October 30, 2023

USDA Forest Service, Rocky Mountain Region, Attn: Reviewing Officer
C/O Director of Strategic Planning 2nd Floor
1617 Cole Blvd. Building 17, Lakewood, CO 80401

Chad Stewart, Forest Supervisor (Responsible Official)
Grand Mesa, Uncompahgre, and Gunnison National Forests Headquarters
2250 South Main Street
Delta, CO 81416
(970) 874-6674

Subject: Grand Mesa, Uncompahgre and Gunnison Forest Plan Revision #51806
Responsible Official: Chad Stewart, Forest Supervisor
Submitted via: http://www.fs.usda.gov/goto/gmug/forestplan_objections

Dear Objection Reviewing Officer:

Pursuant to 36 CFR 219 Subpart B, the Center for Biological Diversity ("Center") herby submits these objections to the Grand Mesa, Uncompahgre, and Gunnison National Forests Revised Land Management Plan ("Revised Plan"), Final Environmental Impact Statement ("FEIS"), and Draft Record of Decision "(Draft ROD").

I. THE PROJECT, THE OBJECTORS, AND OBJECTORS' INTERESTS

The Plan
The Center objects to the revised Land Management Plan for the Grand Mesa, Uncompahgre, and Gunnison National Forests ("GMUG").

Responsible Official and Ranger District
The responsible official who will approve the Record of Decision and the revised Forest Plan is Forest Supervisor Chad Steward, Grand Mesa, Uncompahgre, and Gunnison National Forests Headquarters, 2250 South Main Street, Delta, CO 81416, (970) 874-6674.

Timeliness
These objections are timely filed. The 60-day notice of opportunity to object to the final plan and final Environmental Impact Statement and the availability of Draft Record of Decision for the GMUG Forest Plan was published on August 30, 2023.

The Objectors

Center for Biological Diversity

Allison N. Henderson
Southern Rockies Director, Senior Attorney
P.O. Box 3024
Crested Butte, CO 81224
Phone: (970) 309-2008
ahenderson@biologicaldiversity.org

Interest and Participation of the Objector

The Center for Biological Diversity ("Center") is a nonprofit environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental and administrative law. The Center has over 1.6 million members and online activists dedicated to the protection and restoration of endangered species and wild places. The Center has worked for over twenty-five years to protect imperiled plants and wildlife, open space, air and water quality, and overall quality of life. Much of the Center's work focuses on protecting endangered and threatened species and the habitats that they and other wildlife depend on in the West. This includes the areas covered by the GMUG Forests Plan.

The Center submitted comments in coalition with numerous other organizations on the Draft Revised Forest Plan and Draft Environmental Impact Statement on November 24, 2021 (hereinafter "HCCA et al. DEIS comments"). We received submission receipts. The Center for Biological Diversity and Defenders of Wildlife (hereinafter "Center DEIS comments") submitted additional draft comments that raised the issues regarding climate change, carbon storage, no-more coal leasing alternative. Those DEIS comments were timely submitted, November 26, 2021. HCCA et al. and attachments and the Center DEIS comments and the 22 attached exhibits are incorporated herein in full.

In the Center DEIS comments, starting at page 9, we discussed the need to manage National Forest for carbon sequestration and carbon storage, discussing the climate crisis, President Biden's requiring prompt action to assess and reduce climate pollution, and the need to manage the National Forests as a carbon reserve, the need to analyze and adopt a carbon maximizing alternative, and analyze a no-more coal leasing alternative. The HCCA et al. DEIS comments, starting on p. 192, also requested analysis of that would close the GMUG to further coal leasing. The issues as discussed in these comments and their attachments are incorporated in full.

This objection is additional to one that was submitted previously to the agency from numerous organizations, including the Center early today, October 30, 2023. This objection supplements and addresses additional issues regarding timber suitability, climate change, carbon storage, and a no-coal leasing alternative. This objection also responds to new information and analysis that has arisen since the Draft Plan comment period.

Connection Between Prior Specific Written Comments

As noted above, the Center previously submitted detailed, substantive formal comments regarding deficiencies in the Draft Revised Forest Plan and the Draft EIS these comments. The Revised Plan and associated documents contain a new appendix on carbon and a heavily reworked section on carbon and climate. Since the DEIS comment period new significant

information has come to light bearing on the direct, indirect, and cumulative impacts of the alternatives and the Preferred Alternative carbon. The following specific objections therefore include: 1) Significant new information requires the preparation of a Supplemental EIS ("SEIS") on the impacts of the timber suitability decision and alternatives on carbon storage and the forests' roles in climate mitigation and adaptation; 2) the Forest Service failed to consider a carbon storage alternative, violating NEPA; 3) the Forest Service did not take a hard look at the impacts on GMUG carbon stores; 4) the GMUG National Forest's failure to manage the forests for carbon sequestration violates the National Forest Management Act; 5) the exception to FW-STND-TMBR-02 is vague and unbounded, making this standard meaningless to avoid forest conversion and serve as a check on timber reduction practices and is not consistent with 16 U.S.C. § 1604(E)(ii) and 36 C.F.R. § 219.11(d); and 6) the Forest Service has failed to consider a no more coal leasing alternative, violating NEPA and its duties under NFMA, and the 2012 Planning Rule.

I. LEGAL BACKGROUND

A. National Forest Management Act, Multiple-Use Sustained Yield Act of 1960, and the 2012 Planning Rule.

The National Forest Management Act ("NFMA") directs the Secretary of Agriculture ("Secretary") to develop, maintain and revise management plans for units of the National Forest System.[1] The plans must provide for the multiple use and sustained yield of the products and services obtained from the Forest in accordance with the Multiple–Use Sustained–Yield Act of 1960 ("MUSYA").[2]

NFMA requires that:

> In developing, maintaining, and revising plans for units of the National Forest System pursuant to this section, the Secretary shall assure that such plans—
>
> (1) provide for multiple use and sustained yield of the products and services obtained therefrom in accordance with the Multiple-Use Sustained-Yield Act of 1960 [16 U.S.C. 528–531], and, in particular, include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness; and
>
> (2) determine forest management systems, harvesting levels, and procedures in the light of all of the uses set forth in subsection (c)(1), the definition of the terms "multiple use" and "sustained yield" as provided in the Multiple-Use Sustained-Yield Act of 1960, and the availability of lands and their suitability for resource management.[3]

"Multiple use" means:

---

[1] 16 U.S.C. § 1604(a).
[2] 16 U.S.C. §§ 528–531. *See also*, 16 U.S.C. §§ 1604(b), (d), and (e) (NFMA provisions concerning preparation of management plans, including the need to provide for multiple uses).
[3] 16 U.S.C. § 1604(e) ("required assurances").

> The management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.[4]

The Forest Service's Planning Rules implementing NFMA requirements mandate that plans must take into account "system drivers, including … climate change" and "reasonably foreseeable risks to ecological … sustainability."[5] The Rules require that Forest Service address "measurable changes on the plan area related to climate change" in its plan monitoring program.[6] Plans must also provide for "ecosystem services," which include "regulating services such as long term storage of carbon" and the Forest Service must use the best available scientific information.[7]

B. The Forest Service's NEPA Obligations.

Under the National Environmental Policy Act (NEPA), every federal agency that takes a major federal action "significantly affecting the quality of the human environment" is required to create a detailed statement discussing: (i) the environmental impact of the proposed action; (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented; (iii) alternatives to the proposed action; (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.[8] When, as here, any significant environmental impacts might result from the proposed action, the agency must complete a meticulous environmental impact statement (EIS).[9]

NEPA imposes "action forcing procedures … requir[ing] that agencies take a *hard look* at environmental consequences."[10] The sufficiency and utility of an EIS rely heavily on the scope and depth of the analysis of environmental impacts. The EIS must include the full scope of environmental effects, including direct, indirect, and cumulative impacts.[11] To ensure that the

---

[4] 16 U.S.C. § 531(a).
[5] 36 C.F.R. §§ 219.8(a)(1)(iv), 219.10(a)(7).
[6] *Id*. at § 219.12(a)(5)(vi).
[7] *Id*. at §§ 219.10, 219.19; 36 C.F.R. § 219.3.
[8] 42 U.S.C. § 4332(2)(C)(i)–(v).
[9] *Sierra Club v. Van Antwerp*, 661 F.3d 1147, 1153 (D.C. Cir. 2011) (citing *Sierra Club v. Peterson*, 717 F.2d 1409, 1415 (D.C. Cir. 1983)); *see also* 40 C.F.R. §§ 1508.11, 1508.27 (1978).
[10] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) (citations omitted) (emphasis added).
[11] 40 C.F.R. §1508.25(a)(c)(1)–(3) (1978). The terms "effects" and "impacts" are used synonymously in the CEQ regulations interpreting NEPA. 40 C.F.R. § 1508.8 (1978). Although CEQ issued a final

agency has taken the required "hard look," courts hold that the agency must utilize "public comment and the best available scientific information."[12]

NEPA also requires agencies to explain opposing viewpoints and their rationale for choosing one viewpoint over the other.[13] Courts will set aside a NEPA document where the agency fails to respond to scientific analysis that calls into question the agency's assumptions or conclusions.[14]

The agency must "provide a full and fair discussion of significant environmental impacts" in order to "inform decisionmakers and the public of the reasonable alternative which would avoid or minimize adverse impacts."[15] This includes numerous factors on context and intensity set out

---

rulemaking in July 2020 fundamentally rewriting those regulations, the new rules apply only "to any NEPA process begun *after* September 14, 2020," or where the agency has chosen to "apply the regulations in this subchapter to ongoing activities." 40 C.F.R. § 1506.13 (2020) (emphasis added). Scoping on this project began in 2018, long before September 14, 2020, and neither the Draft nor Final EIS indicates that the agency is opting to use the 2020 CEQ NEPA regulations. The Final EIS repeatedly discloses the proposed plan's cumulative effects, a term the 2020 regulations specifically eliminated. *See, e.g.,* Final EIS at 1 ("In accordance with the National Environmental Policy Act, this final environmental impact statement discloses the potential direct, indirect, and cumulative environmental impacts of implementing the final forest plan and alternatives."). Where agencies have applied the pre-2020 NEPA regulations to actions approved before September 14, 2020, the courts have as well. *See, e.g., Bair v. California Dep't of Transp.,* 982 F.3d 569, 577 n.20 (9th Cir. 2020) ("Because [the agency at issue] applied the previous [NEPA] regulations to the Project, so do we."); *Cascade Forest Conservancy v. Heppler*, 2021 U.S. Dist. LEXIS 30332, at *25 n.7 (D. Or. Feb. 15, 2021) ("Because the Federal Defendants applied the previous regulations to the Project, the Court does so as well.") (citing *Bair*); *City of Crossgate v. United States Dep't of Veterans Affairs*, 2021 U.S. Dist. LEXIS 51130, at *7, n.4 (W.D. Ky. Mar. 18, 2021) ("Because the VA applied the previous regulations to its NEPA process, the Court will do so as well.") (citing *Bair*). In any event, the 2020 regulations have been challenged as illegal in no fewer than four pending lawsuits, and this administration has already restored key components of the 1978 regulations and Phase II of these restorations are currently underway. *See, e.g*., *Environmental Justice Health Alliance v. CEQ*, Case 1:20-cv-06143 (S.D.N.Y. Aug. 6, 2020); *Wild Virginia v. CEQ*, Case 3:20-cv-00045-NKM (W.D. Va. July 29, 2020); *Alaska Community Action on Toxics v. CEQ*, Case 3:20-cv-05199-RS (N.D. Ca. July 29, 2020); *State of California v. Council on Environmental Quality,* Case No. 3:20-cv-06057 (N.D. Cal. Aug. 28, 2020); Council on Environmental Quality, NEPA Implementing Regulation Revisions, 88 Fed. Reg. 55,757 (Oct. 7, 2021) (proposing to restore, inter alia, the 1978 regulations' definition of impacts, including cumulative impacts); Nat'l Envtl. Policy Act Implementing Regulations Revisions Phase 2, 88 Fed. Reg. 49,924 (July 31, 2023).

[12] *Biodiversity Cons. Alliance v. Jiron*, 762 F.3d 1036, 1086 (10th Cir. 2014) (internal citation omitted).

[13] 40 C.F.R. § 1502.9(b) (1978) (requiring agencies to disclose, discuss, and respond to "any responsible opposing view").

[14] *See Ctr. for Biological Diversity v. U.S. Forest Serv*., 349 F.3d 1157, 1168 (9th Cir. 2003) (finding Forest Service's failure to disclose and respond to evidence and opinions challenging EIS's scientific assumptions violated NEPA); *Seattle Audubon Soc'y v. Moseley*, 798 F. Supp. 1473, 1482 (W.D. Wash. 1992) ("The agency's explanation is insufficient under NEPA – not because experts disagree, but because the FEIS lacks reasoned discussion of major scientific objections."), aff'd sub nom. *Seattle Audubon Soc'y v. Espy*, 998 F.2d 699, 704 (9th Cir. 1993) ("[i]t would not further NEPA's aims for environmental protection to allow the Forest Service to ignore reputable scientific criticisms that have surfaced").

[15] *Id*. §§ 1502.1, 1502.14 (1978); *accord California v. Block*, 690 F.2d 753, 767 (9th Cir. 1982).

at 40 C.F.R. § 1508.27 (1978). Among these are the degrees to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.[16]

To take the required "hard look" at impacts, an EIS must "study, develop, and describe" reasonable alternatives to the proposed action.[17] This alternatives analysis "is the heart of the environmental impact statement."[18] The "touchstone" for courts reviewing challenges to an EIS under NEPA "is whether an EIS's selection and discussion of alternatives fosters informed decision-making and informed public participation."[19]

NEPA's implementing regulations require that an agency "[r]igorously explore and objectively evaluate *all* reasonable alternatives."[20] The agency's purpose and need statement sets the parameters for what constitutes a reasonable alternative.[21] Although agencies "enjoy[] considerable discretion" in defining their objectives and are not required to consider an unlimited number of alternatives,[22] they may not dismiss an alternative unless they have, in "good faith," found it to be "too remote, speculative, or impractical or ineffective,"[23] or not "significantly distinguishable from the alternatives already considered."[24] Further, "[t]he existence of a viable but unexamined alternative renders an environmental impact statement inadequate."[25] The agency's obligation to consider reasonable alternatives applies to citizen-proposed alternatives.[26] Courts routinely set aside agency NEPA analysis, including those by the Forest Service, where the agency arbitrarily failed to consider a reasonable alternative.[27]

---

[16] 40 C.F.R. §1508.27(b)(5) (1978).
[17] 42 U.S.C. § 4332(2)(C)(iii), (2)(E).
[18] 40 C.F.R. § 1502.14 (1978).
[19] *California v. Block,* 690 F.2d 753, 767 (9th Cir. 1982).
[20] 40 C.F.R. § 1502.14 (emphasis added); *see also New Mexico*, 565 F.3d at 703 (quoting same); *Custer Cty. Action Ass'n v. Garvey*, 256 F.3d 1024, 1039 (10th Cir. 2001) (agencies must "rigorously explore all reasonable alternatives … and give each alternative substantial treatment in the environmental impact statement.").
[21] *See Dombeck*, 185 F.3d at 1174–75.
[22] *Colo. Envtl. Coal. v. Salazar*, 875 F. Supp. 2d 1233, 1245 (D. Colo. 2012).
[23] *Colo. Envtl. Coal. v. Dombeck*, 185 F.3d 1162, 1174 (10th Cir. 1999) (quotation omitted).
[24] "NEPA does not require agencies to analyze the environmental consequences of alternatives it has in good faith rejected as too remote, speculative, or impractical or ineffective." *New Mexico ex rel. Richardson v. BLM*, 565 F.3d 683, 708 (10th Cir. 2009) (quotation omitted). Moreover, "an agency need not consider an alternative unless it is significantly distinguishable from the alternatives already considered." *Id*. at 708-09.
[25] *Westlands Water Dist. v. United States DOI*, 376 F.3d 853, 868 (9th Cir. 2004).
[26] *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin*., 538 F.3d 1172, 1217-19 (9th Cir. 2008) (finding EA deficient, in part, for failing to evaluate a specific proposal submitted by petitioner); *Colo. Envtl. Coal. v. Dombeck*, 185 F.3d 1162, 1171 (10th Cir. 1999) (agency's "[h]ard look" analysis should utilize "*public comment* and the best available scientific information") (emphasis added).
[27] *See, e.g., See High Country Conservation Advocates v. United States Forest Serv.,* 951 F.3d 1217, 1224-27 (10th Cir. 2020) (finding Forest Service NEPA analysis failed to consider a reasonable alternative concerning roadless area protection, and ordering the lower court to vacate the agency's decision); *New Mexico ex rel. Richardson v. BLM*, 565 F.3d 683 (10th Cir. 2009) (setting aside BLM's EIS concerning oil and gas leasing in the Otero Mesa area); *Wilderness Workshop v. U.S. Bureau of Land Management*, 342 F. Supp. 3d 1145 (D. Colo. 2018) (BLM's range of alternatives violated NEPA by omitting any

Courts hold that an alternative may not be disregarded merely because it does not offer a complete solution to the problem.[28] Even if additional alternatives would not fully achieve the project's purpose and need, NEPA "does not permit the agency to eliminate from discussion or consideration a whole range of alternatives, merely because they would achieve only some of the purposes of a multipurpose project."[29] If a different action alternative "would only partly meet the goals of the project, this may allow the decision maker to conclude that meeting part of the goal with less environmental impact may be worth the tradeoff with a preferred alternative that has greater environmental impact."[30]

The courts also require that an agency adequately and explicitly explain any decision to eliminate an alternative from further study.[31]

Moreover, "[a]gencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements. They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement."13 Federal agencies have a continuing obligation to gather and evaluate new information relevant to the environmental impact of its actions. "An agency that has prepared an EIS cannot simply rest on the original document. The agency must be alert to new information that may alter the results of its original environmental analysis, and continue to take a 'hard look' at the environmental effects of [its] planned action, even after a proposal has received initial approval."14

C. NEPA Requires Agencies to Disclose Climate Impacts of Proposed Actions.

NEPA requires agencies to undertake meaningful consideration of greenhouse gas emissions (GHGs) and carbon sequestration (carbon storage).[32] As the Ninth Circuit has held, in the context of fuel economy standard rules:

> The impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct. Any given rule setting a CAFE standard might have an "individually minor" effect on

option that would meaningfully limit oil and gas leasing and development within the planning area); *Colorado Environmental Coalition v. Salazar*, 875 F. Supp. 1233 (D. Colo. 2012) (BLM was obliged to consider an alternative requiring extraction of oil and gas to be conducted through extended-reach multilateral wells).

[28] *Natural Resources Defense Council, Inc. v. Morton*, 458 F.2d 827, 836 (D.C. Cir. 1972).

[29] *Town of Matthews v. U.S. Dep't of Transp.*, 527 F. Supp. 1055 (W.D. N.C. 1981).

[30] *North Buckhead Civic Ass'n v. Skinner*, 903 F.2d 1533, 1542 (11th Cir. 1990).

[31] *See Wilderness Soc'y*, 524 F. Supp. 2d at 1309 (holding EA for agency decision to offer oil and gas leases violated NEPA because it failed to discuss the reasons for eliminating a "no surface occupancy" alternative); *Ayers v. Espy*, 873 F. Supp. 455, 468, 473 (D. Colo. 1994).

[32] *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008). We use the terms "carbon storage" and "carbon sequestration" interchangeably.

the environment, but these rules are "collectively significant actions taking place over a period of time."[33]

Courts have held that a "general discussion of the effects of global climate change" does not satisfy NEPA's hard-look requirement.[34]

Further, courts have ruled that federal agencies must consider indirect GHG emissions resulting from agency policy, regulatory, and fossil fuel leasing decisions. For example, agencies cannot ignore the indirect air quality and climate change impact of decisions that would open up access to coal reserves.[35] A NEPA analysis that does not adequately consider the indirect effects of a proposed action, including climate emissions, violates NEPA.[36] The disclosure of merely the volume of GHG emissions is insufficient; agencies must also disclose the impacts of those emissions.[37]

NEPA requires "reasonable forecasting," which includes the consideration of "reasonably foreseeable future actions … even if they are not specific proposals."[38] That an agency cannot "accurately" calculate the total emissions expected from project implementation is not a rational basis for cutting off its analysis. As the Ninth Circuit has explained, "[b]ecause speculation is … implicit in NEPA," agencies may not "shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as crystal ball inquiry."[39] The D.C. Circuit has echoed this sentiment, rejecting the argument that it is "impossible to know exactly what quantity of greenhouse gases will be emitted" and concluding that "agencies may sometimes need to make educated assumptions about an uncertain future" in order to comply with NEPA's reasonable forecasting requirement.[40]

Agencies cannot allege that they can forego quantify the project's climate impacts by relying on NEPA regulations concerning "incomplete or unavailable information." Those NEPA provisions require the agency to identify the information as such, to "make clear that such information is lacking," and nonetheless include the information in the NEPA document if the overall costs of

---

[33] *Id*., 538 F.3d at 1216 (quoting 40 C.F.R. § 1508.7 (1978)). *See also WildEarth Guardians v. BLM*, 870 F.3d 1222, 1237 (10th Cir. 2017) (failure to disclose climate impacts of various alternatives "defeated NEPA's purpose").

[34] *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1189-90 (D. Colo. 2014).

[35] *See Mid States Coal. For Progress v. Surface Transp. Bd*., 345 F.3d 520, 532, 550 (8th Cir. 2003); *High Country Conservation Advocates*, 52 F. Supp. 3d at 1197-98; *Montana Environmental Information Center v. U.S. Office of Surface Mining*, 274 F. Supp. 3d 1074 (D. Mont. 2017), *amended in part, adhered to in part*, 2017 WL 5047901 (D. Mont. 2017).

[36] *Ctr. for Biological Diversity v. Bernhardt*, 982 F.3d 723, 2020 U.S. App. LEXIS 38033, *20 (9th Cir. 2020).

[37] *Utah Physicians For A Healthy Env't v. United States BLM*, 2021 U.S. Dist. LEXIS 57756 (D. Utah Mar. 24, 2021).

[38] *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1079 (9th Cir. 2011) (citation omitted).

[39] *Id*. (citations omitted).

[40] *Sierra Club v. Federal Energy Regulatory Commission*, 863 F.3d 1357, 1373-74 (D.C. Cir. 2017).

obtaining it are not "exorbitant" and the information is "essential to a reasoned choice among alternatives."[41]

The 2016 final CEQ *Guidance on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Review* provides useful direction on the issue of federal agency review of greenhouse gas emissions as foreseeable direct and indirect effects of a proposed action.[42] The CEQ guidance provides instructs agencies to conduct a lifecycle greenhouse gas analysis that quantifies GHG emissions and storage because the modeling and tools to conduct this type of analysis are available:

> If the direct and indirect GHG emissions can be quantified based on available information, including reasonable projections and assumptions, agencies should consider and disclose the reasonably foreseeable direct and indirect emissions when analyzing the direct and indirect effects of the proposed action. Agencies should disclose the information and any assumptions used in the analysis and explain any uncertainties. To compare a project's estimated direct and indirect emissions with GHG emissions from the no-action alternative, agencies should draw on existing, timely, objective, and authoritative analyses, such as those by the Energy Information Administration, the Federal Energy Management Program, or Office of Fossil Energy of the Department of Energy. In the absence of such analyses, agencies should use other available information.[43]

The guidance further specifies that estimating GHG emissions is appropriate and necessary for actions such as the management of federal forests, including logging projects.

> In addressing biogenic GHG emissions, resource management agencies should include a comparison of estimated net GHG emissions and carbon stock changes that are projected to occur with and without implementation of proposed land or resource management actions. This analysis should take into account the GHG emissions, carbon sequestration potential, and the changes in carbon stocks that are relevant to decision making in light of the proposed actions and timeframes under consideration.[44]

The guidance shows that CEQ expects that agencies will perform such analysis at a programmatic or plan level, and also at the level of an individual project (such as an individual prescribed burn).

> Biogenic GHG emissions and carbon stocks from some land or resource management activities, such as a prescribed burn of a forest or grassland conducted to limit loss of ecosystem function through wildfires or insect infestations, may result in short-term GHG emissions and loss of stored carbon,

[41] 40 C.F.R. § 1502.22.
[42] Notice available at 81 Fed. Reg. 51,866 (Aug. 5, 2016); full guidance attached as Ex. 1, and available at https://ceq.doe.gov/docs/ceq-regulations-and-guidance/nepa_final_ghg_guidance.pdf (last viewed Oct. 29, 2023).
[43] *Id*. at 16 (citations omitted).
[44] *Id*. at 26 (citations omitted).

> while in the longer term a restored, healthy ecosystem may provide long-term carbon sequestration. Therefore, the short- and long-term effects should be described in comparison to the no action alternative in the NEPA review.[45]

Although the Trump administration withdrew the 2016 CEQ guidance, President Biden on January 20, 2021 rescinded that Trump Executive Order, and directed CEQ to "review, revise, and update" its 2016 climate guidance.[46] On February 19, 2021, CEQ effectively reinstated the 2016 GHG guidance:

> CEQ will address in a separate notice its review of and any appropriate revisions and updates to the 2016 GHG Guidance. In the interim, agencies should consider all available tools and resources in assessing GHG emissions and climate change effects of their proposed actions, including, as appropriate and relevant, the 2016 GHG Guidance.[47]

Further, whatever the state of federal guidance, the underlying requirement from federal caselaw to consider climate change impacts under NEPA, including indirect and cumulative combustion impacts and loss of sequestration foreseeably resulting from decisions that facilitate logging, has not changed.[48]

The Interagency Social Cost of Carbon was developed specifically to provide agencies with a way to quantify and compare those impacts, and agencies have regularly used this method to disclose the climate impacts of federal actions. Courts have found agency action arbitrary and capricious where agencies failed to explain why they refused to use the social cost of carbon.[49]

D. Administrative Procedure Act

---

[45] *Id*. at 18.
[46] Executive Order 13,990 (Jan. 20, 2021), Sec. 7(e), 86 Fed. Reg. at 7042, attached as Ex. 2.
[47] Council on Environmental Quality, National Environmental Policy Act, Guidance on Consideration of Greenhouse Gas Emissions, 86 Fed. Reg. 10,252 (Feb. 19, 2021), attached as Ex. 3, and available at https://www.govinfo.gov/content/pkg/FR-2021-02-19/pdf/2021-03355.pdf (last viewed Oct. 30, 2023).
[48] *See S. Fork Band Council of W. Shoshone v. United States Dept. of Interior*, 588 F.3d 718, 725 (9th Cir. 2009); *Ctr. for Biological Diversity*, 538 F.3d at 1214-15; *Mid States Coalition for Progress*, 345 F.3d at 550; *WildEarth Guardians v. United States Office of Surface Mining, Reclamation & Enf't*, 104 F. Supp. 3d 1208, 1230 (D. Colo. 2015) (coal combustion was indirect effect of agency's approval of mining plan modifications that "increased the area of federal land on which mining has occurred" and "led to an increase in the amount of federal coal available for combustion."); *Diné Citizens Against Ruining Our Env't v. United States Office of Surface Mining Reclamation & Enf't*, 82 F. Supp. 3d 1201, 1213-1218 (D. Colo. 2015); *High Country Conservation Advocates*, 52 F. Supp. 3d at 1174; *Utah Physicians For A Healthy Env't*, 2021 U.S. Dist. LEXIS 57756, at *15-*23.
[49] *High Country Conservation Advocates*, 52 F. Supp. 3d at 1190-93 (finding Forest Service violated NEPA by failing to disclose the climate impacts via the social cost of carbon); *Wildearth Guardians v. Bernhardt*, 2021 U.S. Dist. LEXIS 20792, CV 17-80-BLG-SPW (D. Mont. Feb. 3, 2021) at *25-*31 (finding Office of Surface Mining violated NEPA by failing to disclose the climate impacts via the social cost of carbon). *See also* CEQ, 2016 NEPA Climate Guidance (Ex. 1) at 32-33 (noting the appropriateness of monetizing climate impacts).

The Administrative Procedure Act prohibits "arbitrary and capricious" decision-making,[50] and provides an important layer of legal oversight to agency actions such as the Forest Plan process. The Forest Service must demonstrate a rational connection between the facts found and choices made.[51]

II. STATEMENT OF THE ISSUES AND CONCISE SUMMARY OF OBJECTION[52]

The first objection discusses new significant information that has come to light since the Draft EIS comment period that goes to the heart of the Forest Service's timber suitability determination and the impacts that would occur to carbon stores, mature and old growth, soils, and biodiversity. The Forest Service is under an obligation to gather and evaluate new information about the impacts of its actions, and this is particularly pressing, where as here, the information is not consistent with the Agency's Preferred Alternative. Objection #2 discusses the failure of the Agency to consider a carbon storage alternative, violating NEPA. This is a reasonable alternative that can be conducted, yet the Forest Service provided a variety of unconvincing excuses for failing to do so. Objection #3 is that the Forest Service failed to take a hard look at the impacts of its alternatives on GMUG forests carbon stores. This shortfall severely constraining the ability for informed decision (withheld critical information from the public) about the climate and carbon storage impacts that would result from the alternatives, and particularly the Preferred Alternative and Alternative C that would result in the ability for unprecedent amount of tree reduction across the GMUG forests. Objection #4 is that the Forest failed to manage the forests for carbon sequestration, in violation of the National Forest Management Act. Objection #5 is that exception FW-STND-TMBR-02 is vague and unbounded, making it a meaningless standard meaningless to avoid forest conversion and serve as a check on timber reduction practices and that is it not consistent with 16 U.S.C. § 1604(E)(ii) and 36 C.F.R. § 219.11(d). Finally, Objection #6 discusses the Forest Service's NEPA failure to consider a no-coal leasing alternative as well as how this violates the agency's substantive duties under NFMA and the 2012 Planning Rule.

III. SPECIFIC OBJECTIONS

A. OBJECTION #1: Significant New Information Requires the Preparation of a Supplemental EIS ("SEIS") on the Impacts of the Timber Suitability Decision and of Alternatives on Carbon Storage and the Forests' Roles in Climate Mitigation and Adaptation.

Agencies are under an obligation to gather and evaluate new information relevant to the environmental impact of its actions. "An agency that has prepared an EIS cannot simply rest on the original document. The agency must be alert to new information that may alter the results of its original environmental analysis, and continue to take a 'hard look' at the environmental effects of [its] planned action, even after a proposal has received initial approval."[53]

[50] 5 U.S.C. § 706.
[51] *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).
[52] Suggesting on how to improve the plan are in the following section after each specific objection.
[53] *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360, 373-74 (1989).

Since the DEIS, there is more policy from the Biden Administration and new information that calls into question the very heart of assertions, that "[t]he GMUG's vegetation management program plays a critical role in maintaining the health of the forest, including management for climate change adaptation and ecosystem restoration"[54] and that "Forest management in the GMUG National Forests is motivated by desired conditions for resilient, climate-adapted ecosystems."[55] This result is that the agency must conduct a Supplemental EIS as this information is relevant to the environmental concerns and bears on the proposed Revised Plan and its impacts.

On April 22, 2022, Biden released Executive Order 14072 on Strengthening the Nation's Forests, Communities, and Local Economies that set forth a policy for restoring and conserving the Nation's Forests, including mature and old-growth forests.[56] Biden stated that his administration would:

> manage forests on Federal lands, which include many mature and old-growth forests, to promote their continued health and resilience; retain and enhance carbon storage; conserve biodiversity; mitigate the risk of wildfires; enhance climate resilience; enable subsistence and cultural uses; provide outdoor recreational opportunities; and promote sustainable local economic development. Science—based reforestation is one of the greatest opportunities both globally and in the United States for the land sector to contribute to climate and biodiversity goals.[57]

The United States is one of 140 nations that have pledged to end forest degradation and deforestation by 2030.[58] IPCC 2022 mentions safeguarding biodiversity and ecosystem integrity as fundamental to climate resilient developments.[59]

Dovetailing with these policy directions are multiple scientific publications that have directly admonished the Forest Service's heavy logging and tree reduction practices that are embraced in the Preferred Alternative (as well as found in the other alternatives) and made it especially clear that carbon storage goes hand in hand with biodiversity. This new significant information has called out the lack of accountability and success with "adaptive management," which excuses managers from accountability for results of their management decisions and allows for unending trial and error with despite consequences and lack of empirical evidence of success. This section focuses on two of these studies, additional studies are discussed in following sections and incorporated herein to reduce redundancy.[60]

January of this year, peer reviewed science rejected the Forest Service's approach:

---

[54] *See e.g.* GMUG Revised Forest Plan at 10.
[55] GMUG Revised Forest Plan at 99; *see also* FEIS at 8.
[56] 87 Fed. Reg. 24,851 (Apr. 27, 2022) (Ex. 4).
[57] *Id*. at 24,852.
[58] United Nations University Centre for Policy Research, The Glasglow Leaders' Declaration on Forests and Land Use (Feb. 2, 2021) (Ex. 5).
[59] IPCC 2022 (Ex. 6) ("IPCC 2022).
[60] *See* below discussing Birdsey et al., 2023 (Ex. 21), Barnett et al., 2023 (Ex. 22), DellaSala et al. 2022 (Ex. 15), Law et al, 2022 (Ex. 16); IPCC 2022 (Ex. 6).

> A campaign is underway to clear established forests and expand early successional habitats—also called young forest, pre-forest, early seral, or open habitats—with the intention of benefitting specific species. . . in the face of urgent global crises in climate, biodiversity, and human health, we conclude that public land forest and wildlife management programs must be reevaluated to balance the prioritization and funding of early-successional habitat with strong and lasting protection for old growth and mature forests, and going forward, must ensure far more robust, unbiased, and ongoing monitoring and evaluation.[61]

The study reviewed the

> history of forest disturbance and biodiversity research, the genesis of the forest-clearing campaign and the conservation rationales, the contrasts between natural old-growth forests and intensively managed forests, the impacts of forest-clearing projects, and the current balance of activity between forest management and protection.[62]

The author's concluded that

> **instead of intensive and costly management to create additional early-successional habitats, a new "natural" alternative should be considered which would protect and allow the dynamic growth of established aggrading, mature, and old-growth forests alongside maintaining existing early-successional habitats, where appropriate, for targeted species and cultural values.[63]**

The authors highlighted that "any natural forest, older than 60-80 years, does not have a uniform structure like a plantation. It is set up to become old-growth and old forest."[64] It identified that regarding "risks, there is considerable evidence that human-created or maintained habitats do not provide the complexity, resilience, and diversity over long periods of time that are provided by natural forest ecosystems. Moreover, countless interconnected and long-term ecological variables and processes are not well understood or are still simply unknown—and therefore cannot be 'replicated' by human intervention with any confidence."[65]

Ample evidence illustrates that widespread and increased forest clearing results in the loss of mature forests and future old-growth habitats, reduces connectivity, and increases in edge habitats, the spread of invasive species, and deleterious effect due to mechanical disruption and

---

[61] Michael J. Kellett, et al., *Forest-clearing to create early-successional habitats: Questionable benefits, significant costs*, Front. For. Glob. Change 5:1073677, 1 (Jan. 9, 2023) (Ex. 7).
[62] *Id*. at 2.
[63] *Id*. (emphasis added); *see also id*. at 13 ("Early-successional habitats have declined since their peak in the 19th and early 20th centuries but they are still widely represented, actively created by natural and human disturbances, likely undercounted, and expected to increase in the future. In light of the concerns discussed above, there is a compelling argument for re-evaluating the assertion that creating more early-successional habitat is essential for the survival and health of ecosystems, habitats, or species.").
[64] *Id*. at 12.
[65] *Id.*.

species isolation.[66] Human timber reduction practices and tinkering risks losing important biological flora and fauna that we lack sufficient data on and a vast amount of still to-be-discovered species. These are found in older forests and areas with older trees also contain "vast networks of plant roots and mycorrhizae, which may link trees to each other and allow the transfer of resources between mature trees."[67] Forest maturity also increases the presence of groundwater macroinverbrates, and consequentially uncommon species[68] and makes these forests retain water better than younger forests.

Critically, "[e]ven less-intensive logging activity can diminish or eliminate disturbance-sensitive and slowly dispersing plant and animal species, with recovery potentially taking many decades, it at all."[69] But forests that are allowed to recover naturally, developing past the stem-exclusion phase "steadily gain structural complexity and biodiversity, in part from ongoing low-to-moderate severity disturbances."[70] Here the researchers explicitly pointed out that "Maine's 'forever wild' Baxter State Park, natural insect outbreaks create open habitats that benefit early-successional species."[71] And wilderness areas that were looked at also contained considerable early-successional habitats even though they were never open to logging or habitat management.[72]

Fragmentation from roads and other human intrusion can result in the decline of forest interior species, causing a significant impact on species richness and community dynamics of migratory birds.[73] A spiraling effect can occur with the loss of apex predators, leading to biodiversity loss and altered dynamics of disease, carbon accumulation, invasive species, and biogeochemical cycles.[74] Even common forest species are subject to major declines due to loss of natural forest habitats. A global report shows a 69% decrease in monitored wildlife populations between 1970 and 2018, in large part due to habitat fragmentation and degradation.[75]

When established forests are cleared that opens the door for introduction and spread of invasive and non-native species, which ultimately reduces biodiversity. "Managed forests have been found to have as much as three times more invasives than fully protected national parks or wilderness. Invasive plants can have a negative impact on native animal populations, including birds, mammals, and other vertebrates."[76]

Our forest carbon stocks are already depleted from past logging and clearing and ongoing removal at a 60% loss. At the same time, "[l]ogging accounts for 86% of the carbon emitted by U.S. Forests each year—far greater than insects, storm, damage, fire, development and other uses

[66] *Id*. at 13.
[67] *Id*.
[68] *Id*.
[69] *Id*.
[70] *Id*.
[71] *Id*.
[72] *Id*.
[73] *Id*. at 14.
[74] *Id*.
[75] *Id*.
[76] *Id*.

combined."[77] Logging also leaves an outsized decade, and even century long impact in soils, which on the GMUG retain 50% of the carbon stores because it can take "60 to 100 years for soils on a site to recover from clearcut logging."[78]

Faison et al. 2023, released March 30, 2023 stated that "accepting the capacity of natural systems to adapt and be self-sustaining with natural stewardship is a critical and cost-effective approach . . …"[79] Many of the studies cited by Faison et al. 2023 also post-date the DEIS. Faison et al. 2023 explicitly identified inherent problems with the current "adaptative management" that the Forest Service whole heartedly embraces with all alternatives because while the goals are improved resilience and protection of biodiversity, it rarely (if ever) play out that way.[80]

> in some cases, [adaptive management] **have little effect on future stand resistance** (Morris et al., 2022), is **often unnecessary for natural forest resilience** (e.g., Cansler et al., 2022; Hart et al., 2015) **and biodiversity** (Thom & Seidl, 2016; Viljur et al., 2022), **and is generally counterproductive to carbon storage, structural complexity, tree diversity, and resistance to invasive species.** (Donato et al., 2013; Miller et al., 2018; Patton et al., 2022; Schwilk et al., 2009; Young et al., 2017; Table 1). Moreover, **conservation evidence for the effectiveness of management interventions is often lacking or has mixed results** (Sutherland et al., 2021), resources for interventions are limited, and management incurs substantial financial and other costs to society (Houtman et al., 2013).[81]

A scarcity of empirical evidence is a notable problem of adaptation management strategies. A recent review article found that "most of the inference about intervention options has been drawn from theory rather than empiricism" and according to the latest IPCC report, there is almost no evaluation of the success of adaptation approaches in the scientific literature (Parmesan et al., 2022).[82]

Additional relevant excerpts from Faison et al. 2023 directly questions the assumptions that the analyzed alternatives'—including the Preferred Alternative's identification significantly larger suitable timber base than in the past (and thus allowing its conversion to be managed not as a carbon sink or for other values, like biodiversity, but predominantly for timber production)—approach to timber reduction would "maintain and improve forest health and resilience in the

---

[77] *Id*.
[78] *Id*.
[79] Edward K. Faison et al., *The importance of natural forest stewardship in adaptation planning in the United States*, Conservation Science and Practice, 2 (Mar. 30, 2023) (Ex. 8).
[80] *Id*. at 2.
[81] *Id*. (emphasis added).
[82] *Id*. at 4. Parmesan, C., Morecroft, M. D., Trisurat, Y., Adrian, R., Anshari, G. Z., Arneth, A., Gao, Q., Gonzalez, P., Harris, R., Price, J., Stevens, N., & Talukdarr, G. H. (2022). Terrestrial and freshwater ecosystems and their services. In H.-O. Pörtner, D. C. Roberts, M. Tignor, E. S. Poloczanska, K. Mintenbeck, A. Alegría,M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, & B. Rama (Eds.), Climate change 2022: Impacts, adaptation and vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (pp. 197–377). Cambridge University Press. https://doi.org/10.1017/9781009325844.004 at 1.2.1.3 (Ex. 53).

context of changing climate, while recognizing the necessary role of a viable timber industry as a partner to implement this work."[83]

> From an ecological perspective, it is questionable whether it is even desirable or necessary to reduce the frequency and intensity of fire and other disturbances away from human settlements and forests managed for sustained wood production. Even moderate to severe natural disturbances promote structural heterogeneity, create biological legacies and unique habitats, and can increase biodiversity. And while mechanical thinning may mimic some of the habitat benefits of low to moderate severity fires, it does not emulate the important habitat characteristics of high severity fires.
> . . .
> [M]eta-analyses reveal that overall natural disturbances have either significantly positive or neutral effects on biodiversity. Pollinating insects, tree lichens, birds, reptiles, arachnids, and herbaceous plants tend to increase as a result of disturbance, whereas epigeic lichens, mollusks, and mycorrizhal fungi are more likely to decline.[84]

Interestingly enough, Faison et al. 2023 also identified that

> While often perceived as catastrophic, severe insect outbreaks can result in a decline in subsequent insect attacks for 60 years and result in a decreased (or lack of increased) risk of subsequent fire. Severe fires can also reduce the susceptibility of forests to severe insect outbreaks for 100 years and in some cases can reduce future fire severity even when fire weather conditions are extreme. Severely burned forests can reburn at high severity; however, burned areas that were salvage logged and planted with conifer seedlings experienced more severe reburns than burned areas that were left untreated. In other words, natural forests have built-in resilience and adaptation capacities following many disturbances. At broad scales the resilience ("capacity to withstand and recover from environmental perturbations") of natural forest landscapes typically exceeds that of actively managed forests, in large part because of a generally higher structural complexity and tree species richness in the absence of management. Leveraging this natural capacity of forests to a greater extent via natural stewardship would result in substantial cost and carbon emissions savings by avoiding or reducing pre-emptive and post-disturbance management, resulting in increased protection against species extinctions.[85]

Faison et al., 2023 conclude that "[i]n truth, most forests still regenerate without interventions, even after severe natural disturbances." "[N]atural regeneration often exceeds active restoration efforts, provides greater genetic diversity than planted seedlings, and greater stand-level carbon storage in coarse woody debris."[86]

---

[83] *See e.g.* FEIS at 55.
[84] Faison et al. 2023 at 4, 5 (internal citations omitted).
[85] *Id*. at 5 (internal citations omitted).
[86] *Id*. at 6. (internal citations omitted). ("Perceived regeneration failures from severe fire, intensive ungulate browsing, or seed source limitations may, in many cases, be patchy or delayed tree regeneration that has other benefits when seedling densities, growth rates, and particular tree species are not primary concerns. As one example, low density regeneration reduces the severity of reburns, facilitating forest

The new information (as well as the Forest Service's handling of carbon storage impacts of its analyzed alternatives, which includes a new appendix and heavily reworked section in the FEIS) makes it abundantly clear that the Forest Service has not analyzed and disclosed impacts as NEPA requires from its decision to increase the timber suitability base and the importance of old and mature tree retention (including old growth forests) and undisturbed forests for carbon stores and biodiversity.[87] This blindered approach and the failure to ensure retention of these trees and forests, has resulted in Plan that violates NEPA, NFMA, and the 2012 Planning Regulations. It is critical that the Forest Plan protect mature and old-growth carbon stores and the ability for trees on the GMUG to naturally succeed to these ages and sizes. Yet, between the draft plan and final plan, there is now a less quantitative desired condition for old-growth forest. The agency has also admitted that "the GMUG does not have a Forest wide assessment of old-growth occurrence."[88] Without this baseline information, the Forest Service and the public cannot determine what the actual impacts of any of the alternatives would be on old forests and the true impacts on carbon storage. Indeed, there has been no analysis of the direct, indirect, or cumulative impacts of these alternatives on old-growth and disclosure of the degree of harm the alternatives would have. Accordingly, there is no basis for the Forest Service's perfunctory assertion that "It is not expected that the preferred alternative or Alternative D will have a measurable effect on the amount of old-growth forest in the GMUG."[89]

It is not disputed that mature forests (mature or old-growth) and larges trees within these forests "play an outsized role in the accumulation and long-term storage of atmospheric carbon, and consequently enabling their protection where lacking has been recognized as an effective nature-based climate solution."[90] Protecting mature and old-growth trees also benefits diverse ecological values and allows mid-sized trees to move towards maturity to become mature and old-growth. These forests are refugia for imperiled species and store disproportionate amounts of above-carbon in forests.[91] The Forest Service cannot ignore new significant information that indicates unanalyzed impacts would result from leaving these areas open and vulnerable to logging and other timber reduction practices. Recent studies about land values unequivocally have determined that "the importance of mature forests for ecosystem integrity and non-timber ecosystem services far exceed their value for timber production."[92] The reason this is "controversial" is because it restricts logging, and here, it runs directly contrary to the Forest Service's Revised Plan that puts hundreds of thousands of acres on the chopping block for commercial logging identification alone. That conflict does not excuse the agency needing to conduct a SEIS that analyzes and transparently discloses the impacts of its alternatives.

---

recovery. Heterogeneity of natural regeneration also avoids structural uniformity that occurs with planting and can extend the duration of early successional patches and gaps, there by accelerating the development of spatial and structural complexity.").

[87] *See* FEIS at 8.

[88] FEIS at 139.

[89] *Id*.

[90] Faison et al. 2023 at 2.

[91] *Id*.

[92] *Id*. at 2.

This new significant information also raises questions with the efficacy of the Forest Service's "tool kit" for adapting and mitigating climate change.[93] For example, while some of Millar et al. 2007 may still be relevant, it is apparent that it's conceptual framework of aggressive management and "adaption options"[94] do not align with the resounding conclusions from science about the impacts of timber removal practices on forest carbon stores. Similarly, Peterson et al. 2011 encourages adaptive management, but the latest information, now a decade after this guidebook was developed and started being implemented, has shown that adaptive management is proving negligible to problematic, making it highly questionable whether that should continue being a marker for the agency's management practices over hundreds of thousands of acres. While Swanston et al. 2016 is only seven years old, the reliance and emphasis on adaptive management results in the same and similar incongruities as Peterson et al. 2011.[95] Accordingly, the Forest Service needs to take a hard look at its proposed "tool kit" weighing the new significant information pertaining to carbon stores, impacts from timber reduction practices, carbon stores and their relationship with biodiversity, and "adaptive management."

Suggested Resolutions for Significant New Information Regarding Analyzed Alternatives' Impacts on Carbon Storage

The Forest Service must prepare a SEIS and analyze, in detail, the impacts of its timber suitability decisions and alternatives on the GMUG's carbon storage function and capacity and the function of the Forests ability to support and sustain biodiversity. The SEIS must utilize the best available scientific information, and take a "hard look" at the impacts of each of the alternatives on carbon storage function and capacity, impacts to mature and old-growth, and the function of the Forests ability to support and sustain biodiversity (including natural succession of trees and stands to become mature and old-growth). Lastly, the SEIS must adopt an alternative that includes a standard or standards that ensure protection of mature and old-growth trees and their soils and a standard or standards that ensures these age classes would be developed by affording trees and stands not in these age classes protection from timber reduction activities so they may naturally age and become the next generation of mature and old-growth trees.

B. OBJECTION #2: The Forest Service Failed to Consider a Carbon Storage Alternative, Violating NEPA.

The Forest Service has arbitrarily dismissed and failed to consider a carbon storage maximizing alternative. Neither of the Forest Service's two rationales are sufficient excuses from analyzing this reasonable alternative.

To achieve critical climate goals, and to satisfy the Forest Service's' obligations under NEPA, MUSYA, NFMA and the 2012 Planning Rules, we requested that the Forest Service develop a carbon storage alternative for the Final EIS for the GMUG National Forest Plan Revision. We recommended that such an alternative contain strong plan-level guidance and prescriptions for

[93] *See e.g.* Revised Plan Appendix 2-1.
[94] *See e.g.* Millar et al., *Climate Change and Forests of the Future: Managing in the Face of Uncertainty*, 17 Ecological Applications 8, 2,146 (May 2007) (Ex. 9).
[95] David L. Peterson et al., Responding to Climate Change on Nat'l Forests: A Guidebook for Developing Adaptation Options (Feb. 2011) (Ex. 10). Christopher W. Swanston et al., Forest Adaptation Resources: Climate Change Tools and Approaches for Land Managers, 2nd edition (Sept. 2016) (Ex. 11).

protection and restoration of old-growth, proforestation, afforestation and reforestation.[96] This would facilitate a shift of federal subsidies away from logging toward investments in resilient, carbon-rich ecosystems that provide wildlife habitat and steady sources of clean water. An alternative that maximizes long-term carbon storage on public lands would also require changes in management, including restoring fire as a key ecological process.[97]

We urged that this alternative include but not be limited to:

- Identification of the adverse impacts of climate change on the national forest;[98]

- Recognition of the need for the Forest Service to protect the national forests by managing it to slow climate change and mitigate its causes, here and as part of the national forest system, by minimizing carbon and greenhouse gas emissions and maximizing carbon sequestration and carbon storage;

- Management of the national forest for net carbon neutrality and ultimately as a carbon sink;

- Recognition that old forests accumulate and store vast quantities of carbon and are usually carbon sinks; trees accumulate and store carbon over their entire lifespan and old trees store carbon better than growing trees; and old forests accumulate carbon in soils;

- Recognition that conserving unmanaged wild forests and permanently protecting the forest and allowing it to grow free from direct human manipulation is one of the most effective methods to address the climate crisis;

- Elimination or significant reduction of timber harvest and increasing the rotation intervals for any remaining timber harvest to delay harvests;

---

[96] "Proforestation" involves growing additional existing forests as intact ecosystems. This mitigates climate change through carbon sequestration and storage as well as promoting habitat protection and biodiversity. "Afforestation" involves planting new forests and "reforestation" involves replacing forests on de-forested lands. A sound carbon sequestration strategy would maximize all three of these practices.

[97] Any Plan goals concerning fuel reduction are not to the contrary. Scientific evidence suggests that anthropogenic climate change is contributing to a longer fire season and more acres burned, which releases carbon into the atmosphere. Any assumption that mechanical thinning and treatment will, in the long run, avoid the carbon emissions associated with more frequent high severity fires is flawed. "Thinning," and other forms of commercial logging, cause a substantial net loss of forest carbon storage now, and a net increase in carbon emissions relative to no logging, and logging can increase fire intensity rather than reduce it. Bradley, C. M., C. T. Hanson, and D. A. DellaSala. 2016. *Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States?* Ecosphere 7(10):e01492. 10.1002/ecs2.1492 at 7, 9, attached to Center and Defenders' DEIS Comments as Ex. 12, and attached here as Ex. 12.

[98] These include but are not limited to full analysis of impacts on snowpack, treeline, water availability, drought, temperature, wildfire, pests, and additional adverse impacts on flora and fauna and the human environment. *See e.g.,* EPA, What Climate Change Means for Colorado (Aug. 2016) (Center and Defenders' DEIS Comments Ex. 7).

- Elimination of mechanical thinning of trees other than suppressed small diameter trees or suppressed saplings;

- Reforestation of degraded forest lands and do not conduct post-fire logging;

- In making decisions about both "restoration" and timber harvest levels, optimizing carbon storage and sequestration by undertaking analysis that quantitatively evaluates the whole-ecosystem carbon balance based on the best available scientific information, and takes into account:

    - the synthesis presented in Anderson, M.G. 2019. Wild Carbon: A synthesis of recent findings. Northeast Wilderness Trust. Montpelier, VT USA regarding the value of mature trees and their soils with regard to carbon storage and sequestration

    - how the timing in changes in carbon storage and sequestration resulting from decisions comports with the need for urgent carbon reductions identified in the 2018 report from the IPCC. (Intergovernmental Panel on Climate Change (IPCC), Special Report on Global Warming of 1.5 °C (SR15) (October 2018), available at https://www.ipcc.ch/sr15/download/. (Ex. 13). *See* IPCC, Global Warming of 1.5 °C (Oct. 2018), available at http://www.ipcc.ch/report/sr15/) the at the time latest Synthesis Report, Climate Change 2021, The Physical Science Basis and now, since the DEIS comments, the 2022 IPCC Report.

- Determination of acres available for timber harvest and timber harvest volumes, and a selection of alternatives, based on the factors set forth above.

The Forest Service first states that it's too difficult to determine an action alternative that would maximize carbon storage because of the "multitude of variables at the scale of 3 million acres and 15-20 years of the forest plan."[99] An alternative that would maximize carbon storage is not a black box where the Forest Service is without direction or any idea on where to start and how to analyze the impacts. There are numerous studies that have identified the foundational components for such an alternative: maximizing carbon storage requires the protection of old and mature trees and to ensure that younger trees can naturally evolve to these age classes and ensuring protection of below-ground carbon as well. For example, DellaSala et al. recently offered a comparison of emissions between protecting or logging federal mature old growth. Relying on Brown et al, 1997 and Keith et al., 2014 the study assumed that 50% of the carbon that stored in mature old growth would be emitted to the atmosphere due to combustion or decomposition of waste and short-lived wood products, resulting in a carbon stock loss.[100] It was then calculated that by 2030, 74% of logging emissions would remain in the atmosphere, and by 2050, 54% would still remain, meaning a result in .5 ppm increase in atmospheric CO2

[99] FEIS at 64.
[100] Dominic A. DellaSala et al., *Mature and old-growth forests contribute to large-scale conservation targets in the conterminous United States*, Front. For. Glob. Change 5:979528 at 14 (Sept. 28, 2022) (Ex. 15).

concentration by 2030 and .37 ppm by 2050.[101] This analysis demonstrates that there are ways to analyze an alternative that would maximize carbon storage over the life of the Revised Plan.

While the Forest Service has been revising its forest plan, the need for this analysis to ensure sound decisionmaking has only become more pressing. There's a well-identified necessity of the Forest Service needing to change its typical approach of regularly harvesting on all of the 70% of U.S. forest land designated as "timberlands" and instead, set aside sufficient areas as Strategic Reserves has been acknowledged as being able to significantly increase the amount of carbon accumulated between now, 2050, and 2100.

Areas in the lower 48 with high concentrations of imperiled forests- and non-forest species with small ranges in the west and east have been identified, which includes the nearly the entirety, if not the entirety of the GMUG forests. The GMUG forests have also been identified as having a high carbon forest of particularly vulnerability needing additional preservation if we are to meet the 2022 IPCC AR6 report's metric of needing to conserve 30% to 50% of the Earth's land, freshwater and ocean areas, including near-natural ecosystems.[102]

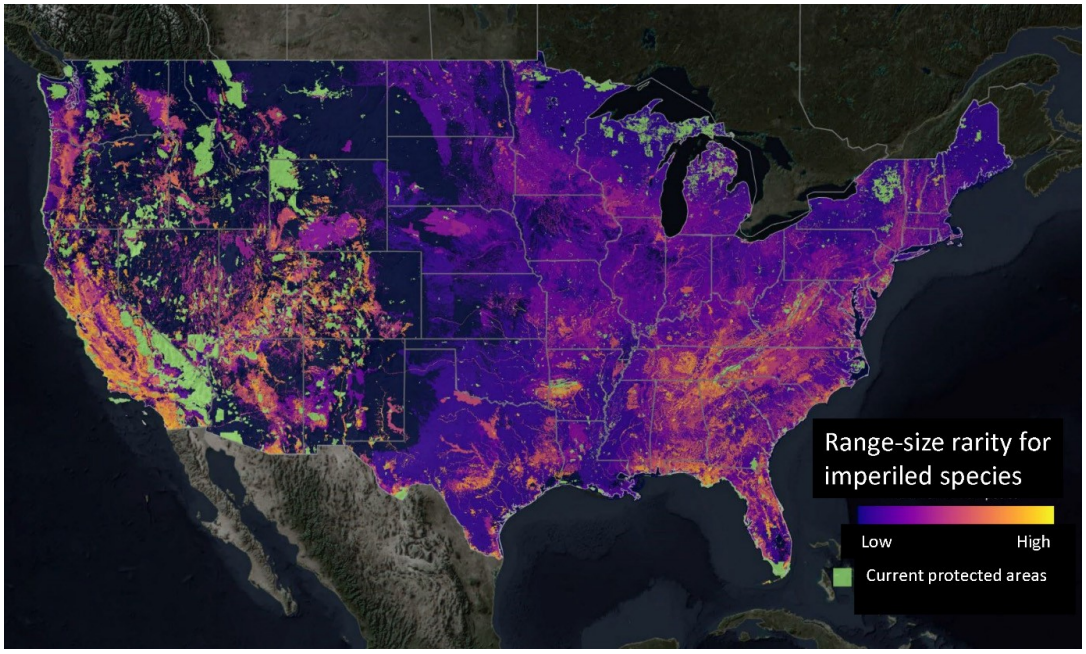

Figure 3. Summed range-size rarity of forest and non-forest species in the lower 48 states that are protected by the Endangered Species Act and/or considered to be in danger of extinction. Species include vertebrates (birds, mammals, amphibians, reptiles, freshwater fishes), freshwater invertebrates, pollinators, and vascular plants. High values (yellow) are areas where species with small ranges (and thus fewer places where they can be conserved) are

[101] *Id*. at 14-15.
[102] IPCC 2022; Beverly E. Law et al., *Creating Strategic Reserves to Protect Forest Carbon and Reduce Biodiversity Losses in the United States*, Land 2022, 11, 721 https://doi.org/10.3390/land1105072 at 19-10 (May 11, 2022) (Ex. 16).

likely to occur; the presence of multiple imperiled species contributes to higher scores. (Image produced by NatureServe; https://livingatlas.arcgis.com, accessed 21 April 2022).[103]

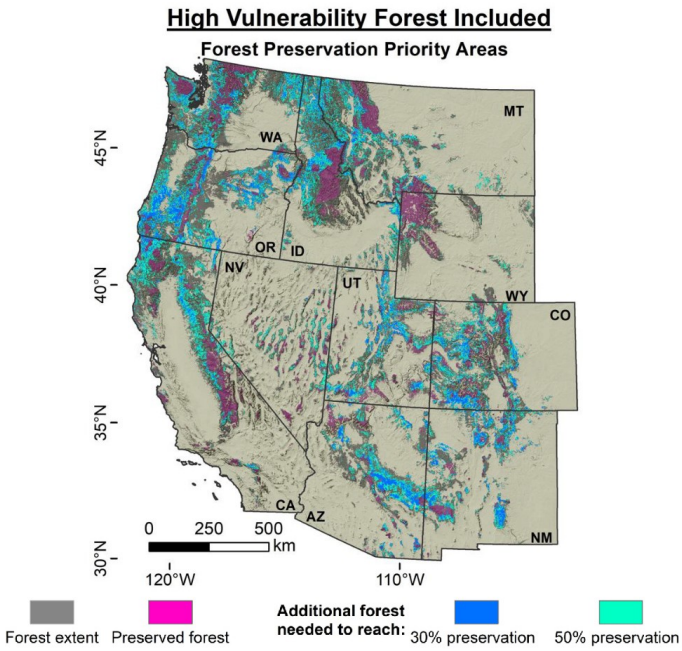

Figure 4. Forestlands that are currently preserved, and additional areas identified as high priority for protection of biodiversity and forest carbon for climate mitigation across the western U.S. Adapted from.[104]

"[L]arge areas of mature federal forests are significant carbon sinks that lack protection. . . **Protecting these carbon sinks and avoiding losses of carbon from logging would require a policy shift to focus more on the potential role of federal forests in climate mitigation.**"[105] Here, the Forest Service with its Revised Plan has the opportunity to analyze an alternative (maximizing carbon storage alternative) and adopt a Plan that is consistent with these needs and is even required to comply with NFMA's substantive diversity mandate and the Planning Rule's requirement of using and applying the best available science.

It is also contradictory for the Forest Service to reject this reasonable alternative where it admits that it has conducted a "carbon stock of the forest overall" and used this as basis of comparison for determining carbon impacts from logging and timber removal practices.[106] While that analysis is highly flawed and not NEPA compliant, the point is that the Forest Service has tools to conduct analysis about the impacts of a carbon storage maximizing alternative.

The Forest Service's analysis is wanting, because had it considered and quantified the carbon sequestration and carbon storage capabilities of wilderness, for example, it might have developed

[103] Law et al. 2022 at 8.
[104] *Id.* at 10.
[105] *Id*. at 11.
[106] FEIS at 372.

and chosen an alternative with greater recommended wilderness or a drastically reduced timber suitability determination. Instead, it rejected the alternatives with the greatest wilderness or less human interference via a smaller timber suitability base, without apparent consideration of these factors.[107]

The agency next said it rejected this alternative stating that it couldn't consider it because the agency is not required to prioritize any particular ecosystem service above all others.[108] This is not a rational basis for excluding this alternative. Indeed, by the agency's same rationale, it means that the Forest Service couldn't consider and chose the Preferred Alternative or Alternative C that would prioritize logging and timber reduction practices. In any event, this statement merely presupposes the outcome of the chosen alternative; it does not explain whether the carbon sequestration alternative meets the purpose and need or is too similar to other analyzed alternatives. It further ignores that a relatively stable climate is a necessary pre-condition for the GMUG forests providing ecosystem services, and that a relatively stable climate will not be possible unless the Forest Service and other agencies take all steps necessary to limit the worst impacts of climate change. The Forest Service also admits that the need to address climate change was a key reason for undertaking the Forest Plan revision.[109]

The Forest Service also cannot rely on its assertions in the FEIS that the revised plan has "more than one hundred final land management plan components, including standards, guidelines, and objectives, explicitly or implicitly address individual climate change adaptation strategies (see the Final Plan, Appendix 13, *Climate Change and Carbon – Crosswalk of Published Strategies and Forest Plan Direction*)"[110] as a rationale for not analyzing a carbon storage maximizing alternative. While it appears the agency is suggesting it's chosen alternative would provide for carbon storage, that is not the same as, nor even similar to, an alternative that *prioritizes* carbon storage. Regardless, there's not a single plan component that directly address carbon stores and requires their protection or preservation to say there's a hundred climate carbon components in the plan is misleading. The Forest Service thus cannot dismiss the carbon sequestration alternative as too similar to other alternatives.

<u>The Forest Service's analysis underscores the failure to address a range of alternatives</u>. The Final EIS considers the effects of the "no action" and three action alternatives. The Final EIS acknowledges that "[a]ll the proposed management activities would initially directly reduce carbon stocks on the forest, though minimally."[111] The Final EIS contains a quantitative estimate of "lost carbon storage potential" caused by logging and prescribed burning under each alternative, and concludes that the Preferred Alternative would remove one percent or slightly more than one percent of the total carbon stock of the GMUG overall and that Alternative D would correspondingly remove a smaller amount of .4 percent.[112] For each alternative, the FEIS concludes:

---

[107] *See* FEIS, Vol. 1, p. xv.
[108] FEIS at 64.
[109] Draft ROD at 4.
[110] *See e.g.* FEIS Vol. I at 8; Draft ROD at 15.
[111] FEIS, Vol. 1, p. 258.
[112] FEIS Vol. I at 373.

> All of the proposed vegetation management activities would initially directly reduce carbon stocks on the forest, though minimally. However, this initial effect would be mitigated or even reversed with time, reducing the potential for negative indirect and cumulative effects. These short-term losses and emissions are small relative to the total carbon stocks on the forest. Further, the proposed activities would generally maintain and improve forest health and supply wood for forest products, thus having positive indirect effects on carbon storage.[113]

The FEIS also shows that there's less than a 2% difference between the estimated gross potential total carbon removed for all the considered alternatives, including the no action.[114] This data thus show that all of the action alternatives will result in a similar amount of carbon losses, and that the magnitude of those losses for all action alternatives only "slightly" differs from one another. This illustrates that the Forest Service failed to consider a mid-range alternative—one where the potential carbon loss (or the lost carbon potential) would be, say, half-way between the no action and other action alternatives. Nor does the agency consider an alternative where the forest would be managed to act as a carbon sink during the plan period, where carbon stores would actually increase. This demonstrates that the Forest Service failure to consider a carbon storage alternative was arbitrary and capricious.

The carbon storage alternative meets the Revised Plan's purpose and needs. It would comply with NFMA. Indeed, we discuss below why NFMA *requires* adoption of an alternative prioritizing a response to climate change. The proposed alternative would guide natural resource management activities on the forest for the next 10 to 15 years, and would address the need to for change in management direction by responding to climate change.

Given that the adverse impacts of climate change on the forest are caused by excessive carbon emissions into the atmosphere, and that carbon sequestration can offset these emissions and hence reduce this cause, it follows that maximizing carbon sequestration promotes the protection of terrestrial ecosystems and habitat, and watersheds and water, which the plan identified as purposes for the Forest Plan Revision. Further, making the maximum effort to protect the climate would not interfere with multiple uses, and would limit the impacts of damaging human uses, and at a maximum ensures that there will be multiple uses left to manage.

For these reasons, the Forest Service should have considered in detail the carbon storage alternative.

Suggested Resolutions for Climate Change and Carbon Storage

The Forest Service must prepare a supplemental EIS and analyze, in detail, the carbon storage alternative proposed by the Center, including in its DEIS comment from 2021. This supplemental EIS must utilize the best available scientific information, and take a "hard look" at the impacts of each of the alternatives on carbon storage and carbon pollution by addressing each of the failings identified above, including by using a life cycle analysis and estimating quantitatively the impacts of each alternative, using a metric such as and including the social cost

[113] FEIS Vol I at 370.
[114] FEIS Vol. I at 375.

of carbon. Lastly, this supplemental EIS must adopt an alternative that complies with NEPA, NFMA, and MUSYA by maximizing the carbon stored on the forest.

C. OBJECTION #3: The Forest Service Did Not Take a Hard Look at the Impacts on GMUG Carbon Stores.

The timber program for the preferred alternative is described as "ambitious."[115] Yield for the preferred alternative is said to be "optimistic."[116] There's no evidence that what is proposed would accomplish the desired conditions. The Forest Service had identified 772,000 acres as "suitable" for commercial timber alone[117] and everywhere else that is not protected by wilderness or some other designation that prevents timber reduction practices could be subjected to salvage and sanitation even when not tied to public health or safety needs.[118] There has been a "deliberate decision to allocate more intact areas as suitable" compared to the previous Plan.[119] There is no discussion of how much more timber could even be identified as suitable, but due to the novel approaches of opening more of the GMUG than ever before to commercial logging there is no question that the GMUG forests would be entering a new territory for aggressive tree reduction practices.

The estimated annual acres of management in the preferred alternative is 210,000 acres for years 1-10 and another 250,000 acers for years 11-20, a total 460,000 acres[120] slated to be managed and resulting in the disturbance of nearly half the soil carbon stores in these chosen areas, contributing to the loss of carbon from these stores for decades and even up to a century after the management would occur. These estimates are not a cap on logging or other timber activities: "The projected timber and wood sale quantities are estimates required by the 2012 Planning Rule, but it is important to note they are "*not a target nor a limitation on harvest*" (FSH 1909.12, 60.5).[121] "The projected timber program is predominantly focused on live/green timber sales, but does assume endemic levels of beetles or other pathogens or fire events will cause some tree mortality and incorporates a small salvage program (5,000 CCF/year) accordingly."[122] And, at the same time, the Forest Service is condoning unproven and historically unprecedented logging activities in particularly vulnerable areas (steep slopes) to erosion and other negative impacts and more road development that increases the spread of invasive and noxious plants and degrades soil health and watershed health:

> • New technology and approaches could make timber harvest in areas with steep slopes (greater than 40 percent) economically feasible.

[115] FEIS Vol. I at 589.
[116] FEIS Vol. I at 425-426.
[117] FEIS Vol. I at 77.
[118] *See e.g.* Revised Plan at 101, FW-STND-TMBR-03.
[119] Draft ROD at 20.
[120] GMUG Revised Forest Plan at 2-2.
[121] GMUG Revised Forest Plan at 2-3 (emphasis is original).
[122] GMUG Revised Forest Plan at 2-3.

• Timber harvest may be done in areas historically difficult to access and that will require new or more extensive infrastructure, such as longer temporary roads than are typical and/or new permanent roads.[123]

In short, the Revised Plan admittedly allows and seeks to go well beyond the historical timber production and the impacts it has had on the GMUG forests. It is extremely concerning that the Forest Service is proposing steep slope logging above 40%, much less to an unknown percentage after its failed efforts to shoehorn logging on up to 60% slopes through the Spruce Beetle Epidemic Sudden Aspen Decline Management Response project was shut down because of concerns of appropriateness and compliance with decision documents.[124]

This would throw the forests into uncharted territory and vulnerability in the age of climate change when these very types of carbon-destructive management activities must be culled to protect carbon storage functions of National Forests. The Forest Service state that its' action alternatives "would be designed to achieve a more resilient forest condition that will improve the ability of the GMUG to maintain carbon stocks or enhance carbon uptake over the long-term."[125] But intentions about project design are not analysis or the hard look that NEPA requires.

While the Revised Plan and related documents play lip service to climate change and carbon storage functions of the forest,[126] there is not a single standard that protects mature and old-growth forests and their soils (and thus 50% of these forests' carbon storage function) from timber reduction practices that would destroy, degrade, and otherwise damage the critical carbon store function they provide. Nor is there a single standard that protects and ensures the trees and areas of the forest that would become mature and old-growth are protected, and allowed to naturally progress to this state. There is also not a single standard about protecting and preserving carbon storage functions. This must be corrected with the adoption of standards in the Revised Plan that would ensure these outcomes.

The Forest Service's justification for its forest-clearing approach is grounded in a failure to take a hard look at the direct, indirect, and cumulative impacts that mature and old-growth forests and their soils have in storing carbon. This violates NEPA, NFMA, and the 2012 Planning Rule. In January this year, 2023, the Forest Service's forest-clearing approach that has been sweeping the nation and is embraced in the Revised Plan was directly identified as failing us in this urgent moment of climate crisis as noted above.[127]

---

[123] GMUG Revised Forest Plan at 2-4.
[124] High Country Conservation Advocates ("HCCA") et al. letter to Chad Stewart, Forest Supervisor, GMUG Nat'l Forests, Request for a Meeting to Discuss Reconsideration of the Spruce Beetle Epidemic and Aspen Decline Mgmt. Response (Apr. 20, 2023) (Ex. 17); Chad Steward, Forest Supervisor, GMUG Nat'l Forests to HCCA et al. (July 11, 2023) (Ex. 18); Email from Michael Salazar to Levi Broyles et al. FW: Industry Meeting with RF and DRF (Aug. 30, 2022) (providing an industry wish list of "access to steep slope areas and other currently inaccessible areas" and removing seasonal restrictions for wildlife.) (Ex. 19).
[125] FEIS Vol. I at 376.
[126] GMUG FEIS at 8.
[127] Kellett et al., 2023 at 16.

While Mildrexler et al. 2020 focused on Northwest forests, the principle remains the same and is applicable to the GMUG:

> To meet net-zero carbon goals by 2050, it is estimated that reductions in net carbon emissions must be 7.6% per year over the decade of the 2020s (UNEP, 2019). This is most readily accomplished by reducing fossil fuel, bioenergy and industrial carbon dioxide emissions while simultaneously accumulating more carbon dioxide by protecting existing older forests that contain the largest share of carbon, and by allowing more forests to continue to accumulate carbon through proforestation (IUCN, 2020). Proforestation allows existing forests to continue growing without harvest or other management practices so that more trees can reach the large tree size that accumulates more carbon in the near and long term than do reforestation and afforestation (Moomaw et al., 2019). No additional land is required as is the case with afforestation, and proforestation is the lowest cost opportunity for reaching the zero net carbon goal by 2050. . .
>
> young trees will never be able to recover and accumulate the amount of carbon that is in the growing and older forests during these next critical decades, and will only equal current levels a century or more from now. Protecting large trees to help stabilize climate is critically important for managing forest ecosystems as social-ecological systems.[128]

The Revised Plan has not taken a hard look at the impacts on carbon storage, much less heeded of the best available science on the imperativeness of protecting carbon storage on the Forests.

In our comments on the DEIS, we pointed out how the analysis had failed to: disclose how each alternative impacts the ability of the forest to store carbon; *quantify* those different impacts in terms of carbon stored, via a life-cycle carbon analysis; and *disclose* the climate impacts of those differences using a metric such as the social cost of carbon. The FEIS still fails to do any of these things.

Instead, the discussion on carbon storage is focused on discounting the impacts of the alternatives and using fire and beetles as cover. This has resulted in biased and misleading discussions about impacts of the preferred and all analyzed alternatives and the Forest Service's erroneous conclusion that the impacts on carbon emissions (and carbon stocks) are small so quantitative analysis of carbon effects is not warranted and not meaningful.[129] By doing so, the Forest Service again exposes a lack of understanding of cumulative impacts analysis, and especially for climate and carbon impacts (see above for discussion not allowing agencies to state climate and carbon impacts are minimal to evade analysis). It also reflects an issue of warped sample size, where Plan level carbon and climate impacts are diluted to look meaningless placing them against "national emissions and on forest carbon stocks."[130]

---

[128] David J. Mildrexler et al., *Large Trees Dominate Carbon Storage in Forests East of the Cascade Crest in the Unites States Pacific Northwest*, Front. For. Glob. Change 3:594274, 11-12 (Nov. 5, 2020) (Ex. 20).
[129]FEIS Vol. I at 369.
[130] FEIS Vol. I at 369.

In failing to disclose the climate impacts of the reduced carbon storage capacity the Plan's logging and burning will initially cause, the Forest Service relies in part on agency guidance entitled "Climate Change Considerations in Project Level NEPA Analysis.[131] The Climate Change Consideration guidance is the flawed product of the final week of the George W. Bush administration in January 2009, and it has long been overtaken by both federal case law and CEQ's reinstated climate 2016 guidance, both of which require robust project level NEPA analysis of climate impacts. The Forest Service cannot continue to rely on this guidance document unless and until it can explain how the 2009 guidance comports with current CEQ guidance, caselaw, and administration policy.

The 2009 guidance is flawed and outdated in part because the Federal interagency social cost of carbon estimates were developed after the 2009 guidance. The social cost of carbon was specifically developed to disclose the impacts of each ton of CO2, contradicting the agency's argument that the Plan's climate impacts are too small to estimate. Case law setting aside agency (including Forest Service) decisions that failed to use the social cost of carbon further undermine the agency's position.[132]

The Forest Service's dated, superseded, 2009 guidance is inconsistent with current Presidential direction, and cannot support the Forest Service's failure to utilize the USDA-endorsed social cost of carbon estimates, to provide the public and decision makers information on the project's global scale, long-lasting, irreversible climate-related impacts. The Forest Service's position contradicts CEQ's February 2021 policy that agencies must use "all available tools" to address and assess climate impacts while CEQ updates its guidance.[133] Further, failing to undertake a robust analysis based on the outdated 2009 guidance borders on insubordination in light of the President's policy requiring a whole-government approach to tackling the climate crisis, including specific policy that "[t]he Federal Government must drive *assessment, disclosure,* and mitigation of climate pollution and climate-related risks *in every sector* of our economy."[134] The Forest Service has a critically important role to play in both disclosing climate risks and in taking pro-active measures to limit and mitigate those risks. Here, the agency has failed to do either, violating NEPA's hard look mandate, CEQ guidance, and the President's directives.

Relying on a 14-year-old IPCC document created before the social cost of carbon was developed, the Forest Service, declines to disclose the Plan's climate impacts as "too difficult." Again, this excuse again ignores Executive Order 14,008's directive that the Forest Service assess and disclose climate impacts, caselaw, and CEQ guidance. Further, NEPA requires that agencies identify "incomplete or unavailable" information as such, to "make clear that such

---

[131] *See id*., citing Forest Service, Climate Change Considerations in Project Level NEPA Analysis (January 13, 2009) (Ex. 54).

[132] *See High Country Conservation Advocates*, 52 F. Supp. 3d at 1190-93 (finding Forest Service violated NEPA by failing to disclose the climate impacts via the social cost of carbon); *Wildearth Guardians v. Bernhardt*, 2021 U.S. Dist. LEXIS 20792, CV 17-80-BLG-SPW (D. Mont. Feb. 3, 2021) at *25-*31 (finding Office of Surface Mining violated NEPA by failing to disclose the climate impacts via the social cost of carbon). *See also* CEQ, 2016 NEPA Climate Guidance at 32-33 (noting the appropriateness of monetizing climate impacts).

[133] Council on Environmental Quality, National Environmental Policy Act, Guidance on Consideration of Greenhouse Gas Emissions, 86 Fed. Reg. 10,252 (Feb. 19, 2021) (Ex. 55).

[134] Executive Order 14,008 (Ex. 56) (emphasis added).

information is lacking," and nonetheless include the information in the NEPA document if the overall costs of obtaining it are not "exorbitant" and the information is "essential to a reasoned choice among alternatives."[135] Here, the information is neither incomplete nor unavailable, the Forest Service has simply chosen, arbitrarily, to deprive the public of the data. Further, given the fact that the climate crisis is the pre-eminent environmental (and social, and public health, etc.) issue of our time, it is arbitrary and capricious for the Forest Service to assert that the Plan's climate impact is not "essential to a reasoned choice among alternatives."

Likewise, the Forest Service's April 2013 "Climate Change Vulnerability Assessment," in the DEIS appendix and cited in the Final EIS, does not mention carbon "sequestration" or carbon "storage." It appears to be an analysis of the impacts of climate change on the forest; however it does not analyze the qualitative or quantitative potential for sequestration or storage to contribute to offsetting these impacts. Carbon sequestration can offset carbon and other greenhouse gas emissions from the National Forest; and storing carbon in the forest keeps it from release into the atmosphere, hence these factors should have been considered fully in the Forest Service's carbon analysis.

As a result, a hard look at the carbon storage impacts remains outstanding and there is a dearth of analysis to support perfunctory statements about impact, such as that when it comes to a conclusion and cumulative impacts: "all plan alternatives would preserve forested lands as forested to the extent within the inherent capability of the unit, per vegetation management objectives."[136]

<u>Impacts to carbon soil stocks were wrongfully excluded.</u>
First, the analysis of impacts currently and going forward do not incorporate or address soil carbon stocks. For example, the discussion about impacts to the carbon sink from insect outbreaks only discusses "non-soil carbon."[137] This is missing a massive part of the picture, as soils can store half of a forests' carbon, and on the GMUG they account for "[a]pproximately 49 percent of forest carbon stocks."[138] At the same time, new methods for accounting for carbon stored in soils has found that estimates from the Carbon Calculation Tool ("CCT") have been discounting the amount of carbon stored in soils across the country by roughly 12 percent.[139] It is not clear what method the GMUG used to calculate that soils store 49% of the carbon, thus there is potential this figure could be even higher (12% more would be nearly 55% of carbon storage function on the GMUG) Birdsey et al. 2023 highlighted that:

> [carbon] pools in standing and down dead wood, understory vegetation including tree seedlings, litter on the forest floor, and soil [carbon] account for significantly more [carbon] that could double or quadruple the amount of estimated [carbon] stock

[135] 40 C.F.R. § 1502.22(a).

[136] FEIS Vol. I at 377.
[137] FEIS Vol. I at 367-68.
[138] FEIS Vol. II at 7-5.
[139] FEIS Vol. II at 7-5.

depending on the geographic location of the forest and other land characteristics such as physiography and soil depth.[140]

Despite the undisputed significance of soil carbon stores, the Forest Service used the ForCaMF model and non-soil carbon stock estimates from the CCT when determining carbon storage impacts from insects, harvest, and fire as well as of the alternatives.[141] Throughout its analysis of impacts on carbon stores from the Forest Service's preferred and all analyzed alternatives the analysis admits being limited to "non-soil" carbon. Excluding at least 49% of the forest's carbon stores is arbitrary and prevents a transparent hard look analysis of direct, indirect, and cumulative impacts. There is a true dissonance with the exclusion of carbon stores in soil and the impacts to those that result from logging and other tree removal activities and the Forest Service purporting that somehow it's analysis is still "overstat[ing] the true carbon *impact* of timber harvest, since they do not take into account the carbon *stored* in harvested wood products, substitution effects, or forest regrowth."[142] To the contrary, it couldn't be clearer that the Forest Service has severely understated these impacts, by excluding impacts to soil carbon stores, relying on disproven claims about carbon storage from logging, and conflating carbon accumulation with carbon storage.

It is also unclear why the Forest Service limited the data input for the ForCaMF modeling to only go back to 1990. By narrowing this model, the Forest Service does not capture whether there was a decline from timber reduction activities that started under the old Plan or reflect the expected increase in carbon storage that resulted forest regrowth that started occurring after significant impacts from forest clearing that occurred until with European colonization before the mid-1900s.[143]

<u>The Forest Service's sample size produces a misleading result, and led to improper dismissal of the Revised Plan's impacts on climate pollution and forest carbon stores.</u>
The FEIS states that "The Forest Service carbon models are conducted for an area of approximately 907,000 hectares (2.24 million acres) of forest land" and that it does not account for rangelands.[144] Even though some acres have been excluded, it is clear that there is an unknown amount of additional acres for which logging and other timber reduction practices could not occur on but are still included in the base pool. By incorporating these acres into the pie, the sample size dilution creates the illusion of minimal carbon storage impacts. For example, Table 109 concludes that the gross potential total carbon removed is at most 2.6% of the entire GMUG leading the Forest Service to erroneously conclude "the action alternatives will not significantly, adversely, or permanently affect forest carbon storage."[145] The Forest

[140] Richard A. Birdsey et al., *Assessing carbon stocks and accumulation potential of mature forests and larger tress in U.S. federal lands*, Front. For. Glob. Change 5:1074508, 10 (Jan. 6, 2023) (Ex. 21).
[141] FEIS Vol. 1 at 368-69; FEIS Vol. 2 at 7-13.
[142] FEIS Vol. I at 373.
[143] *See* Kellet et al 2023 at 3-4; Barnett et al., *Classifying, inventorying, and mapping mature and old-growth forest in the United States*, Front. For. Glob. Change 5:1070372 at 2 (Jan. 3, 2023) (Ex. 22).
[144] FESI Vol. I at 365.
[145] FEIS Vol. I at 376; *see also* FEIS Vol. I at 373 ("The amount of carbon that would be removed in either alternative is small relative to the approximately 126 million metric tons (126 Tg) of carbon stored in the forests on the GMUG.").

Service's approach is akin to a hypothetical where there's 100 acres of land, but only 1 acre that contains trees, but because the full 100 acres are used as the sample size, only 1% is impacted. But, if the correct sample was used, which is the total amount of acres with trees, the impact to would to 100% of those acres. This would result, unsurprisingly in a drastically different direct, indirect, and cumulative impacts.

The Forest Service's conclusion that "the action alternatives . . . would be designed to achieve a more resilient forest condition that will improve the ability of the GMUG to maintain carbon stocks or enhance carbon uptake over the long-term"[146] is untested and defies the resounding conclusions from experts that leaving large, mature, trees and forests and their soils alone is the best course of action to protect carbon storage. An example provided by Law et al. is particularly illuminating:

> [A] comparison of carbon stored in an unharvested versus harvested mature forest using the Forest-GHG life cycle assessment model to track harvested carbon from the forest to landfill shows that the unharvested forest has a much higher carbon density 120 years later, even when carbon in wood produces is summed with the post-harvest carbon storage.

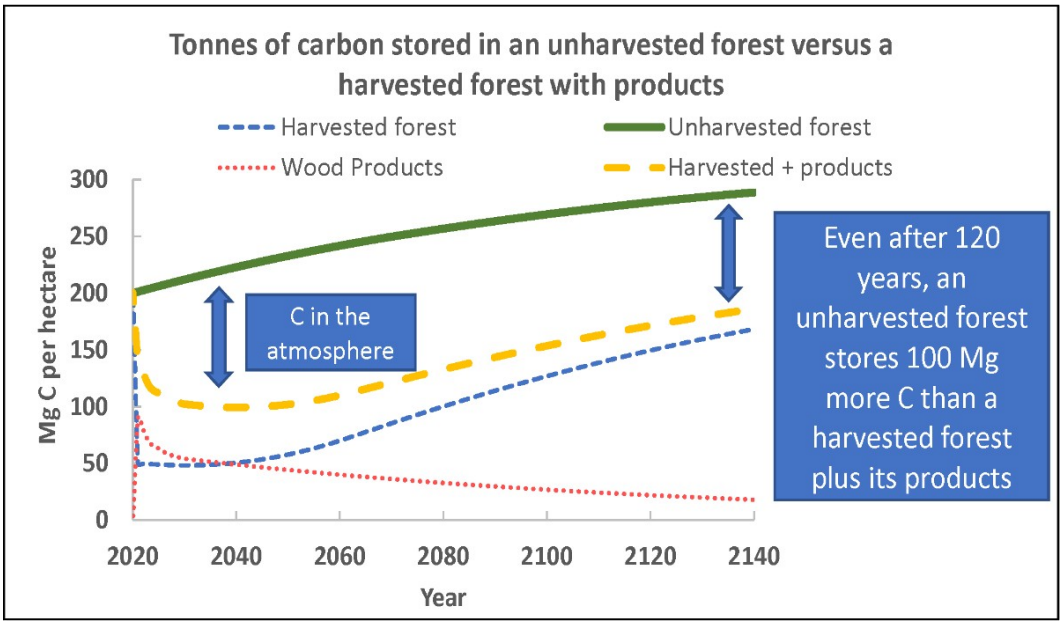

Figure 2. A mature forest with a carbon density of 200 tons of carbon per hectare (green line) is harvested (blue line) in 2020. This results in an immediate reduction of live tree carbon stocks. Approximately half of the aboveground carbon is removed and taken to the mills (as wood) while the other half remains behind in slash piles (leaves, bark, branches, etc.) and in the dead belowground roots. The slash is burned on-site and the carbon is immediately emitted to the atmosphere. The roots decompose over the next few decades, emitting carbon to the atmosphere. The carbon taken to the mill as wood is processed into short- and long-term wood products (red line), that decay over years to centuries, eventually returning the carbon to the atmosphere.

[146] FEIS Vol. I at 376.

> Estimates comparing the carbon benefits of wood products to alternative materials have been found to overestimate the benefit by factors of between 2- and 100-fold by not counting the full life cycle carbon and the shorter durability of wood relative to alternative materials [33].[147]

For these same reasons, it's incorrect for the Forest Service to continue to claim that "[a]ll of the proposed vegetation management activities would initially directly reduce carbon stocks on the forest, though minimally. However, this initial effect would be mitigated or even reversed with time, reducing the potential for negative indirect and cumulative effects. These short-term losses and emissions are small relative to the total carbon stocks on the forest."[148] It is also incorrect to not require project specific greenhouse gas analysis in the forest plan with the perfunctory statement that "the percentage of the GMUG that is affected by timber harvest every year is negligibly small compared to the effects of wildfire and especially insects."[149] It is evident that the Forest Service is missing the very essence of cumulative impacts analysis—as these impacts can result from individually minor but collectively significant actions taking place over time.

And while coal mining is predicted to be the largest contributor to greenhouse gas emissions, followed by oil and gas development, those emissions cannot be used as a comparison, as the agency does, to down play the 5.2 million tons of greenhouse gases over 20 years, and .02 million tons of methane over 20 years (per Table 105) from all the projected emissions for "all planned vegetation management activities in the preferred alternative of the revised forest plan, including prescribed burns."[150] While, for the reasons stated here about the agency's failure to account for loss of carbon in soil indicates that the greenhouse gas and carbon storage impacts analysis is wrong because it fails to account for nearly 50% of the carbon that is impacted by timber reduction practices, even the calculated emissions with that error are not insignificant. This is a meaingful amount of greenhouse gas pollution. For example, Colorado's roadmap for reducing greenhouse gas pollution from transportation calls for 12.7 million tons of reduction in annual transportation by 2030, with current strategies expected to achieve 8 million tons, but the State is still working to identify ways to reduce emissions by "an additional 4.7 million metric tons."[151] As for insects and wildfire notably there's no support for these conclusions, rather to the contrary the evidence is the *opposite*, see section below discussing carbon impacts of fires compare to carbon emissions of logging and timber reduction practices.

The Forest Service's soft-pedaling of the project's climate impacts, using comparisons tailored to make the impacts of logging on carbon storage look small by comparison, is wrong. CEQ's 2016 NEPA climate guidance recommended against using comparisons that make climate impacts seem small:

---

[147] Beverly E. Law et al., 2022 at 5.
[148] FEIS Vol. I at 370; *see also* FEIS Vol. I at 358.
[149] FEIS Vol. III at 23.
[150] FEIS at 348.
[151] Colo. Energy Office, *Colo. Approves nation-leading rule to cut greenhouse gas emissions by shifting how it plans the state's transportation system*, (Dec. 16, 2021) https://energyoffice.colorado.gov/blog-posts/colorado-approves-nation-leading-rule-to-cut-greenhouse-gas-emissions-by-shifting-how-it (last visited Oct. 30, 2023) (Ex. 23).

> a statement that emissions from a proposed Federal action represent only a small fraction of global emissions is essentially a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether or to what extent to consider climate change impacts under NEPA. Moreover, these comparisons are also not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigations because this approach does not reveal anything beyond the nature of the climate change challenge itself ….[152]

The fundamental difficulty at the heart of climate change is that it is the product of thousands of different decisions, yet each one adds to and worsens a problem that threatens trillions of dollars in property damage, will impair public health, and will disproportionately burden people of color and those with lower incomes, among other impacts. Carbon emitted or not stored today will warm the climate for centuries and have impacts far beyond those in New Mexico (or the U.S.).

The agency's dismissal of the Forest Plan's impacts because the carbon storage are "small" or "negligible" in comparison to the Forest's carbon stores masks the fact that every additional bit of climate pollution, or elimination of carbon sequestration ability, makes the problem worse, and that every bit of sequestration is critical to the solution. The GMUG's approach is not only contrary to existing guidance, and Biden administration policy, as discussed above, it is contrary to federal court decisions.[153]

NEPA expressly requires agencies to consider whether agency actions are "related to other actions with individually insignificant but cumulatively significant impacts."[154] Thus, the Forest Service may not downplay the climate impacts of Revised plan and must consider the cumulative significance of the project when added to other past, present, and reasonably foreseeable logging projects and timber reduction practices in the state, region, and nation.[155] The Forest Service failed to address these cumulative effects, violating NEPA.

The Forest Service also attempts to undercut the significant climate impacts of its Preferred Alternative and analysis alleging that the climate impacts will be merely "short term." The Forest Service claims the impacts will be "short term" because: (1) young trees will eventually replace older trees that are logged over the life of the Forest Plan Revision; and (2) logging will allegedly result in healthier forests that will better withstand forest fires and insect infestations

---

[152] CEQ, 2016 NEPA Climate Guidance at 11.

[153] *WildEarth Guardians v. Zinke*, 2019 U.S. Dist. LEXIS 30357 (D. Mont. Feb. 11, 2019) at *25 (proposed findings) ("But by only comparing the estimated emissions to total U.S. emissions, OSM potentially diluted the adverse environmental effects of coal combustion at a local level. The Ninth Circuit has stated that when assessing the effects of an agency action, the appropriate analysis must include consideration of both broad scale and local impacts."); *Pac. Coast Fed. of Fisherman's Ass'ns v. Nat'l Marine Fisheries Serv.*, 265 F.3d 1028, 1036-37 (9th Cir. 2001); *Or. Nat. Res. Council Fund v. Brong*, 492 F.3d 1120, 1129-30 (9th Cir. 2007) (noting that averaging environmental effects based on a broad scope can lead to misleading results).

[154] 40 C.F.R. § 1508.27(b)(7) (1978).

[155] 40 C.F.R. § 1508.7 (1978); *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41 (D.D.C. 2019) (holding that BLM erred by failing to consider the cumulative climate impacts of oil and gas leases together with "GHG emissions generated by past, present, and reasonably foreseeable BLM lease sales in the region and nation").

and thus will reduce the loss in carbon stores from such events. While the merits of these assumptions throughout, we note that the Forest Service fails to address the length of time that the Plan will worsen the Forest's status as a carbon emitter rather than a carbon sink. The failure to estimate the duration of these impacts violates NEPA's hard look mandate. Further, the agency fails to disclose the important, implicit trade-off that the Forest Service is making here: to undertake actions that will *certainly* damage the ability of the GMUG's ability to store carbon on the *uncertain chance* that the proposed actions will reduce the damage from fires and insect infestations. If the Forest Service intends to make such a trade-off, it should estimate the likelihood that the increased treatments (which eliminate carbon stores) would actually have the intended impact (of preventing the future loss of climate stores). The agency's failure to do so here demonstrates it did not take the hard look NEPA requires.

This particularly so because there is a desperate need now to reduce carbon emissions (and maintain carbon storage and sinks). The promise of potential reductions sometime in the distant future will little benefit the planet when every molecule of lost storage now brings the Earth further away from preventing the worst impacts of the climate crisis.

The Forest Service's assumption that young trees are more valuable and store carbon at a faster rate than larger trees conflicts with the best available science. The Forest Service's assumption that growing trees later will make up for the loss of carbon storage from logging trees now is based on the assumption that younger trees store more carbon, or store it faster, than older trees.

This assumption conflicts with the best available science, science that the Forest Service fails to address or respond to, violating NEPA.

The Forest Service alleges that the "no action" alternative will result is a slower rate of carbon storage because uncut trees will age, and store carbon at a slower rate. "As forest stands continue to age toward middle-aged to older more will reach slower growth stages in coming years, potentially causing the rate of carbon accumulation to decline."[156] The agency makes a similar argument in its responses to comments: "The rate at which trees sequester slows with age, and a landscape with a diversity of age classes, species and structure maintain healthy forests, sequestering carbon at a faster rate, and are often more resilient to climate-impacted events such as extreme fire and insect outbreaks."[157]

It is well settled that old growth forests contain huge quantities of carbon accumulated over centuries.[158] Mature and old stands of forest take in more carbon than they release, making them carbon sinks.[159] Large trees, which are usually the oldest trees, contain most of the carbon in dry conifer stands.[160] Old growth ponderosa pine stands have been shown to assimilate more carbon

[156] FEIS, Vol. 1, p, 258.
[157] FEIS, Vol. III at 339.
[158] Sebastiaan Luyssaert et al., *Old-growth forests as global carbon sinks*, Nature 455:213-215 doi:10.1038/nature07276 (Sept. 2008) (Ex. 24).
[159] Maria Janowiak et al., *Considering forest and grassland carbon in land management*, United States Dep't of Agriculture, Forest Service, General Technical Report WO-95 (2017) (Ex. 25).
[160] Malcom North et al., *Fire suppression and fuels treatment effects on mixed-conifer carbon stocks and emissions*, 19 Ecological Applications 6, 1385-1396 (2009) (Ex. 26).

and have greater drought resilience than young stands.[161] A global study concluded in 2014 that most species of old trees continue to sequester carbon at rates far greater than young, fast-growing trees.[162] "**A logged mature forest stores less than half of the carbon of an uncut mature forest, even if carbon stored in wood products is included in the carbon storage total of the logged areas.**"[163] "At the stand level, old-growth forests store 35 to 75% more carbon, including in the soils, compared to logged stands."[164]

Logging mature and old-growth has

> significant climate costs, including the release of greenhouse gases from the cutting, processing, and transporting of trees for wood products; the disposal of waste and wood products; the release of methane from each log landing; the release of carbon from disturbed soils; and the loss of carbon uptake and accumulation by standing trees.[165]

While some studies suggest that younger forests, those between 30 to 70 years old or 40 to 80 years old can sequester carbon at a faster rate than mature or old-growth, "**the climate mitigation value of forest carbon lies not in the sequestration rate but in the total amount that is accumulated and kept out of the atmosphere.** The power of forests in this process is unparalleled and far greater in old forests than in young forests, both above and below ground; **carbon continues to accumulate for centuries**."[166] When cutting old growth or mature forests, the carbon that is lost is not recovered by fast-growing trees and takes decades to well over a century to be recovered.[167] Indeed scientists have repeatedly stressed that "[it's] an important distinction that rates of carbon accumulation tend to be higher in younger forests **while the largest amounts of stored carbon are found in mature forests."[168]**

Another study published earlier this year, 2023, that looked at 11 forests across the country, including the White River National Forest, which shares a border with the GMUG on the northern end of the Gunnison National Forest, concluded that carbon "stock of larger trees in mature stands ranged from 41 to 84 percent of the total C stock of the forests" and carbon accumulation ranged from 53 to 71 percent of total carbon accumulation in these forests.[169]

---

[161] Peter M. Anthoni et al, *Seasonal differences in carbon and water vapor exchange in young and old-growth ponderosa pine ecosystems*, Agricultural and Forest Meteorology 111:203-222 (Mar. 12, 2002) (Ex. 27).
[162] N.L. Stephenson et al. 2014, *Rate of tree carbon accumulation increases continuously with tree size*, Nature doi:10.1038/nature12914 (2014) (Ex. 28) ("Here we present a global analysis of 403 tropical and temperate tree species, showing that for most species mass growth rate increases continuously with tree size. Thus, large, old trees do not act simply as senescent carbon reservoirs but actively fix large amounts of carbon compared to smaller trees.").
[163] Kellett et al., at 14 (emphasis added).
[164] DellaSala et al., 2022.
[165] *Id*. at 14.
[166] *Id*. (emphasis added).
[167] *Id*.
[168] Birdsey et al. 2023 at 11.
[169] *Id*. at 9. *See also* Luyssaert et al., 2008 (discussing that young forests can be CO2 emitters as a result of more decomposition and that assumptions of old forests being carbon neutral is not supported, and originally derived from only 10 years of data.).

While this study only focused on carbon stored and accumulated in above-ground live biomass, the authors were explicit to point out that:

> [carbon] pools in standing and down dead wood, understory vegetation including tree seedlings, litter on the forest floor, and soil [carbon] account for significantly more [carbon] that could double or quadruple the amount of estimated [carbon] stock depending on the geographic location of the forest and other land characteristics such as physiography and soil depth.[170]

"For all continents, aboveground tree mass growth rates (and, hence rates of carbon gain) for most species increased continuously with tree mass."[171] The authors of this letter published in *Nature* concluded that:

> The rapid growth of large trees indicates that, relative to their numbers, they could play a disproportionately important role in these feedbacks30. For example, in our western USA old-growth forest plots, trees .100cm in diameter comprised 6% of trees, yet contributed 33% of the annual forest mass growth. Mechanistic models of the forest carbon cycle will depend on accurate representation of productivity across several scales of biological organization, including calibration and validation against continuously increasing carbon accumulation rates at the scale of individual trees.[172]

The rapid growth of large trees indicates that, relative to their numbers, they could play a disproportionately important role in these feedbacks. For example, in our western USA old-growth forest plots, trees, 100cm in diameter comprised 6% of trees, yet contributed 33% of the annual forest mass growth. Mechanistic models of the forest carbon cycle will depend on accurate representation of productivity across several scales of biological organization, including calibration and validation against continuously increasing carbon accumulation rates at the scale of individual trees.[173]

The GMUG has failed to account for "national and regional estimates of emissions from logging (direct plus lifecycle emissions) are 5-10 times greater than direct emissions from natural disturbances (wildfire, insects, and wind combined).[174]

The Forest Service repeatedly discusses "productivity" of trees in the context solely of them being young,[175] ignores and deemphasizes context that mature and old trees *store the most carbon* and that their soils *also store the most carbon*, are the refugia for biodiversity, and that it takes decades if not centuries for logged forests to hold the carbon they otherwise stored prior to anthropogenic interference. Large trees have an outsized impact on carbon storage in forests, and a sharp increase in carbon storage with increasing tree diameter speaks to the importance of preserving mature and old large trees to keep carbon store in forest ecosystems where it remains

[170] Birdsey et al. 2023 at 10.
[171] Stephenson et al. 2014.
[172] *Id*.
[173] Birdsey et al., 2023 at 11.
[174] *Id*. at 11; *but compare e.g.* FEIS Vol. I at 376; FEIS Vol. II at Appendix 7, 7-12.
[175] *E.g.* GMUG Forest Plan Appendix 7, 7-14-7-15.

for centuries.[176] Additionally, more recent information since 2008 (the generation of science the Forest Service appears to be relying on) has shown that assumptions that old trees may not accumulate as much carbon is not necessarily true.

The Forest Service's assumptions about carbon substution or benefits of converting trees to wood products is unsupported and not consistent with the best available science.[177]
The Forest Service's assertion that there is meaningful retention of carbon in forest wood products is wrong, recent studies have shown these once hypothetical claims have not borne true "harvested wood products helps to offset sources of carbon dioxide to the atmosphere, such as forest fires and fossil fuel emissions."[178] At most, "**a small percentage of the carbon in trees that are cut is stored in durable wood products" while "in the U.S. about 76% of carbon in trees cut for timber is released into the atmosphere each year.**"[179] Most of the carbon is quickly emitted through processing, waste, and short-lived products.[180] Logging emissions remain in the atmosphere for decades, only partially removed by sinks.[181] When a tree naturally dies and remains in the forest, the release of CO2 from the dead wood occurs over decades, whereas natural regeneration or in-growth occurs on a much shorter timescale.[182]

More carbon is stored longer in forests than in wood products because about half of the harvested carbon is emitted soon after logging.[183] In Colorado, harvest has played an outsized roll in carbon storage loss on our forested lands.[184] Of the accumulated carbon harvested from west coast U.S. forests since 1900, 65% has returned to the atmosphere while only 19% is in long-lived wood products, and the remaining 16% is in landfills. That is, 81% of the wood removed from west coast forests since 1900 has been emitted to the atmosphere as carbon dioxide or is in landfills.[185] And increased harvesting adds additional CO2 to the atmosphere, which further accelerates climate change.

Law et al. 2018 looked at net wood emissions in 2011 to 2015 and found that net wood product emissions "are higher than fire emissions despite carbon benefits of storage in wood products

---

[176] Mildrexler et al., 2020 at 8.
[177] *See e.g.* Revised Plan at 10; FEIS Vol. I at 376.
[178] *See e.g.* GMUG Revised Plan at 10 ("harvested wood products helps to offset sources of carbon dioxide to the atmosphere, such as forest fires and fossil fuel emissions.").
[179] Kellett, et al. at 14 (emphasis added).
[180] *Id*. *See also* DellaSala et al., 2022 at 14 ("It is assumed that 50% of the carbon that had been stored in the biomass of logged [mature old growth] is emitted to the atmosphere due to combustion or decomposition of waste and short-lived wood products.").
[181] DellaSala et al., 2022 at 14.
[182] Luyssaert et al., 2008 at 214.
[183] Mark E. Harmon, *Have product substitution carbon benefits been overestimated? A sensitivity analysis of key assumptions*, Envtl. Research Lett. 14 065008 (June 21, 2019) (Ex. 29). Tara W. Hudiburg et al., *Meeting GHG reduction targets requires accounting for all forest sector emissions*, Environ. Res. Lett. 14 (Aug. 23, 2019) (Ex. 30). N.L. Harris et al., *Attribution of net carbon change by disturbance type across forest lands of the conterminous United States*, 11 Spring Open 24 (2016) (Ex. 31).
[184] Harris et al. 2016 at Table 5 (In 2005, 92% of the cause of carbon loss in Colorado forested areas was due to harvest) and Fig. 3.
[185] Hudiburg et al. 2019.

and substitution for more fossil fuel-intensive products."[186] Additionally, forest products that go into buildings still do not amount to the carbon storage benefit of leaving the trees in the forest, which can store carbon for hundreds of years, rather than several decades, which is the consistent with new construction, demolition, and renovation trends.[187]

The Forest Service's assumptions about thinning and treatments needed to reduce fire risk or severity and carbon loss and impacts on carbon stores are not consistent with the best available science.[188]

Targets set in the plan, including FW-OBJ-FFM-02 that seek to have 110,000 acres in the first decade and 150,000 acres in the second decade subject to timber reduction practices would exacerbate the carbon storage loss on the forests and result in negative carbon and climate impacts.[189]

> the amount of carbon removed by thinning is much larger than the amount that might be saved from being burned in a fire, and far more area is harvested than would actually burn. Most analyses of mid- to long-term thinning impacts on forest structure and carbon storage show there is a multi-decadal biomass carbon deficit following moderate to heavy thinning. For example, thinning in a young ponderosa pine plantation showed that removal of 40% of the tree biomass would release about 60% of the carbon over the next 30 years. Regional patchworks of intensive forest management have increased fire severity in adjacent forests. Management actions can create more surface fuels. Broad-scale thinning (e.g., ecoregions, regions) to reduce fire risk or severity results in more carbon emissions than fire, and creates a long-term carbon deficit that undermines climate goals.
>
> As to the effectiveness and likelihood that thinning might have an impact on fire behavior, the area thinned at broad scales to reduce fuels has been found to have little relationship to area burned, which is mostly driven by wind, drought, and warming. A multi-year study of forest treatments such as thinning and prescribed fire across the western U.S. showed that about 1% of U.S. Forest Service treatments experience wildfire each year. The potential effectiveness of treatments lasts only 10–20 years, diminishing annually. Thus, the preemptive actions to reduce fire risk or severity across regions have been largely ineffective.[190]

As Faison et al. 2023 has pointed out:

> the conservation evidence to date suggests that while mechanical thinning alone can be beneficial for forest understories and young trees (Sutherland et al., 2021), it can also

[186] Law et al., *Land use strategies to mitigate climate change in carbon dense temperate forests*, 115 PNAS 14, 3664 (Jan. 22, 2018) (Ex. 32).
[187] *Id*. at 3666.
[188] FEIS Vol. 1 at 373 ("Management activities involving timber harvesting and thinning can result in oth long-term carbon storage off-site and substitution effects through the use of HWPs in place of more carbon materials.") FEIS at Vol. I at 398 ("Fuels reduction treatments primarily consist of thinning . . .);
[189] Revised Plan at 35.
[190] Law et al. 2022 at 6-7 (internal citation omitted).

> increase subsequent fire risk and vulnerability to severe wind damage from hurricanes (Fortuin et al., 2023; Raymond and Peterson, 2005). Additionally, "no evidence was found" to assess the effectiveness of mechanically removing understory vegetation for reducing wildfires (Sutherland et al., 2021).[191]

And a thinning study in a drought-prone young ponderosa pine plantation in Idaho found that removal of 40% of the live biomass from the forest would subsequently release about 60% of that carbon over the next 30 years.[192] It additionally found that "forest sector carbon parity with untreated plots will not occur by 2050 and therefore represents a relative carbon source to the atmosphere in the absence of distrubane."[193]

Thus, instead of the approach embraced by the Revised Forest Plan, effective risk reduction requires specific conditions where in fire-prone dry forests, ladder fuels are carefully removed leaving large fire-resistant trees. Restoration of these areas or reducing their fire risk can be met with removing small trees, underburning to reduce surface fuels, and no removal of large trees.[194] And while a moderate to high severity fire can kill trees, the Forest Service is appearing to rely on decades old science even though we have learned its misrepresents the amount of carbon loss from forest fires.[195]

These more recent studies address the carbon impacts of recent fires in the Pacific Northwest and California and have concluded that timber reduction practices have a 7.5 times more carbon emission than fires.[196] This is because with fires, "most of the carbon remains in the forest as dead wood that will take decades to centuries to decompose." And even with very large fires in the Pacific Northwest, "[l]ess than 10% of the ecosystem carbon enter[ed] the atmosphere as carbon dioxide."[197] Field studies of combustion rates in California's large megafire show that carbon emissions were very low at the landscape-level (0/6% to 1.8%) because larger trees with low combustion rates were the majority of the biomass, and high severity fire patches were less than half of the burn area.[198] In short, harvest-related emissions from thinning are much higher than potential reduction to fire emissions. "In the conterminous 48 states, harvest-related emissions are 7.5 times those from all natural causes. It is understandable that the public wants action to reduce wildfire threats, but false solutions that make the problem worse and increase global warming are counterproductive."[199]

Carbon losses from fire and insects are often much less than models predict.

---

[191] Faison et al. 2023 at 3-4.
[192] J.E. Stenzel et al., *Restoration Thinning in a Drought-Prone Idaho Forest Creates a Persistent Carbon Deficit*, J. of Geophysical Research: Biogeosciences 126, e2020JG005815 (Jan. 22, 2021) (Ex. 33).
[193] *Id*. at 13.
[194] Law et al. 2022 at 7.
[195] *See* FEIS Vol. I at 395.
[196] Law et al. 2022 at 7.
[197] *Id*.
[198] *Id*.
[199] *Id*.

> For instance, Lodgepole pine (Pinus contorta) forests killed by mountain pine beetles (Dendroctonus ponderosae) in the southwestern United States underwent little net flux in carbon for a decade or more because of a cessation of respiration following tree death (Moore et al., 2013). In the Northeastern United States, eastern hemlock (Tsuga canadensis) forests killed by (simulated) Hemlock Woolly Adelgid (Adelges tsugae) insects maintained aboveground carbon storage, primarily in dead and downed wood, similar to pre-infestation forests (Raymer et al., 2013). With respect to fire, observations revealed that on average less than 5% of live tree biomass burns in western US wildfires when considered across the full range of fire severities (Stenzel et al., 2019). As a result, these authors reported that carbon models overestimate carbon loss from fires by up to an order of magnitude (i.e., a factor of 10) at local scales and by 59%–78% at the regional scale.[200]

When it comes to human safety, it is not thinning or other timber reduction activities across the GMUG forests' unbounded from discrete areas of infrastructure, which the Plan proposes. Timber reduction and suppression efforts (e.g., removal of combustible plants and debris, forest clearing, and forest thinning), depending on the region and climate risks, that protect the immediate area around residential homes in the "home ignition zone" (i.e., trees and shrubs in a 30–60 meter buffer area around a house) and preventative fireproofing itself (i.e., metal roof, fire-resistant doors and windows, secured pet doors and attic vents) is primarily what reduces the ignition potential of a home.[201]

The Forest Service places a lot of emphasis on the loss of carbon storage from beetle kill and the risk of fires, however, this misses key information for context and accuracy. While insects, disease, wind, and wildfire account for current and future tree death and some carbon loss, "in many cases disturbances such as insect outbreaks that target dominant tree species result in increased tree diversity in the postoutbreak stand (Morris et al., 2022)."[202] While the Forest Service has expressed concern about the forest seed bank in light of the beetle kill mortality, we are not aware of peer reviewed science that has determined these forests have not merely moved back to an early-successional stage (as is argued as being a benefit from logging or other human timber reduction practices).

At bottom, the unthethered experimentation approach the Revised Plan embraces is not going to meet the stated goals or objectives of ecological integrity on the GMUG, but rather exacerbate problems that would continue to erode ecosystem services and forest function:

> A common rationale for forest adaptation management is preventing future tree mortality, species compositional shifts, and carbon loss from natural disturbances. In some cases, thinning has been shown to reduce subsequent tree death from insects and drought compared to untreated areas, thereby promoting stand resistance and maintaining an existing species composition, while procuring sound timber. However, in other cases prescribed burn treatments increased subsequent tree mortality, and thinning and burn treatments generally promote the spread of invasive plants relative to controls.

[200] Faison et al 2023 at 5.
[201] *Id*. at 2.
[202] *Id*. at 5.

> Additionally, loss of tree basal area and carbon storage from thinning and prescribed burning is often equal to or considerably greater than tree mortality and carbon loss from the disturbances themselves. As a result, treated stands are not objectively more resistant or resilient to tree mortality or carbon loss—and in many cases are less so—if losses from the management itself are taken into account. Not surprisingly, natural forests in strictly protected areas store greater amounts of carbon, on average, than managed and unprotected areas.[203]

Lastly, we would like to point out that the Forest Service has not analyzed impacts from what appears to be a suggestion that it would be appropriate to use genetically modified trees on the forest.[204] The Forest Service needs to clarify what it means when it says "Plant tree species expected to be adapted to future conditions and resistant to insect pests or present pathogens." The Plan cannot condone the use of genetically modified seeds without disclosing and discussing any of the impacts that GMO planting would have.

***

While NEPA does not mandate a substantive result, it does not allow for misrepresentations of the science and/or blindered analysis. NEPA requires federal agencies to take a "hard look" at the environmental consequences of their actions and address the foreseeable direct, indirect, and cumulative impacts to the environment.[205] General statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided. The Forest Service's misrepresentation of the science does not provide a "full and fair discussion of significant environmental impacts"[206] and did not examine the climate and carbon impacts of its proposal in a way to lead to informed and transparent agency decisionmaking. Agencies are required to "insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements."[207]

Suggested Resolutions for Taking a Hard Look at the Impacts on GMUG Carbon Stores.

The Forest Service must prepare a SEIS and analyze, in detail, the impacts of its timber suitability decisions and alternatives on the GMUG's carbon storage function and capacity and the function of the Forests ability to support and sustain biodiversity. The SEIS must utilize the best available scientific information, and take a "hard look" at the impacts of each of the alternatives on carbon storage function and capacity, impacts to mature and old-growth, and the function of the Forests ability to support and sustain biodiversity (including natural succession of trees and stands to become mature and old-growth). Lastly, the SEIS must adopt an alternative that includes a standard or standards that ensure protection of mature and old-growth trees and their soils and a standard or standards that ensures these age classes would be developed by

[203] *Id*. at 4 (internal citation omitted).
[204] FEIS Vol. I at 371.
[205] *League of Wilderness Defenders/Blue Mountains Biodiversity Project v. U.S. Forest Serv.,* 689 F.3d at 1075.
[206] *Conservation Cong. v. Finley*, 774 F.3d 611, 616 (9th Cir. 2014).
[207] 40 C.F.R. § 1502.24.

affording trees and stands not in these age classes protection from timber reduction activities so they may naturally age and become the next generation of mature and old-growth trees.

D. OBJECTION #4: The GMUG National Forest's Failure to Manage the Forests for Carbon Sequestration Violates the National Forest Management Act.

The FEIS identifies 772,000 acres as suitable for timber production[208] under the chosen alterative, a figure the agency deems compatible with the desired conditions and objectives established by the Plan. The Plan states that plan components are designed to provide ecological conditions to sustain functional ecosystems including carbon storage and regulation.[209] And it notes that watershed protection is to support ecological functions that forests provide, including carbon sequestration.[210] The Plan also calls for monitoring for vegetation changes related to climate change and climate vulnerability, and disturbance, management, and environmental factors on carbon stocks.[211]

But there is not a single plan component that is explicitly about preserving and protecting carbon storage on the forest. Despite the Forest Service's representation of what the GMUG Revised Plan does, components that sufficiently address the agency's duty to address climate change and carbon storage are non-existent. The Plan or the FEIS did not consider improving carbon stability through active restoration of the forest to improve resilience or transparently or wholistically evaluate the carbon emissions from timber harvesting in comparing alternatives, especially with regard to its impacts on the carbon carrying capacity of the forest.

As noted above, the 2012 Forest Planning rules mandate that the agency disclose existing information relevant to a baseline assessment of carbon stocks for the forest management unit.[212] But it does not appear the Forest Service took the hard look at these factors in developing this Revised Plan.

Further, the agency's failure to adopt a plan mandating significant levels of carbon storage violates the Forest Planning Rules' requirement that the Forest Service consider climate change and *sustainability* in the planning process.[213] The Rules require that plans must ensure that "[t]imber harvest [for any purpose] would be carried out in a manner consistent with the protection of soil, watershed, fish, wildlife, recreation, and aesthetic resources."[214] As climate change has the potential to adversely affect every item on that list, harvesting (logging) important carbon sinks is inconsistent with protecting these interests as doing so would exacerbate the climate crisis.

---

[208] FEIS Vol. I at 77; Draft ROD at 14.
[209] Revised Plan at 8; Draft ROD at 5.
[210] FEIS Vol. II at 1-61.
[211] Revised Plan at 151 (but note that carbon stocks are not listed in FW-DC-ECO-2).
[212] *See Forest Carbon and Conservation Management: Integration with Sustainable Forest Management for Multiple Resource Values and Ecosystem Services* at 6-7 (Pinchot Institute, May 2015) (Ex. 34).
[213] 36 C.F.R. §§ 219.8 & 219.10.
[214] 36 C.F.R. § 219.11(d)(3).

Importantly, the requirement that Forest Plans provide for sustainability, and that plans must ensure that timber harvests be carried out in a manner consistent with the protection of soil, watershed, fish, wildlife, and other resources, has no balancing factor.[215] This is not a factor to consider, but a regulatory requirement that the Forest Service must follow—regardless of other interests at play. And, due to the importance of carbon sequestration in reducing the widespread ecological impacts of climate change, § 219.11(d)(3) should be applied to ensure the optimization of carbon sequestration in the plan area.[216]

The Rules also provide that "[n]o timber harvest for the purposes of timber production may occur on lands not suited for timber production."[217] Land is not suited for timber production if "[t]imber production would not be compatible with the achievement of desired conditions and objectives established" by the relevant plan.[218]

Because timber production releases carbon in the harvest process, reduces the carbon storage capacity of the forest and reduces its potential for carbon sequestration (which is not fully or timely replaced by replanting), it adds carbon to the atmosphere and is not compatible with the objective of sustaining a healthy forest ecosystem.

Inasmuch as NFMA and MUSYA require management plans provide for "multiple use and sustained yield," these laws require the Forest Service to manage the national forest for maximum carbon storage and carbon sequestration with minimum carbon emissions. The goal should be to make the forest a net carbon sink, and, moreover, to help serve the purpose of offsetting, to the maximum extent possible, the carbon emissions of the U.S. that are contributing to global climate change. Given the adverse impacts of climate change on the health of the national forest, the agency should manage for carbon sequestration and storage the greatest use, for without reducing the adverse impacts of climate change the other uses of the forest (*e.g.* wilderness, recreation and timber) are all impaired, reduced and undermined.

The Forest Service's failure to elevate carbon sequestration use above timber production goals in particular is inconsistent with the 2012 NFMA rule requirements that climate change, sustainability, and the long-term storage of carbon be considered in the planning process. To put it in MUSYA terms, optimizing the carbon sequestration use of the national forest(s) "will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; ... with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output."[219]

---

[215] 36 C.F.R. § 219.11(d)(3).
[216] *See Pinchot Institute Report* at 15: "Developing optimization models in which maximizing carbon stocks is the objective function, subject to constraints to limit any diminishment of other forest resource uses and values, could help identify unexpected opportunities to enhance forest carbon stocks with a minimum of tradeoffs to other environmental, economic, and social values."
[217] 36 C.F.R. § 219.11(d)(1).
[218] 36 C.F.R. § 219.11(a)(1)(iii).
[219] 16 U.S.C. § 531(a).

This is not merely an issue of "prioritization" as the Forest Service seeks to frame it.[220] It's a question of what's required and necessary to meet the substantive mandates that the Forest Service has in light of the significant carbon storage value and impacts the Forest Service's proposed timber removal/forest clearing Revised Plan would have across the GMUG for the following two decades.

In exercising its discretion to balance uses under MUSYA, and the plan for those uses under NFMA, the Forest Service cannot rationally ignore the urgent need to manage the forests in a manner that not only maintains or improves carbon carrying capacity, but optimizes the carbon carrying capacity of the forests in a manner consistent with making the near term reductions in carbon emissions that the October 2018 IPCC report[221] and subsequent reports (e.g. IPCC 2022) have continued to identify as critical. Forest protection in the U.S. is a vital part of achieving those reductions. More logging occurs in U.S. forests than in any other nation in the world, making the U.S. the largest global problem in terms of carbon emissions from logging.[222] Greenhouse gas emissions from the U.S. constitute about one-quarter of the global total, and much of this is the result of fossil fuel extraction from federal public lands, including 41% of all coal extraction that occurs in the U.S.[223] Increased forest protection could account for approximately *half* of the climate change mitigation needed to keep global temperature rise to 1.5 degrees Celsius or less.[224]

The purpose and need that the 2012 forest planning rules were promulgated to address specifically included: "Contribut[ing] to ecological, social, and economic sustainability by ensuring that all plans *will be responsive* and can adapt *to issues such as the challenges of climate change*; the need for forest restoration and conservation, watershed protection, and species conservation; and the sustainable use of public lands to support vibrant communities."[225] Notably, this specific purpose and need was defined distinctly from the purpose and need to emphasize restoration to make the lands resilient to climate change.[226]

The Forest Service has in the past articulated its position regarding how to balance carbon reduction benefits with other land uses as follows: "Taking any tradeoffs into account, the Forest Service will work with partners *to sustain or increase carbon sequestration and storage* in forest and grassland ecosystems and to generate forest products that reduce and replace fossil fuel use.

---

[220] FEIS Vol. I at 64.
[221] IPCC 2018, at 99 (discussing the need deeper emissions reductions in the short term to hedge against uncertainty of climate response and future technology), 126.
[222] M.C. Hansen, et al., *High-resolution global maps of 21st-century forest cover change*, Science 342: 850-53 (Nov. 15, 2013) (Ex. 35); Jeffrey P. Prestemon et al., *The global position of the U.S. forest products industry*, U.S. Forest Service, e-Gen. Tech. Rpt. SRS-204 (Mar. 2015) (Ex. 36).
[223] *See, e.g.*, 81 Fed. Reg. 17,720, 17,224 (Mar. 30, 2016); Stockholm Environment Institute, *How would phasing out U.S. federal leases for fossil fuel extraction affect CO_2 emissions and 2°C goals?* (May 2016). Available at https://mediamanager.sei.org/documents/Publications/Climate/SEI-WP-2016-02-US-fossilfuel-leases.pdf (last viewed Oct. 30, 2023) (Ex. 37).
[224] K.H. Erb et al., *Unexpectedly large impact of forest management and grazing on global vegetation biomass*, Nature 553: 73-76 (2018) (Ex. 38). Bronson W. Griscom et al., *Natural Climate Solutions. Proceedings of the National Academy of Sciences*, Vol. 114, at 11645-50 (Sept. 5, 2017) (Ex. 39).
[225] 77 Fed. Reg. at 21,164 (emphasis added).
[226] *See id.*

The Forest Service will balance its mitigation efforts with all other benefits that Americans get from healthy, resilient forests and grasslands, such as wildlife habitat, wood fiber, water quantity and quality, and opportunities for outdoor recreation."[227]

The emergency need for reductions described in the 2018 IPCC and 2022 IPCC reports make clear that the value of the forests for climate mitigation (i.e. reducing carbon emissions) is even higher than realized at the time the National Roadmap was developed in 2011. In balancing the value of using forest lands to maximize carbon storage and sequestration to mitigate climate change, the Forest Service cannot rationally discount the extreme urgency identified in the IPCC reports, nor the role of land conservation in achieving the reductions necessary by 2030.

Further, to the extent that the Service is balancing the value of mitigation via increased carbon storage and sequestration against purely economic benefits (such as benefits from the sale of logged or salvaged timber), the Service should conduct an explicit cost-benefit analysis to ensure that there are in fact net economic benefits when the impacts of not avoiding carbon emissions are taken into account. In other words, the agency should monetize the value of avoided emissions that are being forsaken for the economic activity, using a tool such as the social cost of carbon. The DEIS fails to do so, the FEIS continues to fail to and this issue remains outstanding.

Due to the failure to provide an assessment specifically of how the timing, extent, and certainty of changes in net carbon emissions under each alternative compare against the urgent need for reductions by 2030, it does not provide an adequate basis for the Forest Service to assert that it is rationally balancing the benefits of climate mitigation efforts with other benefits, let alone optimizing climate mitigation efforts.

Finally, because of the severe impacts of climate change on the lands and resources in the national forest, timber production and the resulting near term carbon emissions from timber production make this Revised Plan incompatible with the uses of those lands for resources such as fish and wildlife, and related desired conditions and objectives.[228] In the FEIS, the Forest Service has failed to address how timber harvest could be carried out in a manner consistent with the urgent need to reduce carbon emissions, and "in a manner consistent with the protection of soil, watershed, fish, [and] wildlife … resources."[229] The agency's failure to do so violates NFMA, MUSYA, and the 2012 Forest Planning Rule.

Suggested Resolutions for the Forest Service's Failure to Manage the Forest for Carbon Sequestration.

The Forest Service must prepare a SEIS and analyze, in detail, the impacts of its alternatives on the GMUG's carbon storage function and capacity and the function of the Forests ability to support and sustain biodiversity. The SEIS must utilize the best available scientific information, and take a "hard look" at the impacts of each of the alternatives on carbon storage function and capacity, impacts to mature and old-growth, and the function of the Forests ability to support and sustain biodiversity (including natural succession of trees and stands to become mature and old-

[227] National Roadmap for Responding to Climate Change, FS-957b (February 2011), at 20 (emphasis added) (Ex. 40).
[228] 36 C.F.R. § 219.11(a)(1)(iii).
[229] 36 C.F.R. § 219.11(d)(3).

growth). Lastly, the supplemental EIS must adopt an alternative that includes a standard or standards that ensure protection of mature and old-growth trees and their soils and a standard or standards that ensures these age classes would be developed by affording trees and stands not in these age classes protection from timber reduction activities so they may naturally age and become the next generation of mature and old-growth trees.

E. OBJECTION #5: The Exception to FW-STND-TMBR-02 Is Vague and Unbounded, Making this Standard Meaningless to Avoid Forest Conversion and Serve as a Check on Timber Reduction Practices and is Not Consistent with 16 U.S.C. § 1604(E)(ii) and 36 C.F.R. § 219.11(d)(5).

While the Draft Plan included an exception to this standard, the new information discussed and provided with this Objection has exposed how meaningless this standard is. The Final Plan's exception to requiring restocking in areas where logging occurs to require assurance of adequate tree seedlings within 5 years after final harvest is that:[230]

> Exceptions to these minimum levels are allowed if supported by a project-specific determination of adequate restocking, e.g., when stands are treated to reduce fuel loadings, to create openings for scenic vistas, to transition a site to an ecosystem better adapted to future climates, to support research experiments, or to remove encroaching trees to meet desired wildlife habitat conditions.[231]

Every single timber project could easily and readily fall under this non-exhaustive exception, including management actions that the best available science (discussed herein) has explicitly called on the Forest Service to immediately halt. At bottom, standards are required to be a "mandatory constraint on a project and activity decisionmaking." They cannot be riddled with an exception so large that it makes it meaningless.[232] The agency has not analyzed or disclosed the impacts of this vague and encompassing exception and what that means for the different alternatives and very significantly, what this means for carbon stores.

Additionally, this standard is not consistent with the Forest Service's statutory mandate that it must "insure that timber will be harvested from National Forest System lands only when—there is assurance that such lands can adequately be restocked within five years after harvest."[233]

Suggested Resolutions for FW-STND-TMBR-02

Remove exceptions to FW-STND-TMBR-02 that make it a meaningless standard and inconsistent with 16 U.S.C. § 1604(E)(ii) and 36 C.F.R. § 219.11(d)(5).

[230] Draft Plan at 75.
[231] Revised Plan at 101; Revised Plan 13-3.
[232] 36 C.FR. § 219.7.
[233] 16 U.S.C. § 1604(E)(ii).

F. OBJECTION #6: The Forest Service Has Failed to Consider A No More Coal Leasing Alternative, Violating NEPA and its Substantive Duties Under NFMA, and the 2012 Planning Rule.

We greatly appreciate FW-STND-ENMI-06 enacts a moratorium on any new oil and gas leasing until a new oil and gas leasing availability decision is issued. We implore, that to uphold its diversity mandate,[234] maintain and restore ecological integrity,[235] landscape connectivity, and water quality, and wildlife diversity[236] the Forest Service cannot allow any further fossil fuel leasing on the GMUG forests.

Developed nations, like the U.S. must phase down all fossil fuel production by around 2030 to have a shot at only a 1.5°C temperature increase.[237] If U.S. Coal production is phased out over a timeframe consistent with equitably meeting the Paris goals, at least 70% of U.S. coal reserves in already-producing mines must stay in the ground.[238] The science is conclusive that "U.S. policy towards the coal industry should be accelerating its phase-out by 2030 or sooner while ensuring a just transition for workers and mining communities."[239]

The World Meteorological Organization (WMO) made official last month what an unprecedented cluster of extreme weather events this summer had already presaged: the Earth had experienced its hottest three months in recorded history.[240] Alarmingly, August 2023 (which is second only to July 2023 in the competition for hottest month ever), averaged 1.5°C warmer than the preindustrial average, bringing the planet a perilous step closer to permanently exceeding the Paris Accord's 1.5°C temperature threshold, *years earlier than anticipated*.[241]

The United States has committed to the climate change target of holding the long-term global average temperature "to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels" under the Paris Agreement.[242] The

---

[234] 16 U.S.C. § 1604(g)(3)(B).
[235] 36 C.F.R. § 219.8 (requiring that plans "must provide for . . . ecological sustainability" and have components that "maintain or restore ecological integrity.").
[236] *Id*.; 36 C.F.R. § 219.9.
[237] Oil Change International, *Drilling Towards Disaster: Why U.S. Oil an Gas Expansion is Incompatible with Climate Limits*, 7 (Jan. 2019) (Ex. 41).
[238] *Id*.
[239] *Id*.
[240] *Earth had hottest three-month period on record, with unprecedented sea surface temperatures and much extreme weather.* World Meteorological Organization News Release September 6, 2023, https://public.wmo.int/en/media/press-release/earth-had-hottest-three-month-period-record-unprecedented-sea-surface (Ex. 42).
[241] *Global temperatures set to reach new records in next five years*, World Meteorological Organization, May 17, 2023, https://public.wmo.int/en/media/press-release/global-temperatures-set-reach-new-records-next-five-years#:~:text=There%20is%20a%2066%25%20likelihood,be%20the%20warmest%20on%20record (ex. 43).
[242] United Nations Framework Convention on Climate Change, Conference of the Parties (Nov. 30-Dec. 11, 2015), Adoption of the Paris Agreement Art. 2, U.N. Doc. FCCC/CP/2015/L.9 (Dec. 12, 2015), available at: http://unfccc.int/resource/docs/2015/cop21/eng/l09.pdf ("Paris Agreement") (Ex. 44). The

Paris Agreement established the 1.5 degree Celsius climate target given the evidence that 2 degrees of warming would lead to catastrophic climate harms.[243] Scientific research has estimated the global carbon budget—the remaining amount of carbon dioxide that can be emitted—for maintaining a likely chance of meeting the Paris climate targets, providing clear benchmarks for the United States and global climate action.[244]

A 2016 global analysis found that the carbon emissions that would be released from burning the oil, gas, and coal in the world's currently operating fields and mines would fully exhaust and exceed the carbon budget consistent with staying below 1.5°C.[245] The reserves in currently operating oil and gas fields alone, even excluding coal mines, would likely lead to warming beyond 1.5°C.[246] The study concluded that no new fossil fuel extraction or infrastructure should be built, and governments should grant no new leases or permits for extraction and infrastructure. Many of the world's existing oil and gas fields and coal mines will need to be closed before their reserves are fully extracted in order to limit warming to 1.5°C.[247] In short, the analysis established that there is no room in the carbon budget for new fossil fuel extraction or infrastructure anywhere, including in the United States, and much existing fossil fuel production must be phased out to avoid catastrophic damages from climate change.[248] As a result of this conclusion *any* additional development must be considered significant under NEPA.

United States signed the Paris Agreement on April 22, 2016 as a legally binding instrument through executive agreement, and the treaty entered into force on November 4, 2016. Although the United States temporarily withdrew from the Paris Agreement during the Trump Administration, it rejoined on January 20, 2021. *The United States Officially Rejoins the Paris Agreement.* https://www.state.gov/the-united-states-officially-rejoins-the-paris-agreement/#:~:text=On%20January%2020%2C%20on%20his,back%20into%20the%20Paris%20Agreement (Ex. 45).

[243] IPCC 2018 Special Report (Ex. 13).

[244] The 2018 IPCC Special Report on Global Warming of 1.5 degrees Celsius estimated the carbon budget for a 66 percent probability of limiting warming to 1.5 degrees at 420 $GtCO_2$ and 570 $GtCO_2$ from January 2018 onwards, depending on the temperature dataset used. At the current emissions rate of 42 $GtCO_2$ per year, this carbon budget would be expended in just 10 to 14 years. *See* IPCC, *Global Warming of 1.5°C*, Ex. 13. Most recently, an updated analysis of carbon budgets in the IPCC's Sixth Assessment Report estimates that the remaining global carbon budget from the beginning of 2020 is now only 400 and 300 $GtCO_2$ for maintaining 67 percent and 83 percent likelihoods, respectively, of limiting global warming to 1.5 degrees Celsius.

[245] Oil Change International, *The Sky's Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production* at Table 3 (Sept. 2016), available at: http://priceofoil.org/2016/09/22/the-skys-limit-report/ (Ex. 46). According to this analysis, the CO_2 emissions from developed reserves in existing and under-construction global oil and gas fields and existing coal mines are estimated at 942 Gt CO_2, which vastly exceeds the 1.5 degrees Celsius-compatible carbon budget estimated in the 2018 IPCC Report on Global Warming of 1.5°C at 420 $GtCO_2$ to 570 $GtCO_2$.

[246] The CO_2 emissions from developed reserves in currently operating oil and gas fields alone are estimated at 517 Gt CO_2, which would likely exhaust the 1.5degrees Celsius-compatible carbon budget estimated in the 2018 IPCC Report on Global Warming of 1.5°C at 420 $GtCO_2$ to 570 $GtCO_2$.

[247] Oil Change International, *The Sky's Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production* at 5.

[248] This conclusion was reinforced by the IPCC Fifth Assessment Report which estimated that global fossil fuel reserves exceed the remaining carbon budget (from 2011 onward) for staying below 2 degrees Celsius (a target incompatible with the Paris Agreement) by 4 to 7 times, while fossil fuel resources

A 2019 analysis underscored that the United States must halt new fossil fuel extraction and rapidly phase out existing production to avoid jeopardizing our ability to meet the Paris climate targets and avoid the worst dangers of climate change.[249] The analysis showed that the U.S. oil and gas industry is on track to account for 60 percent of the world's projected growth in oil and gas production between now and 2030—the time period over which the IPCC concluded that global carbon dioxide emissions should be roughly halved to meet the 1.5 degrees Paris Agreement target.[250] Between 2018 and 2050, the United States is poised to unleash the world's largest burst of CO_2 emissions from new oil and gas development—primarily from shale and largely dependent on fracking—estimated at 120 billion metric tons of CO_2 which is equivalent to the lifetime CO_2 emissions of nearly 1,000 coal-fired power plants. Based on a 1.5 degrees IPCC pathway, U.S. production alone would exhaust nearly 50 percent of the world's total allowance for oil and gas by 2030 and exhaust more than 90 percent by 2050. And, as noted above, at least 70 percent of U.S. coal reserves in already-producing mines must stay in the ground. In short, if not curtailed, U.S. fossil fuel expansion will impede the world's ability to meet the Paris climate targets and preserve a livable planet.

Studies have only become more direct about the urgent and pressing need to keep fossil fuels in the ground. For example, to have a 50% chance of limiting global temperature rise to 1.5°C, approximately 60% of global oil and gas must be left in the ground.[251] As a practical matter, this means that the U.S., along with most other oil producing regions, must reach peak production now or within the next decade, which would render many already operational and planned fossil fuel producing projects unviable.[252] In order to increase our odds of maintaining global temperature increase at 1.5°C (i.e. better than a 50/50 chance), even more existing reserves must remain undeveloped.[253] Given the large number of outstanding but undeveloped leases on federal lands, there is simply no room for any expanded fossil fuel production. If U.S. fossil fuel expansion is not immediately halted, it will make it impossible to meet the 1.5°C limit and preserve a livable planet.

These analyses highlight that the United States has an urgent responsibility to lead in the transition from fossil fuel production to 100 percent clean energy, as a wealthy nation with ample financial resources and technical capabilities, and due to its dominant role in driving climate change and its associated harms. The U.S. is currently the world's largest oil and gas producer and third-largest coal producer.[254] The U.S. is also the world's largest historic emitter of

---

exceed the carbon budget for 2 degrees by 31 to 50 times. *See* Bruckner, Thomas et al., *Energy Systems in Climate Change 2014: Mitigation of Climate Change*, Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press (2014), at Table 7.2 (Ex. 47).

[249] Oil Change International, *Drilling Toward Disaster: Why U.S. Oil and Gas Expansion Is Incompatible with Climate Limits*.

[250] IPCC 2018 Special Report at SPM-15 (Ex. 13).

[251] Dan Welsby et al., *Unextractable fossil fuels in a 1.5 °C world*, Nature 597**,** 230–234 (2021). https://doi.org/10.1038/s41586-021-03821-8 (Ex. 48).

[252] *Id.*

[253] *Id.*

[254] Oil Change International*, Drilling Toward Disaster* at 5.

greenhouse gas pollution, responsible for 25 percent of cumulative global CO_2 emissions since 1870, and is currently the world's second highest emitter on an annual and per capita basis.[255] The U.S. must focus its resources and technology to rapidly phase out extraction while investing in a just transition for affected workers and communities currently living on the front lines of the fossil fuel industry and its pollution.[256]

It is unacceptable and scientifically indefensible for the Forest Service's Revised Plan to leave 70% of the potential coal resource area, over 40,000 acres, available for potential coal leasing and to have failed to analyze a no coal leasing alternative.[257] The cognitive dissonance is astounding. The agency repeatedly relies on the anticipated impacts and risks of climate change for justifying its need to Revise the Plan[258] as well as its timber reduction practices but fails to take the most meaningful action it could to protect the forests from depredations from climate change: "[c]oal mining activities are predicted to be the largest contributor to greenhouse gas emissions, followed by oil and gas development."[259] "Coal production could increase uniformly across all alternatives given that the mining company is currently at about half of their permitted production level for existing leases."[260] The failure to disclose how each alternative *quantify* the greenhouse gas emissions and disclose the impacts of further leasing is also an outstanding omission.

The Forest Service has failed to rise to the occasion with its Revised Plan to take the most climate impactful action it could by analyzing a no coal leasing alternative and prohibiting such leasing moving forward. A no leasing alternative was consistently requested throughout the public engagement process.[261] The Forest Service inadequately dismissed this alternative at the scoping stage, stating:

> Given economic constraints and designated Colorado roadless area constraints (outside of the contested North Fork Mining Area per the Colorado Roadless Rule), the area available to coal leasing is extremely limited. Therefore, an alternative that would preclude future coal leasing in the GMUG is unnecessary.[262]

Now, the Forest Service seems to have changed its position, asserting that it could not consider or adopt an alternative that would close the GMUG to any further coal leasing because precluding all future coal leasing would "not [be] consistent with law, regulation, or policy, including the 2012 Planning Rule and its implementing Policy FSH 1909.12."[263] There is no cite

---

[255] LeQuéré, Corinne et al., *Global Carbon Budget 2018*, 10 Earth System Science Data 2141 (2018) at Figure 5, 2167 (historical cumulative fossil CO_2 emissions by country) (Ex. 49).
[256] Piggot, Georgia et al., *Realizing a Just and Equitable Transition Away from Fossil Fuels*, Discussion brief, Stockholm Environment Institute (Jan. 2019), available at: https://www.sei.org/publications/just-and-equitable-transition-fossil-fuels/ (Ex. 50).
[257] FEIS at 496; Draft ROD at 43, states even more coal could be made available though, citing it as 41,000 acres.
[258] *See e.g.* FEIS Vol. I at 9; Draft ROD at 2, 4.
[259] FEIS Vol. I at 348.
[260] FEIS at 469.
[261] HCCA et al. DEIS comments starting on page 192.
[262] DEIS at 28.
[263] *Id*.

to a law or regulation that precludes the agency from considering this reasonable alternative because there is no such law or regulation. The Forest Service is, however, required to protect forests by regulating their occupancy and use and "to preserve the forests thereon from destruction."[264] To protect the GMUG forests and comply with its substantive statutory duties as well as procedural duties under NEPA, the Forest Service has to analyze a no leasing alternative. We maintain that it is unacceptable for the GMUG to subject the forests that it manages to more damage from climate change that it can directly prevent by prohibiting any further fossil fuel leasing.

A few pages later the Forest Service's explanation changed again, purporting that it is not considering this alternative now because the agency must consider a no action (no leasing) alternative when it receives a coal leasing application, so this analysis would be done later. But this doesn't explain why the Service could not and should not take leasing off the table, especially given that there is no dispute that we must rapidly phase out fossil fuel production to have a shot at a 1.5°C temperature increase. And the identification of areas as unsuitable for coal leasing "is a land use planning decision" thus most and best done at the planning stage.[265] It is also unclear to us, why the citizen proposals would be interpreted as excusing Forest Service's lack of analyzing a no leasing alternative and adopting it.

Analyzing a no coal leasing alternative and adopting it is a viable, reasonable alternative that is also required by the best available science and to make the Plan internally consistent.

We would also like to note that the broad, unsupported generalizations that fossil fuels in the GMUG contribute to "national security and energy supplies"[266] fails to account for the fact that "highly advantageous export markets" are likely contributing to the majority of the West Elk coal mine's coal leaving the U.S.[267] Fossil fuels operate in a global market, fossil fuels that are fracked or mined from the GMUG go to the highest bidder or whatever company contracts are with – it does not necessarily stay within in the U.S. so it is wrong to make that assumption without having the receipts of where GMUG gas and coal go. More importantly, fossil fuel production and burning is a serious National Security risk, agencies that fail to take action accordingly by phasing out and halting more fossil fuel development *are jeopardizing* our National Security.[268] "Climate change will increasingly exacerbate a number of risks to U.S. national security interests, from physical impacts that could cascade into security challenges, to how countries respond to the climate challenge."[269] These risks include: "1) increased geopolitical tension as countries argue over who should be doing more, and how quickly, and

---

[264] 16 U.S.C. § 551.
[265] Draft ROD at 43.
[266] GMUG Revised Plan at 10.
[267] *See* Dennis Webb, *State Coal Mines Produced 12.3 Million Tons Last Year* (Feb. 11, 2023) https://www.coalzoom.com/article.cfm?articleid=31486 (Ex. 51).
[268] Christopher Flavelle, et al., *Climate Change Poses a Widening Threat to Nat'l Security*, N.Y. Times (Oct. 21, 2021); https://www.dni.gov/files/ODNI/documents/assessments/NIE_Climate_Change_and_National_Security.pdf
[269] https://www.whitehouse.gov/briefing-room/statements-releases/2021/10/21/fact-sheet-prioritizing-climate-in-foreign-policy-and-national-security/ (Ex. 52).

compete in the ensuing energy transition; 2) cross-border geopolitical flashpoints from the physical effects of climate change as countries take steps to secure their interests; and 3) climate effects straining country-level stability in select countries and regions of concern."[270]

The "heart" of an EIS is the exploration of possible alternatives, every EIS must "[rigorously explore and objectively evaluate all reasonable alternatives." [271] Environmental analysis under NEPA must be conducted at "the earliest possible time" and here, it is not only the earliest time, but the best time for the agency to conduct this analysis as it is setting the management framework for the forests for the next 10-20 years. NEPA is designed to require analysis of environmental consequences to be done as soon as it can reasonably done, and a no leasing alternative at the Plan stage is that very moment.[272] The Tenth Circuit has rejected agency efforts, such as the Forest Service's here, seeking to excuse themselves from analyzing in detail a no leasing alternative, the Forest Service should comply with this precedent and do so here.

Suggested Resolutions for Reasonable Alternative of A No-Coal Leasing.

The Forest Service must prepare a SEIS and analyze, in detail, a no-coal leasing alternative as proposed by the Center and others in previous comments. This analysis must utilize the best available scientific information and take a "hard look" at the impacts of each alternative on greenhouse gas emissions and climate impacts, using a metric such as the social costs of carbon and carbon budgets. Lastly, this SEIS must adopt an alternative that complies with NEPA, NFMA, and MUSYA by prohibiting any future coal leasing on the GMUG.

Thank you for your attention to these issues. We look forward to continuing to participate in the planning process.

Sincerely,

Allison N. Henderson
Southern Rockies Director
Center for Biological Diversity
P.O. Box 3024
Crested Butte, CO 81224
ahenderson@biologicaldiversity.org
(970) 309-2008

[270] *Id.*
[271] *N.M. ex rel. Richardson v. BLM*, 565 F.3d 683, 708 (10th Cir. 2009); 40 C.F.R. § 1502.14(a).
[272] *N.M. ex rel. Richardson v. BLM*, 565 F.3d 683, 708-711 (10th Cir. 2009).

TABLE OF EXHIBITS

Exhibit 12	Bradley, C. M., C. T. Hanson, and D. A. DellaSala. 2016. *Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States?* Ecosphere 7(10):e01492. 10.1002/ecs2.1492
Exhibit 13	Intergovernmental Panel on Climate Change (IPCC), Special Report on Global Warming of 1.5 °C (SR15) (October 2018)
Exhibit 14	IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3-24. https://doi.org/10.1017/9781009157940.001. Summary for PolicymakersSPM
Exhibit 15	Dominic A. DellaSala et al., *Mature and old-growth forests contribute to large-scale conservation targets in the conterminous United States*, Front. For. Glob. Change 5:979528 (Sept. 28, 2022)
Exhibit 16	Beverly E. Law et al., *Creating Strategic Reserves to Protect Forest Carbon and Reduce Biodiversity Losses in the United States*, Land 2022, 11, 721 https://doi.org/10.3390/land1105072 (May 11, 2022)
Exhibit 17	High Country Conservation Advocates ("HCCA") et al. letter to Chad Stewart, Forest Supervisor, GMUG Nat'l Forests, Request for a Meeting to Discuss Reconsideration of the Spruce Beetle Epidemic and Aspen Decline Mgmt. Response (Apr. 20, 2023)
Exhibit 18	Chad Steward, Forest Supervisor, GMUG Nat'l Forests to HCCA et al. (July 11, 2023)
Exhibit 19	Email from Michael Salazar to Levi Broyles et al. FW: Industry Meeting with RF and DRF (Aug. 30, 2022)
Exhibit 20	David J. Mildrexler et al., *Large Trees Dominate Carbon Storage in Forests East of the Cascade Crest in the Unites States Pacific Northwest*, Front. For. Glob. Change 3:594274 (Nov. 5, 2020)

Exhibit 21	Richard A. Birdsey et al., *Assessing carbon stocks and accumulation potential of mature forests and larger tress in U.S. federal lands*, Front. For. Glob. Change 5:1074508 (Jan. 6, 2023)
Exhibit 22	Barnett et al., *Classifying, inventorying, and mapping mature and old-growth forest in the United States*, Front. For. Glob. Change 5:1070372 at 2 (Jan. 3, 2023)
Exhibit 23	Colo. Energy Office, *Colo. Approves nation-leading rule to cut greenhouse gas emissions by shifting how it plans the state's transportation system*, (Dec. 16, 2021)
Exhibit 24	Sebastiaan Luyssaert et al., *Old-growth forests as global carbon sinks*, Nature 455:213-215 doi:10.1038/nature07276 (Sept. 2008)
Exhibit 25	Maria Janowiak et al., *Considering forest and grassland carbon in land management*, United States Dep't of Agriculture, Forest Service, General Technical Report WO-95 (2017)
Exhibit 26	Malcom North et al., *Fire suppression and fuels treatment effects on mixed-conifer carbon stocks and emissions*, 19 Ecological Applications 6, 1385-1396 (2009)
Exhibit 27	Peter M. Anthoni et al, *Seasonal differences in carbon and water vapor exchange in young and old-growth ponderosa pine ecosystems*, Agricultural and Forest Meteorology 111:203-222
Exhibit 28	N.L. Stephenson et al. 2014, *Rate of tree carbon accumulation increases continuously with tree size*, Nature doi:10.1038/nature12914 (2014)
Exhibit 29	Mark E. Harmon, *Have product substitution carbon benefits been overestimated? A sensitivity analysis of key assumptions*, Envtl. Research Lett. 14 065008 (June 21, 2019)
Exhibit 30	Tara W. Hudiburg et al., *Meeting GHG reduction targets requires accounting for all forest sector emissions*, Environ. Res. Lett. 14 (Aug. 23, 2019)
Exhibit 31	N.L. Harris et al., *Attribution of net carbon change by disturbance type across forest lands of the conterminous United States*, 11 Spring Open 24 (2016)
Exhibit 32	Law et al., *Land use strategies to mitigate climate change in carbon dense temperate forests*, 115 PNAS 14 (Jan. 22, 2018)

Exhibit 33	J.E. Stenzel et al., *Restoration Thinning in a Drought-Prone Idaho Forest Creates a Persistent Carbon Deficit*, J. of Geophysical Research: Biogeosciences 126, e2020JG005815 (Jan. 22, 2021)
Exhibit 34	*Forest Carbon and Conservation Management: Integration with Sustainable Forest Management for Multiple Resource Values and Ecosystem Services* (Pinchot Institute, May 2015)
Exhibit 35	M.C. Hansen, et al., *High-resolution global maps of 21st-century forest cover change*, Science 342: 850-53 (Nov. 15, 2013)
Exhibit 36	Jeffrey P. Prestemon et al., *The global position of the U.S. forest products industry*, U.S. Forest Service, e-Gen. Tech. Rpt. SRS-204 (Mar. 2015)
Exhibit 37	Stockholm Environment Institute, *How would phasing out U.S. federal leases for fossil fuel extraction affect CO_2 emissions and 2°C goals?* (May 2016)
Exhibit 38	K.H. Erb et al., *Unexpectedly large impact of forest management and grazing on global vegetation biomass*, Nature 553: 73-76 (2018)
Exhibit 39	Bronson W. Griscom et al., *Natural Climate Solutions. Proceedings of the National Academy of Sciences*, Vol. 114 (Sept. 5, 2017)
Exhibit 40	National Roadmap for Responding to Climate Change, FS-957b (February 2011)
Exhibit 41	Oil Change International, *Drilling Towards Disaster: Why U.S. Oil an Gas Expansion is Incompaitbile with Climate Limits* (Jan. 2019).
Exhibit 42	*Earth had hottest three-month period on record, with unprecedented sea surface temperatures and much extreme weather.* World Meteorological Organization News Release September 6, 2023
Exhibit 43	*Global temperatures set to reach new records in next five years*, World Meteorological Organization, May 17, 2023
Exhibit 44	United Nations Framework Convention on Climate Change, Conference of the Parties (Nov. 30-Dec. 11, 2015), Adoption of the Paris Agreement Art. 2, U.N. Doc. FCCC/CP/2015/L.9 (Dec. 12, 2015)
Exhibit 45	*The United States Officially Rejoins the Paris Agreement*

Exhibit 46	Oil Change International, *The Sky's Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production* at Table 3 (Sept. 2016)
Exhibit 47	Bruckner, Thomas et al., *Energy Systems in Climate Change 2014: Mitigation of Climate Change*, Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press (2014)
Exhibit 48	Dan Welsby et al., *Unextractable fossil fuels in a 1.5 °C world*, Nature 597**,** 230–234 (2021)
Exhibit 49	LeQuéré, Corinne et al*., Global Carbon Budget 2018*, 10 Earth System Science Data 2141 (2018)
Exhibit 50	Piggot, Georgia et al., *Realizing a Just and Equitable Transition Away from Fossil Fuels*, Discussion brief, Stockholm Environment Institute (Jan. 2019)
Exhibit 51	Dennis Webb, *State Coal Mines Produced 12.3 Million Tons Last Year* (Feb. 11, 2023)
Exhibit 52	Christopher Flavelle, et al., *Climate Change Poses a Widening Threat to Nat'l Security*, N.Y. Times (Oct. 21, 2021)
Exhibit 53	Parmesan, C., Morecroft, M. D., Trisurat, Y., Adrian, R., Anshari, G. Z., Arneth, A., Gao, Q., Gonzalez, P., Harris, R., Price, J., Stevens, N., & Talukdarr, G. H. (2022). Terrestrial and freshwater ecosystems and their services. In H.-O. Pörtner, D. C. Roberts, M. Tignor, E. S. Poloczanska, K. Mintenbeck, A. Alegría,M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, & B. Rama (Eds.), Climate change 2022: Impacts, adaptation and vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (pp. 197–377). Cambridge University Press. https://doi.org/10.1017/9781009325844.004
Exhibit 54	Forest Service, Climate Change Considerations in Project Level NEPA Analysis (January 13, 2009)
Exhibit 55	Council on Environmental Quality, National Environmental Policy Act, Guidance on Consideration of Greenhouse Gas Emissions, 86 Fed. Reg. 10,252 (Feb. 19, 2021)
Exhibit 56	Executive Order 14,008 (Jan. 27, 20221)