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RE: **Comments regarding Public Comment Draft, Greenhouse Gas Emissions of Contemporary Wildfire, Prescribed Fire, and Forest Management Activities**

Dear Ms. Huang,

Thank you for the opportunity to comment on this draft report. As a practicing Registered Professional Forester, this subject is of great interest to me. My comments will start with specific items and will close with general impressions of the document.

Executive Summary

In the section titled "Wildfire Emissions", Figure E-1 shows the estimated annual CO₂ emissions from wildfire by general vegetation type. For the forest and woodland sectors, this graph and explanatory paragraphs should include continuing emissions from trees killed by wildfire. Decomposition rates by species are known and, based on fire severity index, could be included in the model for a more complete and accurate report. If not included in this report, the omission should be noted.

In the section titled "Non-Fire Forest Management Activities", the third sentence states "These estimates do not include soil carbon." It would be appropriate to also include the statement "These estimates do not include carbon captured by forest regeneration". Unless I missed that discussion in this report, regeneration of forest stands, whether resulting from timber harvest or following wildfires, is left out of the calculations for this report. Based on timberland site class, calculating the growth rates of these stands and the consequential carbon sequestration should not be a difficult exercise. Both the Forest Vegetation Simulator (FVS) model and the Forest and Stand Evaluation Environment (FORSEE) model are capable of developing these reports.

In the section titled "Ecosystem Carbon Flow", the paragraph discusses ecosystem carbon transformed from forest management activities attributed to "... wood that may be cut or damaged during this process." I understand and agree that vegetation that is cut through forest management activities is transformed to a different carbon pool. However, saying that vegetation that is damaged is transformed is an oversimplification, and often does not match what actually occurs on the ground. During forest management activities, vegetation that is damaged may be cut or die and transform to a different pool. Other vegetation may have its growth rate either temporarily or permanently reduced, but it is still taking up carbon, so that it does not transform into another carbon pool. This should be added to the report for clarity.

Introduction

In the section titled "Scope of This Analysis", the second paragraph states "Some forest management activities result in ecological outcomes that can enhance the rate of carbon sequestration or resiliency of carbon stores. To inventory these benefits at a state-wide level would require a complex model and additional research to analyze the retrospectively observed carbon gains and attribute them to either prior forest management activities or natural processes." Again, using FVS and the Forest Service's

FACTS database one could certainly, at a coarse, state-wide scale, develop carbon sequestration values. Working with CAL FIRE to get carbon flux patterns from timber harvesting by acres and intensity, CARB should be able to then differentiate, at a state-wide scale, the rate of carbon sequestration and resiliency for forest management activities versus natural processes.

Section 2, Overview of Data and Methodology, subsection 2.2.1, Data Sources Used in This Analysis

The list of entities should include private individuals as a class who conducts forest management activities. While these entities may be small (down to just a few acres), they form a significant portion of the forest landowners in California. These small, private landowners conduct forest management activities, including THPs that are less than 100 acres, which can and do have an effect on carbon stores, sequestration, and resiliency.

The last paragraph in this subsection references “The California Forest Practice Rules GIS (FGP) database”. This should read “The California Forest Practice GIS (FGP) database”.

Section 3, Results of Quantification, subsection 3.3, Non-Fire Forest Management Activities – Carbon Stock Change

The third paragraph briefly discusses the fate of biomass cut under forest management activities. The paragraph, while twice stating that readers should not treat this volume of carbon as emissions, says that listing carbon quantities, in terms of GHG emissions, may be helpful in putting numbers into context. I disagree that this discussion puts any numbers in context as it is extremely vague in the intermediate or final disposition of those carbon stocks. Statements like these are very easily taken out of context depending on the reader’s biases and goals. At the very least, this discussion needs to develop approximate percentages of carbon flows to truly bring the numbers into context (i.e. x% to solid wood products, x% to panel products, x% to biomass cogeneration, x% to biofuels, etc.). Otherwise, a cursory reading could leave one with the impression that all harvested carbon is emitted.

Subsection 3.4, Ecosystem Carbon Flow

In the subsection titled “Cut or Damaged Biomass After Disturbance”, the second paragraph erroneously states “Cut or damaged biomass may remain on the landscape in the form of slash. Portions will decompose or be burned and released into the atmosphere. Some carbon contained in slash will not fully decompose and instead will become a long-term carbon store in the soil. A portion of the cut or damaged carbon will be exported out of state and outside the boundaries of this flow chart, through timber or biomass exports. The remainder of this carbon will be extracted but stay within the State for processing.”

While these statements are true for cut biomass, they are mostly false for “damaged” biomass. In some cases, damaged biomass will be cut either as a roadside fuel hazard treatment or to remove a safety hazard. But there again, that biomass has been cut. Damaged biomass is generally still alive and growing. The growth rate and carbon sequestration rate are likely reduced, but not eliminated. The references to “damaged” biomass in this report should be removed.

In the subsection titled “Extracted Biomass for Energy and Fuel Applications”, every sentence treats this biomass utilization as strictly an emission. While this perspective has some validity, in the larger picture

of GHG emissions, these uses should be compared with the use of fossil fuels, and include a discussion of the relative carbon intensity (CI) of those fuel sources, so as to put this information into context.

Section 4, Future Development and Research Needs, subsection 4.3, Research Needs

Subsection 4.3.1, titled "Characterization of the Effects of Forest Management on Carbon in Diverse Landscapes", discusses the need "to refine estimates of how management transforms carbon stocks." This section needs to include a discussion of non-management (which is a form of management) on carbon stocks. The effects of this choice contribute significantly to carbon stock transformation, especially in the case of wildfire on public lands, which are less likely to receive active management.

Overall Consideration of this Report

A lot of work went into this report and I appreciate the efforts of CARB and its staff. That being said, this document falls far short of telling the story wildfires, prescribed fire, and forest management by limiting consideration of GHG emissions from wildfire to the narrowest definition of sources and timing of emissions, and of almost completely ignoring any GHG emission mitigations related to forest management activities. Especially problematic is the section titled "Extracted Biomass for Energy and Fuel Applications", which seems to take at face value every criticism of utilizing biomass for fuel regardless of the validity of those claims, while completely ignoring the State's goals to increase utilization of woody biomass as a substitute for non-renewable fossil fuels. Almost as bad are the discussions of the carbon impacts from "damaged" vegetation and carbon stock changes from non-fire forest management activities. While there may be some validity in those sections, the overall impression of those sections is that forest management is bad.

Given the almost annual increase in wildfire acreage and associated emissions, it would seem to me that supporting activities that reduce emissions, promote resiliency, and increase carbon sequestration rates would be an important consideration in this report. With the State's pronounced goals of increasing the pace and scale of vegetation treatments across the forested landscapes and increasing habitat resiliency in the face of climate change, this document seems to be attempting to push the state backwards. Thinking outside of the current box, being open to new paradigms of thinking about how we treat our forest, woodlands, and environment, and looking for new solutions instead of old arguments are the only way we can move forward for the climate.

Thank you again for the opportunity to comment on this draft report.

Sincerely,



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