December 8, 2017

Grand Mesa, Uncompahgre, and Gunnison National Forests
Attn: Plan Revision Team
2250 South Main Street
Delta, CO 81416

Sent via email to: gmugforestplan@fs.fed.us

Re: Comments on the November 2017 Draft Carbon Assessment

Dear Forest Planning Team,

Thank you for the opportunity to comment on the Grand Mesa, Uncompahgre, and Gunnison (GMUG) National Forests' draft carbon assessment. The Western Environmental Law Center submits these comments along with Great Old Broads for Wilderness and Rocky Mountain Wild. Our comments are structured as follows: first, we provide background information pertaining to the requirement that the Forest Service address carbon storage in the planning revision process; next, we briefly summarize some related Forest Service climate policies and guidance; and finally, we provide specific recommendations to make the draft carbon assessment clearer and more informative.

In addition to our comments on the draft carbon assessment, we urge the GMUG to develop a climate change assessment that explains how climate change is affecting and is projected to affect the GMUG (over the life of the revised forest plan and beyond), and that identifies opportunities for climate mitigation (including carbon sequestration), adaptation, and resilience on the GMUG. Climate change is addressed in some of the assessments, including terrestrial ecosystems, energy and mineral resources, and infrastructure. Notably, Appendix G for the draft assessment on terrestrial ecosystems contains detailed information about climate impacts, which is very helpful. It would be easier for people to locate this information, however, if it was included in a separate climate assessment in addition to, or instead of, the appendix. At the very least, Appendix G (and other appendices) should be included as separate PDFs on the assessment webpage so they can be located more easily.

A climate-specific assessment would make it easier for people to learn how climate change is affecting and will likely affect the GMUG, and how the GMUG plans to address climate change, all in one document. Appendix G thoroughly addresses climate impacts, but does not fully discuss issues related to resilience or adaptation, and does not identify opportunities for mitigation at all. A climate assessment should include sections on climate resilience, adaptation, and mitigation as well as climate impacts. We recommend that the GMUG add such analysis to Appendix G and include that document as a stand-alone climate assessment. The climate assessment should also cross-reference other assessments that discuss climate change so people can easily locate the relevant information, which is scattered throughout multiple documents and can be difficult to find. In light of these considerations, we respectfully request the GMUG to provide a draft climate change assessment for public comment as soon as possible.

I. How the 2012 Forest Planning Rule Addresses Carbon Storage

The 2012 forest planning rule both directly and implicitly requires the Forest Service to consider carbon sequestration in the forest planning process. During the initial assessment phase, the rule requires the Forest Service to include a "[b]aseline assessment of carbon stocks."[1] The preamble to the final rule explains what this entails:

> The final rule requires that the responsible official use existing information to do a baseline assessment of carbon stocks. Carbon stocks are the amount of carbon stored in the ecosystem, in living biomass, soil, dead wood, and litter. This requirement was included in response to public comments to ensure that information about baseline carbon stocks is identified and evaluated before plan revision or development, and to link this phase to the requirements of the Forest Service Climate Change Roadmap and Scorecard. The Department's expectation is that this information would be generated via implementation of the Roadmap and Scorecard prior to planning efforts on a unit, and that the assessment phase would use that information to meet the direction in § 219.6(b)(4). The Forest Service has developed a National Roadmap and Performance Scorecard for measuring progress to achieve USDA strategic goals (USDA Forest Service 2010d, 2010j). The roadmap describes the Agency's strategy to address climate change and the scorecard is an annual reporting mechanism to check the progress of each NFS unit.[2]

The preamble further notes that the Forest Service changed this requirement from the proposed rule to "lead to a more comprehensive assessment of carbon stocks (as opposed to [only] carbon stored in above ground vegetation) earlier in the planning process."[3]

The planning rule also requires the Forest Service to identify the "[b]enefits people obtain from the [National Forest Service] planning area (ecosystem services)" in the assessment phase.[4] The planning rule defines "ecosystem services" as the benefits that ecosystems provide to humans, including the "long term storage of carbon" and "climate regulation."[5] Therefore, the GMUG carbon assessment should—but does not—clearly identify the ecosystem services and benefits that carbon storage provides.

In addition, forest plans must provide for ecosystem services by including "plan components, including standards or guidelines . . . to provide for ecosystem services . . . in the plan area."[6] Because the planning rule identifies carbon sequestration as an ecosystem service, the Forest Service must include plan components that address carbon sequestration in the planning area. Such components could include standards or guidelines to increase or maximize the sequestration potential of vegetation and soils in the planning area. We encourage the GMUG

[1] 36 C.F.R. § 219.6(b)(4).
[2] 77 Fed. Reg. 21162, 21200 (Apr. 9, 2012).
[3] *Id.* at 21229.
[4] 36 C.F.R. § 219.6(b)(7).
[5] 36 C.F.R. § 219.19.
[6] 36 C.F.R. § 219.10(a).

to start thinking now about how to incorporate such plan components into the revised forest plan, and to ensure that the carbon assessment is sufficiently robust to usefully inform those plan components.

II. Related Forest Service Climate Policies and Guidance

The Forest Service recognizes the importance of proactively addressing climate change. Numerous agency publications and guidance materials emphasize the need to effectively manage national forests and grasslands to increase their resilience to climate impacts and other stressors, using the principles of adaptive management.

The Forest Service also recognizes the importance of establishing practices that help mitigate climate change by reducing atmospheric levels of greenhouse gas (GHG) emissions. For example, the Forest Service Global Change Research Strategy states that forests "play an important role in reducing the buildup of greenhouse gases in the atmosphere by sequestering carbon."[7] In the research strategy, the Forest Service commits to identifying best management practices that will increase carbon sequestration while supporting ecosystem health.[8]

The Forest Service National Roadmap for Responding to Climate Change also addresses the importance of climate change adaptation and mitigation in our nation's forests. It identifies several adaptive management strategies that the Forest Service will use, including building resistance to climate-related stressors, increasing ecosystem resilience, and when necessary, facilitating large-scale ecological transitions.[9] The Roadmap notes a connection between mitigation and adaptation, stating that healthy, resilient forest ecosystems are better able to store carbon.[10]

Carbon sequestration is the primary mitigation strategy of the Forest Service, which has committed to "[p]romoting the uptake of atmospheric carbon by forests and the storage of carbon."[11] The Roadmap identifies the following actions that USFS is taking to promote carbon storage:

- Actively managing carbon stocks in forests, grasslands, and urban areas over time by doing the following:
    - Rapidly reforesting land damaged by fires, hurricanes, and other disturbances, consistent with land management objectives.
    - Conserving working forests and grasslands.
    - Providing technical assistance for programs designed to enhance carbon sequestration potential through afforestation, reforestation, and practices that increase and maintain productivity and ecosystem health.
    - Encouraging cities to retain green space and to plant and maintain trees.
    - Using available tools to understand the impacts of management actions on carbon

[7] The Forest Service Global Change Research Strategy, 2009-2019, p. 5.
[8] *Id.*
[9] USFS National Roadmap for Responding to Climate Change, p. 19-20.
[10] *Id.* at 21.
[11] *Id.*

stocks and fluxes.[12]

The Climate Roadmap also directs the Forest Service to "work with partners to sustain or increase carbon sequestration and storage in forest and grassland ecosystems."[13] There are limits to our ability to increase carbon sequestration on the Forest Service land while achieving other management goals (such as fuel reduction programs to prevent uncharacteristically severe wildfires), and the Roadmap therefore states that the Forest Service should consider tradeoffs as it develops management strategies to achieve the agency's carbon sequestration goals consistent with other agency objectives.

The Forest Service also developed a Climate Change Performance Scorecard that each National Forest must complete annually. Scorecard element #9 concerns carbon sequestration. Each National Forest must determine whether "information relevant to the Unit level [has] been developed and synthesized to assess carbon stocks and the influence of land management activities and disturbances on potential changes in carbon stocks."[14] A detailed handbook, Navigating the Scorecard, was developed to assist Forest Service officials in determining whether they are meeting the Scorecard objectives. The handbook further elaborates on the importance of managing National Forests to effectively promote carbon sequestration:

> Our nation's forests and grasslands play a critical role in storing carbon and helping to reduce the amount of greenhouse gases that are released into the atmosphere. We as an Agency continue to play a strong role in helping to mitigate greenhouse gas emissions by conserving and restoring forest and grassland ecosystems . . . Being a "carbon literate" Agency means understanding how carbon storage varies across the landscape and how disturbances and management actions have affected carbon stocks in the past and may affect them in the future. This understanding is even more critical when climate change may exacerbate stressors, creating even more carbon losses in some ecosystems.[15]

These Forest Service policies and guidance materials recognize the crucial role that the agency plays in safeguarding our national forests' ability to sequester carbon on a long-term basis. They should be explicitly acknowledged and incorporated into the GMUG's carbon assessment.

III. GMUG Draft Carbon Assessment

Below, we include recommendations to make the draft carbon assessment clearer and more informative.

a. Background Information on Climate Change

At a general level, we urge the GMUG to explicitly recognize the climate policies and guidance mentioned above, and to acknowledge the significant role that the Forest Service can play in protecting carbon sequestration on public lands. This information should be included in

[12] *Id.* at 24.
[13] *Id.* at 21.
[14] Climate Change Performance Scorecard at 1.
[15] Navigating the Scorecard at 40.

the carbon assessment's introduction, which is only three paragraphs long in the draft assessment and fails to mention most of the relevant policy and guidance documents.

Chapter 2, which contains some cursory background information about climate change and the role that carbon sequestration plays by storing carbon that, if released, would contribute to the global greenhouse effect, should also be expanded. The chapter should provide more information about the serious threat that climate change poses, including impacts on the GMUG in particular.[16] It should acknowledge that soil, as well as vegetation, is an important carbon sink. It should specifically explain how forest management practices can protect and enhance carbon sequestration (e.g. by requiring longer rotations for timber harvest, such as 70-80 years).

We also recommend a few specific changes to this chapter. The following sentences would be more accurate if amended as follows (underlined language added): "These gases add to the "greenhouse effect" and cause the <u>global average</u> temperature to increase, and lead to changes in precipitation patterns<u>, wildlife habitat, wildfire, and other impacts</u>."[17]

b. Clarifications

The draft assessment states (underlined language added): "The GMUG contains the most sequestered carbon of any National Forest <u>in the Rocky Mountain Region</u>, which is expected because it is the largest unit in the Region."[18] It appears based on Figure 1 that this sentence should be amended to make it clear that the GMUG stores the most carbon of any national forest *in the region*. As currently written, this sentence appears to say that the GMUG stores more carbon than any other national forest in the country.

The draft assessment states: "When comparing carbon to carbon dioxide a conversion factor of 3.67 must be applied."[19] Please explain why this conversion factor must be applied.

It would be helpful for the assessment to include graphs that depict the information in Table 1, Major forest carbon pools on the GMUG National Forests.[20] Specifically, it would be helpful for the assessment to include a line or plot graph (with three different colors to represent the three different categories of live trees, standing dead trees, and soil), as well as a pie graph for at least the most recent year for which data is available (2015), showing what percentage of carbon is stored in each of the three identified categories.

c. Impacts of Forest Disturbances on Carbon Storage

More analysis is needed on the impacts of timber harvest on carbon sequestration. For example, the draft assessment states: "While timber harvesting does play a role in disturbance and the carbon cycle, it is a very small percentage of changes in the overall carbon cycle of the

[16] A cross-reference to Appendix G, or to a climate assessment if the GMUG follows our recommendation to create such an assessment, could be used for this.
[17] Draft Assessment at 1.
[18] *Id.* at 2.
[19] *Id.*
[20] *Id.* at 3.

GMUG."[21] Please explain what is meant by "a very small percentage" by quantifying this statement insofar as possible. The draft assessment also says: "Disturbance levels from harvesting activities is fairly consistent from year-to-year, but fire and insects tend to fluctuate."[22] Please provide further explanation. Does this also mean that the amount of carbon lost from timber harvest remains fairly consistent, but that the amount of carbon lost as a result of wildfire and insect infestations tends to fluctuate? If so, how large are the fluctuations, and how does the GMUG expect climate change to impact these fluctuations? Also, please explain why the disturbance related to timber harvest is generally consistent from year-to-year. Is this because the amount of harvest that occurs each year is approximately the same, or for some other reason? Also, does the GMUG anticipate increased timber harvest as a result of the widespread spruce mortality due to spruce beetle outbreak (e.g. an increase in timber salvage sales), and if so, over what time period? And how will such harvests impact carbon storage on the GMUG?

The draft assessment identifies some major forest disturbances that have affected the GMUG, including beetle infestations, drought, and sudden aspen decline; however, the assessment does not specify how these disturbances have affected current carbon storage on the GMUG, or how they are likely to impact long-term carbon storage on the GMUG. Such analysis should be added.

Analysis should be added that identifies potential climate change-related impacts that may affect carbon storage on the GMUG. For example, does the GMUG anticipate an increase in wildfires, drought, and insect infestations, which would likely increase tree mortality and thereby increase emissions? Will higher average temperatures increase the growing season and therefore (at least temporarily) increase the amount of carbon stored on the GMUG? Projected climate impacts are included in Appendix G, but the implications on carbon storage are not addressed. The carbon assessment must address them. In addition, climate impacts should be quantified as much as possible, and qualitative analysis should be provided when quantification is infeasible. If quantification is not possible at this time, the assessment should explain why.

d. Carbon Storage in Wood Products

The cursory discussion of wood products and carbon sequestration at the end of the draft assessment should either be removed or amended. This paragraph, which is only four sentences long, only contains general statements and provides no useful information about the GMUG specifically; for example, it does not quantify the amount of timber harvest from the GMUG that is currently stored in wood products. Moreover, this section is misleading. It states, without providing a citation, that "Substitution of wood for more fossil fuel-intensive building materials, such as concrete, steel, or plastic, has a carbon emissions benefit."[23] While this may be true in some circumstances, it is not a certainty. This statement, if included at all, should be qualified.

Finally, we note that the issue of carbon storage in wood products is more nuanced and complex than the draft assessment suggests. The Wilderness Society published a report in 2009

[21] *Id.* at 4.
[22] *Id.*
[23] *Id.* at 5.

that summarized the literature on carbon storage in wood products.[24] Significant conclusions from the summary include the following:

- [A]s little as 1% of the carbon present in the standing tree may remain in solid wood products in use after 100 years. Interestingly, landfills make a much larger contribution to long-term carbon storage, sequestering perhaps 13% of the carbon originally present in the standing tree.[25]
    - [Therefore] total harvested wood CO2e [carbon dioxide equivalent] at 100 years is about 14% of that present in the standing tree.[26]
- [E]ven the most efficient processing chain will result in the loss and emission of a significant portion of the carbon present in the standing tree.[27]
- When process energy emissions [e.g. from transportation] are included, the U.S. forest products industry as a whole, including paper, releases nearly twice the greenhouse gases (measured in CO2e) that it stores in products and landfills, even excluding the effects of harvest on forest carbon.[28]

If the GMUG chooses to include a section on carbon storage in wood products in the carbon assessment, more detailed information should be provided, such as the information provided above. However, given that the GMUG lacks information about how much carbon is stored in wood harvested from the GMUG specifically, we question whether it is useful to include a section on carbon storage in wood products in this assessment.

e. Biomass for Energy Production

The draft carbon assessment states: "Forest vegetation treatments also generate excess material (woody biomass). When this can be utilized for fuel, it can be a renewable energy substitute for traditional fuel sources."[29] This statement is somewhat misleading and should be clarified. First, it is unclear what is meant by stating that forest vegetation treatments generate excess woody biomass. Is this material merely "excess" in the sense that it is not commercially valuable as timber? If so, we question whether it should be deemed "excess" at all. If the GMUG means that the material is excess because it is present in larger amounts than were historically present on the GMUG, it should say so explicitly. The assessment should also explain what is meant by the term "traditional" fuel sources. Does this mean fossil fuels? If so, the assessment should say so. It is also confusing to say that biomass could replace "traditional" fuel sources given that biomass itself is one of the oldest sources of fuel that humans have used, and is still used by many people around the world today. Finally, it is misleading to call woody biomass "renewable" because, while trees can be regrown, using biomass for energy production can actually *increase* greenhouse gas (GHG) emissions, as explained below.

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[24] The Wilderness Society, *Wood Products and Carbon Storage: Can Increased Production Help Solve the Climate Crisis?* (2009) [hereinafter "*Wood Products and Carbon Storage*"].
[25] *Id.*
[26] *Id.* at 13.
[27] *Id.* at 6.
[28] *Id.* at 22.
[29] Draft Assessment at 5.

If the assessment mentions biomass at all, it should review the science and explain how woody biomass can impact GHG emissions. Arguments have been made that harvesting woody biomass for energy (heat or electricity) can reduce GHG emissions if (1) the biomass is substituted for fossil fuels, and (2) new trees are planted to replace the ones that were harvested. However, the science clearly shows that harvesting wood for energy generation usually *increases* GHG emissions. First, fossil fuels are needed to produce and transport woody biomass (e.g. wood chips).[30] Depending how far the biomass must be transported, these emissions may be substantial. It is also less efficient to burn wood for energy than it is to burn fossil fuels, which means that more wood must be burned to generate the same amount of energy.[31] Moreover, wood releases more carbon per energy unit than fossil fuels do.[32]

> Since wood actually releases more greenhouse gases per unit of useful energy than fossil fuels, the climate benefits of a switch to wood depend heavily on the assumption that the source forest continues to take up carbon as rapidly as it is released by burning, and even then there will inevitably be some delay between emissions and reabsorption. Hence, an assessment of the GHG impacts of biomass use on the source forest must also account for the full ecosystem effects of intensified management needed to increase biomass supplies. . . . If the source forest regenerated instantly, biomass would earn its "carbon-neutral" label, but the longer it takes to regenerate forest carbon after a biomass harvest, the longer that carbon dioxide remains in the atmosphere exerting its heating effect.[33]

Trees obviously do not regenerate instantly after being cut down, but the argument that biomass is carbon-neutral remains stubbornly persistent. However, the science shows that use of biomass for energy generation usually results in increased GHG emissions. The GMUG should not imply that using woody biomass for energy generation is beneficial from a climate perspective (i.e., that it reduces emissions) unless it has rigorous science to back up this claim.

Respectfully submitted,

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[30] *Wood Products and Carbon Storage* at 19.
[31] *Id.* at 20.
[32] *Id.*
[33] *Id.* at 21.

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