for forest conditions. Next steps in advancing the Forest Carbon Plan goals should be coordinated with the Scoping Plan Update process, and the Natural and Working Land Climate Change Action Plans proposed for development. The SPU is a legally required document, subject to environmental review, and is the appropriate vehicle for advancing next steps. The state should take the lead on developing monitoring protocols, approved methods, and models to ensure that the FCP meets its goals.

⁷ Stephens, S.L., Martin, R.E., Clinton, N.E., 2007. Prehistoric fire area and emissions from California’s forests, woodlands, shrublands, and grasslands. *Forest Ecology and Management* 251, 205–216. doi:10.1016/j.foreco.2007.06.005

⁸ <https://www.pacificforest.org/short-lived-climate-pollutants/>

⁹ Marlon, J.R., Bartlein, P.J., Gavin, D.G., Long, C.J., Anderson, R.S., Briles, C.E., Brown, K.J., Colombaroli, D., Hallett, D.J., Power, M.J., Scharf, E.A., Walsh, M.K., 2012. Long-term perspective on wildfires in the western USA. *PNAS* 109, E535–E543. doi:10.1073/pnas.1112839109

The FCP identifies Conservancies as the primary leadership for regional plans, but the Conservancies have been designed for particular causes or constituencies, and do not span the state or correspond to ecoregions. They also vary widely in size – from the 380-square mile San Diego River Conservancy to the 40,000-square mile Sierra Nevada Conservancy that encompasses a quarter of the land area of CA (see map¹⁰ below). Note that this map substantially overstates the area where the Coastal Conservancy is actually active, which is typically much closer to the coastal zone. Many Conservancies overlap with one another and span multiple ecoregions as identified in the plan (Figure 5). Yet other critical ecosystems – such as oak woodlands – are not well reflected in the Conservancies. While there is a role for Conservancies in the implementation, there needs to be an overarching structure and set of standards established by the state as well as complementary players at the regional scale.



Also essential is that the proper targets are identified for regional scale implementation. In the ecoregional assessments, there is some implication that targets should be used from the Board of Forestry and Fire Protection's Vegetation Treatment Program Draft Environmental Impact Report. This report is fire focused, with targets such as the acres of

¹⁰ Map provided by Sierra Nevada Conservancy, available at:
<https://www.arcgis.com/home/item.html?id=fc8c6ac0ea0f45878f513e7c6c2683a5>

fuel breaks. However, as discussed elsewhere in this letter, fire suppression is not the desired outcome of the FCP and there needs to be a broader array of actions than those focused solely on fuels reduction. We recommend that these references to the Board of Forestry and Fire Protection's Vegetation Treatment Program Draft Environmental Impact Report are properly contextualized, and it is made clear that not all of the activities outlined would be appropriate components of a regional strategy for the FCP.

Recommendations:

- The FCP should not be presented as an implementation document.
- State level leadership is established to guide the regional action plan process. This state effort should establish consistency and clear accountability across regional action plans by establishing metrics for success, methods, modeling, and goals for the regional implementation.
- Regional planning should be done at ecologically relevant scales, with involvement from the conservancies and other regional entities.

5. Some minor editing suggestions:

On page 14 it reads, "The large pine trees that dotted the landscape held enormous amounts of carbon, with a single 300-plus-year-old sugar pine containing more carbon than one hundred 30-year-old white firs." However, this does not quite match with the statement on page 48, "This is demonstrated by measurements in the Sierra Nevada where a remaining 300-year old sugar pine contains as much carbon in its trunk as 175 thirty year old white fir growing nearby (see Section 6.3 and Figure 8)." Similarly, on page 64, the FCP states: "One large, old sugar pine tree, approximately 300 years old, stores as much carbon as 175 younger, 30-year-old white fir (Figure 8)." It would be helpful if a reference was provided for this statement and Figure 8 and if there was clarity about the precise number of white firs and age of the sugar pine in all of the statements. This should also be verified, as the number of fir trees might be greater, given a quote in Sapsis et al. 2016 that reads, "A single large old-growth pine tree stores approximately the same amount of carbon as over a thousand 30 year old fir trees (M. Hurteau, Univ. of New Mexico, Albuquerque, personal communication)."¹¹

There is a small typo on page 93, it should read "see box 9" instead of "see box 8".

¹¹ Sapsis et al. 2016. Forest Fire, Drought, Restoration Treatments, and Carbon Dynamics: A Way Forward. California Forestry Note No. 121. Available at: http://calfire.ca.gov/resource_mgt/downloads/notes/NO.121-Fire_Drought_Restoration_and_CarbonDynamics.pdf