Foothills Landscape Project (FLP) Climate Change Report (CCR) Review

The effects of climate change on the FLP is also provided in the FLP Aquatic Report and Soil Report. I am also offering comments to these documents, and incorporate them herein without reiteration.

I request that the CCR be revised to include the minimum and maximum for numerical estimates, and that if actual project values fall outside the range, the public will be given a subsequent comment period.

“Management actions, such as those proposed, improve the resilience of forests to climate-induced stressors. Harvesting trees for long-lived forest products may help sustain the current strength of the carbon sink in U.S. forests…” CCR pg 3 “Under this (no action) alternative, not acting to improve forest health or to restore hardwoods and southern yellow pine ecological systems would likely result in lower carbon sequestration, but would also create and maintain an herbaceous layer with a capacity for carbon storage and which may be more resistant to long-term climate change.” CCR pg 4 “The action alternative would initially release carbon, leave fewer trees to store carbon…” CCR pg 5 I believes that the large scale tree harvest proposed in the FLP would deplete the total carbon sink in the short and long term, and that the above CCR statements are not been adequately supported in USFS documents, including this CCR.

The benefits of tree harvest that the CCR presents uses words such as “may” and “likely”. Due to the large uncertainty in the current science of carbon sequestration by temperate forests, and the CCR complete discount of carbon sequestration in forest soil, I request that the CCR be revised to consider the sequestration of soil, and that the large scale timber harvest proposed in the FLP would worsen short and long term carbon sequestration in the project area.

The CCR references Birdsey[[1]](#footnote-1); some large omissions in this study that render it not useful:

“We accounted for carbon in forest ecosystem pools (except soil)…”pg 1461

None of the charts in “Fig. 7 How carbon stocks change after disturbance” have a scale shown. Pg 1467

I request that the CCR be revised to include the following important studies which show the importance of old-growth forests and soil in carbon sequestration:

Luyssaert meta-analysis[[2]](#footnote-2) “…it is generally thought that ageing forests cease to accumulate carbon. Here we report a search of literature and databases for forest carbon-flux estimates. We find that in forests between 15 and 800 years of age, net ecosystem productivity (the net carbon balance of the forest including soils) is usually positive. Our results demonstrate that old-growth forests can continue to accumulate carbon, contrary to the long-standing view that they are carbon neutra…Old-growth forests accumulate carbon for centuries and contain large quantities of it. We expect, however, that much of this carbon, even soil carbon, will move back to the atmosphere if these forests are disturbed.”[[3]](#footnote-3)

American Forests “US forests and forest products currently offset 15 percent of US economy-wide carbon dioxide emissions from burning fossil fuels through carbon sequestration—and up to three-quarters of that carbon is contained in forest soils. However, most greenhouse gas mitigation policies and programs have focused on managing this natural climate protection by managing aboveground biomass alone, and little consideration is given to the large and critical pool of soil carbon.”[[4]](#footnote-4)

The CCR does not reference USFS Considering Forest and Grassland Carbon in Land Management. Gen. Tech. Rep. WO-95[[5]](#footnote-5)

“…old growth forest conditions that store among the largest quantities of aboveground biomass in the terrestrial biosphere.” WO-95 Pg 14

“Ultimately, the carbon stored in wood products is returned to the atmosphere through decomposition or combustion, although the time needed for this return can vary widely based on the use and longevity of materials made from harvested wood.” WO-95 Pg22 I request that the CCR be revised to address the carbon release from harvested timber.

“Decreasing the intensity of forest harvest is one way to decrease carbon losses to the atmosphere… the “no harvest” option commonly produces the highest forest carbon stocks…Managed stands typically have lower levels of forest biomass than unmanaged stands, even though the annual rate of sequestration may be higher in a younger forest…found that less-frequent harvests and greater levels of structural retention (e.g., residual trees) resulted in increased forest carbon stocks…Forest harvest can cause disturbance to the ground, releasing carbon from soils and the forest floor” WO-95 Pg 25 I request that the CCR be revised to address the total forest biomass and carbon release from soil disturbance instead of focusing solely on tree age.

“Fuel-reduction treatments lower the density of the forest stand, and, therefore, reduce forest carbon. Some studies suggest that fuel-reduction treatments create carbon benefits over time by increasing the growth of the residual stand and reducing risk of catastrophic fire…The results of studies to date, however, are divided as to whether this benefit can be realized. Prescribed fires also result in the release of greenhouse gas emissions, which need to be accounted for when considering the relationship between fire and carbon…Additionally, carbon emissions from prescribed fire, the machinery used to conduct treatments, or the production of wood for bioenergy may reduce or negate the carbon benefit associated with fuel treatments, especially when treatments are repeated... Further, there are uncertainties in predicting the actual occurrence of wildfire and its impacts on forests due to an incomplete scientific understanding of ecological response to fire, of fire behavior response to treatments, and inability to predict fire occurrence at the stand level... “ WO-95 pg 26 I request that the CCR be revised to address carbon emissions from prescribed fires and the uncertainty associated with wildfire occurrence and response to proposed FLP activities.

WO-95 references a Scharlemann report[[6]](#footnote-6) which states“…most climate change mitigation policies have focused on carbon stored in phytomass… However, in addition to phytomass carbon, soil carbon is likely to be of major importance, as soils and surface litter store two- to three-times as much carbon in organic form as there is carbon in the atmosphere globally, as referred to in the Kyoto Protocol.” Pg 81 “The SOC (soil organic carbon) stock estimates can also vary because some studies included inorganic soil carbon, or varying levels of stone content or disturbance, in the carbon stock estimates. This is difficult to disentangle as most studies do not state explicitly which carbon pools, stone content and levels of disturbance were included. In some cases, the same authors using the same basic data come up with different total SOC stock estimates… Such large differences in global SOC stock estimates… highlight the need for caution to be applied during data processing and interpretation of differences in estimates…”pg 82 “Uncertainty in modeled estimates of soil carbon is very large.” Pg 85 I request that the CCR be revised to address the range of possible under both alternatives considered soil carbon.

“Past and present projects (Forest Service) including periodic prescribed burning, woodland creation and commercial thinning have reduced hazardous fuels, improved growing conditions for trees, and increased habitat diversity that includes a variety of understory grasses, forbs and shrubs on portions of national forest system lands.” CCR pg 5 I request that this statement be removed, as it is not specific to the FLP; it is not supported for the FLP area.

The CCR does not address carbon emissions from fuel for equipment use or transportation. I request that the CCR be revised to include a carbon life-cycle assessment by factoring in all inputs and outputs as a result of the FLP.

1. Birdsey, R., Pregitzer, K., Lucier, A. 2006. Forest carbon management in the United States: 1600-2100. Journal of Environmental Quality. 35: 1461-1469 [↑](#footnote-ref-1)
2. Luyssaert, Sebastiaan & Ernst Detlef, Schulze & Börner, Annett & Knohl, Alexander & Hessenmöller, Dominik & Law, Beverly & Ciais, Philippe & Grace, John. (2008). Old-growth forests as global carbon sinks. Nature. 455. 213-5. 10.1038/nature07276. [↑](#footnote-ref-2)
3. Luyssaert, Sebastiaan & Ernst Detlef, Schulze & Börner, Annett & Knohl, Alexander & Hessenmöller, Dominik & Law, Beverly & Ciais, Philippe & Grace, John. (2008). Old-growth forests as global carbon sinks. Nature. 455. 213-5. 10.1038/nature07276. [↑](#footnote-ref-3)
4. American Forests accessed 1/7/20 https://www.americanforests.org/priorities/climate/forest-soil-carbon-initiative/ [↑](#footnote-ref-4)
5. Janowiak, M.; Connelly, W.J.;Dante-Wood,  K.; Domke, G.M.; Giardina, C.; Kayler, Z.; Marcinkowski, K.; Ontl, T.; Rodriguez-Franco, C.; Swanston, C.; Woodall, C.W.; Buford, M. 2017. Considering Forest and Grassland Carbon in Land Management. Gen. Tech. Rep. WO-95 https://www.fs.usda.gov/treesearch/pubs/54316 [↑](#footnote-ref-5)
6. Jörn PW Scharlemann, Edmund VJ Tanner, Roland Hiederer & Valerie Kapos(2014) Global soil carbon: understanding and managing the largest terrestrial carbon pool, CarbonManagement, 5:1, 81-91, DOI: 10.4155/cmt.13.77 [↑](#footnote-ref-6)