February 8, 2019

Shelby Livingston
Air Resources Board
1001 I Street
Sacramento, CA 95814

Dear Ms. Livingston:

Thank you for the opportunity to provide comments on the January Draft of the California 2030 Natural and Working Lands (NWL) Climate Change Implementation Plan. Sierra Club California and the Center for Biological Diversity appreciate agencies' recognition of the global climate crisis and their efforts in combating the climate crisis.

We support the overarching objective of the NWL Plan to improve conservation, restoration, and management of California's natural and working lands to enhance their resilience to worsening climate impacts, sequester carbon, and reduce GHGs.[1] However, if improperly administered or planned, interventions, particularly those aimed at the forests, could result in carbon losses and harm ecological function and resilience.

The current draft of the NWL Plan has key shortcomings, particularly in failing to accurately represent current scientific research on the state of California's forests and the management practices that promote forest carbon storage and ecological resilience.

As the state finalizes and implements the NWL Climate Change Implementation plans, agencies must:

- Protect environmental review in the form of CEQA and Timber Harvest Plans
- Prioritize actions that promote short and long-term carbon storage
- Use accurate modeling and monitoring tools and promote transparency in the development of these tools
- Encourage funding for programs, like the Healthy Soils Program, that will sequester carbon on the landscape
- Remove forest bioenergy from the Final Plan and inform biomass utilization conversations with real world data and science
- Prioritize conservation, reforestation, managed fire, and logging reductions in the Final Plan's forest management recommendations

(1) Protect CEQA Review and Prioritize Actions that Promote Short and Long-Term Carbon Storage Benefits

The NWL Plan's primary goal is to sequester carbon on the landscape, but such sequestration cannot come at the expense of California's native flora and fauna or ecosystem health. Therefore, the Draft's

[1] NWL Plan at 9 (objective 2).

suggestion that a next step is to modify CEQA[2] is unacceptable. Projects under the NWL Plan cannot forego essential environmental oversight and planning under the guise of benefiting the environment. **In the final plan, agencies should omit any recommendation that would result in reduced environmental oversight under CEQA or other environmental laws and regulations.**

Additionally, the plan should prioritize actions that result in long-term carbon benefits as supported by scientific research. While we appreciate that the January Draft includes goals to protect land from conversion, it does not adequately consider the potential for poorly-implemented fuel management operations to reduce forest carbon stocks in the short term without guaranteeing increased carbon sequestration in the future. Fuel reduction projects decrease carbon in the short-term with no scientifically-based guarantee that the short-term loss will result in long-term carbon benefits. Allowing increased tree removal with reduced oversight with no guarantee of climate mitigation is inconsistent with California's environmental aspirations. Without a guarantee -- or at the very least a high probability -- of long-term carbon benefit, short term carbon losses and negative environmental impacts associated with tree removal are unacceptable. Additionally, the Draft does not consider the benefits of wildlands conservation as it pertains to biological diversity and ecosystem health.

As detailed further below, the plan should prioritize forest management measures that can be scientifically demonstrated to have both short and long-term carbon benefits.

(2) Fund Programs that Sequester Carbon on Agricultural Lands

In his budget proposal speech, Governor Newsom mentioned his passion for healthy soils and his proposed budget directs $18 million to the Health Soils Program. Practices that increase carbon on the agricultural lands are often beneficial to the atmosphere, biological diversity and water quality and conservation.

The Final NWL Plan should continue to prioritize healthy soils funding and prioritize practices with co-benefits.

(3) Use Accurate Monitoring Tools

The Draft encourages the development of accurate monitoring tools to track the effectiveness of interventions. It is imperative that monitoring tools are accurate as they will determine what interventions the state uses moving forward. As detailed in our prior comments, we remain convinced that the CALAND model is not an adequate modeling tool for tracking expected climate benefits and informing the selection of management actions.

We are also concerned about Draft's lack of transparency regarding the CALAND model's GHG projections and their implications. The CALAND model projects that forest fuel reduction activities will result in significant carbon losses from forests to the atmosphere through at least the next several decades,[3] undermining the key objective of the Plan. However, the Draft fails to disclose or discuss these important results. Instead, the Draft only presents *combined* CALAND and COMET-Planner projections in Table 3—which shows significant carbon losses in 2030 of 21.6 MMT CO_2e under Scenario A and 56.8 MMT CO_2e under Scenario 2—but obscures the fact that these carbon losses are driven by

[2] NWL plan at 32.

[3] Although not presented in the January Draft, the November Workshop presentation for NWL Plan indicated that cumulative net emissions do not become negative until ~2037 under alternative A and ~2054 under alternative B.

logging/thinning activities.[4] As reflected in the CALAND results presented in the November workshop, the NWL Plan must be transparent that forest fuels reduction treatments – particularly thinning – are the primary driver of these carbon losses, while "less intensive forest management" and forest conservation provide significant immediate carbon benefits.[5] The Plan must also make clear that the large reductions in GHG emissions projected in 2100 "come with a high degree of uncertainty."[6]

Throughout the NWL process, agencies have not provided timely documentation or results from the CALAND model for public review. In this comment period, the public has not been given adequate time to review the 87-page technical document (dated January 7, 2019) for version 3 of the CALAND model, nor does the documentation provide sufficient results for public review. The technical documentation provides only one figure showing CALAND model projections--Figure 3 showing cumulative CO2e impacts of two scenarios under RCP 8.5. The agencies must provide comprehensive CALAND results for review, including the emissions projections for individual management activities under different time periods and scenarios. **Agencies should not use the CALAND model for decision-making until stakeholders have had ample time to review the model, its assumptions, and comprehensive results, and until it has been fully updated to address concerns.**

CARB's NWL carbon inventory also utilizes satellite imagery to estimate forest carbon and thus forest carbon stocks are measured largely based on canopy cover. As a result, thinning operations that remove large volumes of understory vegetation are not adequately measured as they have little effect on forest canopy. Conversely, carbon losses in forest fires can be overestimated as the satellite detects losses in the canopy, but does not consider the bulk of the tree and its carbon remain intact.

The Final NWL Plan should encourage public participation in the development of monitoring tools. Agencies must steer clear of unwarranted assumptions such as assuming that a fuel management intervention undoubtedly resulted in avoided carbon losses associated with a wildfire.

(4) Remove Forest Bioenergy from the Plan

The Draft remains problematic in including a large role for forest biomass energy as part of the forestry management measures including partial cut/thinning, understory clearing, and enhanced forest biomass utilization interventions. Incentivizing forest bioenergy is a key part of the Plan's overall vision for NWL.[7] As we have extensively pointed out in prior comments, burning forest biomass for energy is wholly incompatible with the Plan's overarching goal of storing carbon on the landscape and reducing GHG emissions.

As we have previously discussed, forest-sourced woody biomass energy generation emits about 50% more CO_2 per megawatt-hour of electricity produced than coal-fired power and three times the CO_2 of natural gas.[8] Scientific research shows that using forest biomass as a feedstock has a significant long-term net negative impact on the climate. Bioenergy converts stored carbon to CO_2 instantaneously, and numerous studies have shown that it can take decades to centuries to discharge the "carbon debt"

[4] The Draft presents the stand-alone GHG outcomes from the COMET-Planner model for changes in agricultural practices in 2030 (Table 2) which projects emissions reductions in both scenarios,
[5] The January 2019 technical documentation for the CALAND model briefly acknowledges that forest fuels reduction is the main driver of the large carbon losses ("While less intensive forest management reduces carbon emissions, increased forest fuel reduction dramatically increases carbon emissions.")
[6] NWL plan at 39.
[7] NWL Plan at 9.
[8] Booth, Mary S., 2014, Trees, Trash, and Toxics: How Biomass Energy Has Become the New Coal, Partnership for Policy Integrity, April 2, 2014, at Table 1, https://www.pfpi.net/wp-content/uploads/2014/04/PFPI-Biomass-is-the-New-Coal-April-2-2014.pdf.

associated with bioenergy production, even where "waste" materials like timber harvest residuals are used for fuel.[9] One study concluded that the resulting atmospheric emissions increase may even be permanent.[10] Policies that subsidize forest bioenergy divert funds from zero-carbon sources like solar and wind, slowing the transition to truly clean energy. **Therefore, measures that promote forest biomass energy should be removed from the Final Plan.**

Commendably, the Draft emphasizes non-emitting biomass utilization methods that will sequester (rather the emit) carbon such as mulch, soil additives, animal bedding and compost. Unfortunately, the Draft continues to prioritize bioenergy production as the chief biomass utilization method and does so without a framework for considering biomass utilization projects or guidelines for biomass utilization.

The bulk of bioenergy produced in California is produced in 1980s facilities that produce energy that is dirtier than natural gas or coal. These facilities emit large amounts of fine particulates and nitrous oxides; both contribute to lung and heart disease. According to a report touted by biomass incineration proponents, biomass incineration as it exists in the state today is only 15% cleaner in terms of carbon emissions than pile burning[11]. **At minimum, the NWL plan should explicitly reject this outdated technology as a means of utilizing biomass.**

There are new, small-scale bioenergy facilities that claim to have state of the art emission controls; some even claim to be carbon neutral or carbon negative. However, as the California Public Utilities Commission has discovered in its floundering bioMAT program, these facilities are fraught with difficulties. With offer prices five times higher than wind or solar generation, the bioMAT program struggles to spur bioenergy production. Interconnectivity logistics and market uncertainty often sink small-scale biomass projects before they get off the ground.

Through the CPUC and the Energy Commission, the state has invested millions of dollars and innumerable hours of staff time to bioenergy production with virtually no results. The focus on bioenergy as a disposal option continues to ignore that such facilities are highly polluting, climate-damaging, and not financially viable.

Instead of pursuing policies that prioritize the removal of trees from the forest, regardless of ecological and climate implications, state should encourage landowners and managers to prioritize the treatment of the 100-foot defensible space zone around homes and structures or where trees are in danger of falling on homes or infrastructure.

Before any effort to facilitate biomass utilization, the state must answer various questions at the state and local scales:

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[9] Manomet Center for Conservation Sciences, 2010, Massachusetts Biomass Sustainability and Carbon Policy Study: Report to the Commonwealth of Massachusetts Department of Energy Resources, Walker, T (Ed.), Natural Capital Initiative Report NCI-2010-03; Repo, Anna et al., 2011, Indirect carbon dioxide emissions from producing bioenergy from forest harvest residues, 3 GCB Bioenergy 107; McKechnie, Jon et al., 2011, Forest bioenergy or forest carbon? Assessing trade-offs in greenhouse gas mitigation with wood-based fuels, 45 Environmental Science and Technology 789; Mitchell, Stephan R. et al., 2012, Carbon debt and carbon sequestration parity in forest bioenergy production, 4 GCB Bioenergy 818; Schulze, Ernst-Detlef et al., 2012, Large-scale bioenergy from additional harvest of forest biomass is neither sustainable nor greenhouse gas neutral, 4 GCB Bioenergy 611; Booth, Mary S., 2018, Not carbon neutral: Assessing the net emissions impact of residues burned for bioenergy, 13 Environmental Research Letters 035001.

[10] Holtsmark, Bjart, 2012, The outcome is in the assumptions: Analyzing the effects on atmospheric CO_2 levels of increased use of bioenergy from forest biomass, 5 GCB Bioenergy 467.

[11] Springsteen, Bruce et al, 2011, Emission Reductions from Woody Biomass Waste for Energy as an Alternative to Open Burning, J. Air & Waste Manage. Assoc 61:63– 68

- What are the ecological and carbon implications of the specific project proposed?
- How would a biomass facility affect the demand for biomass feedstock and potentially drive biomass removal, and what are the ecological and carbon implications of that demand?
- How can the state and local agencies prioritize the treatment of houses and communities and the protection of life and property?
- What changes in planning and management are necessary to restore fire regimes?
- What are the air quality impacts of a biomass facility, including the emissions from transporting the feedstock?
- Would a biomass facility increase air pollution in an already impacted or burdened community or air basin?

Rather than continuing their investment in bioenergy, agencies must answer these questions with real data not merely anecdotes. The Final NWL Plan should recommend that the state answer these basic questions before continuing to prioritize or invest money in utilization methods that may or may not be feasible and may or may not have environmental benefits.

(5) Focus Forest Management Interventions on Forest Conservation, Reforestation, Reductions in Logging, and Managed Wildland Fire

The Draft includes a number of troubling recommendations that would be counterproductive for reducing carbon emissions and would damage vital ecosystems. The Draft:

- Aims interventions at logging/thinning for fuels reduction in wildland, which increases emissions in the near term and does not guarantee emission reductions or increased carbon stocks
- Neglects managed fire as a forest management tool

The Draft focuses forest management interventions on logging/thinning (i.e., partial cut/thinning and clearing the understory of vegetation) which will undermine the Plan's objective of maintaining forest lands as a resilient carbon sink. The Draft assumes that partial cut/thinning and understory clearing "enhance net forest carbon accumulation and reduce fraction of high-severity wildfire for 20 years without additional treatment," but these assumptions are contradicted by scientific research. Instead, research indicates that thinning forests to reduce fire activity decreases forest carbon stocks and results in increased carbon emissions to the atmosphere that can persist for decades to centuries.[12] As summarized by an expert review, "[t]hinning forests to reduce potential carbon losses due to wildfire is in direct

[12] Rhodes, J.J. and W.L. Baker, 2008, Fire probability, fuel treatment effectiveness and ecological tradeoffs in western U.S. public forests, Open Forest Science Journal 1:1-7; Mitchell, S.R. et al. 2009, Forest fuel reduction alters fire severity and long-term carbon storage in three Pacific Northwest ecosystems. Ecological Applications 19: 643-655; Law, B.E. and M.E. Harmon, 2011, Forest sector carbon management, measurement and verification, and discussion of policy related to climate change, Carbon Management 2: 73-84; Campbell, J.L. et al. 2012, Can fuel-reduction treatments really increase forest carbon storage in the western US by reducing future fire emissions? Frontiers in Ecology and the Environment 10: 83-90; Campbell, J.L. and A.A. Ager, 2013, Forest wildfire, fuel reduction treatment, and landscape carbon stocks: a sensitivity analysis, Journal of Environmental Management 121: 124-132; Loehman, R.A. et al. 2014, Wildland fire emissions, carbon, and climate: Seeing the forest and the trees – A cross-scale assessment of wildfire and carbon dynamics in fire-prone, forested ecosystems, Forest Ecology and Management 317: 9-19; Restaino, J.C. and D.L. Peterson. 2013,Wildfire and fuel treatment effects on forest carbon dynamics in the western United States, Forest Ecology and Management 303: 46-60; DellaSala, D.A. and M. Koopman, 2016, Thinning Combined with Biomass Energy Production Impacts Fire-Adapted Forests in Western United States and May Increase Greenhouse Gas Emissions, Reference Module in Earth Systems and Environmental Sciences.

conflict with carbon sequestration goals, and, if implemented, would result in a net emission of CO_2 to the atmosphere because the amount of carbon removed to change fire behavior is often far larger than that saved by changing fire behavior, and more area has to be harvested than will ultimately burn over the period of effectiveness of the thinning treatment."[13] Similarly, Oregon's 2018 Forest Carbon Accounting Project Report concluded that most thinning treatments for fire reduction "result in reduced carbon stores that do not recover in any meaningful time periods":

> There is ongoing discussion of how to align forest fire policies and forest health restoration treatments (generally, forest biomass thinning and prescribed fire as undertaken by the US Forest Service and others) with increased forest carbon storage. Current analysis suggests that treatments which include medium to heavy thinning result in reduced carbon stores that do not recover in any meaningful time periods. Forest managers may elect to pursue thinning and other restoration treatments to achieve other goals, but to align these activities with forest carbon goals, they should be seeking methods that involve the least loss of carbon stores and the earliest recovery of these stores. [14]

Instead, the Plan should emphasize science-based management measures that promote carbon storage and increase forest resilience to climate change – namely, forest land conservation, reforestation, reductions in logging, and managed wildland fire. For example, a recent study in Oregon concluded that the most effective measures for increasing forest carbon stocks were protecting forests from logging on federal lands and extending timber harvest rotations from 35 to 70 years on private lands, followed by reforestation and afforestation.[15] Using forest harvest residues for bioenergy production increased cumulative net emissions compared to leaving residues in the forest to slowly decompose.[16] Avoiding emissions from deforestation and forest degradation is also recommended by the Intergovernmental Panel on Climate Change as an effective means for keeping global warming below 1.5° C globally.

The Plan should also prioritize restoring a natural fire regime though managed wildland fire – i.e., allowing naturally ignited fire to burn in the wildlands and focusing fire suppression more narrowly to lands surrounding towns in combination with home fire-safety measures and the creation of defensible space around structures.[17] There is broad scientific consensus that there is currently far less fire of all intensities in western US forests than there was historically, prior to fire suppression, and that restoring fire is essential for increasing forest health and resilience. Research indicates that restoring natural ecological processes such as wildland fire ("prescribed natural regeneration") best supports resilient, biodiverse forests capable of storing more carbon.[18]

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[13] Law, B.E. and M.E. Harmon, 2011, Forest sector carbon management, measurement and verification, and discussion of policy related to climate change, Carbon Management 2: 73-84.

[14] Oregon Global Warming Commission, 2018, Forest Carbon Accounting Project Report. https://static1.squarespace.com/static/59c554e0f09ca40655ea6eb0/t/5c094beaaa4a99fa6ad4dcde/1544113138067/2018-OGWC-Forest-Carbon-Accounting-Report.pdf.

[15] Law, B.E. et al., Land use strategies to mitigate climate change in carbon dense temperate forests, 115 PNAS 3663-3668 (2018)

[16] *Id.*

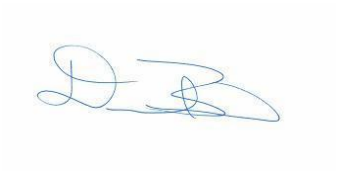
[17] Cohen J.D., Preventing disaster, home ignitability in the wildland-urban interface, J Forestry 98(3):15–21; Syphard, A.D. et al. 2014, The role of defensible space for residential structure protection during wildfires, International Journal of Wildland Fire 23:1165-1175; Scott, J.H. et al. 2016, Examining alternative fuel management strategies and the relative contribution of National Forest System land to wildfire risk to adjacent homes – A pilot assessment on the Sierra National Forest, California, USA, Forest Ecology and Management 362: 29-37.

[18] Dellasala, D.A. et al. 2017, Accommodating mixed-severity fire to restore and maintain ecosystem integrity with a focus on the Sierra Nevada of California, USA. Fire Ecology 13: 148-171; Zachmann, L.J., et al. 2018, Prescribed

These activities will result in healthier forest ecosystems that include more large trees and healthy soil, which will sequester and store more carbon. Forest and habitat conservation preserve current carbon stocks and persistent growth will continue to sequester carbon into the future. The Final NWL Plan should prioritize forest preservation and aim for a natural fire regime in wildlands.

Again, Sierra Club California and the Center for Biological Diversity thank you and the State for recognizing the importance of carbon sequestration and storage in our statewide and global climate mitigation goals, but we caution that the NWL Climate Change Implementation Plan must be thoughtfully constructed and administered, as recommended above, so that it results in actual net carbon storage in our ecosystems in the short and long term, providing true benefits in fighting climate change and protecting California ecosystem health.

Sincerely,



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