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January 10, 2016

Assistant Secretary Claire Jahns and Chief Rajinder Sahota
California Environmental Protection Agency
Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Lawrence Berkeley National Laboratory Model Workshop Comments

Dear Claire Jahns and Rajinder Sahota

On behalf of Defenders of Wildlife and our more than 170,000 California members, we thank you for this opportunity to comment on the modeling workshop for Natural and Working Lands (NWLs) held on December 14th, 2016. Defenders supports the state's commitment to the conservation and restoration of NWLs for their greenhouse gas (GHG) reduction benefits. This commitment was reinforced with the enactment of Senate Bill 1386. The conservation and restoration of NWLs have the benefit of sequestering a tremendous amount of GHGs, while also providing numerous co-benefits to humans and wildlife. We believe, however, that the Lawrence Berkeley National Laboratory (LBNL) model needs to include a broader range of information so NWLs can maximize their GHG sequestration benefit.

We believe the LBNL model must include a quantifiable target with specific implementation measures for the conservation of NWLs. A conservation strategy focused on keeping NWLs intact and undisturbed is particularly important as it is likely the best GHG sequestration strategy for some land types, such as desert lands.

We also believe the state should consider more ambitious conservation target scenarios than 50% and 25% of baseline urban growth (urban expansion) for the model's suggested conservation goals. Considering there is a predicted loss of 294,000 acres of shrubland at baseline, decreasing urban growth by 50-75% of 2050 predicted growth levels still allows for a conversion of 74,000 acres of NWLs in the best case scenario. Instead of a preventative conversion strategy, the state should have a proactive conservation strategy that includes conservation easements as a tool to conserve more NWLs than current baseline.

We also would like clarification on exactly how the state will utilize the LBNL model to set GHG reduction targets in the NWLs sector. With the current data available to the public, the study appears to be missing some key components. For example, the study only included a few of the many management practices that can be employed to sequester GHGs. Further, data on baseline GHG sequestration did not include root carbon sequestration and did not take into account GHG

loss from soil disturbance. Without these key components, the study does not fully evaluate and articulate how much GHG is sequestered. Therefore, it is a tool of limited value and utility for calculating conservation and management goals. We also request that you release more details on the assumptions and definitions that went into development of the model.

Also note, utilizing NWL strategies to meet 2050 GHG reduction goals, like conservation and restoration, can be closely aligned with the state's adaptation strategies. We recommend making climate adaptation strategies a top priority and include this co-benefit as an actionable goal within the state's GHG reduction plan. A significant issue with the state's adaptation strategies, like the State Wildlife Action Plan or the Safeguarding California Plan, is the lack of funding for implementation. Aligning these goals with the state's goals for GHG reduction will go a long way in helping implement them.

Finally, we urge the state to develop specific GHG reduction plans for each land type. There have been several steps taken to establish specific plans for forest and agriculture in the NWLs sector. However, a vision for other land types such as deserts, wetlands, and mountain meadows have not been developed. For these land types, the plans must include a research and monitoring component to further develop GHG sequestration data on these lands. For more specific information on carbon sequestration on desert lands and the benefits of including them in the NWLs portion of the scoping plan, please see below bullet points with references:

- Arid lands encompass 47% of the earth's surface and represents the 5th largest soil organic stored carbon.[1] In California, desert lands make up 28% (more than 29 million acres) of the state's land mass, representing the second largest land type in the state.[2]
- A large, but relatively unknown, amount of CO2 is fixed and stored as organic carbon in deserts, with estimates ranging from 60-600g/m^2/y.[3]
- What is known is that respired CO2 in the desert is dependent upon the vegetation composition and activity; that is why including root sequestration in the LBNL model is so important.[4]
- According to data gathered in a Stanford study, since 1996, .386 petagrams of organic carbon was stored in California deserts to a depth of one meter or the equivalent of 1.4 billion metric tons of atmospheric CO2. [5] As CO2 increases in the atmosphere, more carbon is stored in desert lands.[6]

[1] *Greater ecosystem carbon in the Mojave Desert after ten years exposed to elevated CO2*, RD Evans at el, Nature Climate Change (Apr 2014), pg 1; (APR 2014)
[2] Desert Landscape, Mojave Desert Land Trust. (2015). http://www.mojavedesertlandtrust.org/landscape.php.
[3] *Carbon Balance in California Deserts: Impacts of widespread solar power generation.* University of California Riverside Center of Conservation Biology. Pg 11 (2014)
[4] *Carbon Balance in California Deserts: Impacts of widespread solar power generation.* University of California Riverside Center of Conservation Biology. Pg 11 (2014)
[5] *CO2 Emissions/Reduction Potential Associated with Desert Ecosystems*. Stanford Students Environmental Consulting pg. 6
[6] *Carbon Balance in California Deserts: Impacts of widespread solar power generation.* University of California Riverside Center of Conservation Biology. Pg 11 (2014)

- Organic carbon is converted to CO2 when desert soil is disturbed meaning development on these lands creates a greater risk of CO2 emissions.[7] This makes protection of untouched desert lands so important for the reduction of GHG emissions.
- According to a study published by the National Park Service, the desert national parks located in California make up some of the largest societal value in the conterminous United States when that value is associated with carbon sequestration.[8] Specifically the Mojave NPRES ranks 6th at $25 million, Joshua Tree NP ranks 8th at $16 million, and Death Valley ranks 9th at $15 million among National Parks.[9] In fact it is estimated that deserts already account for 15 to 28 percent of the current land based uptake of CO2.[10]

Conclusion

Thank you for the opportunity to comment on the LBNL model. It is a positive step forward for a climate resilient California. Please consider the information presented to you in this comment letter. Should you require more information or have any questions, feel free to contact me at jhanthorn@defenders.org or (916) 442-5780.

Sincerely,

Joshua Hanthorn
Defenders of Wildlife
California Program Associate

[7] *CO2 Emissions/Reduction Potential Associated with Desert Ecosystems*. Stanford Students Environmental Consulting pg. 2
[8] *Terrestrial Carbon Sequestration in National Parks*, National Park Service US Department of the Interior, pg 9 (2014)
[9] *Terrestrial Carbon Sequestration in National Parks*, National Park Service US Department of the Interior, pg 9 (2014)
[10] *Mojave Desert is an amazing carbon storehouse*, High Country News, http://www.hcn.org/blogs/goat/new-study-that-the-mojave-desert-is-an-amazing-carbon-storehouse-1/print_view ; (APR 2014).