November 1, 2021

USDA Forest Service Southwest Region
Attn: Objection Reviewing Officer
333 Broadway Blvd SE
Albuquerque, NM 87102

Subject: Cibola National Forest Plan Revision Objection
Responsible Official: Jay Turner, Acting Forest Supervisor, Cibola National Forest
Submitted via: objections-southwestern-regional-office@usda.gov

Dear Objection Reviewing Officer:

Pursuant to 36 CFR Part 219 Subpart B, the Center for Biological Diversity, WildEarth Guardians, Sierra Club and New Mexico Wilderness Alliance are filing this administrative objection to the Cibola National Forest revised land management plan, Final Environmental Impact Statement, and Draft Record of Decision.

Sincerely,

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Contents

1 Introduction

We are filing this administrative objection with the United States Forest Service (Forest Service) to the Cibola National Forest's final revised land management plan (Revised Plan) because the planning process and substance of the Revised Plan fail to comply with a set of laws and their implementing regulations and associated policy. With the Revised Plan and supporting analyses for this agency action, the Forest Service[1] is in violation of the National Forest Management Act (NFMA; 16 USC 1600 et seq.)—particularly its "diversity requirement" (16 USC 1604(g)(3)(B)), NFMA's regulations governing management planning—the 2012 Planning Rule (36 CFR 219 Subpart A), the National Environmental Policy Act (NEPA; 42 USC 4321 et seq.) and several implementing regulations under 40 CFR 1500-1508, and the United States Endangered Species Act (ESA; 16 USC 1531 et seq.).

Each Objector previously submitted timely specific written comments regarding the Cibola National Forest's plan revision process and plan documents during designated opportunities for public comment, which occurred during the assessment, scoping, and draft plan phases of planning. Each of the issues discussed in this objection was raised in objectors' prior comments, and objectors hereby incorporate those comments by reference. These comments are referenced in the objection as noted below.

- TWS et al. 2014. The Wilderness Society, Center for Biological Diversity, New Mexico Wilderness Alliance, Great Old Broads for Wilderness, Back Country Horsemen of New Mexico, New Mexico Backcountry Hunters and Anglers, Sierra Club, and Archaeology Southwest. Comments: Feedback on the Cibola National Forest's Draft Assessment for Forest Planning. June 6, 2014.

- CBD 2015. Center for Biological Diversity. Scoping Comments for the Cibola National Forest's Plan Revision Process. April 3, 2015.

- CBD 2015. Center for Biological Diversity. Response to the notice the Draft Forest-wide Ecological and Socioeconomic Desired Conditions for the Cibola National Forest Mountain Ranger Districts. September 25, 2015.

- Sierra Club et al. 2019. Sierra Club, Santa Fe Forest Coalition, Wild Watershed, New Mexico Wilderness Alliance, Great Old Broads for Wilderness, Center for Biological Diversity, WildEarth Guardians, New Mexico Sportsmen, and New Mexico Horse Council. Comments on the Cibola National Forest Draft Land Management Plan and Draft Environmental Impact Statement. October 31, 2019.

[1] The Responsible Official, the Forest Service's planning team, Region 3 staff involved in developing the Revised Plan will generally be referred to as "the Forest Service" in this Objection.

We have mailed a USB storage device to the Regional Office containing exhibits cited in this objection. Please see Appendix A and B for a list of these selected references. The parcel is postmarked November 1, 2021.

2 Sustainable Road System

2.1 Our Objection: The Revised Plan fails to include adequate plan components to ensure it can achieve an environmentally and fiscally sustainable forest road system, violating NFMA, NEPA, and the Travel Management Rule.

Overall, the Plan fails to comply with the 2012 Planning Rule by omitting the necessary components to maintain or restore ecological integrity due to its lack of desired conditions, objections, standards and guidelines necessary to ensure the Revised Plan provides for an ecologically sustainable transportation system. Our comments explained the regulatory history of the Roads Rule clarified that the Forest Service intended land management plans would address TMR Subpart A compliance.

Our comments explained the need for the Revised Plan to include meaningful plan components that will drive progress toward a fiscally and ecologically sustainable road system that is consistent with the Travel Management and the 2012 Planning Rules. Specifically, we explained the DEIS and Draft Plan did not adequately address road density thresholds, fiscal sustainability, or climate change resilience. Without sufficiently considering and incorporating these important factors in the agency's analysis and the Revised Plan, the Forest Service failed to provide plan components that will ensure the forest road system is ecologically and fiscally sustainable. Specifically, the Revised Plan fails to include the necessary components to identify a minimum road system (hereafter, "MRS"), remove unneeded system roads, or otherwise provide for sustainable transportation infrastructure that helps maintain and restore ecological integrity as the 2012 Planning Rule requires. Specifically, the lack of sufficient plan components precludes the agency from complying with the sustainability requirements under 36 C.F.R. § 219.8.

In addition to the requirements of the 2012 Planning Rule and subpart A, NEPA requires the Forest Service to analyze its road system as part of the forest plan revision process. Because they constitute "major Federal actions significantly affecting the quality of the human environment," forest plan revisions require preparation of an environmental impact statement (EIS) under NEPA.[2] The EIS must analyze in depth all "significant issues related to [the plan revision]."[3] Management of the forest road system and its significant environmental impacts on a range of forest resources undoubtedly qualifies as a significant issue that must be analyzed in the plan revision EIS.[4]

[2] 42 U.S.C. § 4332(2)(C); 36 C.F.R. § 219.5(a)(2)(i).

[3] 40 C.F.R. § 1501.7; see also id. § 1502.1 (an EIS "shall provide full and fair discussion of significant environmental impacts" and "shall focus on significant environmental issues and alternatives").

[4] NEPA analysis as part of a previous travel management planning process under subpart B does not satisfy the Forest Service's duty to comprehensively analyze the impacts of its road system in the EIS for the plan revision. As

A robust NEPA analysis of the forest road system and its environmental and social impacts is especially critical in the context of climate change. NEPA requires agencies to analyze proposed actions and alternatives in the context of climate change, including the vulnerability of resources such as transportation infrastructure, and to consider opportunities for climate adaptation and resilience.

Importantly, adequate analysis of the forest road system cannot be provided in a piecemeal fashion under other, individual resource topics in the EIS. That approach would preclude comprehensive analysis of the significant impacts associated with the road system and could result in fragmented and conflicting management direction that fails to satisfy the substantive mandates of the 2012 Planning Rule and subpart A.

As it stands, the agency fails to adequately respond to our comments, provide the requisite analysis in its FEIS as NEPA requires, or demonstrate compliance with the 2012 Planning Rule, in particular its sustainability requirements. The following sections explain further and provide specific examples, but by no means are exhaustive.

2.1.1 The substantive requirements of the 2012 Planning Rule require meaningful plan direction on roads.

The substantive requirements of the 2012 Planning Rule require the Forest Service to comprehensively address the road system in its plan revision. Given the significant aggregate impacts of that system on landscape connectivity, ecological integrity, water quality, species viability and diversity, and other forest resources and ecosystem services, the Forest Service cannot satisfy the rule's substantive requirements without providing management direction for transportation infrastructure. Plans must provide standards and guidelines to maintain and restore ecological integrity, landscape connectivity, water quality, and species diversity. Those requirements simply cannot be met absent integrated plan components directed at making the road system considerably more sustainable and resilient to climate change stressors.

The Forest Service's final directives on infrastructure recognize this: "[t]he central consideration in land management planning for infrastructure is that the integrated desired conditions and other plan components set a framework for the sustainable management of the plan area's infrastructure and mitigation of adverse impacts." To that end, plan components should "reflect the extent of infrastructure that is needed to achieve the desired conditions and objectives of the plan" and "provide for a realistic desired infrastructure that is sustainable and can be managed in accord with other plan components including those for ecological sustainability." Plan components also must ensure fiscal sustainability.

More generally, the Revised Plan is the logical and appropriate place to establish a framework for management of the forest road system. Plans "provide a framework for integrated resource management and for guiding project and activity decisionmaking." Plans allow the Forest Service to comprehensively evaluate the road system in the context of other aspects of forest management, such as restoration, protection and utilization, and fiscal realities, and to integrate

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explained above, the purpose of the TMP is to designate existing roads and trails available for off-road vehicle use, not to identify and provide a framework for a sustainable road system.

management direction accordingly. Plans also provide and compile regulatory direction at a forest-specific level for compliance with the Clean Water Act, Clean Air Act, Endangered Species Act, and other federal environmental laws relevant to the road system and its environmental impacts. And plans allow forest managers and the public to clearly understand the management expectations around the road system and develop strategies accordingly. With frequent turnover in decision-making positions at the forest level, a plan-level management framework for the road system and transportation infrastructure is particularly critical.

Moreover, with climate change anticipated to necessitate forest-wide upgrades and reconfigurations of transportation infrastructure, it is especially important that plans provide direction for identifying and achieving an environmentally and fiscally sustainable road system under future climate scenarios.

Lastly, the Forest Service does not have another planning vehicle to direct long-term and forestwide management of the road system and to ensure compliance with current policy and regulatory direction. Travel Management Plans (TMPs) under subpart B of 36 C.F.R. part 212 are not a substitute for the integrated direction for transportation management that land management plans must provide. The main purpose of TMPs is to designate roads, trails, and areas that are open to motorized travel – not to achieve a sustainable transportation system, decommission unneeded roads, or otherwise meet the ecological restoration mandates of the 2012 Planning Rule.

2.1.2 The Revised Plan and FEIS do not consider or incorporate road density thresholds.

Our comments explained that the Forest Service should use the plan revision process as an opportunity to examine current road densities in the forest, identify their cumulative impacts, and determine how proposed management direction will influence these densities over the life of the Revised Plan. We urged the agency to analyze the impacts of road densities and determine what density thresholds are necessary to protect ecological values in the forest, with a particular focus on sensitive areas such as watersheds, wildlife habitat and migration routes, and areas that are vulnerable to flooding (which may wash out roads and cause harm). In response the Forest Service explains the following:

> Road density can be a misleading indicator; the choice was made not to use road density. If the density area is too small, an intersection of two roads will rate above desired density while ignoring the need for road connection. Topographical and other concerns, constraints, or needs are also ignored by this measure.[5]

The Forest Service uses a straw man fallacy to dismiss our comment by creating a scenario where road density thresholds may not account for the need of a road connection, but the agency does so without disclosing the actual size of the area where this situation may actually occur. Had the Forest Service adequately considered our comments and analyzed an alternative that utilized road or motorized route density standards, or even guidelines, then it may have identified the appropriate scale in which to measure those densities. Instead, the agency created a situation where those densities would conflict with a supposed need (e.g. road connection). Further, the

[5] FEIS Vol. 3 Appendix G at 73.

response also cites topography and other concerns, constraints or needs without actually explaining or demonstrating how road density thresholds may be incompatible. Such a response is arbitrary and capricious, and the failure to consider or analyze road densities is a violation of NEPA. Particularly since the Forest Service uses the Watershed Condition Framework in its analysis that uses the 6th HUC watershed level to determine condition class scores: "[t]o demonstrate improvement in condition class, we will need to track activities at the smallest feasible watershed unit, the 6th-level HUC (typically, 10,000 to 40,000 acres)."[6] The attached literature review summarizing the extensive body of science discussing the ecological consequences of forest roads includes a scientifically supported table of road density thresholds the agency should consider for establishing such components.[7]

The need for such components is most evident when looking at the Revised Plan and the supporting analysis in regards to watersheds, water resources and aquatic species. Specifically, the Revised Plan includes a desired condition where "Watersheds are functioning properly and all indicators are rated as good according to the Watershed Condition Framework (Potyondy and Geier 2011) or similar protocol."[8] We support the agency in its effort to achieve properly functioning watershed conditions and recognizing the need to ensure all indicators have a good rating. Unfortunately, the lack of road density thresholds undermines the agency's ability to achieve this desired condition. The failing is particularly egregious given "[i]n the Cibola, the main indicators that contribute to the impaired watershed condition are roads and trails, soils, and fire regime or wildfire."[9] Given this information, it would make sense for the Forest Service to disclose the ranking for each of the three indicators. Yet, the analysis only discusses the fire regime or wildfire indicator.[10] Missing is any discussion or analysis of the Road and Trails Indicator or their corresponding attributes: 1. Open road density; 2. Road and trail maintenance; 3. Proximity to water; or 4. Mass wasting.[11] Overall, the agency fails to adequately discuss or disclose how current road and trail conditions contribute to the WCF rankings, or how those conditions would change under each alternative. The omission is particularly glaring given the Forest Service analysis relies on "restoration treatments" as the effects indicator to determine the potential effects to watershed condition under each alternative, but the agency fails to specify the amount of restoration treatments needed to improve WCF condition class, let alone the Roads

[6] Potyondy and Geier, July, 2011. Watershed Condition Classification Technical Guide. FS-978 at 4.

[7] See Ex. ROADS 1 WildEarth Guardians Roads Report, "The Environmental Consequences of Forest Roads and Achieving a Sustainable Road System." March 2020. WildEarth Guardians.

[8] Revised Plan at 62, (FW-DC-WTR-01).

[9] FEIS Vol. 1 at 64.

[10] *Id.*

[11] Potyondy and Geier, 2011. Watershed Condition Classification Technical Guide at 5, Figure 1. The WCF utilizes a broad road definition ("the term "road" is broadly defined to include roads and all lineal features on the landscape that typically influence watershed processes and conditions in a manner similar to roads. Roads, therefore, include Forest Service system roads (paved or nonpaved) and any temporary roads (skid trails, legacy roads) not closed or decommissioned, including private roads in these categories. Other linear features that might be included based on their prevalence or impact in a local area are motorized (off-road vehicle, all-terrain vehicle) and nonmotorized (recreational) trails and linear features, such as railroads."). Id. at 26.

and Trails Indicator. Rather, the Forest Service explains that "[t]his analysis provides a qualitative assessment of forecasted trends in surface water quality, water quantity, and hydrologic function for surface water in relation to various restoration management activities."[12] We recognize that the FEIS represents a programmatic analysis of the Revised Plan, yet the Forest Service still needed to provide more than the cursory qualitative assessment that fails to demonstrate the degree to which the Revised Plan can even achieve the desired condition where watersheds are functioning properly and all indicators are rated as good.[13] In fact, the only objective that may move the agency closer to achieving this desired condition is where the Revised Plan states "[r]elocate, improve, or decommission 3 to 5 miles annually of system roads or unauthorized routes to protect ecosystems and watersheds."[14] Yet, due to the qualitative nature of the analysis, the Forest Service to demonstrate if this objective will move the 46 subwatersheds that are functioning at risk, and the 1 subwatershed that is impaired to the functioning properly classification. Further, by not considering road densities as an analysis indicator for watersheds, the Forest Service constrains its analysis and fails to disclose how each alternative would affect the Road and Trail Indicator or the road density attribute.

The failure to adequately demonstrate that unquantified restoration treatments will in fact improve WCF condition classes is also a fatal flaw for the agency's analysis of surface water conditions. The Forest Service discloses the following:

> Two of the perennial streams have been assessed by the State of New Mexico (New Mexico Environment Department 2012) and are listed as impaired. Notably, Las Huertas Creek and Bluewater Creek are listed as impaired. The portion of Bluewater Creek assessed by New Mexico is from Bluewater Reservoir to the headwaters of Bluewater Creek, assessment unit NM-2107.A_01. The designated use of coldwater aquatic life is not supported in this reach as indicated by nutrient and temperature data collected in 2006. Possible sources of impairment include: **forest roads**, loss of riparian habitat, rangeland grazing, silviculture harvesting, and streambank modification/destabilization.[15]

Given the role of forest roads in contributing to an impaired waterbody, it would be reasonable to expect more detailed discussion and analysis in the FEIS that demonstrates the Revised Plan will address forest roads as a source of impairment, along with the others. Here, the agency discloses that the Revised Plan will result in "Road decommission, relocation, or improvement objectives of up to seventy-five miles are also included."[16] However, the objective for water resource features lacks any direction specific to roads, so presumably this number comes from FW-OBJ-RD-01 multiplied over the life of the Revised Plan. Yet, we are left guessing since the Forest

[12] *Id.* at 68.

[13] Revised Plan at 62, (FW-DC-WTR-01).

[14] Revised Plan at 131, FW-OBJ-RD-01.

[15] FEIS Vol. 1 at 63, emphasis added.

[16] *Id.* at 78.

Service fails to cite the Revised Plan, and more concerning the agency fails to demonstrate in its analysis that even achieving such an objective would address the source of impairment.

Had the agency included road density thresholds in its analysis and as Revised Plan components, then it could have effectively demonstrated how it will meet desired conditions for water resources. Unfortunately, the lack of analysis and failure to include sufficient plan components is a fundamental flaw in the FEIS and Revised Plan.

2.1.3 The Revised Plan and FEIS fail to adequately address fiscal sustainability of the forest road system.

Our comments explained the urgent need for the agency to properly analyze and disclose in the Final EIS the current budget for road maintenance, explicitly state the shortfall, and explain in detail how the Revised Plan will prioritize right-sizing the road system and limit ecological damage from the forest's poorly maintained roads in light of the ongoing lack of adequate funding. Yet, the Forest Service failed to do so in any meaningful way despite acknowledging the following:

> Over the last few decades, funding has not been sufficient to maintain all National Forest System roads to appropriate standards to meet road management objective level. Road maintenance budgets have declined over the last several years. The average road maintenance budget to maintain Cibola mountain district system roads in recent years is approximately 19 percent of funding needs. Limited funding has been focused on maintaining the higher standard roads that serve multiple access needs. This reduced fiscal capacity for maintenance may adversely affect future sustainability of the current national forest road system on the Cibola.[17]

The cursory disclosure does not constitute the analysis NEPA requires, even at the programmatic level. Without analyzing or disclosing the fiscal capability of the unit to meet its road management objectives (RMOs), including maintenance schedules, the agency cannot in any reasonable way claim the Revised Plan meets the Planning Rule sustainability requirements, or demonstrate the road system is within the "fiscal capability of the unit."[18] For example, the Forest Service omits road maintenance costs per mile based on ML or the miles of road by ML that are not currently meeting their objective maintenance level per their RMOs, or sufficiently discuss the ecological consequences from the lack of funding and capacity. Instead, the agency simply states "[t]here currently is a backlog of deferred road maintenance due to reduced funding. The failure to perform needed repairs could lead to road deterioration and impacts on adjacent resources."[19] Given the agency priorities maintenance for roads open to the public (ML 2-4), the analysis should have disclosed how many of the 2,564 miles of ML 2 roads are not

[17] FEIS Vol.1 at 198-99.

[18] 36 C.F.R. 219.1(g), ("The responsible official shall ensure that the planning process, plan components, and other plan content are within Forest Service authority, the inherent capability of the plan area, and the fiscal capability of the unit.").

[19] FEIS Vol. 1 at 199

meeting their RMOs, and how that would change under the Revised Plan given the lack of any road maintenance objective that would effectively address the agency's deferred maintenance backlog.

Certainly, decommissioning unnecessary roads would reduce the maintenance burden, but here the Revised Plan only calls for a reduction of 5 miles annually, but decommissioning is optional since the objective allows for system roads to be relocated or improved, meaning the Forest Service could meet this objective without ever reducing its road system: "[r]elocate, improve, or decommission 3 to 5 miles annually of system roads or unauthorized routes to protect ecosystems and watersheds."[20] Further, the analysis fails to disclose how the objective would affect maintenance budgets. Of particular concern is that this objective may also be met by decommissioning unauthorized roads, meaning the agency may choose to actually expand it road system by adding unauthorized roads (e.g. relocate or improve) rather than removing them from the ground. In fact, there is an apparent disconnect between what the Forest Service states in its analysis and the Revised Plan objective in this regard. Specifically, the FEIS states that "[u]nauthorized routes would just be decommissioned."[21] We strongly support this direction and urge the agency to incorporate it into the Revised Plan as a specific plan component, ideally a standard. However, as it stands the Revised Plan allows unauthorized routes to be relocated or improved, not just decommissioned.

In response to our comments the Forest Service said nothing about its lack of maintenance capacity or how the Revised Plan will ensure the road system aligns with the fiscal capability of the Cibola National Forest. This failure to respond violates NEPA.[22] The omission here and the lack of analysis we explain above, preclude the Forest Service from making any claim that the Revised Plan provides sufficient ecological sustainability as required under the 2012 Planning Rule, in particular where it directs the following:

> The plan must include plan components, including standards or guidelines, to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area, including plan components to maintain or restore structure, function, composition, and connectivity, taking into account: Conditions in the broader landscape that may influence the sustainability of resources and ecosystems within the plan area.[23]

Overall, the Forest Service fails to respond to our comments, fails to perform the requisite analysis NEPA requires, and fails to comply with the 2012 Planning Rule.

[20] Revised Plan at 131, FW-OBJ-RD.

[21] *Id.* at 201.

[22] *See* 40 C.F.R. § 1503.4

[23] 36 CFR § 219.8(a)(1)(iii)

2.1.4 The Revised Plan and FEIS fail to adequately address climate change in the context of the forest's transportation system.

Our comments explained the agency's analysis did not adequately address the impacts of climate change on the forest's road system or assess how the Cibola National Forest can increase resilience to these impacts. The omissions were critical flaws that we asked to be addressed in the Final EIS and with specific components added to the Revised Plan to effectively address climate impacts on the forest's roads and trails or increase their resilience to these stressors. The Forest Service response was not to change the analysis or incorporate our recommendations into the Revised Plan. In fact, the agency fails to respond when looking at the Climate and Roads and Travel Management sections within the FEIS response to comments appendix.[24] Further, the agency's analysis discloses the fact that "[c]limate change may increase the frequency and severity of weather or fire events, thereby increasing the need for road reconstruction and maintenance in areas damaged by high winds, increased water flow, or increased wear from firefighting-related traffic."[25] Given this disclosure, the FEIS should have included robust analysis addressing climate impacts on the Cibola's transportation system, and included clear management direction that would increase the roads' resilience to these stressors. Yet, the analysis fails to adequately discuss or analyze the impacts of climate change on roads under each alternative and the Revised Plan lacks any clear components that effectively address these challenges in coming years.

In addition, we also strongly urged the agency to incorporate recommendations from the agency's own transportation resilience guidebook that identifies opportunities for the Forest Service to identify and address climate vulnerabilities in its transportation systems. The guidebook specifically mentions forest plans as an example of planning processes that provide "an opportunity to analyze baseline conditions and climate change vulnerabilities and to develop climate resilient strategies for the future."[26] Yet, the Forest Service did not respond to our comment or incorporate any of the climate resilient strategies specific to the road system.

2.1.5 The Forest Service must strengthen plan components, and specifically incorporate direction to achieve the minimum road system (MRS).

Complementing the substantive requirements of the 2012 Planning Rule, subpart A requires each National Forest to identify its minimum road system (MRS), as well as unneeded roads for decommissioning or conversion to other uses.[27] As explained above, the MRS must, among other things, reflect long-term funding expectations.[28] Completion of the travel analysis process is a

[24] FEIS Vol. 3 Appendix G at 25-27, and 73-74.

[25] FEIS Vol. 1 at 202.

[26] U.S. Forest Service Transportation Resiliency Guidebook: Addressing Climate Change Impacts on U.S. Forest Service Transportation Assets (Sept. 2018), https://www.fs.fed.us/eng/transp/documents/pdf/USFSTransportationResiliencyGuideBook.pdf, at 39.

[27] 36 C.F.R. § 212.5(b)(1)-(2).

[28] *Id.* § 212.5(b)(1).

crucial first step in achieving compliance with subpart A, but forests then must utilize that analysis to identify the MRS and unneeded roads for decommissioning and implement those decisions in order to achieve compliance with subpart A.

The plan revision is the appropriate place to ensure that subpart A's requirements will be met over the next 10 to 15 years, and to set standards and guidelines for achieving an environmentally and fiscally sustainable MRS through decommissioning or repurposing unneeded roads and upgrading the necessary portions of the system. Subpart A defines the MRS as that "needed for safe and efficient travel[;] for administration, utilization, and protection of [forest] lands[; and] to meet resource and other management objectives adopted in the relevant . . . plan."[29] With forest plans determining the framework for integrated resource management and "an appropriately sized and sustainable transportation system," direction for identifying and achieving that MRS belongs in the forest plan.[30] Indeed, the regulatory history of the Roads Rule makes clear that the Forest Service intended that forest plans would address subpart A compliance. In response to comments on the proposed Roads Rule, the Forest Service stated:

> The planning rule provides the overall framework for planning and management of the National Forest System. The road management rule and policy which are implemented through the planning process must adhere to the sustainability, collaboration, and science provisions of the planning rule. For example, under the road management policy, national forests and grasslands must complete an analysis of their existing road system and then incorporate the analysis <u>into their land management planning process</u>.[31]

If the Revised Plans do not provide plan direction towards achieving a sustainable MRS, it is unlikely that the Forest Service will satisfy the requirements of subpart A during the life of the plans (as evidenced by the lack of direction in the existing plans and the inability of forests to achieve environmentally and fiscally sustainable road systems to date). Forest managers and the public need forest-specific direction on how to achieve the desired MRS and ensure its sustainability in the face of climate change, all within realistic fiscal limitations of the unit. The purpose of a forest plan is to provide that direction, and it would be arbitrary for the Forest Service to fail to do so in its plan revision. At the very least, the Revised Plan must include standards and guidelines that direct compliance with subpart A within a reasonable timeframe following plan adoption.

Our comments provided specific plan components to ensure the Forest Service provides for a sustainable road system, and in particular we urged including an objective to implement the minimum road system pursuant to the Travel Management Rule (TMR) under subpart A.[32] With forest plans determining the framework for integrated resource management over the next 10-15 years or more, the revision process is precisely the place to ensure that the requirements of

[29] 36 C.F.R. § 212.5(b)(1).

[30] *See* FSH 1909.12, ch. 20, § 23.23l(2)(a).

[31] 66 Fed. Reg. at 3209 (emphasis added).

[32] 36 C.F.R. § 212.5(b).

subpart A are satisfied and to establish direction for achieving a sustainable minimum road system. Indeed, the substantive ecological integrity and ecological and fiscal sustainability provisions of the 2012 Planning Rule complement and reinforce the requirements of subpart A. As documented in our attached exhibit,[33] the adverse environmental and fiscal impacts associated with existing forest road system (e.g., erosion, compaction, sedimentation and impairment of water quality, fragmentation of wildlife habitat, interference with feeding, breeding, and nesting, spread of invasive species) directly implicate these substantive requirements.[34]

In response to our comments, the Forest Service asserts "Subpart A of the Travel Management Rule is a separate process from the land management plan. Implementation of Subpart A occurs on a project-level basis, with further analyses required."[35] As we explained at length above, there is a clear nexus between forest planning and subpart A of the TMR; a nexus the Forest Service ignores in its response. Further, the Forest Service erroneously asserts "[t]his travel planning process has been completed for the mountain districts but may be revisited on other bases."[36] The Forest Service fails to specify the precise decisions that it relies on to support its assertion, and looking at the 2010 Decision Notice and Finding of No Significant Impact National Forest Travel Management on the Mountainair Ranger District, there was no mention of the minimum road system or compliance with subpart A. Further, the agency must comply with the TMR across the entire Cibola National Forest, not just certain areas or districts.

The Forest Service also suggests that it has completed its duties under subpart A of the TMR with the following statement:

> Road decommissioning would achieve travel management (36 CFR part 212, subpart A) directions for a minimum road system, reduce road density, recreate and stabilize the natural pre-road terrain features, remove roads as potential sources of surface runoff, erosion and sediment delivery to improve soil and water quality. Road decommissioning would be analyzed with public input, at project-level planning under National Environmental Policy Act regulations.[37]

We agree road decommissioning is an effective way to implement the minimum road system. Yet, without actually having identified the MRS, or including components in the Revised Plan that ensures subpart A compliance, the agency cannot demonstrate that the one road objective in the Revised Plan will in fact implement the MRS over the life of the Revised Plan: ("Relocate,

[33] EX ROADS 1 WildEarth Guardians Roads Report.
[34] See EX ROADS 1 WildEarth Guardians Roads Report, "The Environmental Consequences of Forest Roads and Achieving a Sustainable Road System." March 2020. WildEarth Guardians.

[35] FEIS Vol. 3 Appendix G at 73.

[36] FEIS Vol. 1 at 198.

[37] FEIS Vol. 1 at 201-02.

improve, or decommission 3 to 5 miles annually of system roads or unauthorized routes to protect ecosystems and watersheds.).[38]

In addition, we caution the Forest Service against relying on previous Travel Analysis Process (TAP) reports to demonstrate compliance with subpart A of the TMR. For example, the 2010 TAP report for the Magdalena Ranger District describes the MRS and provides a corresponding summary table, but then clarifies that "The MRS in this document is the ID Team's recommendation only. During the NEPA process, roads may be added or deleted from the existing road system in order for the District to achieve the MRS."[39] We are unaware of any district wide travel management decision that identified the MRS or any supporting analysis that demonstrates compliance with the directions under subpart A of the TMR.

To be clear, the Forest Service clarified the role of TAPs in identifying the minimum road system and unneeded roads, as well as the need for NEPA-level decisions to comply with the regulations. Specifically, the Forest Service Washington Office, through a series of directive memoranda, ordered forests to complete the initial travel analysis process and produce a travel analysis report (TAR) by the end of fiscal year 2015, or lose maintenance funding for any road not analyzed.[40] The memoranda articulate an expectation that forests, through the subpart A process, "maintain an appropriately sized and environmentally sustainable road system that is responsive to ecological, economic, and social concerns."[41] They clarify that TARs must address all system roads – not just the small percentage of roads maintained for passenger vehicles to which some forests had limited their previous Roads Analysis Process reports or TARs. And they require that TARs include a list of roads likely not needed for future use. Further, additional guidance from the Forest Service Washington Office explains that once the TAP reports are final, the next step is "to use the travel analysis report to develop proposed actions to identify the MRS" and unneeded roads for decommissioning at a scale of the 6th HUC watershed or larger and undertake appropriate NEPA review.[42] The memo also states that "[t]he MRS for the administrative unit is complete when the MRS for each subwatershed has been identified, thus satisfying Subpart A."[43]

[38] Revised Plan at 131, FW-OBJ-RD.

[39] Cibola National Forest, Magdalena Ranger District. June, 2010. Travel Analysis Process For Magdalena Ranger District Travel Management at 7, Table 1 and at 53.

[40] Memorandum from Joel Holtrop to Regional Foresters et al. re Travel Management, Implementation of 36 C.F.R., Part 212, Subpart A (Nov. 10, 2010) (Ex. ROAD 2 Holtrop memo re subpart A); Memorandum from Leslie Weldon to Regional Foresters et al. re Travel Management, Implementation of 36 C.F.R., Part 212, Subpart A (Mar. 29, 2012) (Ex. ROAD 3 Weldon memo re subpart A); Memorandum from Leslie Weldon to Regional Foresters et al. re Travel Management Implementation (Dec. 17, 2013) (Ex. ROAD 4 Weldon memo re subpart A).

[41] *Id.*

[42] *Id.*

[43] *Id.*

Given the Magdalena Ranger District TAP report (and likely others) is now over 10 years old, it makes sense for the agency to conduct project-specific TAPs that affirm previous MRS recommendations, direction that the Revised Plan can include as a standard or guideline.

In summation, our comments provided specific plan components to help achieve an environmentally and fiscally sustainable road system, and incorporating them in the Revised Plan is not only necessary but would also reflect the Forest Service's current roads policy framework, relevant legal requirements, and best available science. Those comments are still relevant and we point the reviewing officer to specific plan components we urged the agency to include in the Revised Plan.

2.2 Suggested Resolutions for a Sustainable Road System.

Incorporate the plan components we recommended in our comments, especially those that address road density, identifying/implementing the minimum road system, and additionally, directing project-level TAP reports be prepared to support NEPA-level analysis that complies with subpart A direction in the Travel Management Rule. In addition, provide a full and comprehensive corresponding analysis in the roads section of a Supplemental EIS that addresses the deficiencies we explain above and in our comments, particularly as it relates to the environmental consequences of the climate crisis and the capacity to maintain the current and projected road system necessary to implement the Revised Plan, and that explains in detail how the Revised Plan will prioritize right-sizing the road system in a manner that limits ecological damage from roads.

3 Climate Change and Carbon Storage

3.1 Our Objection: The Forest Service fails to comply with NEPA, MUSYA, and the NFMA in its analysis of the plan's impact on carbon stores.

3.1.1 Legal Background

3.1.1.1 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.[44] When, as here, any significant environmental impacts might

[44] 42 U.S.C. § 4332(2)(C)(i)–(v).

result from the proposed action, the agency must complete a meticulous environmental impact statement (EIS).[45]

NEPA imposes "action forcing procedures … requir[ing] that agencies take a *hard look* at environmental consequences."[46] 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.[47] To ensure that the agency has taken the required "hard look," courts hold that the agency must utilize "public comment and the best available scientific information."[48]

[45] *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).

[46] *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) (citations omitted) (emphasis added).

[47] 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 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 October 2015, 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 iv-vi (table of contents indicating the EIS discloses "Cumulative Environmental Consequences" for each resource analyzed). 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 proposed to restore key components of the 1978 regulations. *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).

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

NEPA also requires agencies to explain opposing viewpoints and their rationale for choosing one viewpoint over the other.[49] 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.[50]

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."[51] This includes numerous factors on context and intensity set out 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.[52]

To take the required "hard look" at impacts, an EIS must "study, develop, and describe" reasonable alternatives to the proposed action.[53] This alternatives analysis "is the heart of the environmental impact statement."[54] 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."[55]

NEPA's implementing regulations require that an agency "[r]igorously explore and objectively evaluate *all* reasonable alternatives."[56] The agency's purpose and need statement sets the parameters for what constitutes a reasonable alternative.[57] Although agencies "enjoy[] considerable discretion" in defining their objectives and are not required to consider an unlimited number of alternatives,[58] they may not dismiss an alternative unless they have, in "good faith,"

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[49] 40 C.F.R. § 1502.9(b) (1978) (requiring agencies to disclose, discuss, and respond to "any responsible opposing view").

[50] *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").

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

[52] 40 C.F.R. §1508.27(b)(5) (1978).

[53] 42 U.S.C. § 4332(2)(C)(iii), (2)(E).

[54] 40 C.F.R. § 1502.14 (1978).

[55] *California v. Block*, 690 F.2d 753, 767 (9th Cir. 1982).

[56] 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.").

[57] *See Dombeck*, 185 F.3d at 1174–75.

[58] *Colo. Envtl. Coal. v. Salazar*, 875 F. Supp. 2d 1233, 1245 (D. Colo. 2012).

found it to be "too remote, speculative, or impractical or ineffective,"[59] or not "significantly distinguishable from the alternatives already considered."[60] Further, "[t]he existence of a viable but unexamined alternative renders an environmental impact statement inadequate."[61] The agency's obligation to consider reasonable alternatives applies to citizen-proposed alternatives.[62] Courts routinely set aside agency NEPA analysis, including those by the Forest Service, where the agency arbitrarily failed to consider a reasonable alternative.[63]

Courts hold that an alternative may not be disregarded merely because it does not offer a complete solution to the problem.[64] 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."[65] 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."[66]

[59] *Colo. Envtl. Coal. v. Dombeck*, 185 F.3d 1162, 1174 (10th Cir. 1999) (quotation omitted).

[60] "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.

[61] *Westlands Water Dist. v. United States DOI*, 376 F.3d 853, 868 (9th Cir. 2004).

[62] *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).

[63] *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 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).

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

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

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

The courts also require that an agency adequately and explicitly explain any decision to eliminate an alternative from further study.[67]

3.1.1.2 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).[68] 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 the environment, but these rules are "collectively significant actions taking place over a period of time."[69]

Courts have held that a "general discussion of the effects of global climate change" does not satisfy NEPA's hard-look requirement.[70]

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.[71] A NEPA analysis that does not adequately consider the indirect effects of a proposed action, including climate emissions, violates NEPA.[72] The disclosure of merely the volume of GHG emissions is insufficient; agencies must also disclose the impacts of those emissions.[73]

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[67] *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).

[68] *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.

[69] *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").

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

[71] *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).

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

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

NEPA requires "reasonable forecasting," which includes the consideration of "reasonably foreseeable future actions … even if they are not specific proposals."[74] That an agency cannot "accurately" calculate the total emissions expected from full development 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."[75] 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.[76]

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 obtaining it are not "exorbitant" and the information is "essential to a reasoned choice among alternatives."[77]

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.[78] 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

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

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

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

[77] 40 C.F.R. § 1502.22.

[78] Notice available at 81 Fed. Reg. 51,866 (Aug. 5, 2016); full guidance attached as Ex. CARB1, and available at https://ceq.doe.gov/docs/ceq-regulations-and-guidance/nepa_final_ghg_guidance.pdf (last viewed Oct. 26, 2021).

> Energy. In the absence of such analyses, agencies should use other available information.[79]

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.[80]

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, 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.[81]

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.[82] 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.[83]

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[79] *Id*. at 16 (citations omitted).

[80] *Id*. at 26 (citations omitted).

[81] *Id*. at 18.

[82] Executive Order 13,990 (Jan. 20, 2021), Sec. 7(e), 86 Fed. Reg. at 7042, attached as Ex. CARB2.

[83] 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. CARB3, and available at https://www.govinfo.gov/content/pkg/FR-2021-02-19/pdf/2021-03355.pdf (last viewed Oct. 26, 2021).

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 commercial logging decisions, has not changed.[84]

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.[85]

3.1.1.3 The Forest Service's Obligations Under MUSYA, NFMA, and the 2012 Planning Rules

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.[86] 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").[87]

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

[84] *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.

[85] *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. CARB1) at 32-33 (noting the appropriateness of monetizing climate impacts).

[86] 16 U.S.C. § 1604(a).

[87] 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).

> "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.[88]

"Multiple use" means:

> 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.[89]

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."[90] The Rules require that Forest Service address "measurable changes on the plan area related to climate change" in its plan monitoring program.[91] Plans must also provide for "ecosystem services," which include "regulating services such as long term storage of carbon."[92]

In preparing a Forest Plan Revision, the agency must also undertake a "baseline assessment of carbon stocks" for the management unit.[93] As the Forest Service stated in its response to comments on the Rule:

> The rule sets forth an adaptive land management planning process informed by both a comprehensive assessment and the best available scientific information. Section 219.6(b)(3)-(4) requires responsible officials to identify and evaluate information on climate change and other stressors relevant to the plan area, along with a baseline assessment of carbon stocks, as a part of the assessment phase. Section 219.8(a)(1)(iv) requires climate change be taken into account when the responsible official is developing

[88] 16 U.S.C. § 1604(e) ("required assurances").

[89] 16 U.S.C. § 531(a).

[90] 36 C.F.R. §§ 219.8(a)(1)(iv), 219.10(a)(7).

[91] *Id*. at § 219.12(a)(5)(vi).

[92] *Id*. at §§ 219.10, 219.19.

[93] 36 C.F.R. § 219.6(b)(4); *see also* Forest Carbon and Conservation Management: Integration with Sustainable Forest Management for Multiple Resource Values and Ecosystem Services (Pinchot Institute, May 2015), at 6-7, attached as Ex. CARB4.

> plan components for ecological sustainability. When providing for ecosystem services and multiple uses, the responsible official is required by § 219.10(a)(8) to consider climate change. Measureable changes to the plan area related to climate change and other stressors affecting the plan area are to be monitored under § 219.12(a)(5)(vi). Combined with the requirements of the Forest Service Climate Change Roadmap and Scorecard, these requirements will ensure that Forest Service land management planning addresses climate change and supports adaptive management to respond to new information and changing conditions.[94]

Plans must include desired conditions ("description[s] of specific social, economic, and/or ecological characteristics of the plan area … toward which management of the land and resources should be directed") (DCs) and objectives ("concise, measureable, and time-specific statement[s] of a desired rate of progress toward a desired condition or conditions.").[95] The Rules also 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."[96]

The Rules also provide that "[n]o timber harvest for the purposes of timber production may occur on lands not suited for timber production."[97] 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.[98] In balancing the factors for consideration in the suitability analysis, the Forest Service must provide justification for elevating production goals over other factors.[99] More broadly, the Rules require the use of "the best available scientific information to inform the planning process."[100]

3.1.2 The Need to Manage National Forests for Carbon Sequestration and Carbon Storage

3.1.2.1 The Climate Crisis

The climate crisis is the overriding environmental issue of our time, threatening to drastically modify ecosystems, alter coastlines, worsen extreme weather events, degrade public health, and cause massive human displacement and suffering. Its impacts are already being felt in the United

[94] Forest Service, 2012 Forest Planning Rule, 77 Fed. Reg. 21,162, 21,194 (Apr. 9, 2012)

[95] 36 C.F.R. §§ 219.7(e)(1)(i) & (ii).

[96] *Id*. at § 219.11(d)(3).

[97] *Id*. at § 219.11(d)(1).

[98] *Id*. at § 219.11(a)(1)(iii).

[99] *Citizens for Envtl. Quality v. U.S.*, 731 F. Supp. 970, 988 (D. Colo. 1989) ("if production goals are to be given greater weight in the suitability analysis, then adequate reasons must be set forth for so doing. Defendants must provide justification for allowing production goals, or any other factor required by [the NFMA] and the regulations, to weigh more heavily than other factors.").

[100] 36 C.F.R. § 219.3.

States, and recent studies confirm that time is running out to forestall the catastrophic damage that will result from 1.5 degrees Celsius of warming.[101] More recent studies have confirmed that climate change is accelerating, making the need to protect carbon stores even more urgent than it was just a few years ago.[102]

Climate change is impacting New Mexico now. Most of the state has warmed at least one degree Fahrenheit in the last century. Heat waves are becoming more common, and snow is melting earlier in spring. In the coming decades, the climate crisis "is likely to decrease the flow of water in the Colorado, Rio Grande, and other rivers; threaten the health of livestock; increase the frequency and intensity of wildfires; and convert some rangelands to desert."[103] In the southwestern United States, including New Mexico, other observed and projected impacts include warmer temperatures, lower soil moisture levels, increased frequency and intensity of wildfires, and increased competition and demand for scarce water resources.[104]

The Forest Service needs to be part of the solution to the climate crisis, not part of the problem.

3.1.2.2 President Biden Requires Prompt Action to Assess and Reduce Climate Pollution.

On the day he was inaugurated, President Biden committed to overturning the prior administration's failure to address, and its outright denial of, the climate emergency.

> It is, therefore, the policy of my Administration to listen to the science; to improve public health and protect our environment; to ensure access to clean air and water; to limit exposure to dangerous chemicals and pesticides; to hold polluters accountable, including those who disproportionately harm communities of color and low-income communities; *to reduce greenhouse gas emissions; to bolster resilience to the impacts of climate change*; to restore and expand our national treasures and monuments; and to prioritize both environmental justice and the creation of the well-paying union jobs necessary to deliver on these goals.
>
> To that end, this order directs all executive departments and agencies (agencies) to immediately review and, as appropriate and consistent with applicable law, take action to address the promulgation of Federal regulations and other actions during the last 4 years

[101] *See* IPCC, Summary for Policymakers, 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 (2018), attached as Ex. CARB5.

[102] *See, e.g.*, H. Fountain, Climate Change Is Accelerating, Bringing World 'Dangerously Close' to Irreversible Change, The New York Times (Dec. 4, 2019), attached as Ex. CARB6.

[103] *See* EPA, What Climate Change Means for New Mexico (Aug. 2016), available at https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-nm.pdf (last viewed Oct. 26, 2021), and attached as Ex. CARB7.

[104] *See* Fourth National Climate Assessment (2018), Chapter 25: Southwest, available at https://nca2018.globalchange.gov/chapter/25/ (last viewed Oct. 26, 2021).

> that conflict with these important national objectives, and *to immediately commence work to confront the climate crisis*.[105]

Days later, President Biden further committed to taking swift action to address the climate crisis. Per Executive Order 14,008, he recognized that "[t]he United States and the world face a profound climate crisis. We have a narrow moment to pursue action at home and abroad in order to avoid the most catastrophic impacts of that crisis and to seize the opportunity that tackling climate change presents."[106] Pres. Biden announced that under his administration,

> The Federal Government must drive assessment, disclosure, and mitigation of climate pollution and climate-related risks in every sector of our economy, marshaling the creativity, courage, and capital necessary to make our Nation resilient in the face of this threat. Together, we must combat the climate crisis with bold, progressive action that combines the full capacity of the Federal Government with efforts from every corner of our Nation, every level of government, and every sector of our economy.[107]

Addressing the need for the accurate assessment of climate costs, Pres. Biden announced on day one that "[i]t is essential that agencies capture the full costs of greenhouse gas emissions as accurately as possible, including by taking global damages into account."[108] The President also re-established the Interagency Working Group on the Social Cost of Greenhouse Gases, on which the Secretary of Agriculture serves.[109] The President directed the Working Group to publish interim values for the social cost of carbon by February 19, 2021.[110] The Working Group that month set that price at $51/ton at a 3% discount rate.[111]

3.1.2.3 The Need to Manage the National Forests as a Carbon Reserve

To avoid the most extreme impacts of climate change, it is not enough to move beyond carbon fuel consumption, the Forest Service must also substantially increase forest protection in order to pull large quantities of CO2 out of the atmosphere. This process is known as carbon sequestration or carbon storage.

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[105] Executive Order 13,990, 86 Fed. Reg. 7037 (Jan. 20, 2021) (Ex. CARB2) at Sec. 1 (emphasis added).

[106] Executive Order 14,008, 86 Fed. Reg. 7619 (Jan. 27, 2021), attached as Ex. CARB8.

[107] *Id*. at 7622 (Sec. 201).

[108] Executive Order 13,990 (Ex. CARB2), 86 Fed. Reg. at 7040, Sec. 5(a) (emphasis added).

[109] *Id*., Sec. 5(b).

[110] *Id*., Sec. 5(b)(ii)(A).

[111] Interagency Working Group on Social Cost of Greenhouse Gases, Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990 (Feb. 2021), attached as Ex. CARB9, and available at https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf (last viewed Oct. 26, 2021).

Scientific studies support the need for forests, including national forests, to play a key role in responding to the climate crisis by responding to the need for carbon storage. For example, a 2018 National Academies of Sciences study states that removing carbon dioxide out of the air will be crucial to meeting global climate goals, and a 2018 study by The Nature Conservancy reports that forests and other natural systems in the U.S. could offset as much as 21% of total national greenhouse gas emissions.[112] The *United States Mid-Century Strategy for Deep Decarbonization*, released in 2016 by the Obama White House, states that federal lands will play an important role in preserving carbon storage and calls for quickly mobilizing federal lands towards this goal.[113]

The *United States Mid-Century Strategy for Deep Decarbonization* explains the importance of managing federal lands for decarbonization:

> Covering 28 percent of U.S. land and comprising nearly 20 percent of the annual U.S. carbon sink, federal lands provide an important opportunity to quickly sequester carbon at scale while programs to support carbon sequestration on private lands are gaining momentum (Zhu and McGuire 2016; Zhu, Zhiliang, and Reed 2012, 2014). Building on important progress over the past several years, federal agencies can both begin to track carbon dynamics on federal lands as part of their agency-wide GHG inventories and put in place management guidance to increase carbon sequestration potential. Federal grassland and forest carbon fluxes are reported in the U.S. GHG Inventory, and federal agencies have begun to incorporate carbon sequestration and emissions estimates into land management plans…. These data and federal processes can provide the foundation for developing and implementing guidance to include land carbon sequestration as one of the management priorities for federal lands. Research and data-supported management practices for carbon sequestration and resilience can be integrated into long-term strategic plans, such as BLM Resource Management Plans and National Forest System Land Management Planning. Management priorities could include replanting understocked forests, promoting forest expansion where ecologically sound, and promoting agroforestry in federal grassland and pasture where appropriate…. Land managers should include carbon as a consideration for maintaining and enhancing landscape health in order to avoid undermining carbon mitigation efforts elsewhere…. To date, there has not been an assessment of additional carbon sequestration potential on federal lands. As

[112] Sierra Club, Tackling Climate Change: A Climate Change Adaptation and Carbon Dioxide Removal Landscape Analysis (Feb. 2019) at 14, attached as Ex. CARB10, and available at https://content.sierraclub.org/grassrootsnetwork/sites/content.sierraclub.org.activistnetwork/files/teams/documents/Tackling%20Climate%20Change%20Report%20Feb%202019.pdf (last viewed Oct. 26, 2021).

[113] *Id*.; and *see* White House, *United States Mid-Century Strategy for Deep Decarbonization* (2016), at 15, listing the need to "[q]uickly scale up forest restoration and expansion on federal lands" as a "Long-term U.S. Mid-Century Strategy Priority"; p. 70: "Federal lands will play an important role in preserving carbon stocks and providing early action."; and p. 82 listing "quickly mobilizing federal lands" as a "Priority for Policy, Innovation, and Research" towards achieving 2050 goals." The White House Report is attached as Ex. CARB11, and available at https://unfccc.int/files/focus/long-term_strategies/application/pdf/mid_century_strategy_report-final_red.pdf (last viewed Oct. 26, 2021).

> management guidance is developed, assessing the full potential contribution of federal lands to our 2050 goals can help guide future policy priorities.[114]

Federal public land management practices and policies can enable those lands to achieve net carbon neutrality and ultimately serve as a source of negative carbon emissions by drawing down atmospheric carbon levels. Such practices will result in greater carbon storage, with associated preservation of expansive natural forests, reduced timber harvest, increases in tree species favoring late successional forest, and reduced risk of wildfire. In addition to enhancing the carbon storage potential of U.S. public lands, such practices will have the added benefit of preserving more interconnected habitat for wildlife species as they adapt to a rapidly changing climate.

3.1.2.4 A Carbon Storage Alternative in NEPA Planning

To achieve these critical climate goals, and to satisfy the Forest Service's' obligations under NEPA, MUSYA, NFMA and the 2012 Planning Rules, many of the objectors here, including Sierra Club, specifically requested that the Forest Service develop a carbon storage alternative for the Final EIS for the Cibola National Forest Plan revisions.[115] We recommended that such an alternative contain strong plan-level guidance and prescriptions for protection and restoration of old-growth, proforestation, afforestation and reforestation.[116] 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 maximized long-term carbon storage on public lands would also require changes in management, including restoring fire as a key ecological process.[117]

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

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[114] White House, *United States Mid-Century Strategy for Deep Decarbonization* (Ex. CARB11) at 83.

[115] *See* Sierra Club *et al*., Public Comment on Carbon Management in the Cibola National Forest Land Management Plans Revision (Oct. 31, 2019), attached as Ex. CARB12.

[116] "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.

[117] The Plan's fuel reduction goals 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. As discussed in more detail below, the assumption that mechanical thinning and treatment will, in the long run, avoid the carbon emissions associated with more frequent high severity fires, *see* FEIS, Vol 3, Appx. G, p. 26, 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 as Ex. CARB13.

- Identification of the adverse impacts of climate change on the national forest;[118]

- 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;

- 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/. See IPCC, Global Warming of 1.5 °C (Oct. 2018), available at http://www.ipcc.ch/report/sr15/);

[118] 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 New Mexico (Aug. 2016), (Ex. CARB7).

- Determination of acres available for timber harvest and timber harvest volumes, and a selection of alternatives, based on the factors set forth above.[119]

3.1.3 The Forest Service's Analysis of Carbon Storage Violates NEPA.

The Forest Service should have considered the carbon storage alternative for the Cibola National Forest because it meets the purpose and need for the Forest Plan revision. The alternative is "significantly distinguishable" from the other alternatives already considered, and it is not "too remote, speculative, or impractical or ineffective."[120]

The Final EIS defines the Cibola plan revision's purpose and need as:

> (1) meet the legal requirements of the National Forest Management Act and the provisions of the 2012 Planning Rule (36 CFR Part 219), (2) guide natural resource management activities on the Cibola for the next 10 to 15 years, and (3) address the needs for change in management direction.….
>
> [P]riority needs for change have been grouped here into four main themes that have served to focus the scope of this plan revision[:] Respect Cultural and Traditional Landscapes and Uses ….; Manage Holistically for Watershed and Ecosystem Health; Manage for Sustainable Recreation and Multiple Uses ….; [and] Support for all Resources…. There is a need for updated plan direction that addresses potential climate change effects on the Cibola.[121]

The carbon storage alternative meets the Forest Plan Revision 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 Forest Plan Revision purposes. Further, making the maximum effort to protect the climate would respect cultural and traditional landscapes and uses by doing the most to ensure that those uses could continue in the face of the climate crisis. Watershed and ecosystem health would also benefit from an increase in carbon storage and a reduction in carbon pollution. By reducing the harms caused by the climate crisis, the carbon storage alternative will also ensure that there will be multiple uses and resources left to manage.

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[119] Sierra Club *et al*., Public Comment on Cibola Forest Plan (Ex. CARB12) at 8-9.

[120] *Colo. Envtl. Coal. v. Dombeck*, 185 F.3d 1162, 1174 (10th Cir. 1999) (quotation omitted).

[121] FEIS, Vol. 1, pp. 3-6.

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

3.1.3.1 The Forest Service Failed to Consider a Carbon Storage Alternative, Violating NEPA.

Despite the fact that the carbon storage alternative meets the plan revision purpose and need, is significantly distinguishable from other alternatives, and is not "too remote, speculative, or impractical or ineffective," the Forest Service provided *no explanation at all* for its failure to consider the carbon storage in detail. The Forest Service's failure to respond to the proposed alternative violates NEPA. As noted above, agencies may not dismiss an alternative that meets a project's purpose and need unless they have, in "good faith," found it to be "too remote, speculative, or impractical or ineffective,"[122] or not "significantly distinguishable from the alternatives already considered."[123] Here, the agency did not even bother to explain why it failed to review this alternative in detail. Because "[t]he existence of a viable but unexamined alternative renders an environmental impact statement inadequate,"[124] a court is likely to set aside the Cibola Forest Plan Revision FEIS.[125]

Although the main body of the FEIS does not address or explain the agency's failure to analyze a carbon storage alternative, the appendix including response to comments contains some verbiage that arguably may address the proposal. But those responses fail to provide valid reasons for dismissing the alternative.

First, the responses to comments states: "We disagree that managing to maximize carbon sequestration promotes ecosystem function and management to maximize carbon sequestration over other ecosystem services is not a primary management focus in the plan."[126] 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. The Forest Service provides no basis for stating that managing to maximize carbon

[122] *Colo. Envtl. Coal. v. Dombeck*, 185 F.3d 1162, 1174 (10th Cir. 1999) (quotation omitted).

[123] "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.

[124] *Westlands Water Dist. v. United States DOI*, 376 F.3d 853, 868 (9th Cir. 2004).

[125] *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 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).

[126] FEIS, Vol. 3, Appx. G., p. 25.

storage does not promote ecosystem function. The agency's statement ignores the fact that a relatively stable climate is a necessary pre-condition for the Cibola National Forest providing ecosystem services, and that a relatively stable climate will not be possible unless the Forest Service and other agencies take all steps necessary via an all government approach, as directed by President Biden's executive order, to limit the worst impacts of climate change.

Second, the Forest Service alleges that "[t]he Revised Plan manages for overall ecosystem function which implies inherent levels of carbon sequestration or greenhouse gas emissions."[127] This is not a basis for dismissing a reasonable alternative; it appears to be simply a statement that the plan "manages" for carbon sequestration, not that it maximizes such sequestration as the proposed alternative would. If it is the Forest Service's assumption that its proposed plan manages for ecosystem function and so maximizes carbon storage, it should prove its point by disclosing the impacts of each alternative on carbon storage. As discussed below, the Forest Service failed to undertake that required analysis.

In sum, the Forest Service's dismissal of the carbon sequestration alternative is arbitrary and capricious.

3.1.3.2 The Forest Service's Failure to Take a Hard Look at Carbon Storage Impacts Violates NEPA.

The Final EIS contains some discussion of carbon storage, but that discussion fails to take the hard look at the impacts of each alternative, as NEPA requires.

First and foremost, we note the arbitrary and capricious nature of the Forest Service's handling of carbon storage in the Cibola plan revision FEIS as compared to the way the Carson NF forest plan revision FEIS addresses the issue.

The Carson FEIS contains a five-page section addressing the carbon storage impacts of the plan that includes a quantification of the estimated carbon stocks for each alternative, allowing at least a modest comparison among them those alternatives.[128] The Carson NF's analysis includes a bar graph displaying the "[l]ost potential storage of carbon because of disturbance on the Carson NF by alternative, compared to average carbon stocks between 1990 and 2011."[129] The Carson FEIS's response to comments contains additional data comparing the impacts of each alternative on carbon storage.[130] While the Carson FEIS's analysis is not sufficient to comply with NEPA, it is arbitrary and capricious for the Forest Service to attempt to quantify the carbon storage differences among alternatives in one forest plan in the Southwest, and then not to do it for the plan for a nearby forest in the Southwest Region completed at precisely the same time. At an

[127] *Id*.

[128] Carson Forest Plan Revision Final EIS (2021), Vol. 1, pp. 255-60, excerpts attached as Ex. CARB14.

[129] *Id*., p. 258.

[130] Carson Forest Plan Revision FEIS, Vol. II, Appx. A, p. 70 (including a bar graph that illustrates that "all action alternatives have a greater potential for carbon loss per year from disturbance (tree removal, insects, disease, and fire)" than the no action alternative), included in Ex. CARB14.

absolute minimum, the Forest Service must explain why it chose one path for the Carson and another for the Cibola. The agency failed to do so.

Second, while the FEIS mentions carbon storage, acknowledging the role that forests play in that process, that does not amount to a hard look because the Final EIS fails 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 fails to do any of these things.

The Final EIS states, among other things:

> Forests play an important role in carbon sequestration, which is the direct removal of carbon dioxide from the atmosphere through biologic processes, such as forest growth. Carbon sequestration by forests is one way to mitigate greenhouse gas emissions by offsetting losses through removal and storage of carbon (USDA FS 2015c). Over at least the past several decades, temperate forests have provided a valuable ecosystem service by acting as a net sink of atmospheric carbon dioxide, partly offsetting anthropogenic emissions (Millar & Stephenson 2015). Carbon dioxide uptake by forests in the conterminous United States offset approximately 16 percent of our national total carbon dioxide emissions in 2011 (US EPA 2013). Forests and other ecosystems generally act as carbon sinks because, through photosynthesis, growing plants remove carbon dioxide from the atmosphere and store it (USDA FS 2015c).
>
> Keeping forests as forests is one of the most cost-effective carbon storage measures, as is restoration which brings back badly disturbed forests and grasslands to producing a full range of environmental services (USDA FS 2015c).[131]

The FEIS contains some general discussion of the state of carbon stocks on the forest, and how they vary by ecosystem type.[132] The FEIS also estimates the carbon dioxide emissions from fire and thinning,[133] but includes no numbers on the effects of these actions on carbon stores.

Further, the FEIS does not take a hard look at carbon sequestration in its choice of alternatives or in evaluating the benefits and trade-offs of sequestration, considering it only as a byproduct of other management categories. The Forest Service concludes that this issue is so unimportant that the September 2021 Draft Record of Decision does not even contain the word "carbon."

The FEIS fails to take the required hard look, because had it considered and quantified the carbon sequestration and carbon storage capabilities of wilderness, for example, it might have

[131] FEIS, Vol. 1, p. 99. The proposed Forest Plan also recognizes that healthy watersheds, riparian habitats, and soils all provide carbon storage as an important ecosystem service. Cibola National Forest Land Management Plan, pp. 61, 63, 68.

[132] FEIS, Vol. 1, pp. 43 (general discussion of carbon stores across the Cibola NF); 53-56 (discussing carbon stores and woody debris); 94 (discussing carbon stores in grasslands and shrublands).

[133] FEIS, Vol. 1, p. 104.

developed and/or chosen an alternative with greater recommended wilderness. Instead, it rejected alternatives with the greatest wilderness, without apparent consideration of these factors.[134]

We note that CEQ's guidance on evaluating climate change in NEPA documents explicitly states:

> Agency decisions are aided when there are reasonable alternatives that allow for comparing GHG emissions and carbon sequestration potential, trade-offs with other environmental values, and the risk from – and resilience to – climate change inherent in a proposed action and its design.[135]

The Forest Service failed to heed this direction, undermining its evaluation of alternatives.

Third, while the Forest Service provides excuses for not undertaking any analysis of the alternatives' impacts on carbon storage, none of the agency's excuses has merit. The agency states:

> the Cibola has complied with agency directives regarding carbon by estimating carbon stocks (FSH 1909.12 chapter 10, 12.4). There are no regulatory requirements to evaluate carbon flux or to analyze and contrast future carbon among alternatives in an EIS. Nor are there agency directives for the management of carbon. Also, the science underpinning carbon management in fire-adapted ecosystems is inconsistent (Meigs and Campbell 2010, Campbell et al. 2012).[136]

The allegation that "there are no regulatory requirements to evaluate carbon flux or to analyze and contrast future carbon among alternatives in an EIS" is false, and contradicted by a multitude of authority. President Biden's Executive Order 14,008 explicitly requires that the "Federal Government must drive assessment, disclosure, and mitigation of climate pollution and climate-related risks in every sector of our economy." Here, the agency's decision to ignore the importance of carbon storage undermines that order.

Further, CEQ's 2016 climate guidance, which was effectively reinstated in February 2021, states that "when addressing climate change agencies should consider … [t]he potential effects of a proposed action on climate change as indicated by assessing GHG emissions (e.g., to include, where applicable, *carbon sequestration*)."[137] CEQ's guidance also recognized that models and other products existed *five years ago*, including those developed and used by the Forest Service, to estimate the carbon sequestration effects of agency actions: "These tools can provide estimates of GHG emissions, including emissions from fossil fuel combustion and estimates of GHG

[134] *See* FEIS, Vol. 1, p. 33.

[135] CEQ, 2016 NEPA Climate Guidance (Ex. CARB1), p. 15.

[136] FEIS, Vol 3, Appx. G, p. 25.

[137] CEQ, 2016 NEPA Climate Guidance (Ex. CARB1), p. 4 (emphasis added).

emissions and carbon sequestration for many of the sources and sinks potentially affected by proposed resource management actions."[138]

As discussed above, federal courts have also ruled that agencies are required to disclose the climate impacts of their actions.

In addition, the Forest Service's approach also violates NEPA because methods exist that would allow the agency to quantify climate impacts. For example, a 2018 study concludes that carbon storage impacts can be estimated, accounted for, and factored into a model that calculated the net amount of carbon lost due to forest logging in Oregon over two five-year periods.[139] This is precisely the type of analysis the Forest Service should, and could, have undertaken for Cibola National Forest.

Other reports and agency analysis demonstrate that quantifying climate impacts at the Forest level can be done because it *has* been done. A report from Dr. DellaSala addresses carbon stores from wood products and concluded that logging old-growth forest under the Tongass National Forest's 2016 Forest Plan would result in net annual CO2 emissions totaling between 4.2 million tons and 4.4 million tons, depending on the time horizon chosen.[140] The Bureau of Land Management more than a decade ago completed an EIS for its Western Oregon Resource Management Plan in which that agency also predicted the net carbon emissions from its forest and other resource management programs.[141] Because agencies and academics have quantified and compared the carbon emissions of alternative logging proposals, NEPA requires the Forest Service to do so here. Agencies may not "shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as crystal ball inquiry."[142] The agency has models, and can explain their limitations to inform the public and the decisionmaker. The Forest Service's failure to do so violates NEPA.

The excuse that the Cibola National Forest need not analyze carbon storage impacts because "the science underpinning carbon management in fire-adapted ecosystems is inconsistent," citing two studies each nine years old or older, is equally meritless. This excuse again ignores the fact that the *Carson* National Forest at least attempted such an analysis in a very similar, fire-adapted ecosystem. Further, we are aware of no guidance, regulation, or caselaw that allows a federal

[138] *Id*., p. 12, and footnote 29.

[139] *See* B. Law et al. *Land use strategies to mitigate climate change in carbon dense temperate forests*. Proceedings of the Nat'l Academy of Sciences, vol. 115, no. 14 (Apr. 3, 2018) at 3664 ("Our LCA [life-cycle assessment] showed that in 2001–2005, Oregon's net wood product emissions were 32.61 million tCO2e [tons of carbon dioxide equivalent in net GHG emissions] (Table S3), and 3.7- fold wildfire emissions in the period that included the record fire year (15) (Fig. 2). In 2011–2015, net wood product emissions were 34.45 million tCO2e and almost 10-fold fire emissions, mostly due to lower fire emissions."). Attached as Ex. CARB15.

[140] D. DellaSala. The Tongass Rainforest as Alaska's First Line of Climate Change Defense and Importance to the Paris Climate Change Agreements. 2016. At p. 14. Attached as Ex. CARB16.

[141] *See* Bureau of Land Management, Western Oregon Proposed RMP Final EIS (2009) at 165-181, excerpts attached as Ex. CARB17.

[142] *N. Plains Res. Council*, 668 F.3d at 1079 (9th Cir. 2011) (citation omitted).

agency to ignore an impact of an agency action in a NEPA analysis because of the existence of "inconsistent" science. If the Forest Service is aware of any such authority, it should cite it.

Further, NEPA requires that agencies identify "incomplete or unavailable" 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 obtaining it are not "exorbitant" and the information is "essential to a reasoned choice among alternatives."[143] Here, the information is neither incomplete nor unavailable, the Forest Service has simply chosen, arbitrarily, to deprive the public of the data. Because the climate crisis is the pre-eminent environmental (and social, and public health, etc.) issue of our time, the Forest Service cannot assert that the Plan's climate impact is not "essential to a reasoned choice among alternatives." The Forest Service can and should have undertaken an analysis of the impacts of the alternatives on carbon stores.

Fourth, the overbroad generalizations the FEIS contains concerning carbon storage contradict the best available science. The Final EIS assumes that logging and prescribed fire will, over an unspecified period of time, result in greater carbon storage than maintaining the status quo.

> Practices such as thinning and prescribed fire may release carbon in the short term, but they focus growth and carbon storage for the future on trees that are at lower risk and/or are more resilient to disturbance.
>
> High-severity fire has the potential to be a carbon source for decades post fire compared to 2 to 3 years post treatment from prescribed fire (Dore et al. 2012). Because live trees continually sequester carbon and are a more stable carbon sink than dead biomass left on the site, treating stands is preferred for long-term mitigation of atmospheric carbon levels (Vegh et al. 2013).[144]
>
> ….
>
> We stand by the assumption that thinning and prescribed fire increase carbon sequestration over longer time frames and have added supporting documentation to the assumptions section of Environmental Consequences for Air Resources (final EIS, chapter 3). While mechanical thinning does result in a short-term loss of forest carbon emissions, over the long term (several decades to one century) forest restoration results in more total ecosystem carbon and lower wildfire emissions than a no harvest scenario (Hurteau 2017, McCauley et al. 2019). Carbon "losses caused by thinning and burning treatments are out-weighed by the [carbon] gains from decreased tree mortality rates and increased sequestration" (Hurteau et al. 2016).[145]

The Forest Service's analysis ignores the fact that recent studies agree that maintaining forests rather than cutting them down can help reduce the impacts of climate change. "Stakeholders and

[143] 40 C.F.R. § 1502.22(a).

[144] FEIS, Vol. 1, p. 103.

[145] FEIS, Vol 3, Appx. G, p. 26.

policy makers need to recognize that the way to maximize carbon storage and sequestration is to grow intact forest ecosystems where possible."[146] One report concludes:

> *Allowing forests to reach their biological potential for growth and sequestration, maintaining large trees* (Lutz et al 2018), reforesting recently cut lands, and afforestation of suitable areas *will remove additional CO2 from the atmosphere*. Global vegetation stores of carbon are 50% of their potential including western forests because of harvest activities (Erb et al 2017). Clearly, western forests could do more to address climate change through carbon sequestration *if allowed to grow longer*.[147]

Further, a June 2020 literature review from leading experts on forest carbon storage reported:

> *There is absolutely no evidence that thinning forests increases biomass stored (Zhou et al. 2013).* It takes decades to centuries for carbon to accumulate in forest vegetation and soils (Sun et al. 2004, Hudiburg et al. 2009, Schlesinger 2018), and it takes decades to centuries for dead wood to decompose. We must preserve medium to high biomass (carbon-dense) forest not only because of their carbon potential but also because they have the greatest biodiversity of forest species (Krankina et al. 2014, Buotte et al. 2019, 2020).[148]

Two experts in the field concluded this year:

> Recent projections show that to prevent the worst impacts of climate change, governments will have to increase their pledges to reduce carbon emissions by as much as 80%. We see the next 10 to 20 years as a critical window for climate action, and believe that *permanent protection for mature and old forests is the greatest opportunity for near-term climate benefits*.[149]

Further, to address the climate crisis, agencies cannot rely on the re-growth of cleared forests to make up for the carbon removed when mature forest is logged. One prominent researcher explains: "It takes at least 100 to 350+ years to restore carbon in forests degraded by logging (Law et al. 2018, Hudiburg et al. 2009). If we are to prevent the most serious consequences of

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[146] Moomaw, *et al*., Intact Forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good, Frontiers in Forests and Global Change (June 11, 2019) at 7 (emphasis added), attached as Ex. CARB18. The FEIS failed to address or cite this study.

[147] T. Hudiburg *et al*., Meeting GHG reduction targets requires accounting for all forest sector emissions, Environ. Res. Lett. 14 (2019) (emphasis added), attached as Ex. CARB19. The FEIS failed to address or cite this study.

[148] B. Law, et al., The Status of Science on Forest Carbon Management to Mitigate Climate Change (June 1, 2020), attached as Ex. CARB20.

[149] B. Law & W. Moomaw, Keeping trees in the ground where they are already growing is an effective low-tech way to slow climate change, *The Conversation* (Feb. 23, 2021) (emphasis added), attached as Ex. CARB21, and available at https://theconversation.com/keeping-trees-in-the-ground-where-they-are-already-growing-is-an-effective-low-tech-way-to-slow-climate-change-154618 (last viewed Oct. 26, 2021). The FEIS failed to address or cite this study.

climate change, *we need to keep carbon in the forests because we don't have time to regain it once the forest is logged* (IPCC, 2018)."[150]

Unless and until the Forest Service's decision is informed by these studies, the agency cannot have taken the hard look required by NEPA or utilized the best available science.

In addition, the studies that the Final EIS relies on are flawed because they overstate the likelihood of fire intersecting with thinning treatments, and thus overstate the alleged long-term carbon benefits of that logging. Hurteau (2017) assumes a 1 in 50 chance (2%) of wildfire occurrence, despite the fact that studies reviewing the actual overlap of wildfire and thinning areas show that the probability that the two area areas will overlap is less than 1%.

Likewise, McCauley (2019) underestimates thinning's climate impacts. Both Hurteau and McCauley project that thinning will initially decrease ecosystem carbon, but project that carbon accumulation would overtake prior carbon losses by 2200. However, McCauley states that under higher temperature scenarios, those modeling assumptions break down. Unfortunately, the global climate is on a trajectory to meet those higher temperature scenarios.

The best way for the Forest Service to address these issues is not to simply assume, based on rosy assumptions, that thinning will result, long-term, in improved (but unquantified) carbon storage. To use the best available science, we urge the Forest Service to undertake a carbon life cycle analysis specific to the planning area that does not over-estimate the small chance that fires will hit thinned areas. The Forest Service should use the research-supported chance of less than 1% (Schoennagel 2017), rather than simply assume 2% as Hurteau did.[151]

Further, a life-cycle analysis is necessary because Hurteau and McCauley looked only at carbon left on the forest, and failed to address all upstream (project level) and downstream (processing and transport of wood products) emissions, which may be considerable. Logging itself is a fossil-fuel intensive process; so are transporting logs to the mill, milling products, and transporting wood products to market. All of these are reasonably foreseeable carbon pollution impacts of thinning. Failure to address these facts and this best available science, and failure to undertake the necessary life cycle analysis, violates NEPA's hard look mandate.

In sum, the Forest Service's analysis of the extent to which the plan provides for the "ecosystem service" of "long term storage of carbon," 36 C.F.R. §§ 219.10, 219.19, is lacking. This flaw also violates the NFMA and NEPA requirements to base decisions on the best available scientific evidence. The Forest Service's failure to take a hard look at the impacts of the various alternatives on carbon storage and sequestration violates NEPA.

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[150] B. Law, *et al*., The Status of Science on Forest Carbon Management (Ex. CARB20) (emphasis added). The FEIS failed to address or cite this study.

[151] T. Schoennagel et al. Adapt to more wildfire in western North American forests as climate changes. Proceedings of the National Academy of Sciences. 114 (18). May 2, 2017. Attached as Ex. CARB22, and available at https://www.pnas.org/content/114/18/4582 (last viewed Oct. 26, 2021) ("roughly 1% of US Forest Service forest treatments experience wildfire each year, on average. The effectiveness of forest treatments lasts about 10–20 y, suggesting that most treatments have little influence on wildfire.").

3.1.3.3 The Cibola National Forest's Failure to Manage the Forest for Carbon Sequestration Violates the National Forest Management Act.

The Final EIS identifies 88,403 acres as suitable for timber production under the chosen alternative, a figure the agency deems compatible with the desired conditions and objectives established by the Plan.[152] The Plan notes that healthy watersheds, riparian areas, and soils provide ecosystem services including carbon storage.[153] The Plan also calls for monitoring for vegetation changes related to climate change and climate vulnerability.[154]

Despite these plan components and the agency's duty to address climate change and carbon storage, it does not appear the Plan or the Final EIS considered improving carbon stability through active restoration of the forest to improve resilience or 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.[155] But it does not appear the Forest Service took the hard look at these factors in developing this 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.[156] 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."[157] 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.

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.[158] 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

[152] Draft ROD at 8, Final EIS, Vol. 1, p. 128.

[153] Final Forest Plan, pp. 61, 63, 68.

[154] Final Forest Plan, pp. 178-79.

[155] *See Pinchot Institute Report* (Ex. CARB4) at 6-7.

[156] 36 C.F.R. §§ 219.8 & 219.10.

[157] 36 C.F.R. § 219.11(d)(3).

[158] 36 C.F.R. § 219.11(d)(3).

ecological impacts of climate change, § 219.11(d)(3) should be applied to ensure the optimization of carbon sequestration in the plan area.[159]

The Rules also provide that "[n]o timber harvest for the purposes of timber production may occur on lands not suited for timber production."[160] 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.[161]

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."[162]

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

[159] *See Pinchot Institute Report* (Ex. CARB4) 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."

[160] 36 C.F.R. § 219.11(d)(1).

[161] 36 C.F.R. § 219.11(a)(1)(iii).

[162] 16 U.S.C. § 531(a).

carbon emissions that the October 2018 IPCC report[163] identifies 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.[164] 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.[165] 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.[166]

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."[167] 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.[168]

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. 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."[169]

The emergency need for reductions described in the 2018 IPCC report makes 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

[163] Available at https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf.

[164] Hansen, M.C., et al. 2013. High-resolution global maps of 21st-century forest cover change. Science 342: 850-53. Attached as Ex. CARB23; Prestemon, J.P., et al. 2015. The global position of the U.S. forest products industry. U.S. Forest Service, e-Gen. Tech. Rpt. SRS-204.

[165] *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 visited Oct. 26, 2021).

[166] Erb, K.H., et al. 2018. Unexpectedly large impact of forest management and grazing on global vegetation biomass. Nature 553: 73-76. Attached as Ex. CARB24. Griscom, B.W., et al. 2017. Natural Climate Solutions. Proceedings of the National Academy of Sciences, Vol. 114, pp. 11645-50. Attached as Ex. CARB25.

[167] 77 Fed. Reg. at 21,164 (emphasis added).

[168] *See id*.

[169] National Roadmap for Responding to Climate Change, FS-957b (February 2011), at 20 (emphasis added).

lands to maximize carbon storage and sequestration to mitigate climate change, the Forest Service cannot rationally discount the extreme urgency identified by the 2018 IPCC report, 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 Service 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 Final EIS fails to do so.

Due to the failure of the Final EIS 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 Plan incompatible with the uses of those lands for resources such as fish and wildlife, and related desired conditions and objectives.[170] In the Forest Plan and Final EIS, 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."[171] The agency's failure to do so violates NFMA, MUSYA, and the 2012 Forest Planning Rule.

3.2 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 Sierra Club et al. 2019. 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 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.

4 Threatened and Endangered Species

NFMA requires the Forest Service to develop planning regulations that shall "provide for diversity of plant and animal communities based on the suitability and capability of the specific

[170] 36 C.F.R. § 219.11(a)(1)(iii).

[171] 36 C.F.R. § 219.11(d)(3).

land area in order to meet overall multiple-use objectives" (i.e., the "diversity requirement").[172] The preamble of the Planning Rule states,

> The rule contains a strong emphasis on protecting and enhancing water resources, restoring land and water ecosystems, and providing ecological conditions to support the diversity of plant and animal communities, while providing for ecosystem services and multiple uses.[173]

Additionally, management plans must:

> Contribute 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.[174]

These passages clearly demonstrate that the Planning Rule affirms that wildlife and habitat protection must be given the same priority as forest uses. The Rule requirements in 36 CFR 219.8 and 36 CFR 219.9 make this principle a mandate. The Rule requires forest plans to have plan components to maintain or restore the integrity of the terrestrial and aquatic ecosystems in the plan area and the diversity of ecosystems and habitat types throughout the plan area.[175] Essentially, this requires forest plans to maintain or restore the variety of ecosystems and habitat types found on national forests and grasslands (e.g., conifer forests, wetlands, grasslands), as well as the condition of the ecosystems themselves.

In accordance with 36 CFR 219.9(b)(1), plan components must provide the "ecological conditions necessary to: contribute to the recovery of federally listed threatened and endangered species … ." This means developing desired conditions toward which management actions are achieving that can be measured through monitoring. The desired conditions must include all of the necessary ecological condition to enable each species listed under the ESA to recovery. Additionally, providing the necessary ecological conditions to contribute to recovery means including standards and guidelines to mitigate all manageable threats to these species from uses of the Forest.

A national forest or grassland management plan revision process must be integrated with the procedures outlined in NEPA, and an EIS must be prepared as part of the process.[176] Management plans propose a program of projects and activities over the life of the plan, which is usually at least 15 years. These projects and activities will have effects on at-risk species. In order to contribute to the recovery of threatened and endangered species, conserve species proposed or candidates for listing under the ESA, and maintain the viability of species of

[172] 16 U.S.C. § 1604(g)(3)(B).

[173] 77 Fed. Reg. 21163 (April 9, 2012).

[174] 77 Fed. Reg. 21164 (April 9, 2012).

[175] 36 C.F.R. § 219.8(a), 219.9(a)(1), & 219.9(a)(2).
[176] 36 CFR 219.5(a)(2)(i).

conservation concern, a plan must have significant beneficial effects and minimize adverse effects to the greatest extent possible. Adverse impacts of forest uses on at-risk species addressed by the plan must also be disclosed in the EIS. The effects analysis must be more than a subjective, qualitative, and comparative estimation—it requires in-depth analyses of significant issues, including species viability requirements.

Note that under the CEQ Regulations governing application of NEPA, agencies must, "to the fullest extent possible":

> Use all practicable means, consistent with the requirements of the Act and other essential considerations of national policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment.[177]

Nowhere is this mandate more important than with at-risk species, for which impacts from human uses can drive them closer to extinction, where recovery might become impossible. A full disclosure of the impacts on these species is critical to ensuring that measures can be applied and management can be directed to facilitate their maintenance and recovery on the landscape.

Thus, the EIS must properly characterize what the plan components direct the Forest to do. The plan components comprise the "action" that must be analyzed. The analysis must detail how specific plan components affect each ecological condition needed by each at-risk species. This requires an evaluation of both plan components that are directly related to at-risk species and the ecological conditions upon which they depend and also plan components of the multiple uses that may adversely affect the species and/or the ecological conditions they depend on, such as vegetation management, livestock grazing, recreation, roads and other infrastructure, and mining. The FEIS for the proposed RGNF Plan completely fails in this regard. It is impossible to see how the RGNF can meet its NEPA obligations without producing an EIS that analyzes the effects of the desired conditions, objectives, standards, and guidelines proposed in the plan.

It is important that the Forest grasp the relationship between NEPA procedures and NFMA requirements. NEPA requires procedures - the analysis of effects. However, NFMA requires that those effects meet a substantive threshold, and that determination should be based on documented analysis found in the EIS. The Record of Decision must address compliance with the viability requirement.[178] It is not sufficient to state that a plan meets this requirement because it simply analyzed effects. The ROD must *explain* how the effects disclosed within the EIS demonstrate contributions to recovery and viability. While this analysis may be contained in a NEPA document, it is being used to demonstrate compliance with a substantive legal requirement in NFMA, and therefore requires rigor and certainty that go beyond the disclosure purpose of NEPA. The planning documents must do more than just list or restate the plan components that "support" a conclusion; they must present a reasoned rationale for viability based on reference to specific plan components. Unfortunately, the Forest has not met this bar.

[177] 40 CFR 1500.2(f).

[178] 36 CFR 219.14(a)(2).

The final revised land management plan and FEIS must comply with the ESA. Section 7(a)(1) of the ESA explicitly directs all federal agencies to "utilize their authorities" to carry out "programs for the conservation of endangered species and threatened species."[179] The ESA defines "conservation" to mean "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this [Act] are no longer necessary."[180] In this sense, "conservation" and "recovery" are essentially synonymous. ESA section 7(a)(2) requires the Forest Service to ensure that its actions are not "likely to jeopardize the continued existence" of any listed species or "result in the destruction or adverse modification of" critical habitat.[181] To ensure compliance with these prohibitions, the Forest Service must engage in a consultation with FWS upon proposing to authorize, fund, or carry out any "agency action" that "may affect" a species or its critical habitat.[182]

4.1 Mexican Spotted Owl

The Cibola National Forest is extraordinarily important for the survival and recovery of the Mexican Spotted Owl (MSO) which is estimated to use 40% of the forest,[183] including mixed conifer and pine-oak forest types, canyons and cliffs, and riparian areas.[184] There are 435,100 acres of MSO critical habitat on the Cibola, spanning all four ranger districts,[185] including 65 Protected Activity Centers (PACs) that encompass 47,070 acres.[186] Unique to the Cibola, the critical habitat units are found in three Ecological Recovery Units: the Upper Gila Mountains, Basin and Range East, and Colorado Plateau Recovery Units. Approximately 424,845 acres are considered Recovery Habitat, with an estimated 50,517 acres of dry mixed conifer and ponderosa pine containing suitable nesting and roosting habitat, according to the FEIS Vegetation Analysis.[187]

The objection issues we discuss in this section are based on comments previously submitted, as listed above. In addition, we refer to recent agreements between some objectors and the Forest Service, including:

[179] 16 U.S.C. § 1536(a)(1).

[180] 16 U.S.C. § 1532(3).

[181] 16 U.S.C. § 1536(a)(2).

[182] Id.; 50 C.F.R. § 402.14(a).

[183] FEIS, Vol. 1, p. 307.

[184] FEIS, Vol. 1, p. 305.

[185] FEIS, Vol. 1, p. 305.

[186] FEIS, Vol. 1, p. 307.

[187] FEIS, Vol. 1, p. 307.

- The July 2020 understanding between the Center for Biological Diversity, U.S. Forest Service, U.S. Fish and Wildlife Service, states of New Mexico and Arizona and Eastern Arizona Counties Organization, as recorded in the workshop notes from the June 17 & 26, 2020 meeting of the MSO Leadership Forum Workgroup, dated July 3, 2020.[188]

- The October 27, 2020 stipulation letter from Elaine Kohrman (Southwestern Region USFS) and Amy Lueders (US Fish and Wildlife Service) to John Horning, of WildEarth Guardians, where the agencies describe current and ongoing commitments to ensure conservation and recovery of the MSO.[189]

4.1.1 The Revised Plan fails to provide the ecological conditions necessary to contribute to Mexican spotted owl recovery, in violation of NFMA (36 CFR 219.9(a)(1) & (b)(1)).

4.1.1.1 The necessary ecological conditions that the plan needs to provide.

The FEIS states that the key ecological conditions for MSO include structurally diverse mature forests, conifer forest, structural heterogeneity, and interlocking canopy.[190] Unfortunately, the plan does not provide any standards or guidelines that specifically call for the retention of large and old trees and high canopy cover, which are crucial for MSO survival and recovery.

Forest stands used by spotted owls for nesting and roosting have certain structural features in common. As we explained in previous comments, these typically include relatively high tree basal area (BA), numerous large trees, multi-storied canopy, multi-aged trees, high canopy cover, and decadence in the form of downed logs and snags in varying stages of decay. Studies of MSO have consistently found higher canopy cover of trees (generally >60%) is required for MSO occupancy, survival, and reproduction.[191]

The recovery of the MSO is directly related to the protection and recruitment of key habitat features such as high basal area, canopy cover, and proportion of large trees. The 2012 MSO Recovery Plan provides the following Recovery Criteria for MSO:

1) Owl occupancy rates must show a stable or increasing trend after 10 years of monitoring; and

2) Indicators of habitat conditions (key habitat variables) are stable or improving for 10 years in roosting and nesting habitat. Relevant key habitat variables and recommended minimum conditions in a minimum of 10% of PPF and 25% of MCD forests are:

- Minimum canopy cover of 40% in PPF and 60% in MCD

[188] See Exhibit: Ex. MSO 1 Leadership Forum June 2020 Notes.

[189] See Exhibit: Ex. MSO 2 USFS letter to John Horning.

[190] FEIS, Vol. 1, p. 331 and 341-342.

[191] see Appendix A

- Diversity of tree sizes with trees 12-18 inches DBH contributing >30% of the stand basal area (BA) and trees >18 inches DBH contributing >30% of stand BA in PPF and MCD

- Minimum tree BA in stands = 110 ft^2/acre in PPF and = 120 ft^2/acre in MCD

- Minimum density of large trees (>18 inches DBH) = 12 trees per acre in PPF and MCD

For the Revised Plan to provide ecological conditions necessary to contribute to Mexican spotted owl recovery, it must demonstrate that the key habitat features listed above will be stabilized or improved under the direction of plan components. The current FEIS and Revised Plan fail to adequately address how these variables will be inventoried, monitored, restored, retained, conserved, and protected.

4.1.1.2 The threats the plan must mitigate via standards and guidelines.

According to the 2012 MSO Recovery Plan, in 1993 the U.S. Fish and Wildlife Service listed the Mexican Spotted Owl as threatened under the ESA. Two primary reasons were cited for the original listing of the Mexican spotted owl in 1993: alteration of its habitat as the result of timber-management practices, and the threat of these practices continuing as evidenced in existing national forest plans. The 2012 revision of the recovery plan lists stand-replacing fire as the most significant threat to the MSO, in addition to human disturbances such as logging, grazing, and recreation.

The Final EIS states that threats to MSO include:

> Past actions, such as even-aged management and fire suppression, which have led to uncharacteristic states and highly departed conditions; risk of loss of ecological condition and habitat fragmentation of conifer forest from wildfire outside the natural range of variability; uncharacteristically high levels of natural disturbance (for example, insect outbreaks, drought); and climate change.[192]

> Loss of the large tree component and associated components is the primary threat for these species. In fire-adapted systems, large trees are rare on the landscape as a result of past management and overstocking (for example, fire suppression and even-aged management) causing a departure from reference conditions and lack of appropriate seral state. This departure from historic conditions can lead to uncharacteristic stand-replacing wildfire and wholesale loss of habitat including loss of key structural features needed for nesting, breeding, and roosting. Additional threats to tree features include fuelwood collection, uncharacteristically high levels of natural disturbance (for example, insect outbreaks, drought), and climate change.[193]

An extensive body of literature on MSO universally correlates the species with old growth forests dominated by large and old trees, high canopy cover, and large snags and coarse woody

[192] FEIS, Vol. 1, p. 331 and 341-342.

[193] FEIS, Vol. 1, p. 332.

debris.[194] The FEIS states that "Primary threats common to species that use frequent fire forests include the loss of large trees, snags, and down woody debris and loss of interlocking canopy which provide nesting, roosting, and foraging habitat."[195] Aside from a single mention of the threat of "fuels reduction activities"[196] the threats listed in the FEIS do not address the risk posed to mature and old growth forests by the expansive logging that would be initiated under the plan.

Widespread old and large tree logging will have dire effects on MSO, northern goshawk, and other canopy dependent wildlife. The Revised Plan focuses on eliminating the threat of stand-replacing fire, which is certainly an important step in protecting MSO, but it does not provide any plan components to protect MSO from the potential harms of vegetation management (logging and other mechanical treatments), which is the focus of this objection issue.

As we explained in past comments, *ongoing* (not just historic) timber harvesting continues to pose real threats to MSO. Direct effects of mechanical thinning on MSO have not been studied, so the best available science comes from studies of other spotted owl subspecies, which share the preference for old growth forests and mature forest structural elements. Studies that have examined the impact of logging within a spotted owl territory have found that any reduction in canopy cover by logging harms owls by negatively impacting owl occupancy, reproduction, and survival.[197] The FEIS and Revised Plan fail to address the potential harms caused by mechanical thinning in MSO habitat.

The Revised Plan and FEIS identify uncharacteristic fire as a primary threat to MSO. The FEIS states that "The ecological and socioeconomic benefits of restoring historic stand structure and reduction of the risk for uncharacteristic fires are primary areas of focus in this plan revision."[198] Uncharacteristic fire is usually defined as large-scale, stand-replacing fire that does not normally occur as a part of the fire regime for the ERU involved. The FEIS states that large-scale, high-severity fire is a threat to MSO, but this assertion does not entirely reflect the uncertainty reflected in the best available science on the topic. Very few studies to date have adequately documented significant negative effects of fire on MSO population parameters of site occupancy, survival, reproduction, or habitat selection. While extensive high-severity fire can sometimes negatively impact MSO, the assumption in the Revised Plan and FEIS that high-severity fire is a universal threat to MSO, and that logging is not a threat, is incompatible with MSO recovery and disregards the full range of the best available science.

[194] We have reviewed the species ecological needs extensively in past comments.

[195] FEIS, Vol. 1, p. 342.

[196] FEIS, Vol. 1, p. 324.

[197] See, for example: Blakesley et al. 2005, Seamans and Gutiérrez 2007, Stephens et al. 2014, Tempel et al. 2014b, Tempel et al. 2016, listed and described in Appendix A and B.

[198] FEIS, Vol. 1, p. 5.

4.1.1.3 The fallacy of high-severity fire being universally harmful to MSO.

The 2012 MSO Recovery Plan entirely relies on the assertion that burned forest is somehow degraded or lost as MSO habitat. This assertion is made in spite of the fact that no statistically significant negative effects of fire on MSO are reported anywhere in the recovery plan, and nearly all burned sites studied were equivalent to unburned sites in every way. Remarkably, in this documented absence of any significant negative effects of fire on MSO, the MSO Recovery Plan decides habitat alteration from fire must somehow indirectly affect MSO and is therefore, in some as yet undetected manner, a threat.

The Revised Plan and FEIS takes the same leap in logic as the MSO Recovery Plan and asserts that because fires burn the forest and kill trees, it must be bad for MSO. To do so, they disregard not only the MSO and fire studies summarized in the 2012 Recovery Plan, but also subsequent studies of fire effects on MSO and other subspecies of Spotted Owl.

For example, we introduce here new information published since the draft EIS and draft plan:

Lommler, M.A. 2019. Mexican spotted owl breeding population, site occupancy, and habitat selection 13-15 years after the Rodeo-Chediski fire in east-central Arizona. Northern Arizona University Dissertation.

Lommler's work – which was not included in the FEIS – examined MSO site occupancy, breeding and habitat selection 13-15 years after a large fire (462000-ac, 36.6% burned at high severity) and subsequent salvage logging. Lommler's committee consisted of renowned MSO experts Paul Beier, Ph.D., Chair, Joseph L. Ganey, Ph.D., Jamie L. Sanderlin, Ph.D., Samuel A. Cushman, Ph.D., and Tad C. Theimer, Ph.D., making this dissertations findings extremely important.

In Chapter 3, Lommler used valid occupancy modeling with covariates to examine effects of fire and salvage logging on site occupancy and found significant positive effect of % area composed of MCD forest, significant negative effect of salvage logging, and no significant effect of fire. In Chapter 4, he examined nest and roost habitat selection and model averaged coefficients showed basal area of large trees and forest cover were significant positive effects, and no significant fire effects were found. In summary, Lommler's results contradict the FEIS because he showed MSO would be significantly harmed in terms of occupancy and nesting/roosting habitat provisions by the Revised Plans recommendations that reduce basal area and canopy cover in MCD and PPF forests.

Also relevant are publications by Lee (2018[199], 2020[200]). Since there are so few studies of fire effects on MSO specifically, the best available science is found in studies of fire and all Spotted Owl subspecies. In these two systematic reviews and meta-analyses of all published fire effects on Spotted Owls from across their entire range and including all 3 subspecies, Lee found: 15

[199] Lee DE. 2018. Spotted owls and forest fire: a systematic review and meta-analysis of the evidence. Ecosphere 9:e02354. doi: 10.1002/ecs2.2354

[200] Lee DE. 2020. Spotted Owls and forest fire: Reply. Ecosphere 11:e03310. doi: 10.1002/ecs2.3310

papers representing more than 20 fires, 425 burned territories and 37 radio-tracked owls reported 50 effects from fire that could be differentiated from post-fire logging. These meta-analyses examined key life history parameters in response to fires as they have burned through spotted owl habitat in recent decades under existing forest structural, fire regime, and climate conditions, including multiple "megafires" with large patches of high-severity burn. Spotted Owls were usually not significantly affected by fire, as 83% of all studies and 60% of all effects found no significant impact of fire on mean owl parameters.

The strength of meta-analysis as an evidence-based decision support tool is that it enables managers and decision-makers to justify management decisions using patterns and trends from all available data. Contrary to current perceptions and recovery efforts for the Spotted Owl, fire does not appear to be as significant of a threat to owl populations as we are led to believe; rather, wildfire has arguably more benefits than costs for Spotted Owls. Lee (2018) found significant positive effects on foraging habitat selection and recruitment from forest fires, and significant positive effects on reproduction from high-severity fire. The absence of any widespread, consistent, and significant negative fire-induced effects and the presence of significant positive effects indicated forest fire is not the outsized threat to spotted owl populations that the FEIS and Revised Plan assume. In addition, there is considerable uncertainty about the effects of fire and logging on MSO. Therefore, fuel-reduction treatments intended to mitigate fire severity in spotted owl habitat may be unnecessary and counterproductive to the species' recovery. The Forest Service's failure to address or respond to these studies violates NEPA's "hard look" mandate.

4.1.1.4 The plan does not sufficiently provide standards and guidelines to mitigate threats.

The Final EIS and Plan provide a list of coarse and fine filter components that are proclaimed to benefit MSO under the heavy pro-logging paradigm championed by this Plan. However, these components fail to sufficiently mitigate the threats posed to the MSO, specifically, the threats caused by a dramatic expansion of logging without adequate Standards and Guidelines to mitigate potential harms. Even worse, the plan rolls back existing protections for MSO and goshawk that exist in the current forest plan, that were established in the 1996 plan amendments. The FEIS admits that the 1996 plan amendments provided protections for the MSO and goshawk.[201] But, the FEIS also admits that these protections limit the Forest Service's ability to log.[202]

The reliance on inadequate plan components that fail to conserve existing crucial habitat structures (old and large trees, and high canopy cover) is arbitrary and capricious and is at-odds with the best available science. The FEIS states that "All alternatives are intended to ensure that key habitat characteristics like interlocking canopy and old growth characteristics including large trees are retained and that disturbance is minimized near breeding sites,"[203] but the Revised Plan never once provides assurance that this will be followed through. The primary deficiency here is

[201] FEIS, Vol. 1, p. 323.

[202] FEIS, Vol. 1, p. 322.

[203] FEIS , Vol. 1, p. 315.

that the plan does not provide Standards or Guidelines that specifically call for retaining high canopy cover of old and large trees, so the plan fails to provide any actual constraints to management that would reduce the potential harm of logging on the owl. In other words, none of the plan components protect large or old trees, specify desired canopy cover, or preserve existing old and mature forest structure that are key habitat variables needed for species recovery. The intent of the Forest Service might be to do these things, but the plan fails to articulate that.

On the contrary, the Desired Conditions contain regressive direction such as old growth occurs in "…generally in small areas as individual old growth components or as clumps of old growth," despite their being no scientific evidence for the natural range of variability supporting the notion that old growth would have occurred primarily in small areas as individual components. This language could be used to justify cutting existing old growth structure to establish regeneration openings, and to arbitrarily reduce the size of contiguous patches into smaller clumps of old growth, which would harm MSO, northern goshawk, and other species which rely on mature forest structure. In fact, this is illustrated at the Bluewater demonstration site, where large and old trees were logged to meet the desired conditions in GTR-310.

As another example, the Desired Condition for ponderosa pine and dry mixed conifer forests that reads as follows:

"Dwarf-mistletoe occurs in less than 15 percent of host trees in uneven-aged forest structures and less than 25 percent in even-aged forest structures."[204]

This Desired Condition fails to assure that essential habitat structures (dwarf mistletoe and its brooms) are retained during forestry operations. This states that dwarf mistletoe occurs *less than* a given percentage. A silviculturalist could eliminate every tree with any mistletoe at all under this Desired Condition, stripping the forest of crucial wildlife habitat. This type of management has recently been observed at the Little Creek Timber Sale on the Apache-Sitgreaves National Forest and the Jacob-Ryan Timber Sales on the Kaibab National Forest, two examples that the Regional Office is well aware of.

The plan also states that:

"Dwarf mistletoe witches' brooms may be present, providing habitat for wildlife."[205] This is a Desired Condition for wet mixed conifer forest.

"Dwarf mistletoe infections may be present on ponderosa pine and Douglas-fir, and rarely on other tree species, but the degree of infection severity and rate of mortality varies among infected trees. Witches' brooms may be present with these infestations, providing habitat for wildlife."[206] This is a Desired Condition for dry mixed conifer forest.

[204] Revised Plan, p. 39 and p. 42.

[205] Revised Plan, p. 37.

[206] Revised Plan, p. 40.

"Isolated infestations of dwarf mistletoe may occur, but the degree of severity and mortality varies among the infected trees. Witches' brooms may form on infected trees, providing habitat and food for wildlife and invertebrate species." This is a Desired Condition for ponderosa pine forest.

In these three examples, dwarf mistletoe witches brooms *may* form on some trees. Again, this provides the flexibility for future foresters to target trees with brooms for removal, which will eliminate key wildlife habitat. The plan lacks Standards and Guidelines that call for retaining important habitat features like dwarf mistletoe brooms.

The reliance on Desired Conditions provides zero commitment to protecting and restoring owl habitat. Without specific Standards or Guidelines to instruct managers to retain old and large trees, adequate canopy cover, dwarf mistletoe brooms, or sufficient downed woody debris or snags, these Desired Conditions do not provide satisfactory safeguards and as such the plan fails to provide the ecological conditions necessary to contribute to Mexican spotted owl recovery.

This deficiency should not come as a surprise to the Forest Service, though, as the agency just recently settled legal actions taken by the Center for Biological Diversity and WildEarth Guardians on these issues. During the June 2020 MSO Leadership Forum Workgroup meeting, the Forest Service, the Center, and other stakeholders agreed that Region 3 projects in MSO habitat could proceed if they demonstrated that no trees large than 18" DBH would be cut in PACs or recovery (or threshold) habitats. This includes the Bill Williams, 4FRI 1st EIS, FWPP, West Escudilla, Hassayampa, Luna, Southwest Jemez, Burro projects. On the Puerco project, the MSO Forum concluded that the "Forest Service needs to clearly display to the Public that there will not be trees > 18 DBH removed from PACs and Recovery Nest/Roost Habitat."[207] And the Forum determined that the Rio Tusas San Antonio project posed no threat to the owl because no mechanical treatments were approved for either PACs or nest-roost habitat.[208] So, the outcome of the Forum was agreement that one way to mitigate harm to the MSO is to commit to retaining large trees. The Cibola plan provides no assurances that old and large trees will be retained. It is clear to us that in the absence of setting Standards to retain large trees, canopy cover, coarse woody debris, and other key habitat variables, the Forest Service remains legally vulnerable to continued challenges for any projects in MSO habitat.

4.1.2 The FEIS and other relevant plan documents fail to take a 'hard look' at the environmental consequences of the Revised Plan to the Mexican spotted owl, in violation of NEPA (40 CFR 1502.16).

The Revised Plan and FEIS ignore any possible adverse impacts that forest management can have on MSO, rendering the 'hard look' requirements under NEPA entirely deficient The EIS fails to take a 'hard look' at the plans impacts to MSO because every alternative promotes increased logging under the same set of incomplete assumptions.

[207] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 15.

[208] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 16.

It is well documented in the literature that MSO prefer higher canopy cover and higher large tree density than what the Revised Plan provides.[209] This is confirmed in the FEIS in multiple locations. Forest structural characteristics that benefit MSO, such as canopy cover, would be reduced by the logging and thinning required to achieve landscape-scale desired vegetation conditions in the Revised Plan. However, the FEIS and Revised Plan overlook logging and mechanical thinning as a known or potential threat from forest activities to MSO.

As discussed above, another flawed assumption underlying each alternative is the notion that mixed and high severity fire will have wholly disastrous consequences for MSO. The FEIS repeatedly states large-scale, high-severity fire is an existential threat to MSO. However, as stated above, this does not fully reflect the best available science on the topic, which is much more nuanced than the EIS suggests. For example, Lommler reports the following:

> The relationship between spotted owls and wildfire is complex. There is now considerable evidence that low- and moderate-severity fire have little effect on spotted owls (Bond 2016, Ganey et al. 2017). Our own results indicate that high-severity fire and Mexican spotted owls are not necessarily incompatible, depending upon the scale of inference and the spatial configuration of the fire.[210]
>
> It is possible that high-severity fire only has a significant negative effect on MSO when concentrated around nest and roost sites (at fine scales) or in very large, contiguous patches (at coarse scales). This is consistent with suggestions made by Jones et al. (2016) and Rockweit et al. (2017). Otherwise, high-severity fire may produce a healthy landscape mosaic that includes a balance of nesting, roosting, and foraging habitat.[211]
>
> We believe that some level of high-severity fire can help maintain Mexican spotted owl habitat over large temporal and spatial scales. However, large patches of high-severity fire may present a threat to the recovery of the owl.[212]

These three passages from this recent dissertation clearly demonstrate how nuanced the relationship between high severity fire and MSO is. Planning documents claiming that forest fires currently, or will in future, pose the greatest risk to owl habitat and are a primary threat to population viability are either outdated or highly speculative in light of Lommler's work, in combination with the Lee (2018) review and Lee (2020) reanalyses. When all available data are examined objectively in meta-analysis, the larger pattern is revealed that high-severity fire patches from climate-changed wildfire events are used by spotted owls for foraging in proportion to their availability, and more high-severity fire significantly increases reproduction, but no strong consistent negative effects are apparent. This is exactly why meta-analyses such as Lee

[209] See Appendix A.

[210] Lommler (2019), p. 74.

[211] Lommler (2019), p. 73.

[212] Lommler (2019), p. 97.

(2018) and (2020) are so valuable, because they provide decision-makers with the broader consistent patterns found among all studies.

Numerous systemic issues plague the way the Forest Service analyzes effects of forest management activities on MSO, which has led to the litigation and threatened litigation discussed above. These project-level issues can only be corrected if a coordinated effort is made by the Forest Service to address systemic flaws in analysis and disclosure. From our vantage, revised forest plans are the best way to provide the direction needed to ensure individual NEPA projects are planned, analyzed, and implemented in a manner that can avoid jeopardy. On the contrary, revised forest plans, such as the Cibola's plan, that remain vague and lack standards and guidelines that provide specific direction for management of MSO habitat, will result in future legal challenges, delays, and costs.

The MSO Leadership Forum described a "Systemic Issue" of a "disconnect between the broader scope public documents readily available for review and what actually happens on the ground during implementation."[213] This Plan and EIS continues this disconnect in providing no description of how treatments in MSO habitat will be designed or implemented. There are no sideboards (for example, diameter cutting limits or minimum canopy cover standards) to mechanical treatments in MSO habitat, so the Plan fails to show that the massive increases in logging envisioned by the plan will have no adverse effects on the owl.

The MSO Leadership Forum further explained this "Systemic Issue" when they stated that

> …the NEPA process does not analyze actual stand treatments for the MSO projects but broad ranges of allowable treatments. Actual treatments are decided during field trips prior to project implementation. NEPA analyzes actions at a broad scale and in some cases (e.g. Hassayampa) appears insufficient.[214]

We recognize that the forest plan does not propose any specific treatments, but the lesson here is that in the absence of clear direction, any future district-level project design, analysis, and implementation will vary between projects, and will fail to adequately address potential threats to the owl caused by widespread mechanical thinning. In essence, maintain the status-quo approach to management of MSO habitat that has resulted in recent legal challenges described elsewhere in this letter.

This deficiency is amplified when considering the trend towards vague condition-based management projects, which we expect the Cibola to utilize. In fact, the MSO Leadership Forum stated:

> There is a strong nexus between the MSO discussion and "Conditions Based Management" (CBM). There is a systemic learning point for the upcoming

[213] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 2.

[214] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 3.

> implementation of CBM: the current MSO challenges likely exemplify issues to come, NEPA-wide, when CBM gets rolled out at full scale.[215]

In addition, they stated:

> Current MSO management appears to be a precursor of the proposed general "Condition Based Management" (CBM) in the on-going NEPA Revision. Lessons learned in the MSO Workshop are likely applicable to CBM at-large, as relates to communicating to the public the treatments and monitoring that are actually implemented.[216]

Again, the revised forest plan could address this issue by providing – or at the least analyzing in one alternative – Standards and Guidelines that would ensure protection of key owl habitat features. This refusal to analyze a large tree protection alternative is a violation of NEPA.

We anticipate the Forest Service will expand on the use of CBM in projects that proceed under the new plan. This will only further complicate existing systemic issues in evaluating restoration impacts on MSO. The MSO Leadership Forum made the following statements relevant to this problem:

- There is no clear tool or method in place to account for the cumulative effect across various projects' actual treatments, and to reconcile the distribution of treatments along the spectrum of intensities (including no treatment) within the landscape, as recommended in the Recovery Plan, to establish an environmental baseline among neighboring projects."[217]

- The current management practice of relying on post NEPA field trips by a few select individuals to decide upon actual treatments is not scalable to landscape scale restoration."[218]

- Science is emerging in recent literature regarding the effectiveness of mechanical treatments in MSO habitat. A Workshop is needed to review this science and its applicability to projects in the Region."[219]

So, to summarize these three points, the Forest Service doesn't have a clear tool or method to analyze impacts to MSO and instead leaves decision making up to district level silviculturalists post-NEPA, even though emerging science questions the effectiveness of mechanical treatments in MSO habitat.

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[215] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 22.

[216] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 3.

[217] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 3.

[218] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 3.

[219] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 4.

This approach violates NEPA's mandate to take a hard look at the environmental consequences of the individual projects to the Mexican spotted owl. So far, no such workshop has been convened, and none of the systemic issues identified by the MSO Leadership Forum have been addressed, despite the fact that forest planning is the appropriate level to resolve them. Now, the Forest Service is approving numerous forest plans that fail to address any systemic issues. The revised forest plan will simply carry on this legally questionable legacy of ambiguity, as once again the Forest Service failed to take a hard look at the effects of a dramatic increase in mechanical treatment in owl habitat.

The MSO Leadership Forum concluded that Region 3 restoration projects in the planning phase need to complete their NEPA analysis "integrating the outcomes of the workshop." This is very important: the projects in question, which include the Santa Fe Landscape Resiliency Project, the 4FRI Rim Country Project, Black River Restoration Project, and the South Sacramento Restoration Project, need to "integrate the outcomes of the workshop." What this means is that if these projects don't "integrate the outcomes of the workshop," they risk failing to protect the owl, and violating the ESA. The Revised Plan should rectify this issue and set clear standards for management of MSO habitat in this (and other) forest plans. If not, the Forest Service should not be surprised when more legal challenges are directed at future projects advanced under the new plan, as the Final EIS and Plan fail to take a hard look at issues which the Leadership Forum identified as systemic in Region 3.

4.1.3 The Revised Plan fails to provide a program for Mexican Spotted Owl conservation in violation of Section 7(a)(1) of the Endangered Species Act.

The MSO Leadership Forum stated:

> The Regional Office needs to provide planning guidelines and templates for future MSO planning that are consistent with the requirements in the Recovery Plan, standardized across forests, and better representative of actual likely implementation prescriptions within PACs and Nest Roost Recovery Habitat.[220]

The urgent need for this is made evident in the June 2020 Notes, where the participants observed that:

> The NEPA prescriptions quality control and decision-making takes place at post NEPA field-trip level. This method is likely not scalable across AZ and NM if/when both States ramp up to landscape scale restoration. Shaula will not be able to visit every project in both States, especially when AZ does 50,000 acres/year and NM ramps up.[221]

This is again made evident in the following statement in the Notes:

> There is an enormous amount of unique knowledge resting in very few key individuals. For example, if Shaula, Karl, Ian and Dick were withdrawn from the process overnight,

[220] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 20.

[221] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 21.

> the management of MSO projects within R3 would be severely crippled, if not coming to a complete stand still. There is a need for critical knowledge to be captured and backed up, and for succession plans. This is an urgent issue as Karl is leaving the region and Dick is retiring.[222]

The MSO Forum recognized the urgent need to address the impending loss of institutional knowledge, reflected in the statement that there is a need to:

> Organize promptly the workshop(s) required to resolve the issues identified in the "Systemic Issues" section. The first workshop will be focused on consolidating and prioritizing the issues, and organizing a workplan for the Leaders' consideration to resolve the issues.[223]

To date, this workshop has not convened, and therefore the systemic issues have not been resolved. Now, the Revised Plan proceeds under a vulnerable and uncertain status quo. It is because of this that we argue that the Revised Plan fails to provide a program for MSO conservation in violation of Section 7(a)(1) of the Endangered Species Act. Region 3 has no less than six forest plans in revision that will have direct, indirect, and cumulative effects on MSO. Now, three forests Revised Plans are near completion, and no regional program for owl conservation has been provided, despite the widely recognized need to do so.

Once the numerous Revised Plans for southwestern forests are finalized, there will be a massive ramping up in landscape logging treatments. The Reconciliation Bill in congress will provide hundreds of millions of dollars for logging national forests. Based on the admissions of the Leadership Forum highlighted above, there is no way that a few key people from USFWS and USFS will be able to keep up with a slew of new projects in MSO habitat. However, the Revised Plan is counting on exactly that happening by stating numerous times the following:

> Work closely with U.S. Fish and Wildlife Service personnel to address the habitat needs of the Mexican spotted owl in the pine-oak forest type by minimizing disturbance and providing nest or roost habitat, which includes managing for areas of closed canopy and desired levels of key structural elements such as large old trees, snags, and downed woody material.[224]

The Forest Service cannot count on a separate agency with its own resource limitations to ensure that a growing number of large projects won't jeopardize MSO. This is why Standards and Guidelines to protect old and large trees and areas of high canopy cover are so badly needed.

A legitimate program for MSO conservation would also include robust monitoring. The June 2020 Leadership Forum Notes describe a project-level systemic issue of "Monitoring as a

[222] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 21.

[223] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 26.

[224] FEIS, Vol. 1, p. 37 (wet mixed conifer), p. 40 (dry mixed conifer), p. 43 (ponderosa pine), and p. 50 (Madrean pinyon-oak woodland)

reasonable and prudent measure often lacks clarity and specificity at the NEPA stage and the Revised Plan is not always appended to the BO."[225] Monitoring of MSO populations, habitats, and forest management treatments are required to assess recovery and avoid harm.

Without specific, directed, and regularly assessed monitoring as specified below, the Revised Plan will fail to achieve this Desired Condition for MSO, an at-risk species. The Monitoring Plan in Chapter 4 of the Revised Plan fails to provide the level of detail needed to evaluate whether or not projects approved under the plan "contribute to the survival, recovery, and delisting of species under the Endangered Species Act." The monitoring questions are vague, the intervals are too infrequent, and the indicators fail to capture essential habitat features needed by MSO such as canopy cover, large tree basal area, and other metrics.

The 2012 MSO Recovery Plan monitoring guidelines require the following:

1. Landscape analyses must be conducted prior to initiating any management actions. These analyses should identify known owl sites, areas to be managed as replacement nest/roost habitat, potential foraging habitat, and prospective habitat corridors.

2. Forest restoration and fuels-reduction treatments must be evaluated over time using appropriate modeling, rigorous monitoring, management experiments, and/or research to assess their effectiveness in maintaining or creating owl habitat and/or their effectiveness in reducing the threat of high severity or stand-replacing wildland fire.

3. Monitoring Treatment Effects on Owls. Monitoring must be designed and implemented to evaluate effects of treatments on owls and retention of or movement towards desired conditions. The monitoring design must be rigorous and adhere to strict quality assurance/quality control standards. Designing such a monitoring study requires a coordinated effort across administrative units. Ideally, the monitoring design should be developed by a scientific committee and implemented by the action agencies.

4. In all cases where salvage logging is being considered, the PAC and a buffer extending 400 m (433 yd) from the PAC boundary should be surveyed for owls before non-occupancy is inferred. This survey should occur during the breeding season following the fire or other large-scale mortality events and should adhere to the accepted protocol (Appendix D) except that it could be completed with four visits in a single season.

The Revised Plan fails to provide clear direction to accomplish any of these guidelines, again leaving planning and implementation of individual projects up to the judgement of district level managers.

To provide an example of a specific Standard that would address this deficiency in monitoring, we again point to the MSO Leadership Forum, where the June 2020 Notes recommend that that the Pinaleno, Bill Williams, 4FRI, West Escudilla, Luna, Southwest Jemez, Puerco, and Burro projects must be corrected to specify that "Monitoring in PACs post treatment needs to be clearly

[225] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, p. 3.

stated as five years post treatment."[226] The Revised Plan should eliminate this need to chase after projects post-decision and add these crucial monitoring details after the fact. So, to address this example, the Plan should provide a Standard requiring that monitoring in PACs must be completed for five years post treatment.

There are a number of additional Standards that should be considered to address the systemic issues identified in Region 3 management of MSO habitat. Three other important examples of where stronger plan components are needed are here:

1. The need for each forest to contribute to regional owl population trend monitoring.

2. The need to assess the effects of mechanical and prescribed fire treatments on the owl and its habitat in PACs outside of core areas.

3. The need to track long-term trends in Mexican spotted owl PAC and Recovery Habitat on NFS lands of the Southwestern Region and assure retention of adequate habitat for recovery.

If these needs sound familiar, that's because they are direct commitments made by the Forest Service in settling six notices of intent to sue filed by WildEarth Guardians in 2019[227]. The Revised Plan does not include any Standards or Guidelines or Monitoring Plan components to ensure that the needs identified by the Forest Service will be met, which clearly demonstrates that the plan fails to provide a program for MSO conservation.

The stipulation letter between the Forest Service and WildEarth Guardians says:

> The purpose of these experiments is to establish consistent and up-to-date monitoring and monitoring protocols across multiple owl Ecological Management Units (EMUs) and provide a scientific basis for the modification of forest management treatments based on lessons learned and the best available science.

One simple way for the Cibola to better contribute to resolving this issue at the regional scale is to provide a plan component (a standard, guideline, or management approach) that expresses a commitment to conduct future individual projects within a management experiment framework, rather than rely only on results from 4FRI, FWPP, Rio Puerco, or the South Sacramento projects. The need for this is elevated, in part, because a significant portion of the FWPP management experiment burnt up in the Museum Fire, interfering with the experiment.

[226] MSO Leadership Forum Workgroup, June 17 & 26, 2020 Workshop Notes, dated July 3, 2020, numerous locations.

[227] See Exhibit: Ex. MSO 2 USFS letter to John Horning.

4.1.4 The Revised Plan fails to utilize the best available science in regard to retention of old and large trees, in violation of NFMA and NEPA (36 CFR 219.3, 36 CFR 219.9(c), 36 CFR 219.14(a)(4), and 40 CFR § 1500.1(b)).

We have commented to the Cibola NF that the planning process must discuss and explain the importance of large and old trees to the MSO, the northern goshawk, and forest restoration in general. For example, in our Scoping comments (CBD 2015) we said that "research into southwest frequent-fire adapted landscapes has shown that prey species relied upon by raptors such as owls also benefit from heterogeneous forest structures, including the presence of snags, large-diameter trees, and downed debris," and "In particular, Mixed Conifer-Frequent Fire, Mixed Conifer with Aspen, Ponderosa Pine Forest, and Spruce-Fir ecosystems within the Cibola have all seen significant and devastating decreases in large, old trees – one of the primary functional components for these ecosystems."

The loss of large and old trees, including by the widespread large tree logging that the plan envisions, is a serious risk to MSO and other species. Let us be very clear, the Revised Plan sets a course for extensive logging of large trees to meet arbitrary seral state proportions and basal area guidelines. Instead of providing a single Standard or Guideline that instructs managers to retain large and old trees during thinning operations, the plan provides Desired Conditions that ultimately will force silviculturalists to sacrifice large and old trees to meet structural targets (basal area and trees per acre) established in GTR-310.

In our observation of thinning projects across the southwestern region, meeting a target basal area established in GTR-310 and adopted into the Revised Plan almost always requires removal of large and old trees. This contradicts reams of best available science that instruct restoration projects to focus less on structural targets, and retain existing old and mature forest structural elements. In addition to what we have already stated in past comments, consider the following:

More than a century of fire suppression, overgrazing by livestock, and unsustainable logging practices in southwestern frequent fire adapted forests has severely depleted large and old trees and resulted in larger and more severe wildfires. This phenomenon can explain current departed conditions on the Cibola National Forest. Large and old trees provide a critical ecological backbone for dry to mesic pine and mixed conifer forests,[228] providing essential habitat for species like northern goshawk, Mexican spotted owl, and other species discussed in the Final EIS and Revised Plan, as well as containing most of the carbon stored on the landscape.[229]

Large and old tree retention has been a fundamental component of southwestern forest restoration since the earliest developments of science-based recommendations to guide restoration implementation, and has been a central focus of the Four Forest Restoration Initiative

[228] Hessburg, P.F., D. J. Churchill, A.J. Larson, R.D. Haugo, C. Miller, T.A. Spies, M.P. North, N. Povak, R.T. Belote, P.H. Singleton, W.L. Gaines, R.E. Keane, G.H. Aplet, S.L. Stephens, P. Morgan, P.A. Bisson, B.E. Rieman, R.B. Salter, and G.H. Reeves. 2015 Restoring fire-prone Inland Pacific landscapes: seven core principles. *Landscape Ecology* 30: 1805-1835.

[229] North, M., M. Hurteau, and J. Innes. 2009. Fire suppression and fuels treatment effects on mixed-conifer carbon stocks and emissions. *Ecological Applications* 19(6):1385–1396.

(4FRI) stakeholders as expressed in The Path Forward (March 24, 2010),[230] the 4FRI Old Growth Protection & Large Tree Retention Strategy (September 13, 2011),[231] The Statewide Strategy for Restoring Arizona's Forests (Governor's Forest Health Council 2007),[232] and the New Mexico Forest Restoration Principles.[233]

Recognizing that characteristic southwestern frequent fire adapted forests prior to the interruption of natural fire regimes had higher proportions of large and old trees than contemporary forests,[234] forest landscape restoration practices have focused on the need to reduce densities of small and young trees to restore low intensity fire[235] and offset carbon losses resulting from uncharacteristically high severity wildfires.[236]

The best available science as well as the social tolerance for southwestern forest restoration unequivocally calls for the retention of old trees. Early forest restoration pioneers Wally Covington and Margaret Moore stated in a seminal 1999 publication that the first point in a general framework for ecological restoration treatments suggested for southwestern ponderosa pine in northern Arizona is to leave all presettlement trees (those predating the fire regime disruption date (circa 1870 to 1880).[237] Mr. Covington in fact was quoted to High Country News saying "I've made it clear for 20 years there's been a population crash of old-growth trees - leave the damn things alone!"[238]

In the most-cited scientific article in the domain of ponderosa pine forest research, a long list of prominent experts stated: "Large and old trees, especially those established before ecosystem disruption by Euro-American settlement, are rare, important, and difficult to replace. …

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[230] 4FRI Stakeholders: The Path Forward. March 2010.

[231] http://4fri.org/wp-content/uploads/2018/04/old_growth_protection-revised080812.pdf

[232] https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5137128.pdf

[233] https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5207898.pdf

[234] Reynolds, R.T., A.J. Sánchez Meador, J.A. Youtz, T. Nicolet, M.S. Matonis, P.L. Jackson, D.G. DeLorenzo, and A.D. Graves. 2013. Restoring composition and structure in Southwestern frequent-fire forests: A science-based framework for improving ecosystem resiliency. Gen. Tech. Rep. RMRS-GTR-310. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 76 p.

[235] Agee, J.K. and C.N. Skinner. 2005. Basic principles of forest fuel reduction treatment. *Forest Ecology and Management* 211: 83–96, and Reinhardt, E.D. R.E. Keane, D.E. Calkin, J.D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. *Forest Ecology and Management* 256: 1997-2006.

[236] North, M.P., and M.D. Hurteau. 2011. High-severity wildfire effects on carbon stocks and emissions in fuels treated and untreated forest. *Forest Ecology and Management* 261:1115-1120.

[237] Margaret M. Moore, W. Wallace Covington, And Peter Z. Fule. 1999. Reference Conditions and Ecological Restoration: A Southwestern Ponderosa Pine Perspective. *Ecological Applications* 9(4): 1266-1277.

[238] https://www.hcn.org/issues/47/1441

Ecological restoration should protect the largest and oldest trees from cutting and crown fires, focusing treatments on excess numbers of small young trees."[239]

An article of similar significance, written by some of the most respected scientists alive today stated that "…cutting of old trees always should be avoided, because they have been severely depleted since European settlement…We recommend that treatments in ponderosa pine–dominated reserves be of the minimal intensity needed to restore grassy understories and protect old trees and imperiled species habitat."[240]

And another similarly important paper stated: "Retaining large, fire tolerant trees is a key principle of dry forest restoration and increasing resilience, and removal of pre-settlement era trees (old trees) is not necessary to restore pattern."[241]

Large and old trees and mature and old growth forests have a prominent role in fighting climate change, but the Forest Service consistently ignores this, even though scientific studies have long concluded that old trees and old growth forest structure play an outsized role in carbon sequestration and storage. Old growth forests contain huge quantities of carbon accumulated over centuries.[242] Mature and old stands of forest take in more carbon than they release, making them carbon sinks.[243] Large trees, which are usually the oldest trees, contain most of the carbon in dry conifer stands,[244] and their retention in tree thinning operations helps offset carbon losses that result from wildfires.[245] Old growth ponderosa pine stands have been shown to assimilate

[239] Craig D. Allen, Melissa Savage, Donald A. Falk, Kieran F. Suckling, Thomas W. Swetnam, Todd Schulke, Peter B. Stacey, Penelope Morgan, Martos Hoffman, And Jon T. Klingel. 2002. Ecological Restoration of Southwestern Ponderosa Pine Ecosystems: A Broad Perspective. *Ecological Applications* 12(5): 1418-1433.

[240] Reed F. Noss, Paul Beier, W. Wallace Covington, R. Edward Grumbine, David B. Lindenmayer, John W. Prather, Fiona Schmiegelow, Thomas D. Sisk, and Diane J. Vosick. 2006. Recommendations for Integrating Restoration Ecology and Conservation Biology in Ponderosa Pine Forests of the Southwestern United States. *Conservation Biology* 14(1): 4-10.

[241] Derek J. Churchill, Andrew J. Larson, Matthew C. Dahlgreen, Jerry F. Franklin, Paul F. Hessburg, James A. Lutz. 2013. Restoring forest resilience: From reference spatial patterns to silvicultural prescriptions and monitoring. *Forest Ecology and Management* 291: 442-457.

[242] S. Luyssaert et al. 2008. Old-growth forests as global carbon sinks. *Nature* 455:213-215.

[243] Janowiak, M., W.J. Connelly, K. Dante-Wood, G.M. Domke, C. Giardina, Z. Kayler, K. Marcinkowski, T. Ontl, C. Rodriguez-Franco, C. Swanston, C.W. Woodall, and M. Buford. 2017. Considering forest and grassland carbon in land management. United States Department of Agriculture, Forest Service, General Technical Report WO-95.

[244] M. North et al. 2009. Fire suppression and fuels treatment effects on mixed-conifer carbon stocks and emissions. *Ecological Applications* 19(6):1385–1396

[245] North, M.P. & M.D. Hurteau. 2011. High-severity wildfire effects on carbon stocks and emissions in fuels treated and untreated forest. *Forest Ecology and Management* 261:1115-1120

more carbon and have greater drought resilience than young stands,[246] and old trees continue to sequester carbon at rates far greater than young, fast-growing trees.[247]

As we said in previous comments, we support the protection of old growth ponderosa, mixed conifer, and pinyon-juniper forests and all individual old trees. Old growth forest is essential to many species because it provides habitat attributes not found in younger forests. These include large, old trees, large standing dead trees, vertical and horizontal structural diversity, nesting cavities, broken tops, and fire-resistant "plated" bark structure. In addition to these important habitat characteristics, old growth provides a host of ecological services including overall watershed function, clean water, soil retention and storage of greenhouse gasses.

We generally consider "old trees" to be those that established prior to the onset of fire suppression, which is approximately 1870, based on arrival of settlers who arrived with cattle and sheep, as well as the arrival of miners, both of which contributed to early fire suppression through displacement of Native Americans and elimination of the fine fuels that carried fire. Therefore, any tree that is approximately 150 years or older should be retained. Forest restoration practitioners generally agree that 150 years is the threshold of an old tree, and many NEPA projects on US Forest Service lands include protections for trees over 150 years old. Because it is difficult and time consuming to age trees during treatment design, any tree that exhibits morphological characteristics of advanced age (yellow/red bark, large diameter, deeply furrowed bark, large bark pates, broad flattened crown, drooping branches, cat-face fire scars, and other features) should be retained regardless of diameter.

Unfortunately, the Revised Plan follows in the path of GTR-310 by failing to codify these management approaches as enforceable Standards or Guidelines, disavowing the need for old and large tree protection that is the underpinning of forest restoration literature and practice. The Revised Plan should reflect this science and clearly state that "old trees (>150 years) will be retained" and that "old trees (>150 years) will not be cut." In addition, the plan should be clear that no large trees (generally those 16" dbh and larger) will be cut, except in narrowly defined circumstances.

4.1.5 The Revised Plan fails to comply with the Endangered Species Act with regard to the Mexican Spotted Owl.

Under the ESA, the Forest Service has an independent legal duty to formally consult with the U.S. Fish and Wildlife Service (FWS) to ensure the Cibola's Revised Plan is not likely to jeopardize the continued existence of any endangered species or threatened or result in the destruction or adverse modification of habitat of such species.[248] Here, the Forest Service completed a Biological Assessment dated September 2020 that determined the Revised Plan

[246] P.M. Anthoni et al. 2002. Seasonal differences in carbon and water vapor exchange in young and old-growth ponderosa pine ecosystems. *Agricultural and Forest Meteorology* 111:203-222.

[247] N.L. Stephenson et al. 2014. Rate of tree carbon accumulation increases continuously with tree size. *Nature* doi:10.1038/nature12914.

[248] 16 U.S.C. § 1536(a)(2).

"may affect, and is likely to adversely affect" threatened Mexican spotted owl (MSO), southwestern willow flycatcher, and Zuni bluehead sucker; it "may affect, but is not likely to adversely affect" western yellow-billed cuckoo, Chiricahua leopard frog, Alamosa springsnail, and Zuni fleabane; and is not likely to jeopardize the experimental nonessential populations of the Mexican gray wolf or northern Aplomado falcon. As for critical habitat, the Forest Service determined the Revised Plan "may affect, is likely to adversely affect" critical habitat for MSO and Zuni bluehead sucker; "may affect, but is not likely to adversely affect critical habitat for Chiricahua leopard frog or southwestern willow flycatcher; and it is not likely to destroy or adversely modify proposed critical habitat for western yellow-billed cuckoo.

For the species analyzed in its biological assessment, the Forest Service formally consulted with FWS. However, the Forest Service improperly relies on the FWS's flawed May 13, 2021 Biological Opinion for the Cibola's Revised Plan (hereafter, 2021 Biological Opinion or 2021 BiOp), and fails to discuss information that would undercut the 2021 Biological Opinion's conclusion.[249] Courts have made clear that an agency "cannot abrogate its responsibility to ensure that its actions will not jeopardize a listed species; its decision to rely on a . . . biological opinion must not have been arbitrary or capricious."[250] The following section focuses on the MSO sections as just one example of how the 2021 Biological Opinion for the Revised Plan is flawed.

4.1.5.1 The Cibola's 2021 Biological Opinion for Mexican Spotted Owl is legally flawed.

When FWS first listed the MSO as a threatened species in 1993, it identified two primary threats to the MSO's survival and recovery: (1) destruction and modification of habitat from timber management, and (2) the threat of these practices continuing as evidenced in existing national forest plans.[251] The danger of stand-replacing wildland fire was also cited as a threat at that time. *See* 2012 Recovery Plan at VI. FWS states that threats to MSO population "in the U.S. (but likely not in Mexico) have transitioned from commercial-based timber harvest to the risk of stand-replacing wildland fire."[252] Yet FWS has never modified its rule for listing the MSO through formal rulemaking. Thus, to achieve the Recovery Plan goal to recover MSO owl populations to the point that it can be removed from the ESA list of threatened species, FWS must, *inter alia*, manage the threats identified for listing the species. This includes threats from timber management activities as well as stand-replacing and uncharacteristic fire. As explained below, FWS fails largely ignores the threats from timber management activities in its analysis.

[249] *See, e.g., Center for Biological Diversity v. U.S. Bureau of Land Mgmt.*, 698 F.3d 1101, 1121 (9th Cir. 2012).

[250] *Pyramid Lake Paiute Tribe of Indians v. U.S. Dep't of Navy*, 898 F.2d 1410, 1415 (9th Cir. 1990). *See also Defenders of Wildlife v. EPA*, 420 F.3d 946, 976 (9th Cir. 2005) (rev'd on other grounds); *Wild Fish Conservancy v. Salazar*, 628 F.3d 513, 532 (9th Cir. 2010).

[251] 58 Fed. Reg. 14,248 (Mar. 16, 1993).

[252] 2021 BiOp at 19.

In 2004, FWS designated MSO critical habitat, including 8.6 million acres on Federal lands in Arizona, Colorado, New Mexico, and Utah.[253] MSO critical habitat only includes those areas within designated critical habitat boundaries that are defined as protected and restricted habitat. "Protected habitat" is defined as protected activity centers (PACs) and unoccupied steep slopes that have not had timber harvest in the last 20 years, and administratively reserved lands. "Restricted habitat" is all other mixed conifer, pine-oak, and riparian forests not falling within PACs or slopes greater than 40 percent. Under the 2012 Recovery Plan, unoccupied protected habitat and all restricted habitat are referred to cumulatively as "recovery habitat" (which includes unoccupied owl foraging, dispersal, and future nest and roost habitat). The 2012 Recovery Plan does not recognize administratively reserved land as automatically included as protected areas.

FWS's 2012 Recovery Plan lists 1,324 known owl sites in the United States.[254] The majority of MSO in the United States are found on National Forest System lands. Because MSO are largely limited to national forest lands in Forest Service Region 3, the protection of its populations and habitat on national forest lands in Region 3 is crucial to the continued survival and recovery of the species.

4.1.5.2 An Overview of MSO on the Cibola National Forest.

MSO are known to occur on the Cibola National Forest, including on the Mt. Taylor, Magdalena, Mountainair, and Sandia Ranger Districts.[255] There are currently 65 PACs across the Cibola National Forest encompassing about 40,070 acres of protected habitat.[256] Within this area, there is about 7,623 acres of nest/roost core habitat.[257] The MSO likely uses about 40 percent of the forest.[258] Given the MSO's struggle to survive much less recover, and the Cibola National Forest's role in providing important habitat for MSO survival and recovery, it is crucial that the Cibola Revised Plan's Biological Opinion include a robust analysis of the effects of the Revised Plan components on MSO and its critical habitat.

Unfortunately, the FWS's 2021 Biological Opinion that analyzes effects of the Revised Plan on MSO and its critical habitat is flawed for numerous reasons, including but not limited to: relying on the programmatic nature of the action to avoid a robust analysis of the Revised Plan's effects; ignoring best available science; failing to explain or justify inconsistencies with the 2012

[253] 69 Fed. Reg. 53,182 (Aug. 31, 2004).

[254] *See* U.S. Fish and Wildlife Service, 2012 Final Recovery Plan for the Mexican Spotted Owl (*Strix occidentalis lucida*), First Revision (hereafter, "2012 Recovery Plan"); 77 Fed. Reg. 74688 (Dec. 17, 2012).

[255] 2021 BiOp at 25.

[256] 2021 BiOp at 25.

[257] *Id.*

[258] *Id.*

Recovery Plan; failing to consider relevant factors; failing to explain changes in policy for MSO conservation and recovery; and providing a flawed no jeopardy determination.

4.1.5.3 Programmatic in nature.

FWS states the Revised Plan is simply a "framework programmatic action." and "does not authorize any future action(s)."[259] But elsewhere FWS states that "[t]he proposed action being analyzed in this opinion involves the *implementation of the management direction* provided in a revised LMP for the Forest's Mountain Ranger Districts."[260] Implementation of the Revised Plan will have very real direct and indirect effects.

FWS also notes that "the current LMP contains a greater emphasis on vegetation and watershed restoration."[261] To translate, "vegetation restoration" means the Revised Plan increases the active management of the forest. *See, e.g.*, 2021 BiOp at 11 ("The proposed action emphasizes accelerated restoration using mechanical treatments and wildfire to move toward vegetative desired conditions") and 13 ("The proposed action uses mechanical thinning, wildfire, and fuelwood collection to decrease risk from stand-replacing wildfire and to improve ecosystem function"). Simply because an action is programmatic in nature, it does not follow that the action will have no direct or indirect effects on a listed species or its critical habitat. The increased active timber management authorized by this Revised Plan is a very real direct and indirect threat to MSO and its critical habitat that the FWS fails to acknowledge.

And although FWS notes that site-specific actions will be subject to future ESA consultations, none of those piecemeal analyses will be able to capture the forest-wide perspective and approach to increase active timber management that is set forth in this Revised Plan. The Forest Service already ditched its approach of analyzing the impacts of all Region 3 forest plans on the MSO's survival and recovery, eliminating an otherwise useful way to assess the effects of Forest Service actions on MSO range-wide as opposed to piecemeal within each national forest's boundaries. As such, it is crucial that FWS in the very least acknowledge the very real, direct and indirect impacts the Revised Plan will have on MSO and its critical habitat within the Cibola National Forest—especially in terms of plan components that increase the level of vegetation management as compared to the previous forest plan's components.

4.1.5.4 The Biological Opinion ignores best available science.

A biological opinion must be based on "the best scientific and commercial data available."[262] But here there are numerous examples of where FWS fails to provide any scientific basis for its conclusions, much less consider, disclose, or analyze the best scientific and commercial data available. As just one example, FWS fails to incorporate and assess its own new information

[259] 2021 BiOp at 6.

[260] 2021 BiOp at 6 (emphasis added).

[261] *Id.* At 6.

[262] 16 U.S.C. § 1536(a)(2), (b)(3)(A).

regarding the MSO. This includes new estimates of habitat trends; annual maps of MSO forest habitat based on Landsat imager, climate data, topography, and known MSO nest and roost locations; and long-term trends in potential MSO forest habitat.[263]

FWS fails to provide any scientific basis for its conclusion that the Revised Plan components will provide long-term benefits to the MSO and its protected, recovery, and critical habitat.[264] FWS provides no rational basis for its conclusion that, in sum, implementation of the Revised Plan, including increased logging and prescribed burning and transportation access, will not jeopardize the continued existence of the owl, and will not destroy or adversely modify its designated critical habitat. FWS provides no basis for its assumptions that the Revised Plan will allow the forest to manage for owl recovery and implement the 2012 Recovery Plan; implementation of active timber management will improve forest condition and sustainability; and that the plan components will help minimize any short-term adverse effects over the long-term resulting in overall benefit to the MSO.[265] These bare conclusions lack any reference to best scientific information, much less a reasoned explanation. There is no substantial evidence for FWS's no jeopardy and no adverse modification determinations.

4.1.5.5 The Biological Opinion is inconsistent with the 2012 MSO Recovery Plan.

This 2021 Biological Opinion is inconsistent with the 2012 Recovery Plan. Aspects of the 2021 Biological Opinion itself are inconsistent with the 2012 Recovery Plan and FWS provides no explanation. As just one example, the 2012 Recovery Plan states that an increase in number of known owl sites is mainly a product of new owl surveys being completed within areas that had not previously been surveyed, and therefore an increase in abundance in the species range-wide cannot be inferred from these data. Basically, the PAC increase cannot lead to the inference of an increase in abundance. But in this 2021 Biological Opinion, FWS attempts to make just such an inference, stating: "[h]owever, we do assume that an increase in the number of areas considered to be occupied is a positive indicator regarding owl abundance."[266]

4.1.5.6 The Biological Opinion fails to consider relevant factors.

Throughout its analysis, FWS adopts the Forest Service's assumption that active forest management can, should, and will result in restoring historic ecological conditions. *See, e.g.*, 2021 BiOp at 30 ("Forest-wide OBJ (FW-OBJ-VEG-1) may be beneficial to the owl and critical habitat since it includes mechanically treating 750 to 3,500 acres . . . annually of highly departed forest habitat *which could lead* to improvements in PCEs found within critical habitat. Additionally, these sections include numerous STD (FW-STD-VEG 1-4) and GDL (FW-GDL-ID 1-2, FW-GDL-VEG 3, FW-GDL-SPC 1, FW-GDL-VEG 2, 5-6, 10) components that are also

[263] *See* The Living Map of MSO Forest Habitat, *available at* https://www.fs.usda.gov/detailfull/r3/plants-animals/wildlife?cid=FSEPRD890979&width=full (last accessed Oct. 26, 2021).

[264] *See, e.g.*, 2021 BiOp at 43-44.

[265] *See* 2021 BiOp at 43-44.

[266] 2021 BiOp at 19.

likely beneficial since they include specifications, constraints, or requirements promoting management for natural ecosystems and *may help reduce* consequences of the proposed action on the owl.") (emphasis added). These assumption ignore several key and relevant factors.

One key and relevant factor that FWS ignores in its analysis is climate change. Climate change and resulting changes in weather patterns such as drought and high winds may be the driving factor for stand-replacing wildfire. As FWS noted in its own 2012 Recovery Plan, "[t]he intensification of natural drought cycles and the ensuing stress placed upon forested habitats could result in even larger and more severe wildland fires in owl habitat."[267] Indeed, heavy forest management may be a futile exercise in attempting to restore conditions of the past instead of adapting to a new normal. By failing to even consider relevant factors, FWS glosses over and ignores effects of the Revised Plan on MSO and its critical habitat. This leads to a flawed no jeopardy determination.

Another key factor is that best available scientific and commercial data does not support FWS's and the Forest Service's assumptions. FWS ignores the possibility that active forest management may not be effective in reducing the threat of stand-replacing or uncharacteristic wildfire to MSO and its critical habitat. Simply because stand-replacing wildfire has become a major threat to the MSO's survival and recovery, it does not follow that timber management activities do not also threaten the survival and recovery of MSO. It is equally plausible that active timber management is an additive threat to MSO and its critical habitat, rather than a mitigating factor.

FWS assumes, without providing a scientific basis or explanation, that high severity fires are bad for MSO. It fails to disclose or consider studies finding that wildfire can be beneficial to MSO.[268] FWS assumes that increased logging and prescribed burning authorized under the Revised Plan components will reduce the likelihood of habitat loss from large wildland fires. This, despite the Forest Service's own data showing that southwestern forests have experienced larger and more severe wildland fires since 1995 despite active management, as compared to before 1995.

In the very least, FWS must acknowledge there is much uncertainty regarding thinning and burning treatment effects and the risks to owl habitat with or without forest treatment. It is unreasonable for FWS maintain these assumptions despite (1) Forest Service data that calls into question the efficacy of the Forest Service's own timber management practices in reducing stand-replacing wildfires; (2) the lack of any data showing long-term effects of wildland fire on the MSO populations; and (3) the lack of any Forest Service commitment in its Revised Plan or this 2021 Biological Opinion to conduct range-wide MSO population monitoring consistent with 2012 Recovery Plan protocol to test these assumptions.

[267] *See* 2012 Recovery Plan at VI.

[268] *See, e.g.*, 2011 Occupancy and Reproductive Success of Mexican Spotted Owls in the Chiricahua Mountains (studies from the Coronado National Forest showing that Mexican spotted owls can survive and reproduce in areas subjected to high-intensity fire); 2012 Occupancy and Reproductive Success of Mexican Spotted Owls in the Chiricahua Mountains (similar, noting PACs can produce exceptional numbers of owl young following severe burns, perhaps due to increasing rodent populations post-fire).

4.1.5.7 The Biological Opinion fails to explain change in position.

FWS fails to provide a rational explanation for numerous changes in its conclusions, policy, and approach to MSO conservation and recovery in the 2021 Biological Opinion. As just one example, the 2021 Biological Opinion does not quantify incidental take and does not appear to authorize incidental take[269] even though prior biological opinions for the similar agency action—implementation of the 1985 Cibola Forest Plan and its amendments—included incidental take statements.[270] The FWS itself notes that "[m]any aspects of program management are similar to when the Forest consulted on the previous LMP, so that documentation (consultation #02ENNM00-2012-F-0003; #02ENNM00-2012-F-0003-R001) serves as a partial basis for an effects determination, although the current LMP contains a greater emphasis on vegetation and watershed restoration."[271] Without an explanation for the change in approach, FWS lacks a reasoned basis for its determinations here.

4.1.5.8 The Biological Opinion issues a flawed no jeopardy determination.

A jeopardy analysis should consider, *inter alia*: (1) the status of the species, including its range-wide condition, factors responsible for that condition, and its survival and recovery needs; (2) the environmental baseline of the species or critical habitat; (3) effects of the action to the environmental baseline; and (4) cumulative effects to the environmental baseline.[272]

The 2012 Recovery Plan recognizes that both management and monitoring of the MSO and its habitat are key to the eventual recovery of the owl. Yet FWS fails to analyze the effect of the Revised Plan on the recovery of MSO. The 2021 Biological Opinion is based on a fictional Forest Service management approach to MSO conservation and recovery, and not the management approach that the Forest Service actually implements.

One blatant example is the lack of any forest-wide monitoring in the Revised Plan, as the 2012 Recovery Plan envisions.[273] Range-wide monitoring is necessary and crucial to track and demonstrate MSO population trends. FWS should revise the 2021 Biological Opinion to require, *inter alia*: protocol occupancy surveys prior to commencement of any ground-disturbing activities within Recovery Habitat; and require the Forest Service to use the most current version of the FWS MSO survey protocol in accordance with the Recovery Plan.

[269] It is unclear from the vague and ambiguous and somewhat conflicting language in the 2021 Biological Opinion whether this Take Statement is intended to authorize take incidental to the implementation of the Cibola Revised Plan.

[270] *See* 2021 BiOp at 45.

[271] 2021 BiOp at 6.

[272] *See, e.g.*, 50 C.F.R. § 402.14(g)(2) – (4).

[273] *See, e.g.*, Cibola Revised Plan at 169-183 *and* 2021 BiOp at 46 (listing as a conservation recommendation, but no requirement or commitment, "to work with the USFWS to conduct owl surveys over the next several years to determine how owls modify their territories in response to fuel treatments, forest restoration, and wildland fire").

FWS provides no explanation for why it would be inappropriate to include range-wide monitoring for the Cibola portion of the MSO's range as part of this consultation. Especially when there is no agency decision-making related to that level of geographic scope. On the other hand, FWS also recognizes that implementation of its 2012 Recovery Plan is not enforceable. Thus, by punting any range-wide monitoring to voluntary and purely discretionary efforts by the Forest Service, FWS arbitrarily creates a shell game in which the Forest Service will never be accountable to complete range-wide monitoring. Because this monitoring is essential to understanding population trends, by failing to analyze the effects of this end result, FWS ignores a key factor relevant to its jeopardy analysis.

For reasons including but not limited to those set forth above, FWS violated the ESA in preparing the 2021 Biological Opinion for the Cibola's Revised Plan, and the 2021 Biological Opinion is arbitrary, capricious, and contrary to the APA. 16 U.S.C. § 1536; 5 U.S.C. § 706(2)(A). FWS's determination that the Cibola's Revised Plan is not likely to jeopardize the continued existence of MSO, or destroy or adversely modify its designated critical habitat, is unsupported, arbitrary, and capricious.

4.2 Suggested Resolutions for Mexican Spotted Owl.

The Forest Service must modify the Revised Plan's components to ensure the Forest Service is committed to a blueprint for the forest that is consistent with the 2012 Recovery Plan for MSO and an approach that will provide for survival and recovery of the MSO, based on the best available scientific and commercial data available. In addition, FWS must revise the 2021 Biological Opinion accordingly. Until then, the Forest Service must refrain from issuing any decision regarding the Revised Plan unless and until the legal flaws identified above are resolved, including through additional Section 7 consultation with FWS.

The Forest Service must produce a Supplemental EIS and Revised Plan that does the following:

- Provide Standards and Guidelines to ensure that Recovery Criteria metrics (both occupancy rates and habitat conditions) are incorporated and followed in any forest management activities affecting the MSO.

- Incorporate the outcomes of the MSO Leadership Forum June 2020 Agreement as well as the October 2020 Stipulation Letter.

- Commit to ongoing owl population trend monitoring, including monitoring as a standard, or at least a guideline, with corresponding provisions within the monitoring plan.

- Do more to identify and protect owls; the Revised Plan needs to include, as a standard, direction to conduct protocol occupancy surveys prior to commencement of ground-disturbing activities within Recovery Habitat, along with direction to minimize harm and harassment to Mexican spotted owl individuals in project areas that reside outside of currently known PACs. The standard should direct that if surveys cannot be completed, the unit will assume owl presence within the project area not surveyed, plus a buffer of 0.50 miles. The specific buffer makes this component more appropriate as a standard, but

should the agency elect to incorporate it as a guideline, the buffer should still be included as a standard.

- Provide a framework to assess the effects of mechanical and prescribed fire treatments on the owl and its habitat in PACs outside of core areas.

- Provide a framework for tracking long-term trends in Mexican spotted owl PAC and Recovery Habitat on the forest, preferably as a standard with corresponding direction in the monitoring section of the Revised Plan, specifically providing direction that the Forest Service shall maintain the habitat trend information on an ongoing basis based upon the results of the most recent model inputs and analysis.

- Include standards or guidelines that provide better protections for old and large trees, canopy cover, and higher basal area in recovery habitat.

- Evaluate the full range of best available science on the effects of fire and logging on MSO and provide an effects analysis that recognizes the threats posed by logging and associated road construction.

- Commit to following the MSO Recovery Plan as a Standard, not a Guideline.

5 Grazing

5.1 Introduction and overview of grazing objections.

We strongly support riparian restoration as it is vital for the health of the environment and wildlife, especially when facing a hotter, more arid future resulting from climate change. But effective restoration will only occur if the Forest Service: (1) manages riparian area restoration projects in tandem with limits on livestock grazing, and correctly acknowledges it as the number one threat to riparian health; (2) reviews site-specific information about the nature of at-risk streams and the identifies specific projects meant to improve those streams; (3) provides management approaches as enforceable Standards or Guidelines, with robust monitoring requirements, and (4) utilizes the best available science to support and guide conservation and the Duty to Conserve. The Cibola's Revised Plan has failed to do any of these things in a meaningful way that will result in a different outcome than what has been the status quo for decades.

As is set out in more detail below, our objections are:

1. The Revised Plan violates NEPA by failing to consider and fully analyze all reasonable alternatives.

2. The Revised Plan violates NEPA by failing to take a "hard look" at the key issue of riparian restoration and how that is directly impeded by authorized and unauthorized grazing activities.

3. The Revised Plan violates NEPA as the Forest Service has shirked it's duty to conserve threatened and endangered wildlife and has ignored the best science that would guide the agency to achieve that legal obligation.

4. The Revised Plan violates ESA by utilizing a faulty riparian assessment methodology, therefore again shirking the agency's duty to conserve.

5. The Revised Plan violates NEPA as the Forest Service relies on a vaguely detailed 'adaptive management strategy.

As we have previously commented, we expect the Forest Service to acknowledge the inherent connection between grazing and riparian restoration, to meaningfully address the root cause of riparian impairment and degradation, and not ignore the chronic problem that is posed by ongoing prioritization of livestock encouraged by complicit federal land managers. Rather than acknowledge and analyze all connected and cumulative actions of the proposed action, the Cibola aims to increase public lands grazing in the midst of climate-fueled western megadrought, even when one of the primary focuses of the Revised Plan is riparian restoration. Moreover, the 2021 Revised Plan is coincidentally revised concurrently with the approval of a massive riparian restoration project, the Northern New Mexico Riparian Restoration Project, which was objected to by some organizations. Our stance is that meaningful restoration cannot occur in isolation from changes in permitted grazing.

As suggested in previous comments, we should no longer see a 'stand-alone' analysis of grazing. In this Revised Plan, the Cibola should rightly include meaningful project-level grazing guidance, as decisions made at project-level should be guided by the plan. We should see new and enforceable Standards and Guidelines in place to protect endangered riparian ecosystems into a hotter and dryer future. Such guidance is needed to provide enduring direction for sustainable use, and these must clearly confront the biodiversity and climate crises which are stated and known top Biden administration priorities.

Degradation of natural resources and declines in forage production on national forest lands are both predicted and observed.[274] However, the Revised Plan requires no assessment of whether inherent capacity of the land for permitted stocking rates has been and will continue to be reduced; offers no guidance for grazing management amid protracted periods of drought; and does not consider climate consequences for native vegetation, wildlife, or sustainability of livestock operations.[275] This head-in-the sand approach to climate changes is neither protective of public natural resources, nor supportive of needed changes in grazing operations.

Not only would improved programmatic direction and guidelines (complete with riparian grazing restrictions for example, as suggested in previous comments) provide immediate short-term ecological benefits, they would set a solid organizational foundation for long-term sustainability

[274] Hoglander, C. 2016. Change in Vegetation Productivity for Three National Forests in Utah, 1986-2011: Dixie, Fishlake, and Manti-La Sal National Forests. Analysis for Grand Canyon Trust. Flagstaff, AZ.

[275] Holechek, L., H.M.E. Geli, A.F. Cibils, and M.N. Sawalhah. 2020. Climate change, rangelands, and sustainability of ranching in the western United States. Sustainability. 12(12): 4942.

moving forward. We cannot accept a forest plan void of such ecosystem management goals, one that shrouds the root causes of riparian degradation in outdated grazing management. The inevitable result is kick-the-can approach with status quo results. There are forest plan standards for range and ecological condition, and these are directly related to grazing. The Cibola should make protecting and restoring riparian areas a measurable and enforceable priority in the forest plan's desired conditions, objectives, and future management direction.

Numerous systemic issues plague the way the Forest Service analyzes effects of forest management activities on riparian ecosystems, which has led to degradation, species loss, and subsequent litigation. These project-level issues can only be corrected if a coordinated effort is made by the Forest Service to address systemic flaws in analysis and disclosure. From our vantage, revised forest plans are the best way to provide the direction needed to ensure individual NEPA projects are planned, analyzed, and implemented in a manner that can avoid jeopardy. On the contrary, revised forest plans that remain vague and lack standards and guidelines that provide specific direction for management of riparian habitat, such as the Cibola's plan, will guarantee future legal challenges, delays, and associated costs. Thus, one simple way for the Cibola to better contribute to resolving this issue at the regional scale is to provide a plan component (a standard, guideline, or management approach) that expresses a commitment to conduct habitat monitoring within a conservation management framework and that relates it back to authorized grazing.

Federal lands comprise nearly half the area of the eleven western states.[276] Grazing has been the most widespread management practice on federal lands.[277] It is time for agencies to respond appropriately with improved grazing guidance and updated resource management philosophies to curb species loss during this global biodiversity crisis and extreme regional drought. 'Multiple use' no matter what the consequence has constantly proven to be a failed policy and to preclude environmental protection, let alone restoration. A paradigm shift in the way livestock is managed is required moving forward into a dryer, hotter, and climatically unstable future.

5.2 Our Objection: The Revised Plan violates NEPA by failing to consider a reasonable alternative of riparian exclusion.

In scoping comments, we requested the Cibola analyze an Alternative that provides at least some level of grazing restriction in riparian zones. Disappointingly however, the FEIS only analyzed two alternatives where permitted grazing is unchanged, and two (including the preferred Alternative) where permitted grazing is increased. We argue that considering a restricted grazing alternative is not only necessary but would be a legally, responsible decision from a managerial standpoint and one that supports the Forest Service's legal obligations and duty to conserve natural resources. Without discussing changes in permitted grazing, the Revised Plan fails to appropriately guide natural resource management activities on the Cibola for the next 10 to 15

[276] Vincent, C.H., L.A. Hanson, L.F. Bermejo. 2021. Federal Land Ownership: Overview and Data. Congressional Research Service. R42346. https://crsreports.congress.gov.

[277] Fleischner, T.L. 1994. Ecological costs of livestock grazing in western North America. Conservation Biology. 8: 629-644.

years and fails to address the needs for change in management direction according to the stated purpose and need of the Revised Plan.[278]

According to the Revised Plan,

> Historically closed allotments (such as those near the Cañón de Carnue and San Antonio de Las Huertas Land Grant communities on Sandia Ranger District and the Manzano, Torreón, Tajique, and Tomé Land Grant communities on the Mountainair Ranger District) should be considered for new grazing authorization to support rural historic community grazing allotments.[279]

According to the FEIS, "there would be a slight increase of proposed grazing allotments of 2 percent under alternative C (the preferred alternative), similarly to alternative B. This is due to the updated plan direction to consider reopening historically closed allotments specified as significant for traditional communal grazing uses during scoping."[280]

We strongly disagree with reopening historically closed allotments. There is not a justifiable need in 2021, during a climate-fueled western mega-drought, to expand public lands grazing. The best the Cibola offered in respect with our requests to restrict grazing moving forward, was the possibility of riparian exclusion through an ill-defined adaptive management procedure:

> The impacts of livestock grazing to riparian habitat at wetlands and springs would be analyzed in all new range projects on the Cibola. If substantial negative effects such as trampling, and over utilization of riparian vegetation, cannot be mitigated through grazing management practices (herding and grazing deferment when the areas are wet), then livestock exclosures may be necessary. These exclosure areas would likely not be available for forage but are not big enough to reduce stocking rates in a pasture. The use of water by livestock at these exclosures is mitigated with alternative water sources, including wells, or by providing lanes to the water, or piped to a livestock drinker.[281]

It can be argued that range allotment management plans that direct best management practices, adaptive management and site-specific mitigation to reduce direct grazing effects to riparian function have not been working, evident in the need to initiate a massive riparian restoration project that is happening concurrent with this updated forest plan for the Cibola, spanning an area of over 600,000 acres with an estimated 2,000 acres of riparian ecosystem. And much like this Plan, the restoration project does not deal with the root cause of riparian degradation, claiming it is outside the scope of the project.

Indeed, all plan alternatives are analyzed in the context of a guaranteed right to run cattle, which appears a foundational assumption in the Revised Plan. But the rationale for requesting an

[278] FEIS Vol. 1, p. 3.

[279] Revised Plan, p. 90.

[280] FEIS Vol. 1, p. 23

[281] FEIS, Vol. 1, p. 118.

Alternative that limits or prohibits riparian grazing is clear. Natural riparian and spring habitats make up <1% of the landscape, yet those habitats directly support a disproportionate level of species richness across a variety of taxonomic groups and commonly 2-3 orders of magnitude greater productivity than the surrounding arid uplands.[282, 283] Despite being keystone ecosystems, riparian zones are considered one of the most endangered ecosystems in the Southwest.[284] Because riparian zones provide water, shade, and succulent vegetation, livestock grazing is a primary cause of stream and riparian habitat degradation in the western United States and continues to exert pervasive adverse influences on springs and other riparian habitats.[285, 286] Because of their biological importance, increasingly threatened status, and potential for offering resilience to protect biodiversity, protection and restoration of riparian ecosystems should become a high priority for federal agencies.[287, 288]

Cattle should be removed from any riparian system that is not fully ecologically functional. Grazing should be required to be short-term, cool season use only. Grazing should be excluded entirely from some areas depending on stream conditions or the designation of critical habitat; the standard should be 'no grazing' in protected habitat. Long term riparian degradation must no longer be allowed for new agency directives to be congruent with the Biden administration's stated climate and biodiversity priorities.

Livestock exclusion has shown to be the most practical approach for initiating rapid riparian recovery or improving highly sensitive areas, and it works.[289] There is ample scientific record

[282] Stevens, L.E., A. Jones, P. Stacey, D. Duff, C. Gourley, and J.C. Catlin. 2002. Riparian ecosystem evaluation: a review and test of BLM's proper functioning condition assessment guidelines. Technical Report submitted to the National Riparian Service Team. U.S. Department of the Interior.

[283] Soykan, C.U., L.A. Brand, and J.L. Sabo. 2009. Causes and consequences of mammal species richness. Ecology and Conservation of the Upper San Pedro Riparian Ecosystem. University of Arizona Press. Tucson, AZ. pp. 107-126.

[284] Noss, R.F., and J.M. Scott. 1995. Endangered ecosystems of the United States: a preliminary assessment of loss and degradation. https://www.researchgate.net/profile/Reed-Noss/publication/246063035_Endangered_ecosystems_of_the_United_States_A_preliminary_assessment_of_loss_and_degradation/links/0deec5389ecd1092a8000000/Endangered-eco-systems-of-the-United-States-A-preliminary-assessment-of-loss-and-degradation.pdf.

[285] Fleischner, T.L. 1994. Ecological costs of livestock grazing in western North America. Conservation Biology. 8: 629-644.

[286] Fleischner, T.L., 2010. Livestock grazing and wildlife conservation in the American West: historical, policy and conservation biology perspectives. Wild Rangelands: Conserving Wildlife While Maintain Livestock in Semi-Arid Ecosystems, 1st edition. J.T. du Toit, R. Kocki and J.C. Deutsch (eds.) Blackwell Publishing. pp. 235-265.

[287] Belsky, A.J., A. Matzke, and S. Uselman. 1999. Survey of livestock influences on stream and riparian ecosystems in the western United States. Journal of Soil and Water Conservation. 54(1): 419-431.

[288] Roper, B.B., J.M. Capurso, Y. Paroz, and M.K. Young. 2018. Conservation of aquatic biodiversity in the context of multiple-use management on National Forest System lands. Fisheries. 43(9): 396-405.

[289] Grudzinski, B., K. Fritz, and W. Dodds. 2020. Does riparian fencing protect stream water quality in cattle-grazed lands? Environmental Management. 66(1): 121-135.

showing that livestock exclusion results in improvements to riparian areas.[290, 291, 292, 293, 294] Cessation of livestock grazing in riparian areas can increase the abundance of small mammals that require dense vegetation.[295] The substantial increase of plant cover that followed the removal of livestock from southwestern riparian areas quickly increases abundance and diversity of invertebrates, herpetofauna, birds, and small mammals.[296, 297, 298, 299]

CEQ regulations which apply to all NEPA documents, and not just EISs, require that agencies "to the fullest extent possible . . . [i]mplement procedures . . . to emphasize real environmental issues and alternatives" and to "use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment."[300]

For decades, the Ninth Circuit and district courts therein have explicitly held that the alternatives requirement applies equally to EAs and EISs. "Any proposed federal action involving . . . the

[290] Strong, T.R., and C.E. Bock. 1990. Bird species distribution patterns in riparian habitats in southeastern Arizona. The Condor. 92(4): 866-885.

[291] Hayward, B., E.J. Heske, and C.W. Painter. 1997. Effects of livestock grazing on small mammals at a desert cienaga. The Journal of Wildlife Management. 123-129.

[292] Krueper, D., J. Bart, and T.D. Rich. 2003. Response of vegetation and breeding birds to the removal of cattle on the San Pedro River, Arizona (USA). Conservation Biology. 17(2): 607-615.

[293] Wyman, S., D. Bailey, M. Borman, S. Cote, J. Eisner, W. Elmore, B. Leinard, S. Leonard, F. Reed, S. Swanson, L. Van Riper, T. Westfall, R. Wiley, and A. Winward. 2006. Riparian area management: Grazing management processes and strategies for riparian-wetland areas. Technical Reference 1737-20. BLM/ST/ST-06/002+1737. U.S. Department of the Interior, Bureau of Land Management, National Science and Technology Center. Denver, CO. 105 pp.

[294] Grudzinski, B., K. Fritz, and W. Dodds. 2020. Does riparian fencing protect stream water quality in cattle-grazed lands? Environmental Management. 66(1): 121-135.

[295] Soykan, C.U., L.A. Brand, and J.L. Sabo. 2009. Causes and consequences of mammal species richness. Ecology and Conservation of the Upper San Pedro Riparian Ecosystem. University of Arizona Press. Tucson, AZ. pp. 107-126.

[296] Duncan, D.K., 1988. Small mammal inventory of the upper San Pedro River Valley, Cochise County, Arizona: Progress report. San Pedro Project Office, San Simon Resource Area, Safford District, Bureau of Land Management.

[297] Fleischner, T.L. 1994. Ecological costs of livestock grazing in western North America. Conservation Biology. 8: 629-644.

[298] Soykan et al. 2009.

[299] Grudzinski et al. 2020.

[300] 40 C.F.R. § 1500.2(b), (e).

proper use of resources triggers NEPA's consideration of alternatives requirement, whether or not an EIS is also required."[301] Other courts agree.[302]

NEPA requires that federal agencies consider alternatives to recommended actions whenever those actions "involve[] unresolved conflicts concerning alternative uses of available resources."[303] "NEPA's requirement that alternatives be studied, developed, and described both guides the substance of the environmental decisionmaking and provides evidence that the mandated decisionmaking process has actually taken place."[304]

In taking the "hard look" at impacts that NEPA requires, an EA must "study, develop, and describe" reasonable alternatives to the proposed action.[305] CEQ regulations explicitly mandate that an EA "[s]hall include brief discussions . . . of alternatives."[306] The purpose of the multiple alternative analysis requirement is to insist that no major federal project be undertaken without intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means.[307]

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[301] *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1229 (9th Cir. 1988), cert denied, 489 U.S. 1066 (1988). *See also W. Watersheds Project v. Abbey*, 719 F.3d 1035, 1050 (9th Cir. 2013) (in preparing EA, "an agency must still give full and meaningful consideration to *all* reasonable alternatives" (emphasis added) (internal quotation and citation omitted)); *Te-Moak Tribe v. Interior*, 608 F.3d 592, 601-602 (9th Cir. 2010) ("Agencies are required to consider alternatives in both EISs and EAs and must give full and meaningful consideration to all reasonable alternatives."); *Native Ecosystems Council v. U.S. Forest Service*, 428 F.3d 1233, 1245 (9th Cir. 2005) ("alternatives provision" of 42 U.S.C. § 4332(2)(E) applies whether an agency is preparing an EIS or an EA and requires the agency to give full and meaningful consideration to all reasonable alternatives); *Gifford Pinchot Task Force v. Perez*, 2014 U.S. Dist. Lexis 90631, No. 03:13-cv-00810-HZ (D. Or. July 3, 2014) (finding agency failed to consider range of reasonable alternatives in an EA); *Envtl. Prot. Info. Ctr. v. Blackwell*, 389 F. Supp. 2d 1174, 1199 (N.D. Cal. 2004) (stating that "an EA must consider a reasonable range of alternatives"); *Or. Natural Desert Ass'n v. Singleton*, 47 F. Supp. 2d 1182, (D. Or. 1998) ("The requirement of considering a reasonable range of alternatives applies to an EA as well as an EIS" (citing 40 C.F.R. § 1508.9(b)).

[302] *See Davis v. Mineta*, 302 F.3d 1104, 1120 (10th Cir. 2002) (granting injunction where EA failed to consider reasonable alternatives); *Diné Citizens Against Ruining Our Env't v. Klein*, 747 F. Supp. 2d 1234, 1254 (D. Colo. 2010) (alternatives analysis "is at the heart of the NEPA process, and is 'operative even if the agency finds no significant environmental impact.'" (quoting *Greater Yellowstone Coal. v. Flowers*, 359 F.3d 1257, 1277 (10th Cir. 2004)).

[303] 42 U.S.C. § 4332(2)(E). *See also* 40 C.F.R. § 1501.2(c) (agencies must "study, develop, and describe appropriate alternatives to the recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources as provided by section 102(2)(E) of the Act.").

[304] *Bob Marshall Alliance*, 852 F.2d at 1228 (citation omitted).

[305] 42 U.S.C. § 4332(2)(C) & (E).

[306] 40 C.F.R. § 1508.9(b).

[307] *Environmental Defense Fund v. Corps of Engineers*, 492 F.2d 1123, 1135 (5th Cir. 1974); *Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810 (9th Cir. 1987), *rev'd on other grounds*, 490 U.S. 332 (1989) (agency must consider alternative sites for a project).

Reasonable alternatives must be analyzed for an EA even where a FONSI is issued because "nonsignificant impact does not equal no impact. Thus, if an even less harmful alternative is feasible, it ought to be considered."[308] When an agency considers reasonable alternatives, it "ensures that it has considered all possible approaches to, and potential environmental impacts of, a particular project; as a result, NEPA ensures that the most intelligent, optimally beneficial decision will ultimately be made."[309]

The agency's obligation to consider reasonable alternatives applies to citizen-proposed alternatives.[310] "In respect to alternatives, an agency must on its own initiative study all alternatives that appear reasonable and appropriate for study at the time, and must also look into other significant alternatives that are called to its attention by other agencies, or by the public during the comment period afforded for that purpose."[311]

Courts hold that an alternative may not be disregarded merely because it does not offer a complete solution to the problem.[312] 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."[313] 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."[314]

Further, courts reviewing EAs have consistently found them lacking where there existed feasible mid-range or reduced-impact alternatives failing between the extremes of granting in full or denying in full the proposed action, but the agency opted not to analyze them in detail.[315]

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[308] *Ayers v. Espy*, 873 F. Supp. 455, 473 (D. Colo. 1994) (internal citation omitted).

[309] *Wilderness Soc'y v. Wisely*, 524 F. Supp. 2d 1285, 1309 (D. Colo. 2007) (quotations & citation omitted).

[310] *See 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).

[311] *Dubois v. U.S. Dept. of Agric*., 102 F.3d 1273, 1291 (1st Cir. 1996) (quoting *Seacoast Anti-Pollution League v. Nuclear Regulatory Comm'n*, 598 F.2d 1221, 1230 (1st Cir. 1979).

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

[313] *Town of Matthews v. U.S. Dep't. of Transp.*, 527 F. Supp. 1055 (W.D. N.C. 1981). *See also Citizens Against Toxic Sprays v. Bergland*, 428 F. Supp. 908, 933 (D. Or. 1977) ("An alternative may not be disregarded merely because it does not offer a complete solution to the problem.").

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

[315] *See, e.g., W. Watersheds Project v. Abbey*, 719 F.3d at 1050 (finding EA arbitrary and capricious where it failed to consider "reduced-grazing" alternatives); *Pac. Coast Fed'n of Fishermen's Ass'ns v. Dep't of Interior*, 655 F. App'x 595, 599 (9th Cir. 2016) (holding that agency's "decision [in EA] not to give full and meaningful

The courts also require that an agency adequately and explicitly explain in the EA any decision to eliminate an alternative from further study.[316]

As specifically stated in previous comments, livestock grazing in New Mexico is associated with negative effects on riparian vegetation composition and structure, increased siltation, effects to stream hydrology and water quality, reduced soil permeability, increased soil compaction, and diminished wildlife habitat quality.[317] Indeed, the Cibola admits that livestock grazing "can impact different species in different ways. The more relevant impacts for at-risk species assessed in this document include direct impacts to at-risk plant species from browsing and trampling, increased erosion, changes in plant species composition, reduction of stubble height, woody recruitment and herbaceous ground cover, and disease transmission (domestic sheep and bighorn sheep). Overgrazing has been a significant historical factor in the modification and loss of riparian habitat in particular, in the west."[318] These impacts are widely documented in several decades of scientific literature, and summarized well in Fleischner (1994[319]), Gifford and Hawkins (1978[320]), Krueper (1995[321]), and Kauffman and Krueger (1984[322]).

consideration to the alternative of a reduction in maximum interim contract water quantities was an abuse of discretion, and the agency did not adequately explain why it eliminated this alternative from detailed study"); *Wild Fish Conservancy v. Nat'l Park Serv.*, 8 F. Supp. 3d 1289, 1300 (W.D. Wash. 2014) (finding agency's EA deficient because the "conclusion that there is not a meaningful difference, or viable alternative, between 0% and 90% [of fish survival] [was] suspect"), aff'd, 687 F. App'x 554 (9th Cir. 2017); *Native Fish Soc'y v. Nat'l Marine Fisheries Serv.*, 992 F. Supp. 2d 1095, 1110, (D. Or. 2014) (holding that agency "erred in failing to consider a reasonable range of alternatives" in EA, and finding that "[g]iven the obvious difference between the release of approximately 1,000,000 smolts and zero smolts, it is not clear why it would not be meaningful to analyze a number somewhere in the middle").

[316] *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*, 873 F. Supp. at 468, 473.

[317] New Mexico Department of Game and Fish. 2006. Comprehensive Wildlife Conservation Strategy for New Mexico. New Mexico Department of Game and Fish. Santa Fe, New Mexico. 526 pp + appendices.

[318] FEIS Vol. 1, p. 302.

[319] Fleischner, T.L. 1994. Ecological costs of livestock grazing in western North America. *Conservation Biology* 8(3): 629-644.

[320] Gifford G.F., R.H. Hawkins. 1978. Hydrologic Impact of Grazing on Infiltration: A Critical Review. *Water Resources Research* 14(2): 305-313.

[321] Krueper, D.J. 1995. Effects of livestock management on Southwestern riparian ecosystems. In Shaw, D.W. and D.M. Finch, tech coords. 1996. Desired future conditions for Southwestern riparian ecosystems: Bringing interests and concerns together. 1995 Sept. 18-22, 1995; Albuquerque, NM. General Technical Report RM-GTR-272. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 359 p.

[322] Kauffman, J.B., and W.C. Krueger. 1984. Livestock impacts on riparian ecosystems and streamside management implications…a review. *Journal of Range Management* 37(5): 430-438.

The Revised Plan has an inherent inability to fulfill the purpose and need for riparian restoration if cattle are continually permitted to degrade riparian areas. In order to remove ecological stressors in the form of non-native livestock, we support the installment of additional and extensive livestock exclosures in riparian corridors. This is a vital component of riparian restoration that the best available science supports. Any alternative that is unreasonably excluded will invalidate the NEPA analysis. "The existence of a viable but unexamined alternative renders an EA inadequate."[323]

Current management strategies also need to incorporate climate change impacts and focus on minimizing existing stressors in order to protect freshwater ecosystem integrity and biota.[324] In sensitive aquatic ecosystems such as high-elevation meadows commonly used to graze cattle, measures should be taken to reduce the stressors that further accentuate the impacts of climate change.[325] [326] There is also mounting evidence that protecting pristine ecosystems might be both the least expensive and most effective defense against climate change.[327]

Because of the impacts of domestic livestock grazing on riparian, aquatic, wetland, and watershed ecosystems, and because the continuance of domestic livestock grazing exacerbates ongoing stressors such as drought, climate change, recreation pressure, and invasive species, the Center previously proposed a reasonable alternative for comparison. That alternative was simple and would meet the project purpose and need: "We request an alternative is analyzed that includes the currently proposed restoration interventions, plus 1) the closure of all riparian, aquatic, and wetland ecosystems to all domestic livestock grazing, and 2) a reduction in upland livestock stocking levels to reduce erosion and pollution of riparian systems where that is identified as a problem."

While ignoring such an alternative, the Revised Plan provides no solution to ecosystem stressors and instead focuses on undisclosed, band-aid mitigation strategies to patch damages without changing the very land use strategies that created the current state of degraded riparian ecosystems across the Cibola National Forest. The strategy as described in the Revised Plan is inadequate and destined to fail in the long term without addressing livestock impacts to riparian areas. Indeed, peer-reviewed strategies to restore riparian systems have generally found little evidence that restoration techniques are effective or sustainable over a period of decades,

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[323] *Western Watersheds v. Abbey*, 719 F.3d. at 1050; *see also Diné Citizens Against Ruining Our Env't*, 747 F. Supp. 2d at 1256 ("The existence of a viable but unexamined alternative renders an alternatives analysis, and the EA which relies upon it, inadequate.").

[324] Ficke, A.D., Myrick, C.A. and Hansen, L.J., 2007. Potential impacts of global climate change on freshwater fisheries. *Reviews in Fish Biology and Fisheries*, *17*(4), pp.581-613.

[325] Heller, N.E. and Zavaleta, E.S., 2009. Biodiversity management in the face of climate change: a review of 22 years of recommendations. *Biological conservation*, *142*(1), pp.14-32.

[326] Beschta, R.L., Donahue, D.L., DellaSala, D.A., Rhodes, J.J., Karr, J.R., O'Brien, M.H., Fleischner, T.L. and Williams, C.D., 2013. Adapting to climate change on western public lands: addressing the ecological effects of domestic, wild, and feral ungulates. *Environmental Management*, *51*(2), pp.474-491.

[327] Martin, T.G. and Watson, J.E., 2016. Intact ecosystems provide best defence against climate change. *Nature Climate Change*, *6*(2), pp.122-124.

especially when the original stressors are not removed.[328] Negative impacts of unremitting grazing by cattle and horses on the landscape cannot be mitigated by installing hundreds of structures into the stream, (as is planned in the concurrent riparian restoration project for the Cibola), in fact the scientific literature suggests that such an approach could make ecological conditions even worse.[329]

5.3 Suggested Resolution for Grazing Objection 1.

In a Supplemental EIS, analyze a reduced riparian grazing alternative, which better supports stated plan goals and the legal Duty to Conserve. The Forest Service must analyze a range of alternatives with great emphasis and reliance on livestock exclusion to achieve project goals than does the FEIS in its current form. This strategy is supported by science yet actively avoided by the Forest Service, even though it couldn't be negated entirely due to connectedness. "Riparian habitat, including seeps and springs, perennial streams and wetlands and other water features, occupies a very small portion of the Cibola and is highly departed."[330] This is all the more reason to protect and restore what riparian exists on the Cibola.

This alternative was requested during scoping, but has been ignored, thus violating NEPA.

The FEIS should have analyzed an Alternative that prohibits grazing in places where restoration activities are occurring (which are still unspecified). The exclusion of cattle should logically accompany every instance of restorative effort. This is the first and simplest step to recover riparian vegetation and structure. Such an alternative would simplify management by reducing the potential for ecosystem damage, wildlife conflicts, it would simplify monitoring, and would allow more movement towards stated desired conditions. If management is unwilling to sufficiently change the grazing system that has resulted in current conditions, restoration is destined to fail in the long term.[331]

The presence of unique and protected riparian species should preclude stream reaches from grazing to address and mitigate the worsening biodiversity and climate crises. In Region 3, expansive destruction of riparian critical habitat reflects the fact that the range management program has failed and that the threatened, endangered & sensitive species programs exist in name only.[332] Virtually no T&E species and critical habitat protection occurs in this region

[328] Opperman, J.J. and Merenlender, A.M., 2004. The effectiveness of riparian restoration for improving instream fish habitat in four hardwood-dominated California streams. North American Journal of Fisheries Management, 24(3), pp.822-834. (Opperman and Merenlender 2004)

[329] Stewart et al. 2009. Effectiveness of engineered in-stream structure mitigation measures to increase salmonid abundance: a systematic review Ecological Applications, 19(4), 2009, pp. 931–941.

[330] FEIS Vol. 1, p. 339.

[331] Opperman and Merenlender 2004.

[332] Trudeau, J. 2020. Ravaged River: Cattle Damage to Endangered Species Habitat in Arizona's Verde River Watershed. Report. Center for Biological Diversity. 39 pp.

unless forced by litigation or by resulting Court order.[333, 334] Revitalizing Forest Service management at the programmatic level, especially in the face of worsening drought and climate changes, represents a grand opportunity to shift this unfortunate and unacceptable litigatory cycle.

Actions that harm or delay riparian function and recovery should be completely disallowed at the programmatic level moving forward. A list of such actions, with abundant relevant citations, is taken from Swanson et al. 2015[335] and is presented here:

Table 1. Comparison of riparian grazing management strategies related to duration and timing of use and recovery periods that often preclude or support riparian function and recovery.

Often Precluding Riparian Functions and Recovery	Supporting Riparian Functions and Allowing Recovery
Long Season of Use – Plants experience repeated defoliation throughout season Platts, 1991; Clary et al., 1996; Saunders & Fausch, 2007; George et al., 2011; Raymond & Vondracek, 2011.	**Short Grazing Period** – Grazed plants are not re-grazed Myers, 1989; Glimp & Swanson, 1994; Lyons et al., 2000; Lucas et al., 2004; Magner et al., 2008; Saunders & Fausch, 2007; Saunders & Fausch, 2007, 2012; Raymond & Vondracek, 2011; Dalldorf et al., 2013.
Little Time for Recovery – Plants without time to regrow before next grazing event Myers, 1989; Fitch and Adams, 1998; Jansen & Robertson, 2001; Lucas et al., 2004; Saunders & Fausch, 2007, 2012; Dalldorf et al., 2013; Kamp et al., 2013.	**Long Recovery Periods** – All plants recover before subsequent grazing event Myers, 1989; Fitch and Adams, 1998; Lyons et al., 2000; Jansen & Robertson, 2001; Lucas et al., 2004; Magner et al., 2008; Saunders & Fausch, 2007, 2012; Dalldorf et al., 2013; Kamp et al. 2013.
Late Season Use – Little time to regrow or amass residual stubble before dormancy Green & Kauffman, 1995; Parsons et al., 2003.	**Regrowth Before Winter** – Vegetation grows and provides residual to protect streambank at high water in spring Myers, 1989; Boyd and Svejcar, 2004.
Consistent Season of Use – Use repeated in the same phenological stage year after year	**Vary Season from Year to Year** – Grazing different seasons or phenology stages every year

[333] Greenwald, D.N., K.F. Suckling, and M. Taylor. 2006. The listing record. The Endangered Species Act at Thirty: Renewing the Conservation Commitment. Island Press. Washington, DC. pp. 51-67.

[334] Nie, M., 2008. The underappreciated role of regulatory enforcement in natural resource conservation. Policy Sciences. 41(2): 139-164.

[335] Swanson, S.R., Wyman, S. and Evans, C., 2015. Practical grazing management to meet riparian objectives. Journal of Rangeland Applications, 2, pp.1-28.

Gillen et al., 1985; Myers, 1989; Masters et al., 1996a, 1996b; Wyman et al., 2006; Schwarte et al., 2011; Boyd & Svejcar, 2012; Dalldorf et al., 2013.	Gillen et al., 1985; Myers, 1989; Masters et al., 1996a, 1996b; Wyman et al., 2006; Schwarte et al., 2011; Boyd & Svejcar, 2012; Dalldorf et al., 2013;
Repeated Growing Season Use – Grazing every year without rest Platts, 1991; Masters et al., 1996b.	**Occasional Growing Season Rest** – Opportunity for plants to regrow leaves and roots Platts, 1991; Masters et al., 1996a, 1996b.
No Woody Recovery – Woody plants stay short and within height accessible to herbivores Kovalchik & Elmore, 1992.	**Woody Plants Allowed to Grow** – Woody plants grow above grazing height Platts, 1991.
Large Pasture – Lacking riparian objectives Platts, 1991; Masters et al., 1996a, 1996b; Fitch and Adams, 1998; Lucas et al., 2004; Wyman et al., 2006.	**Riparian Pasture** – With riparian objectives Platts, 1991; Masters et al., 1996a, 1996b; Lucas et al., 2004; Wyman et al., 2006.

Table 2. Comparison of riparian grazing management tools and strategies addressing distribution and intensity of riparian use. Strategies that preclude riparian function and recovery are compared to those that generally support riparian function and allow recovery.

Often Precluding Riparian Functions and Recovery	Supporting Riparian Functions and Allowing Recovery
Hot or Dry Growing Season Use – Greener vegetation attracts more grazing use in riparian area Parsons et al., 2003; DelCurto et al., 2005; George et al., 2011.	**Cool or Warm Season Use** – Upland vegetation and warmer temperatures attract livestock to uplands Knopf et al., 1988; Myers, 1989; Platts, 1991; Clary et al., 1996; Masters et al., 1996a, 1996b; Lucas et al., 2004; Saunders & Fausch, 2007; George et al., 2011; Raymond & Vondracek, 2011; Booth et al., 2012.
Season-Long Use – Entire growing season access to riparian area so plants frequently experience herbivory Knopf et al., 1988; Platts, 1991; Saunders & Fausch, 2012.	**Graze Early in Season** – While uplands are attractive and riparian plants have ample time for recovery Clary, 1999; Parsons et al., 2003; Crawford et al., 2004; Evans et al., 2004; Pelster et al., 2004; DelCurto et al., 2005; McInnis & McIver, 2009.
Sustained Heavy Use– Inadequate leaf area depletes carbohydrate reserves Clary et al., 1996; Platts, 1991; DelCurto et al., 2005; Jeffress & Roush, 2010; Teuber et al., 2013.	**Moderate to Light Intensity** – Plants maintain leaf area to sustain carbohydrate reserves and growing points Marlow & Pogacnik, 1986; Clary, 1999; Jansen & Robertson, 2001; Crawford et al., 2004; Lucas et al., 2004; Pelster et al., 2004; Jones et al., 2011; George et al., 2011; McIlroy and Allen-Diaz, 2012; Teuber et al., 2013; Freitas et al. 2014;

In response to new climatic conditions, actions that support riparian function and allow for recovery should be required at the programmatic level across the board. Only such priorities can be considered congruent with the Biden administration and its prioritization of addressing severe climate predictions, the biodiversity crisis, and using science to inform management decisions with these crises in mind. No grazing management strategy that knowingly precludes riparian recovery should be allowed moving forward and no additional grazing should also not be added to the system. The fact that grazing is not discussed in comparable contexts speaks to the enshrinement of poor grazing management and of agency hesitancy and timidity to address an elephant in the room. We disagree that cattle grazing should be enshrined as a traditional land use, it is more accurate to describe it as a colonial practice that became commercial/industrial. The 1985 plan did not recognize livestock grazing as an important use to be continued on the Cibola,[336] and actually aimed to reduce the level of livestock grazing in the Forest.[337] Since then,

[336] FEIS Vol. 1, p. 4.

[337] FEIS Vol. 1, p. 18.

riparian habitat and livestock forage have declined dramatically in quality over the last 36 years due to livestock grazing. From our vantage, to increase grazing now is backward progress. The Cibola states that its ability to even provide a sustainable recreation program is at risk,[338] so how is this not true for livestock grazing as well? Instead, enshrinement of grazing is one of the primary stated purposes of the plan renewal from the 1985 iteration: "The 1985 plan does not address issues such as recognizing livestock grazing and fuelwood gathering as important uses to be continued on the Cibola."[339]

The bottom line is that riparian ecosystems and associated flora and fauna fare better without the crippling pressure of grazing domestic stock, especially in the face of an historically unprecedented, climate change-driven "exceptional drought"[340] which we are currently experiencing in the Southwest. Livestock exclusion should be the prominent strategy when restoration is the priority, as is stated in the FEIS. We have entered an era where ecological restoration must be prioritized. We must adapt to these conditions with the way water and wetland resources are managed and protected.

Although southwestern stream ecosystems have been greatly altered, these systems are ecologically resilient and are likely to respond positively to improved management and restoration practices, the simplest being to curb poorly managed gazing practices.[341, 342, 343,344] Management moving forward should not further contribute to downward trends of native and protected wildlife. The Revised Plan should call for expanding the use of riparian exclosures as a restoration tool and analyze an Alternative that focuses primarily on cattle exclusion to achieve riparian restoration. The Revised Plan should describe how authorized grazing activities and schedules will be adjusted to be compatible with the instream improvements in order to fulfill the purpose and need of this Revised Plan and to ensure that restoration efforts will not be used solely for promoting more grazing, eventually resulting in further environmental degradation. Status quo grazing practices will continue to have negative environmental impacts.

[338] FEIS Vol. 1, p. 4.

[339] FEIS Vol. 1, p. 4.

[340] NOAA 2021. United States Drought Monitor. https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx.

[341] Hayward, B., E.J. Heske, and C.W. Painter. 1997. Effects of livestock grazing on small mammals at a desert cienaga. The Journal of Wildlife Management. 123-129.

[342] Phillips, F., 1998. The'Ahakhav Tribal Preserve: Colorado River Indian Tribes initiate a major riparian restoration program. Restoration and Management Notes. 16(2): 140-148.

[343] Giuliano, W.M., and J.D. Homyack. 2004. Short-term grazing exclusion effects on riparian small mammal communities. Rangeland Ecology and Management. 57(4): 346-350.

[344] Hough-Snee, N., B.B. Roper, J.M. Wheaton, P. and R.L. Lokteff. 2013. Riparian vegetation communities change rapidly following passive restoration at a northern Utah stream. Ecological Engineering. 58: 371-377.

5.4 Our Objection: The FEIS fails to take a 'hard look' at riparian restoration.

The Forest Service explicitly that the need for the updating the Revised Plan includes to "provide updated plan direction for the protection, maintenance, and restoration of riparian vegetation and channel morphology in the plan area and for restoration of priority watersheds."[345] In terms of current riparian conditions, the FEIS clearly states "riparian habitat, including seeps and springs, perennial streams and wetlands and other water features, occupies a very small portion of the Cibola and is highly departed."[346]

Despite these stated needs, the Revised Plan and FEIS completely ignore any possible adverse impacts that grazing management can have on riparian resources, rendering the 'hard look' requirements under NEPA entirely deficient. If livestock grazing is not excluded from riparian areas, wetlands, and aquatic ecosystems in during and following restoration projects, the proposed action is unlikely to achieve any level of restoration success, denying our public lands of the ecological integrity and resilience they need to endure increasingly stressful conditions driven by climate change.

In reference to the second grazing guideline in the Revised Plan, the Cibola NF states "Livestock grazing within riparian management zones should be managed to sustain proper stream channel morphology, floodplain function, and riparian vegetation desired conditions" [347] We commend and support this guideline, but many allotments of The Magdalena Ranger District, unlike other areas of the country, are grazed yearlong.[348] And since 2006, the number of authorized livestock has averaged about 85 percent of the number permitted due to drought-related issues such as reduced forage production or lack of livestock water.[349] This number is very high, especially when sustained year-round.

The Cibola's very first stated standard, FW-DC-WRF, states: "Livestock management shall be compatible with capacity and address ecological concerns (such as forage, invasive plants, at-risk species, soils, riparian health, and water quality) that are departed from desired conditions, as determined by temporally and spatially appropriate data."[350] This is not compatible with current stocking rates and yearlong grazing as seen in the Cibola.

The Cibola's stated objectives for watershed conditions, i.e., "annually improve water resources features (for example, riparian areas, springs, streams) or soils", would require using the best available science to address ecological concerns and can in no way be achieved with practices such as yearlong grazing at 85% stocking. The Cibola must consider the best available

[345] Revised Plan, p. 9.

[346] FEIS Vol. 1, p. 339.

[347] Revised Plan, p. 90.

[348] Revised Plan, p. 5.

[349] Revised Plan, p. 89.

[350] Revised Plan, p. 90.

conservation science to achieve that objective. The best applicable science does not indicate in any manner that yearlong grazing is the way to promote riparian resources.

Further, the only stated objective for grazing in the 2021 plan is to "remove, improve, or reconstruct at least 15 to 20 improvements annually (such as fences, water developments, and cattle guards) that are no longer necessary or in poor condition, or to move toward desired conditions."[351] That this is the only objective for permitted grazing to help restore departed riparian conditions is testament that no 'hard look' analysis took place.

What is particularly worrisome in terms of riparian restoration moving forward is the enshrinement of grazing public lands and the increase of AUMs under the preferred Alternative. Presumably, the riparian restoration components and objectives noted in the Forest Plan hinge on another massive project- the Northern New Mexico Riparian Restoration Project- to which the Center for Biological Diversity has also objected on the grounds that it too refuses to meaningfully address grazing management as within the project scope and ignores the best available science. It would be prudent and applicable to have a hard look discussion of the areas of overlap between this restoration project and the Revised Plan.

Importantly, it seems that increasing forage is the sole motivation for restoring riparian vegetation, since the Forest Service has primarily and systemically managed rangelands for livestock forage (USDA FS 2015c).[352] The FEIS states that "forage-producing National Forest System lands will be managed for livestock grazing and the allotment management plans will be prepared consistent with land management plans (36 CFR 222.2)."[353] And finally, in reference to the preferred Alternative, the FEIS states "As more areas are proposed for treatments in this alternative, the short-term effects may be greater than those in alternatives A and B; however, the long-term effects are anticipated to be more beneficial with the potential increase in forage quality and quantity."[354]

If the Forest Service increases stocking rates to accompany restoration progress, how will that ever result in restoration progress? From our vantage, increased stocking equals increased grazing pressure, and it would seem from such statements that the goal will always be to break even by maintaining the status quo. Status quo does not equal restoration, and restoration progress should not immediately be used for increased cattle stocking. Restoration, as opposed to status quo degradation, requires different management action that results is different outcomes. There is no evidence that adjusted grazing management strategies are even being considered here. The Revised Plan will not move restoration forward.

According to the Multiple Use Sustained Yield Act, not all forest resources are likely to be available and suitable for use in every management area. Federal code states that "[i]n the

[351] Revised Plan, p. 89.

[352] FEIS, Vol. 1, p. 273.

[353] FEIS, Vol. 1, p. 114.

[354] FEIS, Vol. 1, p. 117.

administration of the national forests due consideration shall be given to the relative values of the various resources in particular areas."[355] A number of limitations must be considered as the Forest Service attempts to balance the production of forest products and services for a given management area. The Multiple Use Sustained Yield Act clearly establishes that "some land will be used for less than all of the resources" and that the national forests are utilized in such a manner that does not impair the productivity of the land.[356] Let us be clear, this Project Area is ecologically impaired, and the Forest Service would be hard-pressed to disagree with that statement. Yet, the Cibola is pushing for Multiple Use no matter what the cost, and the result of such a philosophy is decline in quality of wildlife habitat and in forage production, which is both predicted and observed.[357]

5.5 Suggested Resolution for Grazing Objection 2.

A Supplemental EIS must take a 'Hard Look' at the impacts of grazing on riparian ecosystems and obligate wildlife, including a discussion of the Northern New Mexico Riparian Restoration Project that is occurring concurrently with the Revised Plan, upon which much of the riparian restoration of the plan will hinge, as these are connected and cumulative actions.

5.6 Our Objection: The Revised Plan and FEIS fail to consider the best available science regarding the impacts of domestic grazing on riparian areas and wetlands.

The Forest Service has a Lawful Duty to Conserve under the ESA. Section 7 of the ESA requires federal agencies, in consultation with USFWS, to ensure that any action authorized, funded, or carried out by the agency is not likely to (1) jeopardize the continued existence of any threatened or endangered species, or (2) result in the destruction or adverse modification of the critical habitat of such species.[358] "Action" is broadly defined to include all activities or programs of any kind authorized, funded, or carried out by federal agencies, including actions directly or indirectly causing modifications to the land, water, or air; and actions intended to conserve listed species or their habitat.[359]

In addition to the obligation to avoid jeopardizing species or destroying or adversely modifying their critical habitat under Section 7(a)(2) of the ESA, Section 7(a)(1) imposes an obligation on all federal agencies, in consultation with the FWS, to "carry out programs for the conservation" of listed species.[360] This provision imposes an "affirmative duty on each federal agency to

[355] 16 U.S.C. § 529.

[356] 16 U.S.C. § 531.

[357] Hoglander, C. 2016. Change in Vegetation Productivity for Three National Forests in Utah, 1986-2011: Dixie, Fishlake, and Manti-La Sal National Forests. Analysis for Grand Canyon Trust. Flagstaff, AZ.

[358] 16 U.S.C. § 1536(a)(2).

[359] 50 C.F.R. § 402.02.

[360] 16 U.S.C. § 1536(a)(l).

conserve each of the species listed."[361] "Conserve" is defined by the ESA to mean *recovery, i.e.,* the "use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided [in the ESA] are no longer necessary."[362]

The Revised Plan and FEIS violate the ESA and NEPA because the Forest Service has a duty to conserve and has ignored crucial science that would guide the agency to achieve that legal obligation. Contrary to explicitly denying that management actions such as grazing is even an environmental stressor, the negative impacts of livestock grazing in riparian areas have been well documented.[363] Extensive scientific literature reveals that livestock grazing negatively affects water quality and water seasonal quantity, stream channel morphology, hydrology, riparian zone soils, instream and streambank vegetation, and aquatic and riparian wildlife.[364, 365, 366, 367, 368, 369, 370]

Presence of livestock in riparian areas can negatively affect ecosystem integrity including reducing vegetation complexity and plant biomass, bank stability, soil quality, litter cover and water quality. Selective consumption of palatable vegetation by cattle can alter ecosystem structure, function and species composition.[371, 372] Cattle graze cottonwood seedlings preventing

[361] *Sierra Club v. Glickman*, 156 F.3d 606,616 (5th Cir. 1998); *accord Pyramid Lake Paiute Tribe*, 898 F.2d at 1416-17 (noting that federal agencies have "affirmative obligations to conserve under [S]ection 7(a)(1)").

[362] 16 U.S.C § l 536(a)(1).

[363] Poff, B., K.A. Koestner, D.G. Neary and V. Henderson 2011. Threats to riparian ecosystems in Western North America: an analysis of existing literature. Journal of the American Water Resources Association. 47(6): 1241-1254.

[364] Kauffman, J.B. and W.C. Krueger. 1984. Livestock impacts on riparian ecosystems and streamside management implications... a review. Rangeland Ecology and Management/Journal of Range Management Archives. 37(5): 430-438.

[365] Fleischner, T.L., 2010.

[366] Belsky, A.J., A. Matzke, and S. Uselman. 1999. Survey of livestock influences on stream and riparian ecosystems in the western United States. Journal of Soil and Water Conservation. 54(1): 419-431.

[367] Ohmart, R.D. 1996. Ecological condition of the East Fork of the Gila River and selected tributaries: Gila National Forest, New Mexico. General Technical Report RM., 272, p. 312.

[368] Elmore, W., and B. Kauffman. 1994. Riparian and watershed systems: degradation and restoration. Ecological implications of livestock herbivory in the West. M. Vavra, W.A. Laycock, and R.D. Pieper (eds.) Society of Range Management, Denver, CO. p. 212-231.

[369] Stevens et al. 2002.

[370] Poff et al. 2011.

[371] Kauffman and Krueger 1984.

[372] Poff et al. 2011.

tree growth and recruitment.[373] Grazing can severely reduce riparian vegetative cover which increases air and water temperatures and influences invertebrate and native wildlife distribution and diversity.[374] In addition to herbivory and alteration of vegetation, hoof action through concentrated trampling directly degrades streambanks through bank sheering.[375] This leads to excessive erosion and nutrient runoff.[376] Loss of riparian vegetation compounds degradation of streambanks, precipitating permanent channel incisions.[377] Eventually, channels lose their riffle areas, streams migrate laterally, pools shallow out, water tables lower, and riparian vegetation composition shifts from hydric to more mesic species.[378]

Over *thirty years ago*, overall estimates of riparian habitat loss ranged from 40-90% among the southwestern states.[379] This trend has only steadily continued and there may be as little as 2% of the original forested riparian habitat remaining in the West.[380] A literature review on livestock grazing impacts on arid land ecosystems reported that 69% of 132 studies demonstrated significant detrimental effects.[381] There are more publications in the literature that discuss grazing as a threat to western riparian ecosystems than any other single threat.[382]

Over three decades ago, an assessment by the U.S. General Accounting Office found that that most (~90%) of the lands managed by the Forest Service were in need of restoration. GAO 1988. A few years later, Elmore and Kaufman (1994) reaffirmed this point, stating, "Current Forest Service policy calls for undertaking a national riparian strategy designed to improve markedly riparian conditions along lakes and streams by the year 2000." This has still not occurred and the

[373] Poff et al. 2011.

[374] Fleischner, T.L., 2010.

[375] Neary and Medina 1996.

[376] Tufekcioglu, M., R.C. Schultz, G.N. Zaimes, T.M. Isenhart, and A. Tufekcioglu. 2013. Riparian grazing impacts on streambank erosion and phosphorus loss via surface runoff. Journal of the American Water Resources Association. 49(1): 103-113.

[377] Poff et al. 2011.

[378] Poff et al. 2011.

[379] Dahl, T.E., 1990. Wetlands losses in the United States, 1780's to 1980's. United States Department of the Interior, Fish and Wildlife Service.

[380] Jones, K.B., E.T. Slonecker, M.S. Nash, A.C. Neale, T.G. Wade, and S. Hamann. 2010. Riparian habitat changes across the continental United States (1972–2003) and potential implications for sustaining ecosystem services. Landscape Ecology. 25(8): 1261-1275.

[381] Jones, A., 2000. Effects of cattle grazing on North American arid ecosystems: a quantitative review. Western North American Naturalist. 155-164.

[382] Poff et al. 2011.

West's riparian systems have been in a chronic state of degradation and this is particularly true in Arizona and New Mexico (Region 3).[383]

Environmental degradation through grazing is not restricted to historical practices. To this day, it is a chronic and ongoing issue. For example:

> One of the most significant adverse impacts within western riparian systems has been the perpetuation of improper grazing practices (Hastings and Turner 1965, Ames 1977, Glinski 1977, Marlow and Pogacnik 1985). Chaney et al. (1990) noted that initial deterioration of western riparian systems began with severe overgrazing in the late nineteenth century. For the last 75 years, the Forest Service has acknowledged the continued damage cattle have done to riparian areas, upland tributaries, and ranges. The effects of both past and ongoing grazing activities on the forest have had a profound effect on riparian habitat and there has been little improvement western watersheds under modern range management. (GAO 1988, Alford 1993). By not allowing riparian vegetation to develop, there is no rehabilitation of stream banks or prevention of erosion. As a result, the conditions of these streams are in a perpetual state of decay.[384]

Studies also show that current levels of livestock grazing are degrading the stream and riparian components and not allowing for recovery of degraded stream banks.[385, 386, 387] The American Fisheries Society editorial (Hughes 2014) stated "Livestock grazing exacerbates climate change effects on stream, riparian, and upland natural resources. Greatly reducing public land livestock grazing would greatly reduce this spatially extensive pressure and thereby reduce the susceptibility of those resources to climate change. It could also free up over $144 million for more fish- and wildlife-friendly landscape rehabilitation."

Instead of considering the best available science, the Cibola shrouds discussion of the detrimental impacts of authorized grazing to riparian systems, and even goes as far as claiming that grazing is ecologically beneficial. For example, "Livestock grazing today plays an essential role in providing ecosystem services",[388] or, "some ecological benefits from livestock grazing include soil aeration through hoof action, invasive plant control, fine fuels reduction (of decadent grasses and forbs), maintenance of open space off-forest, increased water developments in

[383] Trudeau, J. 2020. Ravaged River: Cattle Damage to Endangered Species Habitat in Arizona's Verde River Watershed. Report. Center for Biological Diversity. 39 pp.

[384] Tonto National Forest 20 Allotment Biological Opinion (02-21-99-F-300), p. 19.

[385] Knapp, R.A., V.T. Vredenburg, and K.R. Matthews. 1998. Effects of stream channel morphology on Golden Trout spawning habitat and recruitment. Ecological Applications. 8: 1104-1117.

[386] Nussle, S.C., K.R. Matthews, and S.M. Carlson. 2017. Patterns and dynamics of vegetation recovery following grazing cessation in the California golden trout habitat. Ecosphere. 8(7): e01880. 10.1002/ecs2.1880.

[387] Nussle, S.C., K.R. Matthews, and S.M. Carlson. 2015. Mediating water temperature increases due to livestock and global change in high elevation meadow streams of the Golden Trout Wilderness. PLOS ONE. 10(11): 1-22.

[388] Revised Plan, p. 88.

uplands, and an important source of food and fiber (a cultural and provisional ecosystem services).[389] These claims are not supported by the best available science and conveniently he Cibola has provided no citations to suggest otherwise.

5.7 Suggested Resolution for Grazing Objection 3.

Issue a Supplemental EIS and Revised Plan that considers the best available science regarding the threats posed to riparian areas and wetlands by livestock grazing.

5.8 Our Objection: The riparian assessment methodology used in the FEIS is deficient and does not support the duty to conserve.

The Revised Plan states a reliance on Proper Functioning Condition to support ecological values such as wildlife habitat. For example, "plan components were developed using the proper functioning condition concept",[390] and "riparian areas are in proper functioning condition with all indicators rated as satisfactory and support higher ecological values such as wildlife habitat."[391]

The PFC method generally overestimates stream health, is subjective, and leads to mismanagement and strained utilization that chronically degrades the system.[392] Proper Functioning Condition is fundamentally flawed and inappropriate to assess ecological conditions and wildlife habitat. For example, consider this example from the Lincoln National Forest:

- "By 2004, the Forest Service's FEIS reported that continued excessive forage utilization led to soil instability and deterioration of range and watershed conditions, primarily in riparian areas of the **Alamo Pasture** (USFS 2004c)."[393]

- "In 2004, the Forest reported that more than 90 percent of the riparian areas associated with perennial streams in the Sacramento Allotment were in poor condition.[394]

- "Streams within the action area, including those in **Alamo Pasture** are prone to recurring floods (USFS 2009b). These events have damaged and destroyed poppies and potential habitat. For example, floods in the summers of 2006 and 2008 in **Alamo and Caballero Canyons** (Sacramento Allotment) scoured vegetation and soils from occupied poppy habitat, washing much of the material downstream. Vegetative losses included grasses,

[389] Revised Plan, p. 88.
[390] Revised Plan, p. 63.

[391] Revised Plan, p. 171.

[392] Stevens, L.E., A. Jones, P. Stacey, D. Duff, C. Gourley, and J.C. Catlin. 2002. Riparian ecosystem evaluation: a review and test of BLM's proper functioning condition assessment guidelines. Technical Report submitted to the National Riparian Service Team. U.S. Department of the Interior.

[393] The October 5, 2018 Biological Opinion for continued grazing on Sacramento allotment, Lincoln NF, p. 58.

[394] The October 5, 2018 BiOp p. 39.

> forbs, shrubs, and trees that held soil in place and the soil structure that supports the poppy. Silt, sand, and loam were largely removed from the system"[395]

Considering this bleak discussion of current conditions in this allotment, below are PFC's for the Alamo and Caballero watersheds, first reported in 2018[396] and recycled into the 2021 Lincoln Forest Plan DEIS.[397] This is the highest percentage reported across the entire LNF.

Watershed Name	**Nonfunctioning**	**Functioning-At Risk**	**Properly Functioning Condition**
Alamo and Caballero Canyons	2%	8%	90%

A key question arises: How can such a knowingly degraded system achieve such a high Properly Functioning Condition score? This clearly speaks to the inadequacy of such monitoring methods and their susceptibility to inaccuracy and subjectivity.

Stevens et al. (2002)[398] identified several important elements that are missing from the present PFC approach including: data management, site scoring, and assessment of water quality, stream health, species of concern (including endangered, indicator and exotic taxa), wildlife habitat assessment, and direct human impacts. They also describe regional-scale synoptic analyses needed to improve the process including use of the PFC approach at reference sites, incorporating land use history and agency objectives for all sites, and incorporating regional hydrogeology and biology (particularly ecosystem distribution and sensitive species habitat requirements).

We hope that the Cibola will employ a more comprehensive habitat assessment protocol that is primarily focused on imperiled species and their habitat. This would be required if the Cibola intends to adhere to the many stated objectives of prioritizing imperiled species and managing habitat according to Recovery Plans. For example, guideline FW-GDL-AQSP 3 states:

> Streams, streambanks, shorelines, lakes, wetlands, seeps, springs and other bodies of water should be protected from detrimental changes (as described in species-specific literature including recovery plans, listing and critical habitat designations, and conservation strategies)

[395] The October 5, 2018 BiOp p. 60.

[396] Lincoln National Forest Plan Draft Assessment Report Volume I. Ecological Resources pg. 235.

[397] 2021 Lincoln NF DEIS pg. 163.

[398] Stevens, L.E., A. Jones, P. Stacey, D. Duff, C. Gourley, and J.C. Catlin. 2002. Riparian ecosystem evaluation: a review and test of BLM's proper functioning condition assessment guidelines. Technical Report submitted to the National Riparian Service Team. U.S. Department of the Interior.

> to protect water quality, aquatic species diversity and quantity, riparian and aquatic habitat quality, and riparian and aquatic habitat connectivity.[399]

The FEIS goes on:

> The primary needs for threatened and endangered species are addressed through law, regulation, and policy (such as recovery plans and conservation agreements) which are incorporated by reference. The land management plan provides the framework for implementing the recommendations from these higher-level laws, regulations, policies, plans, and agreements for these species, with limited needed additional direction.[400]

Furthermore, plan components for sustainable rangeland and grazing would maintain habitat by ensuring multiple use activities are compatible with wildlife habitat needs (FW-DC-GR; FW-OBJ-GR; FW-STD-GR; FW-GDL-GR).[401]

These are commendable and necessary strategies, to prioritize imperiled species above other land uses. We hope the Cibola will remain accountable in adhering to these plan components and would like to see this philosophy elevated to include enforceable standards. However, we are concerned these efforts represent an adaptive management strategy that is based on utilization measurements as triggers. For example, the guideline for at-risk species (FW-GDL-ARS 3) states "protection measures can include timing restrictions, adaptive percent utilizations, distance buffers, or other means of avoiding disturbance based on best available information and site-specific factors"[402]

Guideline 1 of the Revised Plan states: "Forage use should be based on current and desired ecological conditions as determined by temporally and spatially appropriate scientific data during planning cycles (such as annual operating instructions and permit renewal) to sustain livestock grazing and maintain ecological function and processes.[403] The Revised Plan also references using "adaptive percent utilizations", among other things to protect wildlife resources and Aquatic and Terrestrial Species.[404]

Measuring utilization is not appropriate as an index or monitoring strategy for wildlife habitat. Much like measuring PFC, measuring utilization is inapplicable to resource conservation and ecological needs. In fact, it is often unreliable even to estimate cattle forage. The Society for Rangelands Management (2018) states:

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[399] FEIS Vol. 1, p. 349.

[400] FEIS Vol. 1, p. 315.

[401] FEIS Vol. 1, p. 338.

[402] FEIS Vol. 1, p. 344.

[403] Revised Plan, p. 90.

[404] Revised Plan, p. 76, 81.

> Measuring utilization on "key species" as a basis for adjusting stocking rates (i.e., either removing some or all animals from a pasture) or for calculating the "desired" stocking rate for following years, is based on the concept that the use on the key species is gradual throughout the grazing period and correlated with stocking rate. Except for monocultures or very short grazing periods, this is not often the case because animal preferences shift as different plants or locations become more or less attractive to them. The above issues make it unlikely that "utilization limits" have much actual relevance except maybe where the growing season and grazing season are concurrent, and utilization is measured at the end of both.[405]

The Forest Service's current grazing management of vegetation focuses on utilization (cattle consumption) of vegetation as biomass for forage, rather than the height and cover of vegetation to be retained in order to provide forbs for wildlife. While vegetation for livestock consumption is palatable biomass, Forest Service wildlife biologist Don DeLong[406] documents how vegetation for birds, invertebrates (including pollinators), mammals, amphibians, and aquatic species is measured by the height and density of vegetation. What wildlife need is

> …vegetation that is tall and dense enough to provide for sufficient (1) leafy material, flowers, and seeds for forage; (2) hiding and escape cover; (3) nesting cover; (4) ground-level moisture and humidity; (5) temperature moderation near the ground; (6) forage and cover for a diverse invertebrate community; and (7) residual thatch and litter which in turn contributes to these functions and the sustainability of plant communities, as well as (8) retaining soil looseness.[407]

The bulk of biomass in grass is in the lowest 10% of height, while the greatest value of grass for wildlife is in the upper 90% of grass, which is permitted for consumption in Forest Service utilization standards. The percent consumption of biomass. The value of forbs for pollinators lies within the portion of palatable forbs most likely to be consumed by livestock, i.e., the tallest portion of forbs, where the flowers are located.

The Forest Service's current grazing management plans often lack direct monitoring and assessment of the responses of specific riparian or wetland species to cattle grazing. Monitoring tends to stop at the streams edge without a clear understanding of how common measures of utilization and stream bank characteristics translate to aquatic organisms living in or near the water. Despite the widespread deleterious impacts of cattle grazing on wildlife habitat and

[405] Society for Rangelands Management. 2018. Utilization and Residual Measurements: Tools for Adaptive Rangeland Management. Technical Report by SRM Rangeland Assessment and Monitoring Committee. Rangelands 40(5):146-151 (doi 10.1016/j.rala.2018.07.003).

[406] DeLong, D. 2012. Importance of Composition and Structure of Herbaceous Vegetation to Great Gray Owls and Northern Goshawks on the BTNF [Bridger-Teton National Forest]. Greys River Ranger District, Afton, Wyoming

[407] DeLong 2012.

populations[408, 409, 410, 411, 412] little to no monitoring of wildlife responses to cattle grazing is conducted primarily due to lack of staff and funds. In some cases, The Forest Service relies on the state agencies to monitor populations but little coordination or linkage to the state's limited population monitoring to grazing impacts is done.

Livestock grazing directly affects three general components of stream and riparian ecosystems that are important to maintaining viable fish and amphibian populations: streamside vegetation; stream channel morphology, including the shape of the water column and streambank structure; and water quality including water temperature.[413, 414, 415] These impacts can ultimately alter the population structure of resident fish, particularly salmonids.[416] One review reported that 15 of 19 studies showed that stream fish were diminished in the presence of livestock grazing.[417]

Scientific evidence compiled for selected amphibians implies a low-end threshold of retaining 70% of herbaceous vegetation within all these habitats in grazing allotments.[418] The retention of that amount of herbaceous vegetation stands in stark contrast to livestock utilization on national forests. There are no mechanisms, conversion factors, or accurate inferences to be made that can help translate PFC ratings or utilization to taxa-specific habitat quality. In the Revised Plan, vegetation is only discussed in terms of cattle forage only in relation to designing and constructing livestock rangeland infrastructure. Because of the absence of consideration for

[408] Platts, W.S. 1981. Influence of forest and rangeland management on anadromous fish habitat in western North America: 7. Effects of livestock grazing. USDA Forest Serv. Gen. Tech. Rep. PNW-124.

[409] Platts, W.S. 1982. Livestock and riparian-fishery interactions: what are the facts? Transactions of the North American Wildlife and Natural Resources Conference. 47: 507-515.

[410] Platts, W.S. 1991. Livestock grazing. Influences of Forest and Rangeland Management on Salmonid Fishes and their Habitats. W.R. Meehan (ed.) American Fisheries Society Special Publication. 19: 389-424.

[411] Knapp, R.A., V.T. Vredenburg, and K.R. Matthews. 1998. Effects of stream channel morphology on Golden Trout spawning habitat and recruitment. Ecological Applications. 8: 1104-1117.

[412] USDA (United States Department of Agriculture). 2001 Sierra Nevada Forest Plan Amendment: final environmental impact statement and record of decision. USDA – 2001 Federal Register.

[413] Kauffman, J.B. and W.C. Krueger. 1984. Livestock impacts on riparian ecosystems and streamside management implications... a review. Rangeland Ecology and Management/Journal of Range Management Archives. 37(5): 430-438.

[414] Nussle, S.C., K.R. Matthews, and S.M. Carlson. 2017. Patterns and dynamics of vegetation recovery following grazing cessation in the California golden trout habitat. Ecosphere. 8(7): e01880. 10.1002/ecs2.1880.

[415] Nussle, S.C., K.R. Matthews, and S.M. Carlson. 2015. Mediating water temperature increases due to livestock and global change in high elevation meadow streams of the Golden Trout Wilderness. PLOS ONE. 10(11): 1-22.

[416] Platts, W.S. 1991.

[417] Platts, W.S. 1991.

[418] DeLong 2012.

wildlife habitat in the Revised Plan, vegetation as habitat for the diversity of wildlife residing within the national forests will inevitably be ignored and routinely degraded.

Because many sensitive and federally listed species inhabit streams within grazing allotments, an overall assessment to determine whether cattle grazing is compatible with the habitat needs of these species and with viable aquatic ecosystems is warranted and should be performed in the Revised Plan. The Cibola stated that they've already been balancing permitted numbers with the changing capacity of the land,[419] and "since 1992, most range allotments in the analysis area have been through a rigorous evaluation and environmental analyses. Forage production has been matched with permitted livestock numbers. Adaptive management is being used to maintain and improve the rangeland resources."[420] However, if suitable monitoring protocols are not employed, and habitat is measured using PFC and utilization, then habitat protection according to stated plan components will miss the mark. This is evident in the fact that riparian habitat is still degraded and on-the-ground restoration progress has yet to be achieved after decades.

The potentially extensive conflicts between livestock grazing and provision of adequate habitat for native and imperiled wildlife is not acknowledged meaningfully in the Revised Plan, but are reasonably expected to occur with no real solutions set in place other than potential litigation. Enforceable limits and triggers should be put in place for riparian areas at the programmatic level, especially in riparian critical habitat.

5.9 Suggested Resolution for Grazing Objection 4.

A Supplemental EIS should use a more comprehensive stream assessment that better relates stream criteria to ecological functionality and species needs. The idea is that a stream ecosystem includes not only channel and moving water, but also lower and upper floodplains and associated flora and fauna, especially sensitive, endemic species, and non-native species. Thus, we propose a refined methodology that expands the existing PFC criteria, relates those criteria specifically to southwestern riparian ecosystem processes, and clarifies the ecological accountability for decisions about riparian ecosystem condition as provided by Stevens et al. 2002.

We urge the Forest Service to consider an expanded PFC as more of an ecosystem analysis process, one using thoroughly trained and consistent observers who make detailed and, where possible, quantitative, field observations and measurements, and who compare their results against similar measurements made at control (reference) sites. Stream health and vegetation should be assessed ***in relation to*** wildlife including biomass, taxa, and diversity. Endangered species surveys or research data from the region should be compiled along with distribution of non-native species in the assessment area, as non-native species can severely threaten ecosystem function and integrity and is not currently a focus of the Forest Service stream assessment process. This approach provides a more intensive, repeatable, and less subjective framework for riparian ecosystem evaluation, while remaining an efficient and cost-effective rapid assessment technique.

[419] FEIS Vol. 1, p. 114.

[420] FEIS Vol. 1, p. 118.

Rigorous riparian ecosystem health assessment is much needed by land managers, both for reasons of compliance with federal and state laws, and to meet long-term environmental management mandates and objectives. Please consider Stevens et al. 2002 (provided as an attachment), where a comprehensive, more ecologically sound stream assessment process is outlined in full detail. Also, refrain from using utilization estimates to assess wildlife habitat quality as it isn't related or applicable.

5.10 Our Objection: A Vaguely Detailed 'Adaptive Management' Strategy Violates NEPA.

The FEIS repeatedly touts reliance on an adaptive management strategy for grazing. For example, "there is a need for plan direction that recognizes the interdependence of resources and provides for all-inclusive (holistic) and adaptive management to better respond to changing environmental conditions"[421], and "the monitoring strategy provides a framework for subsequent monitoring and evaluation designed to inform adaptive management.[422]

The Cibola claims that "since 1992, most range allotments in the analysis area have been through a rigorous evaluation and environmental analyses. Forage production has been matched with permitted livestock numbers. Adaptive management is being used to maintain and improve the rangeland resources."[423] In the Revised Plan, the Cibola states that "adaptive management has been implemented since 2006 and is the plan moving forward."[424]

In a few places, the FEIS discusses some general adaptive management strategies for grazing. For example, stating:

> Livestock management on National Forest System lands has shifted to an adaptive management philosophy that allows timely changes in livestock numbers or time to be made in response to changing conditions involving changes in forage production, water availability, and precipitation patterns. As a result, livestock numbers have declined over the last 20 years, because Cibola National Forest personnel have balanced permitted numbers with the capacity of the land while responding to environmental changes such as but not limited to drought and shrub encroachment. Over the last decade, Cibola personnel have worked with partners and permit holders to manage grazing pressure on sensitive areas (for example, critical areas, riparian areas).[425]

If this adaptive management strategy had been working properly, over the course of the last 20 years, then why is riparian degradation still a problem on the Cibola, even when there are relatively few riparian acres to manage compared to the Santa Fe and the Carson?

[421] FEIS Vol. 1, p. 5.

[422] Revised Plan, p. 169.

[423] FEIS Vol. 1, p. 118.

[424] Revised Plan, p. 91.

[425] FEIS Vol. 1, p. 114.

Perhaps it is because that while Revised Plan relies on adaptive management, it does not contain key elements required to comply with Forest Service regulations, nor does it meet the goals for such a plan set out by academics. It is presently unclear how monitoring of restoration outcomes will be achieved, especially when permitted grazing activities that are subject to adaptive management but are still degrading riparian zones on the Cibola.

Adaptive management still requires a general plan and framework to inform decisions. None of these aspects are currently put forth in the Revised Plan. To be effective and legal, adaptive management must: (1) clearly identify measurable thresholds that, if exceeded as determined by monitoring, will require a change in management; (2) clearly identify what that changed management will entail; and (3) disclose in the NEPA document the impacts caused by that change in management. Because the Revised Plan fails on all three counts, the Forest Service cannot rely on the adaptive management strategy as currently proposed.

5.10.1 The Law and Policy of Adaptive Management.

5.10.1.1 Academic recommendations concerning adaptive management.

Academics conclude that effective adaptive management should involve treating management interventions as experiments, the outcomes of which are monitored and fed back into management planning. As outlined by land management experts, an adaptive management approach to forest management should include the following:

- Creation of management strategies (specific action alternatives in this case);
- Implementation of those strategies/actions;
- Monitoring of the effects (under the monitoring framework developed as part of the planning process); and
- Predetermined triggers for changes in management based on the results of monitoring.[426]

Forest Service experts have said that "[a]daptive management requires explicit designs that specify problem-framing and problem-solving processes, documentation and monitoring protocols, roles, relationships, and responsibilities, and assessment and evaluation processes."[427]

The fourth component, regarding triggers, is described by adaptive management experts in the following statement:

[426] Schultz, C. and M. Nie. 2012. Decision-making triggers, adaptive management, and natural resources law and planning. *Natural Resources Journal* 52:443-521.

[427] Stankey, G.H., R.N. Clark, and B.T. Bormann. 2005. Adaptive management of natural resources: theory, concepts, and management institutions. Gen. Tech. Rep. PNW-GTR-654. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 73 p., at page 58. Available at https://www.fs.fed.us/pnw/pubs/pnw_gtr654.pdf (last viewed August 10, 2020).

> The term trigger, as used here, is a type of pre-negotiated commitment made by an agency within an adaptive management or mitigation framework specifying what actions will be taken if monitoring information shows x or y. In other words, predetermined decisions, or more general courses of action, are built into an adaptive framework from the beginning of the process.[428]

The literature cited here calls for details and specifics, not ambiguity.

5.10.1.2 Regulations concerning adaptive management.

This academic framing is reinforced by the Forest Service's NEPA regulations, adopted in 2008, which define adaptive management as:

> [a] system of management practices based on *clearly identified intended outcomes and monitoring* to determine if management actions *are meeting those outcomes*; and, if not, to facilitate management changes that will best ensure that those outcomes are met or re-evaluated. Adaptive management stems from the recognition that knowledge about natural resource systems is sometimes uncertain.[429]

These regulations further state that:

> An adaptive management proposal or alternative must *clearly identify the adjustment(s) that may be made* when monitoring during project implementation *indicates that the action is not having its intended effect*, or is causing unintended and undesirable effects. The EIS must disclose not only the effect of the proposed action or alternative *but also the effect of the adjustment*. Such proposal or alternative must also *describe the monitoring that would take place* to inform the responsible official during implementation whether the action is having its intended effect.[430]

The preamble to the Forest Service's regulation that adopted the adaptive management definition states that the agency must identify the proposed changes, and their impacts, in the NEPA document. "When proposing an action, the responsible official may identify possible adjustments that may be appropriate during project implementation. Those possible adjustments must be described, and their effects analyzed in the EIS."[431]

5.10.1.3 Federal caselaw concerning adaptive management.

Federal courts have found agencies violated NEPA or the Endangered Species Act (ESA) where the agency relied on an "adaptive management" plan that was vague, set no specific triggers for

[428] Schultz and Nie, Decision-making triggers, adaptive management, and natural resources law and planning at 455.

[429] 36 C.F.R. § 220.3 (emphasis added).

[430] 36 C.F.R. § 220.5(e)(2) (emphasis added).

[431] 73 Fed. Reg. 43,084, 43,090 (July 24, 2008).

future action, failed to describe that future action, or failed to ensure that resources will be protected as the adaptive management plan asserts.

In *Natural Resources Defense Council v. U.S. Army Corps of Engineers*, 457 F. Supp. 2d 198 (S.D.N.Y. 2006), the court found that the Army Corps' attempt to supplement an inadequately explained finding of no significant impact concerning a dredging project was arbitrary and capricious where the agency relied on ill-defined "adaptive management" protocols to conclude that impacts would be mitigated below the level of significance.

> The Plan makes several promises that it will alter its monitoring plan should it prove necessary. For example, the Plan relies on a general promise that it will "as appropriate, reevaluate, the need for altering its dredging methods" … through the use of its coordination plan and monitoring program. The Plan also explains that the Corps will follow "adaptive management practices as it moves through construction of its contracts," thus allowing it to change future contracts should the data indicate it is necessary. These promises, however, provide no assurance as to the efficacy of the mitigation measures. The Corps did not provide a proposal for monitoring how effective "adaptive management" would be.[432]

Mountaineers v. United States Forest Service, 445 F. Supp. 2d 1235 (W.D. Wash. 2006) set aside a Forest Service decision to open motor vehicle trails where the agency proposed to monitor impacts to wildlife and potentially change the trails later based on an adaptive management plan. The court stated that these adaptive management strategies "amount … to a 'build-first, study later' approach to resource management. This backward-looking decision making is not what NEPA contemplates."[433] Other cases similarly conclude that NEPA forbids the use of ill-defined adaptive management plans to assume away likely impacts of agency action.[434]

Courts also hold unlawful agency projects that may impact species protected by the Endangered Species Act where the biological opinion is based on the assumption that a vague and ill-defined monitoring and adaptive management plan will mitigate impacts to the species at issue. These cases provide a useful analogy to adaptive management in the NEPA context. *Natural Resources Defense Council v. Kempthorne*, 506 F. Supp. 2d 322 (E.D. Ca. 2007) is key precedent. There, plaintiffs challenged a proposed plan to manage water diversions in a manner that could adversely impact the delta smelt, a species listed as threatened under the Endangered Species Act. The Fish and Wildlife Service prepared a biological opinion (BiOp) on the proposal which concluded that the project would neither jeopardize the smelt nor adversely modify the smelt's critical habitat. "Although the BiOp recognize[d] that *existing* protective measures may be

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[432] *NRDC v. United States Army Corps of Eng'rs*, 457 F. Supp. 2d at 234 (citations omitted).

[433] *Mountaineers v. United States Forest Serv.*, 445 F. Supp. 2d at 1250.

[434] *See, e.g., High Sierra Hikers Association v. Weingardt*, 521 F. Supp. 2d 1065, 1090-91 (N.D. Ca. 2007) (overturning a Forest Service decision to liberalize the rules limiting campfires in high country parts of a wilderness area on the grounds that the agency could not rely on adaptive management to overcome an inadequate response to the problems raised in the record).

inadequate, the FWS concluded that certain proposed protective measures, including … a proposed 'adaptive management' protocol would provide adequate protection."[435]

Plaintiffs alleged, among other things, that the BiOp "relie[d] upon uncertain (and allegedly inadequate) adaptive management processes to monitor and mitigate the [project's] potential impacts."[436] They asserted that the adaptive management plan, which required a working group meet and consider adaptive measures in light of monitoring, failed to meet the ESA's mandate that mitigation be

> "'reasonably specific, certain to occur, and capable of implementation'" because: (1) the [working group] has complete discretion over whether to meet and whether to recommend mitigation measures; (2) even if the [working group] meets and recommends mitigation measures, the [agency management team] group is free to reject any recommendations; (3) there are no standards to measure the effectiveness of actions taken; (4) reconsultation is not required should mitigation measures prove ineffective; and (5) ultimately, no action is ever required.[437]

The *Kempthorne* court cited prior caselaw holding that "a mitigation strategy [in the ESA context] must have some form of measurable goals, action measures, and a certain implementation schedule; i.e., that mitigation measures must incorporate some definite and certain requirements that ensure needed mitigation measures will be implemented."[438] The court found that adaptive management plan "does not provide the required reasonable certainty to assure appropriate and necessary mitigation measures will be implemented."[439] The court concluded that: "Adaptive management is within the agency's discretion to choose and employ, however, the absence of any definite, certain, or enforceable criteria or standards make its use arbitrary and capricious under the totality of the circumstances."[440]

5.10.2 The Revised Plan Does Not Comply with Law or Policy for Adaptive Management.

The Revised Plan fails to do the following:

- Describe what changed management or actions the Forest Service will take (beyond doing more of the same) if restoration goals succeed or fail.

[435] *NRDC v. Kempthorne*, 506 F. Supp. 2d at 333-34 (emphasis in original).

[436] *NRDC v. Kempthorne*, 506 F. Supp. 2d at 329.

[437] *NRDC v. Kempthorne*, 506 F. Supp. 2d at 352. *See also id.* at 350 (explaining the "certain to occur" standard and citing *Ctr. for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1152 (D. Ariz. 2002)).

[438] *NRDC v. Kempthorne*, 506 F. Supp. 2d at 355, citing *Rumsfeld*, 198 F. Supp. 2d at1153.

[439] *NRDC v. Kempthorne*, 506 F. Supp. 2d at 356.

[440] *NRDC v. Kempthorne*, 506 F. Supp. 2d at 387.

- Disclose what ecological outcomes would determine project success and fails to describe what thresholds or triggers would initiate a changed course of action.

- Define thresholds that influence a subsequent decision.

- Identify measurable triggers that, if exceeded as determined by monitoring, will require a change in management.

- Describe the nature or impacts of project adjustments.

We do not argue that the Forest Service cannot adopt and expand on an adaptive management approach for the final plan. An adaptive management approach may be feasible and helpful in terms of permitting the agency to fine tune its management in the face of changing conditions. However, the agency's proposed approach fails to meet the conditions required to establish a lawful and effective plan.

5.11 Suggested Resolution for Grazing Objection 5.

In a Supplemental EIS, provide an adaptive management plan that meets legal, regulatory, and scientific requirements.

Conclusion

This concludes our objection. We look forward to working to resolve these issues.

6 Appendix A: Synopsis of canopy cover as reported in MSO studies.

These reports are provided ion a USB storage device that has been mailed to the Regional Office. Also; also See Appendix B.

Authors	Date	Topic	Results
Seamans and Gutierrez	1995	Breeding habitat of MSO in Tularosa Mts NM	Mean roost canopy closure (%) of **85**. Mature tree BA 9.0 (m^2ha^{-1})[e]. Higher CC, taller and more mature trees, and greater variation in tree heights best separated roosts from random plots. Canopy closure **76**% at nests, significantly higher than random. Mature tree BA 12.4 (m^2ha^{-1})[e], significantly higher than random.
Grubb et al	1997	Canopy closure around nests in NC Arizona	Nest sites contained more area in the >**70**% CC class within 0.1 km of nests. MSOs select nest stands with denser canopy than available.
Tarango et al	1997	MSO habitat in SW Chihuahua	Roost sites mean CC of **68**%. Tree density of 643 trees/ha and mean tree BA 28.5 m^2ha^{-1}.
Young et al	1998	Density and roost site characteristics in Sierra Madre Occidental	Roosts had more canopy layers, greater %CC, and greater live tree basal area then random sites. Mean CC **73**% at roosts, live basal area 20.8 m^2ha^{-1}.
Peery et al	1999	Habitat composition and configuration Tularosa Mts	Owls occupied sites with more mature mixed-conifer and mature pine than random sites. Recommended retaining 235.8 ha of mature forests (124.2 ha mixed-conifer and 111.6 ha pine) around MSO sites, similar to PAC sizes.
Seamans et al	1999	Demography of two MSO populations: Tularosa NM & Coconino AZ	Both populations declined from 1991-1997, with apparently no floater population.
Ganey et al	1999	home range and habitat use in pine-oak forest	More roosting and foraging locations in stands with >= 60% CC and stands with 20-39% CC used less than expected except for foraging. Breeding season ranges had more areas with CC >=60% and less areas with 20-39% CC than nonbreeding season home ranges. Foraging stands had greater CC than stands with no documented use (mean foraging CC 43%). Mean roost stands in breeding season = **53** % CC, nonbreeding = 44% CC.

Ganey et al	2000	Roost sites of radio-marked MSO	CC % = **74, 76, 70** in breeding season and 59, 80, 70 in nonbreeding (59 was in oak area where leaves had fallen).
Ward and Salas	2000	Roost locations for defining buffers around nests in Sacramento Mts	Nesting habitat described as >=49 treez/ha (>45 cm dbh).
Bond et al	2002	Fire and site/mate fidelity	No difference in survival, site fidelity, and fecundity between burned and unburned sites. More fledglings produced in burned sites.
May and Gutierrez	2002	Habitat associations of nest and roost sites in central AZ	Owls selected mature and young mixed conifer forests that had high canopy closure (>=55 %) in a 201-ha area around nests/roosts more than expected based on availability (no mean or raw data provided). Areas occpuied in younger forests all had residual large >=45.7 cm dbh trees present.
Ganey	2004	Thermal regimes MSO nest stands	Owl nest areas significantly cooler than random areas.
Jenness et al	2004	Fire and MSO occupancy and reproduction	Non-significant effect of fire on occupancy. Slightly lower occupancy in burned sites.
May et al	2004	Nest and roost site habitat in Coconino, N AZ	Nests and roost sites had greater % CC and greater mature and old-growth tree basal area than random sites. Mean % CC over nest = **94**. Mean % CC in nest stand = **79**, Mature/OB BA = 12.4. Mean % CC in roost stands = **84**, Mature/OG BA = 7.5. Hardwood trees also important at nest sites.
Block et al	2005	Prey ecology in Pine-Oak forests of N AZ	Maintain shrub and herbaceous vegetation for owl prey.
Ganey and Block	2005	Winter movements and range use	Nesting habitat conservation should help with wintering habitat.
Ganey et al	2005	Home range, habitat use, survival, fecundity in Sacramento Mts	Mixed-conifer forests were important roosting habitat in mesic and xeric areas. Home range sizes were significantly larger in xeric than mesic areas.
Hathcock and Haarmann	2008	Predictive habitat model in **Jemez Mts**, N New Mexico	Owls select habitat with greater diversity, density, and height of trees, canopy cover, and shrub density. All burned sites were excluded from the study/model.
Mullet and Ward	2010	Microhabitat features at nests and roosts in Guadalupe Mts NM & TX	Significantly higher tree % CC at use sites in canyons (mean **75**%) and also more saplings (63%).

Moors and Ward	2011	Chiricahua Mts occupancy	A lot of use of post-fire sites documented
Ward and Moors	2011	Pinaleno Mts occupancy	
Ganey et al	2013	Nesting habitat selection in Sacramento Mts NM	At nests and in PACs, owls sites had greater % CC and higher BA from large trees (>46 cm dbh) and BA from very large trees (>61 cm) than random sites. Mean tree CC at nests was **67**. BA live trees 35.6, BA very large trees 10.4.
Ganey et al	2014	Use of PACs by MSO in Sac Mts NM	Most (but not all) nest and roost sites were captured within PACs, and vacant PACs were recolonized, over a period of 24 years. Conclusions is PACs work.
Willey & Zambon	2014	Predicting occurrence of MSO in S UT canyonlands	Steeper slopes in deep canyons had more MSO.
Willey and Van Riper	2014	Home range characterstics of MSOs in Rincon Mts AZ	Roosts had signifcantly higher tree % CC (mean **96.5**%), number of trees (mean 6.5), tree height (12.5 m) and tree diameter (mean 33 cm) than random sites.
Bowden et al	2015	HR and habitat use below S Rim Grand Canyon NP	Use of cliffs and pinyon-juniper.
Willey and Van Riper	2015	Roost habitat in Canyonlands, UT	Mean roost % CC was **60**.
Timm et al	2016	Multiscale nest/roost habitat selection in Coconino and Apache-Sitgreaves NFs, AZ	From 1990-1993, top multiscale nest/roost models all contained positive selection for %CC.
Wan et al	2017	Nonstationarity in habitat selection MSO	Final multi-scale model showed % CC was the most important covariate that explained MSO habitat selection.
Hoagland et al	2018	MODIS NDVI to characterize habitat	Lincoln NF owl sites had a higher proportion of closed canopy white fir species (wet) whereas owl sites on the Reservation had higer composition of Douglas-fir stands and dry mixed-conifer, at a landscape scale
Lommler	2019	Occupancy and habitat selection after Rodeo-Chediski Fire	Significant positive effect of mixed conifer forests, significant negative effect of salvage logging, no significant effect of fire. Nest/roost selection increased with increasing BA large trees and % CC, and no fire effect
Ganey et al	2020	Annual climate in MSO habitat in Sacramento Mts	Canopy cover at weather stations in 8 MSO territories ranged from **83** to **95**%.

7 Appendix B: Exhibits submitted by mail on a USB storage device.

Appendix A Literature: “Cibola NF Canopy Cover Table Exhibits.”

- Ex. MSO Blakesley et al 2005 CSO demography_habitat
- Ex. MSO Block et al 2005 MSO prey ecology
- Ex. MSO Bond et al 2002 fire and fidelity
- Ex. MSO Bowden et al 2015 habitat use S Rim Grand Canyon
- Ex. MSO Ganey 2004 Thermal regimes MSO nest stands
- Ex. MSO ganey and block 2005 winter use of radioed MSO gtr148
- Ex. MSO Ganey et al 1999 HR and habitat use in pine oak forest
- Ex. MSO Ganey et al 2000 Roost sites of MSO
- Ex. MSO Ganey et al 2005 hr, hab use, survival of MSO in Sac Mts
- Ex. MSO Ganey et al 2013 MSO nesting habitat in Sac Mts
- Ex. MSO Ganey et al 2014 Breeding dispersal of MSO in Sac Mts
- Ex. MSO Ganey et al 2020 annual climate in MSO habitat Sac mts
- Ex. MSO Grubb et al 1997 canopy around MSO nests in Coconino NF AZ
- Ex. MSO Hathcock and Haarmann 2008 MSO predictive model in Jemez Mts NM
- Ex. MSO Hoagland et al 2018 MODIS NDVI to classify MSO in Sac Mts
- Ex. MSO Jenness et al 2004 MSO and fire
- Ex. MSO Lee 2018 owl_and_fire_review
- Ex. MSO Lee 2020 SPOW and fire Reply ecs2.3310
- Ex. MSO Lommler 2019 PhD occupancy breeding habitat selection Rodeo Chediski
- Ex. MSO May and Gutierrez 2002 MSO nest and roost sites in Coconino NF AZ
- Ex. MSO May et al 2004 MSO roost and nest sites Coconino NF AZ
- Ex. MSO Moors and Ward 2011 Chiricahua Mountains MSO Surveys
- Ex. MSO Mullet and Ward 2010 MSO nest and roosts Guadalupe Mts
- Ex. MSO Peery et al 1999 MSO habitat in Tularosa Mts NM
- Ex. MSO Seamans and Gutierrez 1995 Breeding habitat of MSO in Tularosa Mts NM
- Ex. MSO seamans and gutierrez 2007 CSO sources of variability in lambda
- Ex. MSO Seamans et al 1999 Demography of MSO Coconino and Tularosa Mts
- Ex. MSO Stephens et al 2014 CSO and fuel tmts
- Ex. MSO Tarango et al 1997 MSO habitat in SW Chihuahua
- Ex. MSO Tempel et al 2014 logging and CSO
- Ex. MSO Tempel et al 2016 meta territory occupancy
- Ex. MSO Timm et al 2016 Multi-scale MSO habitat selection in AZ
- Ex. MSO Wan et al 2017 nonstationarity in habitat selection MSO
- Ex. MSO Ward and Moors 2011 Pinaleno Mountains MSO Surveys
- Ex. MSO Ward and Salas 2000 roost location buffers MSO Sac Mts
- Ex. MSO Willey and Van Riper 2014 HR characteristics MSO Rincon Mts AZ
- Ex. MSO Willey and Van Riper 2015 Roost habitat MSO in Canyonlands
- Ex. MSO Willey and Zambon 2014 Predicting MSO occurrence in UT canyons
- Ex. MSO Young et al 1998 Density _ roost site characteristics MSO sierra madre occid

Appendix B, continued: "Cibola NF Carbon Exhibits."

- Ex. CARB1 - CEQ, NEPA Climate Guidance (2016)
- Ex. CARB2 - Exec. Order 13,990 (Jan. 20, 2021)
- Ex. CARB3 - CEQ, Climate Guidance, 86 Fed. Reg. 10252 (Feb. 19, 2021)
- Ex. CARB4 - Pinchot Inst., Forest Carbon (2015)
- Ex. CARB5 - IPCC, Summary for Policymakers, 1.5 C (2018)
- Ex. CARB6 - H. Fountain, Climate Change Is Accelerating, NYTimes (Dec. 2019)
- Ex. CARB7 - EPA, Climate Change NM (2016)
- Ex. CARB8 - Exec. Order 14,008 (Jan. 27, 2021)
- Ex. CARB9 - TSD on SCC (Feb. 2021)
- Ex. CARB10 - Sierra Club, Tackling Climate Change (2019)
- Ex. CARB11 - White House, US Mid-Century Strategy (2016)
- Ex. CARB12 - Sierra Club Cibola NF Plan DEIS Comments (Oct. 2019)
- Ex. CARB13 - Bradley et al. (2016)
- Ex. CARB14 - Carson Forest Plan FEIS - Excerpts - Carbon stores (2021)
- Ex. CARB15 - Law et al. Land use and climate change (2018)
- Ex. CARB16 - D. DellaSala - Tongass emissions final report compressed
- Ex. CARB17 - BLM, Western Or. RMP FEIS (2009)
- Ex. CARB18 - Moomaw et al., Proforestation (2019)
- Ex. CARB19 - Hudiburg, Life-Cycle Assessment (2019)
- Ex. CARB20 - B. Law et al., Status of Science on Forest Carbon Managament (2020)
- Ex. CARB21 - B. Law & W. Moomaw, Keeping Trees in the Ground, The Conversation - 2021-02-23
- Ex. CARB22 - Schoennagel (2017)
- Ex. CARB23 - Hansen et al. (2014)
- Ex. CARB24 - Erb (2018)
- Ex. CARB25 - Griscom (2017)

Appendix B, continued: “Cibola NF Grazing Exhibits.”

- Ex. GRAZ Belsky et al. 1999
- Ex. GRAZ Dauwalter et al. 2018
- Ex. GRAZ Fleischner 1994
- Ex. GRAZ Grudzinski et al. 2020
- Ex. GRAZ Hough-Snee et al. 2013
- Ex. GRAZ Jones 2000
- Ex. GRAZ Kauffman and Kreuger 1984
- Ex. GRAZ Kreuper_etal_2003
- Ex. GRAZ Perla and Stevens 2008
- Ex. GRAZ Poff et al. 2011
- Ex. GRAZ Stevens et al. 2002
- Ex. GRAZ Swanson et al. 2015

Other Exhibits:

- Ex. MSO 1 Leadership Forum June 2020 Notes
- Ex. MSO 2 USFS letter to John Horning
- Ex. ROAD 1 WildEarth Guardians Report
- Ex. ROAD 2 Holtrop memo re subpart A
- Ex. ROAD 3 Weldon memo re subpart A
- Ex. ROAD 4 Weldon memo re subpart A