August 3, 2021

Ms. Rajinder Sahota,
Deputy Executive Officer
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comments on Natural and Working Lands in the 2022 Climate Change Scoping Plan

Dear Ms. Sahota:

The Bioenergy Association of California (BAC) submits these comments on the Natural and Working Lands presentations on July 20, 2021. BAC strongly supports the inclusion of NWL in the 2022 Climate Change Scoping Plan. BAC urges the Air Resources Board to expand the focus of the NWL chapter to include the following:

- A specific focus on Short-Lived Climate Pollutant emissions and opportunities to reduce those emissions from NWL;
- Including anthropogenic black carbon emissions, including human caused wildfires, in the inventory of emissions from NWL;
- Strategies to reduce anthropogenic black carbon emissions to meet the requirements of SB 1383;
- Opportunities for carbon negative emissions from BECCS (Bioenergy with Carbon Capture and Storage);
- Opportunities to use biochar for permanent carbon sequestration on NWL; and
- Including the long-term climate benefits of forest fuel thinning.

The Bioenergy Association of California (BAC) represents more than 80 local governments, public agencies, private companies, environmental and community groups, investors, utilities, research institutions and others. BAC's public sector members include local air districts, environmental agencies, waste and wastewater agencies, publicly owned utilities, and public research institutions. BAC's private sectors members include energy and technology firms, project developers and investors, investor owned utilities, waste haulers, food and agricultural producers, and

more.

BAC submits the following comments on the July 20 Natural and Working Lands presentations for the 2022 Climate Change Scoping Plan.

1. **The NWL Chapter Should Focus on Near-Term Urgency of Reducing SLCP Emissions in Addition to the Long-Term Goal of Carbon Neutrality.**

Natural and Working Lands present the largest opportunities to reduce Short-Lived Climate Pollutants – black carbon from wildfire and methane from dairies - in California. SLCP reductions are the most urgent step California can take to address climate change since SLCP reductions benefit the climate right away. The two most prevalent SLCPs in California – black carbon and methane – are also harmful air pollutants whose reduction benefits public health in addition to the climate.

According to many climate scientists, reduction of SLCP emissions is "the last lever we have left" to avoid catastrophic climate change.[1] It is critical, therefore, to include a specific focus on SLCP reduction opportunities in the NWL chapter of the Scoping Plan.

The two largest sources of SLCP emissions in California are wildfires and dairies,[2] so the NWL plan should include a significant focus on opportunities and strategies to reduce SLCP emissions from these sources, as well as open burning of forest and agricultural waste.

2. **The NWL Strategy Must Address Emissions from Human Caused Fires in the Emissions Inventory and Reduction Strategies.**

Large fires in California are enormous sources of climate pollution, especially black carbon emissions, but also methane and carbon dioxide. SB 1383 requires California to cut anthropogenic black carbon emissions 50 percent and methane emissions 40 percent by 2030.[3] It will not be possible to meet those requirements, especially the requirement to cut black carbon in half by 2030, without including human-caused wildfire emissions in the NWL inventory.

While some large fires are triggered by natural causes such as lightening, most large fires are anthropogenic in origin and should be included in the NWL inventory. CalFire determines the cause of every major fire in the state. Over the past decade, the vast majority of large fires has been caused by human activity or infrastructure and should, therefore, be included in the state's carbon inventory for NWL.

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[1] Presentation of Dr. V. Ramanathan, UC San Diego and Scripps Institute, Presentation June 24, 2021 at MoveLA Symposium on Short-Lived Climate Pollutant Reductions.

[2] *Short-Lived Climate Pollution Reduction Strategy,* adopted by the California Air Resources Board in March 2017.

[3] Health and Safety Code section 39730.5.

3. **The NWL Strategy Must Include Strategies to Reduce Anthropogenic Black Carbon to Meet the Requirements of SB 1383.**

In addition to including anthropogenic black carbon in the NWL inventory, the NWL strategy should include specific measures to reduce anthropogenic black carbon on NWL. In particular, the NWL chapter should address at least the following:

- Emissions from prescribed fire, pile and burn, and pile and decay of forest waste compared to mechanical thinning;
- Emissions from advanced technology (non-combustion) bioenergy and opportunities to reduce those emissions;
- Opportunities to convert forest and agricultural waste to carbon negative emissions;
- Emissions comparisons between different end uses of forest and agricultural biomass, including different forms of bioenergy, finished wood products, compost, mulch, and wood chips, and how those emissions compare to open burning, pile and burn, or pile and decay of that biomass waste; and
- Opportunities to use forest and/or agricultural waste for carbon sequestration.

4. **The NWL Strategy Should Identify Opportunities and Strategies for Carbon Negative Emissions from Livestock, Agricultural and Forest Waste.**

The NWL strategy should identify opportunities to convert forest, agricultural and livestock waste to carbon negative emissions that will be essential to achieve carbon neutrality. According to Lawrence Livermore National Lab, biomass conversion with carbon capture and storage (BECCS) can provide more than two-thirds of all the carbon negative emissions needed to reach carbon neutrality by mid-century.[4] CARB's recent report to the Legislature on the state's climate investments also shows that these are the most cost-effective of all of the state's climate investments to date.[5] BAC urges CARB, therefore, to identify specific strategies to accelerate the conversion of livestock, agricultural and forest waste to carbon negative emissions as part of the NWL strategy. The strategy should identify the size of the opportunity by feedstock sector, the regulatory and financial barriers, technology needs, and ways to accelerate market development.

[4] Lawrence Livermore National Lab, *Getting to Neutral – Options for Negative Carbon Emissions,"* January 2020, at page 2.

[5] CARB's Annual Report to the Legislature: *California Climate Investments Using Cap-and-Trade Auction Proceeds*, issued April 2021, Table 2.

5. **The NWL Strategy Should Address Opportunities and Strategies to Accelerate the Use of Biochar for Sequestration and Other Uses.**

BAC urges CARB to focus on opportunities to produce and use biochar as an important strategy to increase sequestration and reduce emissions from NWL. Biochar can be generated as a byproduct of gasification or pyrolysis of forest and agricultural waste or it can be the sole product. Once generated, it can be used to provide permanent carbon sequestration[6] or it can be used in a variety of other ways to reduce enteric fermentation (emissions from cows), reduce emissions from cement, replace fossil fuels in other manufactured products, and provide water filtration. Given the enormous volume of forest and agricultural waste that California must address, and the many beneficial end uses of biochar that can be generated from that waste, the NWL strategy should assess the net carbon benefits of different uses of biochar and recommend strategies to accelerate its production and use. In particular, BAC urges CARB to include an assessment of:

- The lifecycle carbon analysis of different end uses of biochar;
- Strategies to accelerate market development for the most beneficial uses;
- Regulatory incentives such as carbon offset protocols and other incentives to accelerate biochar production and use;
- Funding sources that could be used to demonstrate and deploy biochar production and use on NWL.

6. **The NWL Strategy Should Recognize the Climate Benefits of Forest Fuel Thinning.**

Both SB 901 (Dodd, 2018) and the 2020 Forest Stewardship Agreement entered into between California and the U.S. Forest Service require substantial forest fuel removal. The NWL Strategy should include a discussion of the carbon benefits that forest fuel thinning ("treatment" or "reduction") can provide. Forest fuel reductions – through selective and strategic prescribed burning and/or mechanical thinning activities – can provide significant climate benefits through:

- Mitigating wildfire size and severity on both treated and adjacent untreated forest stands. This reduces wildfire emissions, tree mortality and subsequent decay and rot, and conversion of forest to long-term grassland and shrubland.
- Enhancing the growth rate of the thinned forest compared with the untreated stagnant forest due to a reduction in competition for water, nutrients, and light.
- Utilizing fuel treatment byproducts (small diameter stems, limbs, tops, brush) as long-lived wood products that sequester carbon and displace fossil fuel intensive alternatives to wood products, such as concrete and steel; and renewable energy production that displaces fossil fuel energy alternatives.

[6] Lawrence Livermore National Lab report, footnote 4 above.

Fuel treatments produce a short-term carbon deficit. However, they can have long term benefits particularly where wildfire threat is significant and the probability of future interaction between wildfire and treatments is likely – see references attached below.

The NWL strategy should support the on-going development of a forest fuel thinning carbon offset protocol that incorporates the latest science in forest growth and wildfire dynamics and combines field data with probability-based wildfire models. The protocol has been used to demonstrate GHG benefits in a case-study evaluation of simulated fuel treatments in the Eldorado National Forest. The protocol is a more comprehensive version of the Quantification Methodology that is an approved part of CARB's GHG GGRF Program. The protocol is currently undergoing review in the Climate Action Reserve Climate Forward program.

Thank you for your consideration of these comments on the Natural and Working Lands presentations for the 2022 Climate Change Scoping Plan.

Sincerely,

Julia A. Levin
Executive Director

cc: The Honorable Matt Baker, Deputy Secretary for Energy, CNRA
The Honorable Amanda Hansen, Deputy Secretary for Climate, CNRA
The Honorable Jessica Morse, Deputy Secretary for Forests, CNRA

References for Forest Fuel Treatment Benefits

Hurteau M, M North (2009) Fuel treatment effects on tree-based forest carbon storage and emissions under modeled wildfire scenarios. Frontiers in Ecology and the Environment 7:409-414

Krofcheck, DJ, CC Remy, AL Keyser, MD Hurteau (2019) Optimizing forest management stabilizes carbon under projected climate and wildfire. J. Geophys. Res. Biogeosciences 0. https://doi.org/10.1029/2019JG005206

Krofcheck DJ, MD Hurteau, RM Scheller, EL Loudermilk (2018) Prioritizing forest fuels treatments based on the probability of high severity fire restores adaptive capacity in Sierra forests. Global Climate Change Biology 24:729-737

Liang S, MD Hurteau, AL Westerling (2018) Potential decline in carbon carrying capacity under projected climate wildfire interactions in the Sierra Nevada Sci Rep 7:2420

Liang, S., MD Hurteau, AL Westerling (2018) Large-scale restoration increases carbon stability under projected climate and wildfire regimes. Front. Ecol. Environ. 16, 207–212. https://doi.org/10.1002/fee.1791

Loudermilk EL, A Stanton, RM Scheller, TE Dilts, PJ Weisberg, C Skinner, J Yang (2014) Effectiveness of fuel treatments for mitigating wildfire risk and sequestering forest carbon: A case study in the Lake Tahoe Basin. Forest Ecology and Management 323:114-125

North MP, MD Hurteau (2011) High-severity wildfire effects on carbon stocks and emission in fuels treated and untreated forest. Forest Ecology and Management 261:1115-1120

Safford HD, DA Schmidt, CH Carlson (2009) Effects of fuel treatments on fire severity in an area of wildland–urban interface, Angora Fire, Lake Tahoe Basin, California. For. Ecol. Manag. 258, 773–787. https://doi.org/10.1016/j.foreco.2009.05.024

Stephens SL, JD McIver, REJ Boerner, CJ Fettig, JB Fontaine, BR Hartsough, PL Kennedy, DW Schwilk (2012) The Effects of Forest Fuel-Reduction Treatments in the United States. BioScience 62, 549–560. https://doi.org/10.1525/bio.2012.62.6.6

Stephens SL, JJ Moghaddas, BR Hartsough, EE Moghaddas, NE Clinton (2009) Fuel treatment effects on stand-level carbon pools, treatment-related emissions, and fire risk in a Sierra Nevada mixed-conifer forest. Can. J. For. Res. 39, 1538–1547. https://doi.org/10.1139/X09-081

Tubbesing CL, DL Fry, GB Roller, BM Collins, VA Fedorova, SL Stephens, JJ Battles (2019) Strategically placed landscape fuel treatments decrease fire severity and promote recovery in the northern Sierra Nevada. For. Ecol. Manag. 436, 45–55. https://doi.org/10.1016/j.foreco.2019.01.010

Winford EM, JC Gaither (2012) Carbon outcomes from fuels treatment and bioenergy production in a Sierra Nevada forest. Forest Ecology and Management 282:1-9