September 4, 2020

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Submitted via https://cara.ecosystem-management.org/Public//CommentInput?Project=56958

Re: Comments on Scoping for the Pinaleño FireScape Project Environmental Assessment, Project #56958

Dear Ms. Williams:

Thank you for the opportunity to provide comments on the Pinaleño FireScape Project ("Pinaleño Project"). We submit these comments on behalf of the Center for Biological Diversity.

The Center for Biological Diversity is a non-profit environmental organization with more than 81,000 members, and more than 1.7 million members and online activists nationwide, who value wilderness, biodiversity, old growth forests, and the threatened and endangered species which occur on America's spectacular public lands and waters. Center members and supporters use and enjoy the Coronado National Forest and the Pinaleño Project area for, among other things, recreation, photography, wildlife viewing, nature study, and spiritual renewal.

The Center for Biological Diversity believes that the welfare of human beings is deeply linked to nature — to the existence in our world of a vast diversity of wild animals and plants. Because diversity has intrinsic value, and because its loss impoverishes society, we work to secure a future for all species, great and small, hovering on the brink of extinction. We do so through science, law and creative media, with a focus on protecting the lands, forests, waters and climate that species need to survive. The Center has and continues to actively advocate for increased protections for species and their habitats in the forests of the American Southwest.

The Center has for decades advocated for the sound management of lands in the Pinaleño Mountains, particularly in relation to efforts to protect the Mount Graham red squirrel, one of the most endangered mammals in North America. Despite our advocacy, the Forest Service has continued its industrial affront to nature and traditional Western Apache culture by sacrificing the mountain to corporate academic and religious special interests. The Forest Service's defense of these invasive institutions, including the intentional torching of forest to protect a telescope, has further threatened the survival of the red squirrel, a fact that the preparers of this NEPA document must directly address. As a reminder of the legacy of unlawful desecration permitted,

endorsed, sanctioned and celebrated by the Forest Service, we have attached a Notice of Intent to Sue the Forest Service written in 2010 by the Center's Dr. Robin Silver.[1] In addition, we have attached a more recent complaint filed against the Forest Service for the continued failure to conserve and recover the squirrel.[2] We request that the project Interdisciplinary Team carefully study these documents, as we suspect that new staff have arrived at the Coronado NF who are unaware of this decades-long struggle to save Mount Graham and its unique habitat. The Interdisciplinary Team must be fully aware of the tragic trajectory the Coronado National Forest has been on with regards to the care for this site of unparalleled ecological significance. And, we urge the Interdisciplinary Team to be mindful of how any action undertaken by the Forest Service here will be subject to our strict scrutiny to ensure that the agency's actions are lawful.

To be clear, the Center strongly supports the restoration of fire within the parameters of natural range of variability. We recognize and appreciate the progress made by the Forest Service in restoring functional fire regimes at landscape scales. And we support some strategically located and appropriately scaled thinning and mechanical operations as needed in order to support safe and effective fire operations. However, much can go awry in planning and implementing landscape scale projects, especially when the Forest Service's institutional prejudice in favor of logging and industrial timber management override sound, ecologically-based planning. To this point, the scoping letter does not reassure us that the Forest Service is taking a prudent approach. The information the Forest Service provides in its scoping letter is exceptionally vague in its description of proposed treatments, especially mechanical operations. We hope that the Forest Service, as it moves forward, will describe the proposed action in much more detail in subsequent NEPA documents. And we ask that the nexus with the Pinaleño Ecosystem Restoration Project is clearly described.

Federal law mandates that all agencies shall "initiate and utilize ecological information in the planning and development of resource-oriented projects." [3] "NEPA procedures must ensure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA." [4]

The comments here represent a wealth of high quality, scientific analysis, expert agency-produced reports, and a high level of public scrutiny provided by our organization. As stewards of our public lands, we expect the Coronado National Forest to utilize the best available science, public participation, and ecological management principles to move the vegetative communities of the project area towards a state of higher ecological integrity and resilience, consistent with law and agency regulation.

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[1] *See* R. Silver, Notice of Intent to Sue (Dec. 22, 2010), attached as Ex. 1.

[2] Complaint, *Center for Biological Diversity v. Christiansen*, Docket No. 4:20-cv-00251-BGM (D. Ariz. June 10, 2020), attached as Ex. 2.

[3] 42 U.S.C. § 4332(H)

[4] 40 C.F.R. § 1500.1(b)

I. ANY ENVIRONMENTAL ANALYSIS MUST COMPLY WITH NEPA.[5]

The National Environmental Policy Act (NEPA) is "our basic national charter for protection of the environment."[6] Congress enacted NEPA to "encourage productive and enjoyable harmony between man and his environment … promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulating the health and welfare of man; and enrich the understanding of the ecological systems and natural resources important to the Nation."[7] "NEPA has twin aims. First, it places upon an agency the obligation to consider every significant aspect of the environmental impact of a proposed action, and to consider reasonable alternatives that could mitigate those impacts. Second, it ensures that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process."[8]

A. Any Environmental Analysis Must Provide Baseline Information about the Project Area.

Information contained in a NEPA analysis "must be of high quality. Accurate scientific analysis … [is] essential to implementing NEPA."[9] An agency's "[h]ard look" analysis should utilize "the best available scientific information."[10] As part of developing an accurate analysis, NEPA documents must "succinctly describe the environment of the area(s) to be affected ... by the alternatives under consideration."[11] "Establishing appropriate baseline conditions is critical to any NEPA analysis. 'Without establishing the baseline conditions which exist ... before [a project] begins, there is simply no way to determine what effect the [project] will have on the environment and, consequently, no way to comply with NEPA.'"[12] The Ninth Circuit has explained that "[t]he establishment of a 'baseline is not an independent legal requirement, but rather, a practical requirement in environmental analysis often employed to identify the environmental consequences of a proposed agency action.'"[13]

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[5] This action is governed by the Council on Environmental Quality's 1978 regulations, as amended, and so all references to the CEQ regulations are to those currently in force. 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). This process was begun before September 14, 2020, and the Forest Service has not indicated that it has chosen to apply the new rules to this project.

[6] 40 C.F.R. § 1500.1(a).

[7] 42 U.S.C. § 4321.

[8] *Balt. Gas & Elec. Co. v. Natural Res. Def. Council*, 462 U.S. 87, 97 (1983) (citation omitted).

[9] 40 C.F.R. § 1500.1(b).

[10] *Colo. Envtl. Coal. v. Dombeck*, 185 F.3d 1162, 1171 (10th Cir. 1999).

[11] 40 C.F.R. § 1502.15.

[12] *Great Basin Res. Watch v. BLM*, 844 F.3d 1095, 1101 (9th Cir. 2016) (quoting *Half Moon Bay Fishermans' Mktg. Ass'n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988)).

[13] *Or. Natural Desert Ass'n v. Jewell*, 840 F.3d 562. 568 (9th Cir. 2016) (quoting *Am. Rivers v. FERC*, 201 F.3d 1186, 1195 n.15 (9th Cir. 1999)).

Any NEPA document prepared for the Pinaleño Project must provide the following baseline information concerning the project area:

- Fire regimes of all plant communities and fire history and fire atlas information
- Location and status of all rare species populations
- Location, extent, and severity of invasive plants and animals and factors leading to current conditions
- Current forest and woodland structural conditions including size and density distributions
- Location, extent, and condition of old growth forests and woodlands
- Historic climax plant communities and reasons for their decline
- Location and condition of northern goshawk and Mexican spotted owl habitats
- Ecological Site Description, soils, and associated potential vegetation types or ERU's
- Occupied and potential habitat for endemic species
- Soils with potential to develop biological soil crust cover
- Current cover of biological soil crust (distinguishing light cyanobacteria, dark cyanobacteria, moss, and lichen)
- Size/density/species of shrubs present in shrub and chaparral communities
- Current authorized system roads and user-created motorized vehicle routes
- Sources of water for wildlife by season of use in the proposed treatment area
- Fences and water transport, storage, and intensity of use within and near the proposed treatment areas, and other range management infrastructure
- Location, status, and condition of livestock exclosures or areas closed to livestock
- Incised channels, areas of severe erosion, soils with severe erosion hazard, and areas subject to increased erosion following treatment

B. Any Environmental Analysis Must Analyze a Range of Reasonable Alternatives.

In taking the "hard look" at impacts that NEPA requires, an EA must "study, develop, and describe" reasonable alternatives to the proposed action.[14] NEPA's requirement that alternatives be studied, developed, and described both guides the substance of the environmental decision-making and provides evidence that the mandated decision-making process has actually taken place."[15]

Federal courts explain that this mandate extends to EAs as well as EISs. "A properly-drafted EA must include a discussion of appropriate alternatives to the proposed project."[16] This alternatives analysis "is at the heart of the NEPA process, and is 'operative even if the agency finds no

[14] 42 U.S.C. § 4332(2)(C) & (E); 40 C.F.R. § 1508.9(b) (an EA "[s]hall include brief discussions . . . of alternatives").

[15] *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1228 (9th Cir. 1988) (citation omitted).

[16] *Davis v. Mineta*, 302 F.3d 1104, 1120 (10th Cir. 2002) (granting injunction where EA failed to consider reasonable alternatives).

significant environmental impact.'"[17] 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."[18] 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."[19]

In determining whether an alternative is "reasonable," and thus requires detailed analysis, courts look to two guideposts: "First, when considering agency actions taken pursuant to a statute, an alternative is reasonable only if it falls within the agency's statutory mandate. Second, reasonableness is judged with reference to an agency's objectives for a particular project."[20] Any alternative that is unreasonably excluded will invalidate the NEPA analysis. "The existence of a viable but unexamined alternative renders an alternatives analysis, and the EA which relies upon it, inadequate."[21] The agency's obligation to consider reasonable alternatives applies to citizen-proposed alternatives.[22]

Courts hold that an alternative may not be disregarded merely because it does not offer a complete solution to the problem.[23] 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."[24] 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."[25]

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[17] *Diné Citizens Against Ruining Our Env't v. Klein*, 747 F. Supp. 2d 1234, 1254 (D. Colo. 2010) (quoting *Greater Yellowstone Coal. v. Flowers*, 359 F.3d 1257, 1277 (10th Cir. 2004)). *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)); 40 C.F.R. § 1502.14 (describing alternatives analysis as the "heart of the environmental impact statement").

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

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

[20] *Diné Citizens Against Ruining Our Env't*, 747 F. Supp. 2d at 1255 (quoting *New Mexico ex rel. Richardson*, 565 F.3d at 709). *See also Idaho Conservation League v. Mumma*, 956 F.2d 1508, 1520 (9th Cir. 1992) ("nature and scope of proposed action" determines the range of reasonable alternatives agency must consider).

[21] *Diné Citizens Against Ruining Our Env't*, 747 F. Supp. 2d at 1256.

[22] *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).

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

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

[25] *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 in the EA any decision to eliminate an alternative from further study.[26]

1. The Forest Service Should Analyze a Strategic Treatments for Fire Use Alternative.

The Forest Service should analyze in detail a Strategic Treatments for Fire Use (STFU) alternative. The Forest Service's failure to analyze this alternative in detail, or explain why the agency would not, would violate NEPA.

The origin of the contemporary health crisis affecting Southwestern forests such as the Pinaleño Mountains lies squarely on past attempts to bring order to wild, natural ecosystems. Fire suppression, old-growth liquidation, excessive livestock grazing, and application of silvicultural systems designed to maximize sawtimber production are primary factors that led to degraded forest health, diminished ecological integrity, and reduced resilience to climate change and other perturbations. Recognizing the need for comprehensive ecological restoration of degraded fire-adapted forests, watersheds, and endangered species habitats, a range of stakeholders have worked towards solutions to this crisis for two decades.

As an active participant in southwestern forest restoration for this more than twenty years, the Center has been at the philosophical forefront of forest restoration activities in the southwest. The Center believes that many of the Forest Service's recent actions relating to forest restoration are now moving in the wrong direction, with excessive emphasis on structural manipulation and insufficient attention to fire-driven ecological processes. As an example, the Apache-Sitgreaves National Forest has recently ramped up old growth logging to a level not seen in 25 years because of perceived threats to forest sustainability due to dwarf mistletoe. Another example is the recently abandoned effort to increase the intensity of thinning treatments in 4FRI under the guise of "Extended Duration Restoration". We are hopeful that the Pinaleño Project will not continue this unfortunate trajectory of misguided decision-making.

In response to the pattern of drifting away from core restoration principles, the Center has prepared the *Strategic Treatments for Fire Use Alternative* as a change of course to accomplish forest restoration goals in a more effective and efficient manner, and we are now requesting that this model is incorporated into the Pinaleño Project as a stand-alone action alternative for analysis.

Fundamental to nearly all guiding forest restoration documents is the need for strategically prioritizing and placing mechanical thinning treatments that facilitate safe application of prescribed and wildland fire. This need is consistent throughout the entire history and evolution of southwestern and national level forest restoration literature. At the core of the *Strategic Treatments for Fire Use Alternative* is our position that the current direction in planning, analysis and implementation of Southwestern forest restoration is overly reliant on meeting structural and compositional targets, representing what is in effect a non-viable silvicultural solution to a

[26] *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.

complex ecological problem. The quest to create the ideal vegetative state across every operable acre has marginalized the overriding importance of fire-driven ecological processes.

The Center rejects a framework which assumes that complex ecosystems can be wrangled into fixed proportions of tree ages and sizes that must be repeatedly tinkered with at 30-year rotations to maintain "desired conditions." In areas where strategically located mechanical intervention is implemented, fire alone can and should be the primary future maintenance tool.[27] Measuring the health of the forest on the basis of density-metrics represents a worn-out allegiance to a past industrial paradigm. This regulated-forest model defines successful restoration as growing large, defect-free trees as quickly as possible and ignores the complexity of process-centered ecosystem function. Restoring a forest is not an exercise in manipulating every quantifiable metric into a neat category, or alleviating any form of stress that might lead to unexpected mortality. Renowned fire ecologist Dr. Pete Fulé stated that "The fire-related adaptations of pine forests are associated with fire's role as a selective force going far back in evolutionary time,"[28] suggesting that restoration of fire adapted dry forests is inseparable from the influence of recurrent fire as a primary selective force. Applying a new form of growth and density regulation, as articulated in the Forest Service study known as GTR-310[29], cannot by itself accomplish restoration at meaningful landscape scales; only the additive effects of frequent fire can fully restore these ecosystems. We are hopeful that because the Pinaleño Project is a "firescape" project, our vision for strategically designed and implemented small-scale treatments fits well into the Forest Service's proposed action.

USFS research scientists have long worked to develop decision support, risk management, and prioritization tools for use in applications like the Pinaleño Project. Their work has been fundamental in establishing the science of optimization that is increasingly being explored and implemented in the western United States. Important considerations for utilizing wildland fire use have been identified by fire management professionals[30,31] and agency-developed risk management and decision support systems, such as Fire Effects Planning Framework,[32] provide systematic geospatial techniques for managing fire for resource benefit.

Prominent fire scientists and managers are increasingly calling for strategically-placed treatments on portions of the landscape in order to safely facilitate the use of prescribed and managed wildfire to achieve restoration of frequent fire adapted ecosystem processes, composition, and

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[27] North, M., B.M. Collins, and S. Stephens. 2012. Using Fire to Increase the Scale, Benefits, and Future Maintenance of Fuels Treatments. *Journal of Forestry* 110(7): 392-401. *See also* Reinhardt, E.D., R.E. Keane, D.E. Calkin, and 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.

[28] p. 528 in Fulé 2008. Does it make sense to restore wildland fire in changing climate? *Restoration Ecology* 16(4): 526-531.

[29] Reynolds *et al.* 2013. Restoring composition and structure in Southwestern frequent-fire forests: A science-based framework for improving ecosystem resiliency. RMRS-GTR-310.

[30] Black *et al.* 2008. Wildland Fire Use Barriers and Facilitators. *Fire Management Today* 68(1): 10-14.

[31] Doane, D., J. O'Laughlin, P. Morgan, and C. Miller. 2006. Barriers to wildland fire use: A preliminary problem analysis. *International Journal of Wilderness* 12(1): 36-38.

[32] Black and Opperman 2005. Fire Effects Planning Framework: a user's guide. RMRS-GTR-163.

structure. In a sweeping review of federal fire policy, Stephens and others recommended that the number one improvement that could be made in planning and implementing forest and fire management is to "mandate evaluation of opportunities for ecologically beneficial fire in land management planning."[33] Forest Service researchers have established that any science-based planning should ask "Which locations provide the greatest strategic opportunity for fuel treatments that would facilitate attainment of desired conditions?"[34] The Strategic Treatments for Fire Use Alternative asks this important question. One of the Nation's foremost forest restorationists has stated that "restoration of surface fire in most sites and thinning in strategic sites will increase resistance to severe wildfire at the stand and landscape scales, insect pathogens, and invasive non-native species."[35] The Center agrees with that assertion and believes that the Forest Service should approach the Pinaleño Project analysis within such a framework, wherein project objectives relax the focus on strict structural parameters and instead utilize cost-effective means that emphasize fire-based ecological process to establish landscape mosaics and maintain ecological integrity. If this is indeed the Project's objective, we request that the Forest Service state that clearly and convincingly in future documents.

Ager and colleagues stated in a 2013 article that "Meeting the long-term goals of dry forest restoration will require dramatic increases in prescribed and managed fire that burn under conditions that pose minimal ecological and social risk. Optimization models can facilitate the attainment of these goals by prioritizing management activities and identifying investment tradeoffs."[36] That 2013 work, located in ponderosa pine forests on the Deschutes National Forest in Oregon, studied an optimization model "to locate project areas to most efficiently reduce potential wildfire loss of fire resilient old growth ponderosa pine while creating contiguous areas within which prescribed and managed fire can be effectively used."[37] The complex modelling and algorithms used by the researchers ultimately identified locations where strategically deployed mechanical treatments would reduce flame length and thus save old growth ponderosa pine while killing small diameter ladder fuels.

One common fundamental similarity between all optimization models is that they seek to reduce fire-severity or minimize wildfire risk, balancing tradeoffs between the size of treatment units,

[33] p. 4 in Stephens, S.L., B.M. Collins, E. Biber, and P.Z. Fule. 2016. U.S. federal fire and forest policy: emphasizing resilience in dry forests. *Ecosphere* 7(11): 1-19.

[34] Peterson and Johnson 2007. Science-based strategic planning for hazardous fuel treatments. *Fire Management Today* 67(3): 13-18.

[35] p. 529 in Fule, P.Z. 2008. Does it make sense to restore wildland fire in changing climate? *Restoration Ecology* 16(4):526-531.

[36] p. 11 in Ager, A.A., N.M. Vaillant, and A. McMahan. 2013. Restoration of fire in managed forests: a model to prioritize landscapes and analyze tradeoffs. *Ecosphere* 4(2): 1-19.

[37] p. 3 in Ager *et al.* 2013.

the placement of treatments, and the proportion of the landscape treated.[38,39,40] Collins and colleagues[41] also reviewed fuel treatment strategies, including much of Finney and Ager's work, and arrived at some basic parameters for optimizing fuel reduction treatments at the landscape scale that provide some guidance for those evaluating tradeoffs and can be used as guidelines in the *Strategic Treatments for Fire Use Alternative*:

> • Treating 10% of the landscape provides notable reductions in modeled fire size, flame length, and spread rate across the landscape relative to untreated scenarios, but treating 20% provides the most consistent reductions in modeled fire size and behavior across multiple landscapes and scenarios.
>
> • Increasing the proportion of area treated generally resulted in further reduction in fire size and behavior, however, the rate of reduction diminishes more rapidly beyond 20% of the landscape treated.
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> • Random placement of treatments requires substantially greater proportions of the landscape treated compared with optimized or regular treatment placement.
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> • The improvements offered by optimized treatments are reduced when 40%-50% of the landscape is unavailable for treatment due to land management constraints.
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> • Treatment rates beyond 2% of the landscape per year yield little added benefit.

The Pinaleño Project NEPA analysis should identify strategic treatment priorities incorporating new scientific information relevant to landscape-scale restoration within the Pinaleño Project landscape. These include:

> • Strategically placed treatments to support fire use in the long-term, utilizing anchor points such as natural fuel breaks, previously treated or burned areas, roads, and waterways
>
> • Reasons why the location, timing and intensity of proposed mechanical actions will support a coherent restoration strategy
>
> • Landscape scale assessment of opportunities to manage unplanned natural ignitions for resource benefits

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[38] Collins *et al.* 2010. Challenges and approaches in planning fuel treatments across fire-excluded forested landscapes. *Journal of Forestry* Jan/Feb 2010: 24-31.

[39] Chung 2015. Optimizing fuel treatments to reduce wildland fire risk. *Current Forestry Reports* 1: 44-51.

[40] Krofcheck, D.J., M.D. Hurteau, R.M. Scheller, and E.L. Loudermilk. 2017a. Prioritizing forest fuels treatments based on the probability of high-severity fire restores adaptive capacity in Sierran forests. *Global Change Biology DOI: 10.1111/gcb.13913.*

[41] Collins *et al.* 2010.

- An analysis of fire-risk at multiple spatial scales using broader criteria[42]
    - surface fuel density and arrangement
    - canopy base height
    - crown bulk density
    - local topography
    - prevailing weather patterns

Without active fuels management and fire use for resource benefits on relatively short rotations compared to the era of total fire suppression, the Forest Service generally manages landscapes for large-scale, high-intensity fires that outrun suppression resources in extreme weather and create unnecessary management expense and unacceptable risks to human life and resource values. We appreciate that the Pinaleño Project intends to use prescribed fires to accomplish a range of objectives. In addition, we urge the Forest Service to design the project to promote use of unplanned wildland fires while providing for public safety. The NEPA analysis should provide meaningful analysis of how, where, and when unplanned ignitions could be used to accomplish resource management objectives, and what the range of effects of fire-use could be. Adverse effects of fire control practices to the environment[43] should be analyzed and disclosed where proposed treatments are designed to increase the effectiveness of fire suppression.

Ultimately, forest structure and fire regime must be restored in an integrated way.[44] In ponderosa pine forest and mixed-conifer forest, this means emphasizing landscape-scale use of wildland fire as the primary self-sustaining disturbance process that will naturally promote ecosystem adaptation and resilience—and then scaling down to coordinated project-level actions including fuel treatments that accomplish landscape-level objectives.[45] The project analysis should demonstrate that the proposed action fits into the coordinated management strategy possible through the *Strategic Treatments for Fire Use Alternative* that moves towards allowing natural ignition fires to burn.

Considering the fire modeling that we assume is already underway by the Forest Service for the Pinaleño Project, and the key takeaways reviewed here, the Center believes that a modified version of the methodology developed by the Hurteau lab and used by Krofcheck and

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[42] These criteria have long-been identified as fundamental factors in effective fire and fuels-management planning, for example, *see*: Agee, J.K., and C.N. Skinner. 2005. Basic principles of forest fuel reduction treatments. *Forest Ecology and Management* 211(1): 83-96. *See also* Reinhardt, E. D., R.E. Keane, D. E. Calkin, and 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.

[43] Backer, D.M, S.A. Jensen, and G.R. McPherson. 2004. Impacts of fire suppression activities on natural communities. *Conservation Biology* 18: 937-46.

[44] DellaSala, D.A., J.E. Williams, C.D. Williams and J.F. Franklin. 2004. Beyond smoke and mirrors: a synthesis of fire policy and science. *Conservation Biology* 18: 976-86.

[45] Peterson, D.L. and M.C. Johnson. 2007. Science-based strategic planning for hazardous fuel treatment. *Fire Management Today* 67(3):13-18.

colleagues[46,47] is completely appropriate for the Pinaleño Project. Their research[48] has developed "prioritization strategies for implementing fuel treatments…with the goal to maximize treatment efficacy using optimal placement and prescription options under typical and extreme fire weather conditions."[49] Their optimization model, which mechanically treats only the operable areas with a high probability of mixed- and high-severity fire, was shown in multiple fire simulations to be as effective as thinning all operable acres at reducing wildfire burn severity and facilitating landscape scale low-severity fire restoration. This approach could inform landscape-scale restoration planning nationwide, as "Testing of strategic placement of treatments by resource managers will add data in the years ahead and provide information that can be shared and applied in other locations."[50] The authors summarize their methods here:

> "We developed three scenarios: no-management, naive placement, and optimized placement. Both management scenarios employed combinations of mechanical thinning and prescribed burning. The naive placement scenario aimed to simulate mechanical thinning from below and prescribed fire to all forest types that have experienced a fuels load departure from their historic condition due to fire exclusion. Within each forest type that received mechanical thinning, thinning was constrained based on operational limits (slope>30%, which totaled 22,436 ha available for mechanical thinning). The optimized placement scenario further constrained the area that received mechanical thinning by limiting thinning to areas that also had a high probability of mixed- and high-severity wildfire…In both treatment scenarios, stands identified for mechanical treatment were thinned from below, removing roughly one-third of the live tree biomass over the first decade of the simulation. Stands selected for mechanical thinning were only thinned once in the simulations, and all thinning was completed within the first decade."[51]

Their results suggested that thinning the most optimum 33% of the operable acres could achieve the same effect as thinning all operable acres. The study was simulated in the Sierra Nevada of California, but the authors asserted that their approach was "broadly applicable to historically frequent-fire ecosystems, or systems which have transitioned away from a low severity and fuel limited fire regime to one characterized by high-severity fires."[52] The authors have recently completed similar optimization simulations in the Santa Fe Fireshed, which is likely to provide additional direction for utilizing such an approach in Southwestern ponderosa pine and mixed conifer forests. We recommend that the Hurteau Lab be contacted immediately to begin a

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[46] Krofcheck *et al*. 2017a.

[47] Krofcheck, D.J., M.D. Hurteau, R.M. Scheller, and E.L. Loudermilk. 2017. Restoring surface fire stabilizes forest carbon under extreme fire weather in the Sierra Nevada. *Ecosphere* 8(1): 1-18.

[48] Krofcheck *et al*. 2017a; Krofcheck *et al*. 2017b.

[49] http://www.hurteaulab.org/

[50] p. 15 in Peterson, D. L. and M.C. Johnson. 2007. Science-based strategic planning for hazardous fuel treatment. *Fire Management Today* 67(3):13-18.

[51] p. 2 in Krofcheck *et al*. 2017a.

[52] p. 6 in Krofcheck *et al*. 2017a.

dialogue with as to how an optimization process can incorporate optimized fire modelling to achieve a high level of strategic utility for the benefit of the Pinaleño Project.

Optimizing spatial prioritization of non-commercial mechanical treatments reflects an evolution of fire management, placing emphasis on restoring fire as a natural process, rather than simply disrupting fire spread and protecting areas from burning.[53] The result of a strategic approach is to move away from managing for short-term outcomes and towards achievement of long-term restoration goals and objectives, consistent with calls from the scientific community to increase the use of prescribed and managed wildfires for resource benefit.[54] In a review of optimization strategies, Collins and colleagues stated that "[t]he basic idea is that an informed deployment of treatment areas, a deployment that covers only part of the landscape, can modify fire behavior for the entire landscape."[55] As an example, researchers have observed that thinned stands within the Rodeo-Chediski Fire affected fire behavior in neighboring untreated stands, leading to more complex heterogeneity, reduced fire severity, and increased ponderosa pine regeneration following the fire.[56]

The Center believes that an *informed deployment* of the non-commercial mechanical and fire treatments can more effectively and efficiently restore ponderosa pine and mixed conifer forests, and the *Strategic Treatments for Fire Use Alternative* is the way to get there. NEPA regulations refer to the selection and review of alternatives as "the heart" of the environmental review.[57] NEPA requires the Forest Service to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."[58] Regulations implementing NEPA require that the agency "[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated."[59] The NEPA process must "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."[60] The analysis of the *Strategic Treatments for Fire Use Alternative* is critical as it ensures that the Forest Service does not "prematurely foreclose options that might protect, restore, and enhance the environment."[61]

Current Forest Service policy and guidance calls for strategic treatment implementation. The dramatic deficit of annual acreage burned in frequent-fire adapted forests has led senior Forest Service scientists to call for increasing the scale and rate of fuels treatments following three key

[53] Ager *et al.* 2013.

[54] Stephens *et al.* 2016.

[55] p. 25 in Collins *et al.* 2010.

[56] Shive, K.L., C.H. Seig, and P.Z. Fule. 2013. Pre-wildfire management treatments interact with fire severity to have lasting effects on post-wildfire vegetation response. *Forest Ecology and Management* 297: 75-83.

[57] 40 C.F.R. § 1502.14.

[58] 42 U.S.C. § 4332(2)(E)

[59] 40 C.F.R. § 1502.14(a)

[60] 40 C.F.R. § 1500.2(f)

[61] FSH 1905.15 Ch. 20 § 14.

strategies:[62] 1) Increasing the extent of fuel treatments if resources permit; 2) Designing treatments to create conditions conducive to naturally ignited fires burning under desired conditions while fulfilling an ecological role; and 3) Placing treatments to reduce hazard while providing options for firefighting when highly valued resources and assets are present. These strategies are becoming widely accepted by fire scientists and managers, but intransigence remains firmly rooted in certain elements of Forest Service culture.[63]

The *Strategic Treatments for Fire Use Alternative* is rooted in these strategies and demonstrative of the approach promoted in the *National Cohesive Wildland Fire Management Strategy* ("National Strategy").

The National Strategy identifies this general guidance for Vegetation and Fuels Management:[64]

> • **Design and prioritize fuel treatments.** Where wildfires are unwanted or threaten communities and homes, design and prioritize fuel treatments to reduce fire intensity, structure ignition, and wildfire extent.
>
> • **Strategically place fuel treatments.** Where feasible, implement strategically placed fuel treatments to interrupt fire spread across landscapes.
>
> • **Increase the use of wildland fire for meeting resource objectives.** Where allowed and feasible, manage wildfire for resource objectives and ecological purposes to restore and maintain fire-adapted ecosystems and achieve fire-resilient landscapes.
>
> • **Continuing and expanding the use of all methods to improve forest and range resiliency.** Continue and expand the use of prescribed fire to meet landscape objectives, improve ecological conditions, and reduce the potential for high-intensity wildfires. Use and expand fuel treatments involving mechanical, biological, or chemical methods where economically feasible and sustainable, and where they align with landowner objectives.

By focusing limited resources on specific key locations, expanded wildland fire use for resource benefit can be utilized to achieve fuels reduction and ecological restoration objectives. The National Strategy clearly asserts that "Prescribed fire and managing wildfire for resource objectives have the greatest potential for treating large areas at lower cost than mechanical

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[62] p. 301 in Vaillant and Reinhardt 2017. An evaluation of the Forest Service hazardous fuels treatment program—are we treating enough to promote resiliency or reduce hazard? *Journal of Forestry* 115(4): 300-308.

[63] Doane *et al.* 2006. Barriers to wildland fire use a preliminary problem analysis. *International Journal of Wilderness* 12(1): 36-38.

North *et al.* 2015b. Reform forest fire management – agency incentives undermine policy effectiveness. *Science* 349(6254): 1280–1281.

Stephens *et al*. 2009. Fire treatment effects on vegetation structure, fuels, and potential fire severity in western U.S. forests. *Ecological Applications* 19(2): 305-320.

[64] pp. 1 and 58 in National Strategy 2014: https://www.forestsandrangelands.gov/strategy/thestrategy.shtml.

treatments."[65] Researchers have long asserted that "Prioritizing restoration efforts is essential because resources are limited. An initial focus on areas most likely to provide benefits and that present a low risk of degradation of ecological values will build experience and credibility."[66] Prominent fire scientists have affirmed that "Strategically placing fuel treatments to create conditions where wildland fire can occur without negative consequences and leveraging low-risk opportunities to manage wildland fire will remain critical factors to successful implementation of the [National] Strategy."[67] This approach is further called for in the 2012 Mexican Spotted Owl Recovery Plan, which suggests that restoration projects: "Conduct a landscape-level risk assessment to strategically locate and prioritize mechanical treatment units to mitigate the risk of large wildland fires while minimizing impact to PACs."[68] The *Strategic Treatments for Fire Use Alternative* considers these fundamental principles, and prioritizes mechanical thinning where it would be most effective to ensure community protection, preserve recreational opportunities, and restore predominantly low-intensity fire regimes where they are appropriate, and facilitate use of mixed severity fire where it is appropriate.

2. The Forest Service Should Analyze an Alternative that Prohibits Mechanical Treatments in Inventoried Roadless Areas and the Mount Graham Wilderness Study Area.

As described below, the project area overlaps the nearly 62,000-acre Mount Graham Wilderness Study Area (WSA), and the majority of the project area is inventoried roadless areas protected by the Roadless Area Conservation Rule. The Forest Service cannot approve a plan that violates the Roadless Rule, the Arizona Wilderness Act of 1984 or Forest Plan provisions concerning the management of these areas.

The Forest Service should consider an alternative that prohibits the use of mechanical treatments in both inventoried roadless areas and the Mount Graham WSA. This alternative will best protect the wild, roadless nature of these areas, while still allowing some prescribed fire and low-impact hand thinning treatments to occur under the right conditions.

Consideration of such an alternative would align with recent agency practice in the Southwest Region and beyond. For example, the proposed action for the Kaibab Plateau Ecological Restoration Project (Forest Service project #54226) – another landscape-scale attempt to return fire to forested landscapes – prohibited

> mechanical treatments with *machinery or hand tools* … in inventoried roadless areas. Prescribed fire may be used in … Roadless Areas to promote desired conditions and maintain roadless area characteristics by reducing the risk of uncharacteristic, high-intensity wildfires. The objective is to modify vegetation

[65] p. 58 in National Strategy 2014

[66] Brown *et al*. 2004. Forest restoration and fire: principles in the context of place. *Conservation Biology* 18(4): 903-912.

[67] p. 8 in Barnett *et al.* 2016. Beyond fuel treatment effectiveness: characterizing interactions between fire and treatments in the US. *Forests* 7(237): 1-12.

[68] p. 262 in USFWS 2012 Mexican Spotted Owl Recovery Plan, First Revision (*Strix occidentalis lucida*). Southwest Region U.S. Fish and Wildlife Service Albuquerque, New Mexico.

> and fuel loads to allow us to better manage wildfires and promote the historical role of fire on the landscape. No holding lines would be constructed in inventoried roadless areas.[69]

The Forest Service issued its EA for the Kaibab project in June, 2020. That EA states that the project would allow some "mechanical treatments" with "hand tools" for tree removal in IRAs only "to protect fire-sensitive heritage resources."[70] The Forest Service here should consider such an alternative for the Pinaleño Project.

The Medicine Bow National Forest in the Rocky Mountain Region last month similarly approved a landscape scale project to address concerns about fire sparked by widespread beetle tree mortality from a beetle epidemic. There, the Regional Forester, ruling on conservation groups' objections, concluded that the Medicine Bow NF had violated NEPA by failing to consider a reasonable alternative that would eliminate proposed treatments in inventoried roadless areas, or to explain why such an alternative was not reasonable, and ordered the Forest to review such an alternative.[71] In response, the Forest Service last month issued a Record of Decision on the project that excluded inventoried roadless areas from the project.[72]

These recent agency proposals and decisions make clear that the Forest Service should consider reasonable alternatives to protect the values of roadless forest by excluding tree removal in such areas.

II. THE FOREST SERVICE MUST ENSURE THAT THE PINALEÑO PROJECT COMPLIES WITH THE ROADLESS AREA CONSERVATION RULE.

The U.S. Forest Service adopted the Roadless Area Conservation Rule (Roadless Rule) in 2001 "to protect and conserve inventoried roadless areas on National Forest System lands."[73] The rule observed:

> Inventoried roadless areas provide clean drinking water and function as biological strongholds for populations of threatened and endangered species. They provide

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[69] Kaibab Nation Forest, Environmental Assessment, Kaibab Plateau Ecological Restoration Project (June 2020) at 154, excerpts attached as Ex. 3.

[70] *Id*. at 15; *see also id*. at 18 ("The only mechanical treatments proposed are those needed to protect fire-sensitive heritage resources in inventoried roadless areas, and only hand tools would be used to cut vegetation on or around sites or build hand lines around sites"); *id*. at 94 ("In inventoried roadless areas, the proposed action includes prescribed fire and mechanical cutting with hand tools and construction of hand line to protect fire-sensitive heritage sites. No other tree cutting would occur.").

[71] Forest Service, Rocky Mountain Region, Medicine Bow Landscape Vegetation Analysis Project (LaVA), Reviewing Officer's Response to Eligible Objections (June 10, 2020) at 41 ("I instruct the Responsible Official to consider the alternative of excluding treatments within inventoried roadless areas"), excerpts attached as Ex. 4, and available at https://www.fs.usda.gov/nfs/11558/www/nepa/106251_FSPLT3_5303848.pdf (last viewed Sep. 4, 2020).

[72] Medicine Bow National Forest, Medicine Bow Landscape Vegetation Analysis Project Record of Decision (Aug. 2020) at 9-11, excerpts attached as Ex. 5, and available at https://www.fs.usda.gov/nfs/11558/www/nepa/106251_FSPLT3_5334953.pdf (last viewed Sep. 4, 2020).

[73] Forest Service, Special Areas, Roadless Area Conservation, Final Rule, 66 Fed. Reg. 3244 (Jan. 12, 2001).

> large, relatively undisturbed landscapes that are important to biological diversity and the long-term survival of many at risk species. Inventoried roadless areas provide opportunities for dispersed outdoor recreation, opportunities that diminish as open space and natural settings are developed elsewhere. They also serve as bulwarks against the spread of non-native invasive plant species and provide reference areas for study and research.[74]

The Rule "prohibits road construction, reconstruction, and timber harvest in inventoried roadless areas because they have the greatest likelihood of altering and fragmenting landscapes, resulting in immediate, long-term loss of roadless area values and characteristics."[75]

Compliance with the Roadless Rule will be a significant issue here because it appears that the vast majority of the project area overlaps lands identified and protected by the Rule.[76] We note that neither the Scoping Letter nor the "Design Features and Goals" document the Forest Service provided to the public even contains the word "roadless;" only the project map alerts the public to the potential for the project to impact these critical areas. This is a significant oversight.

We specifically request that if the Forest Service intends to undertake any treatments in IRAs, that the agency identify design features and goals specifically to protect roadless area values and characteristics.

A. The Roadless Area Conservation Rule.

The Roadless Rule generally prohibits road construction and timber removal within IRAs across the National Forest System outside of Colorado and Idaho.[77] The Roadless Rule contains exceptions to the logging prohibition, but they are narrowly tailored:

> Notwithstanding the prohibition in paragraph (a) of this section, timber may be cut, sold, or removed in inventoried roadless areas if the Responsible Official determines that one of the following circumstances exists. The cutting, sale, or removal of timber in these areas *is expected to be infrequent.*
>
> (1) The cutting, sale, or removal of *generally small diameter timber* is needed for one of the following purposes *and* will *maintain or improve one or more of the roadless area characteristics* as defined in § 294.11.
>
> (i) To *improve* threatened, endangered, proposed, or sensitive species habitat; or
>
> (ii) To maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects,

[74] 66 Fed. Reg. at 3245.

[75] 66 Fed. Reg. at 3244.

[76] *See* Map, Pinaleño FireScape Project (July 30, 2020) (project file).

[77] 36 C.F.R. § 294.12(a) (generally prohibiting road construction); 36 C.F.R. § 294.13(a) (generally prohibiting timber removal).

> within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period.[78]

The Roadless Rule defines "roadless area characteristics" as including:

> (1) High quality or undisturbed soil, water, and air;
>
> (2) Sources of public drinking water;
>
> (3) Diversity of plant and animal communities;
>
> (4) Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land;
>
> (5) Primitive, semi-primitive nonmotorized and semi-primitive motorized classes of dispersed recreation;
>
> (6) Reference landscapes;
>
> (7) Natural appearing landscapes with high scenic quality;
>
> (8) Traditional cultural properties and sacred sites; and
>
> (9) Other locally identified unique characteristics.[79]

The Roadless Rule anticipates that the Forest Service will engage in a ***highly site-specific analysis*** before it can consider logging in IRAs, given the regulation's emphasis on "***locally identified*** unique characteristics."[80] The Roadless Rule's preamble reinforces the need for such a site-specific analysis.

> Because of the great variation in stand characteristics between vegetation types in different areas, a description of what constitutes "generally small diameter timber" is not specifically included in this rule. Such determinations are best made through *project specific* or land and resource management plan *NEPA analyses*, as guided by ecological considerations such as those described below.
>
> The intent of the rule is to limit the cutting, sale, or removal of timber *to those areas that have become overgrown with smaller diameter trees*….
>
> [A]ll such *determinations of what constitutes* "*generally small diameter timber*" will consider how the cutting or removal of various size classes of trees would affect the potential for future development *of the stand*, and the characteristics and interrelationships of plant and animal communities associated with the site and

[78] 36 C.F.R. § 294.13(b)(1) (emphasis added).

[79] 36 C.F.R. § 294.11.

[80] *Id.* (emphasis added).

the overall landscape. *Site productivity due to factors such as moisture and elevational gradients, site aspect, and soil types will be considered, as well as how such cutting or removal of various size classes of standing or down timber would mimic the role and legacies of natural disturbance regimes in providing the habitat patches, connectivity, and structural diversity critical to maintaining biological diversity*. In all cases, the cutting, sale, or removal of small diameter timber will be consistent with maintaining or improving one or more of the roadless area characteristics as defined in § 294.11.[81] ….

Vegetative management would focus on removing generally small diameter trees while leaving the overstory trees intact. The cutting, sale, or removal of trees pursuant to 294.13(b)(1) *must be clearly shown through project level analysis to contribute to the ecological objectives described*. Such management activities are expected to be rare and to focus on small diameter trees.[82]

B. The Pinaleño Project May Involve Tree Removal in Inventoried Roadless Areas.

The scoping proposal, though vaguem indicates that "[a]nticipated treatments include planned fire, hand thinning, mechanical treatments, herbicide application, regeneration treatments, and erosion control measures. Projects would be implemented incrementally over a 20-year period."[83] Hand thinning and mechanical treatments will involve tree removal, which the Roadless Rule generally prohibits. The Scoping Letter fails to disclose where such tree removal may occur or under what conditions, making it impossible to understand the impacts to IRAs. However, the Forest Service discloses that the hand thinning and mechanical tree removal could occur in virtually every ecosystem within the project area.[84]

C. The Forest Service Cannot Log in Roadless Areas Unless it Meets the Roadless Rule's Criteria.

1. The Forest Service Must Demonstrate that Tree Removal in Roadless Areas Will Be "Infrequent."

As noted, the Roadless Rule requires that the "cutting, sale, or removal of timber" will be "infrequent." Any subsequently prepared NEPA document must ensure that the agency will meet this requirement. Because the proposal could result in tree removal across 100,000 acres or so of IRAs, and treatments occurring in such areas every year for 20 years, the Forest Service's proposal may violate this Roadless Rule provision.

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[81] Forest Service, Roadless Area Conservation Rule, 66 Fed. Reg. 3244, 3257 (Jan. 12, 2001) (emphasis added).

[82] *Id*. at 3258 (emphasis added).

[83] Letter of G. Garcia, District Ranger to Friends and Neighbors of the Coronado National Forest (July 30, 2020) at 3 (hereafter "Scoping Letter"); *see also id*. at 6-7 (describing hand thinning and mechanical treatments).

[84] Scoping Letter at 7.

2. The Forest Service Must Undertake a Site-Specific Analysis of Authorized Roadless Area Logging.

As noted above, the Forest Service directed that "[t]he cutting, sale, or removal of trees pursuant to 294.13(b)(1) must be clearly shown through project level analysis to contribute to the ecological objectives described."[85] The Roadless Rule preamble anticipated that the Forest Service would "consider how the cutting or removal of various size classes of trees would affect the potential for future development of the *stand*," and would consider "[s]ite productivity due to factors such as moisture and elevational gradients, site aspect, and soil types … as well as how such cutting or removal of various size classes of standing or down timber would mimic the role and legacies of natural disturbance regimes in providing the habitat patches, connectivity, and structural diversity critical to maintaining biological diversity."[86]

The Roadless Rule thus requires that the Forest Service prepare a site-specific, and stand-specific, analysis evaluating factors include elevation, aspect, soils, and the nature of natural disturbance regimes before it approves tree removal within IRAs.

3. The Forest Service Must Ensure That Only Small Trees Are Removed.

The Roadless Rule permits the removal of "generally small diameter timber" if certain other requirements are met. Therefore, the Forest Service may authorize hand treatments or mechanical removal of only "small diameter" trees. We urge the Forest Service to set site-specific (and species-specific) diameter limits to ensure that the agency complies with this rule. To protect old and large trees, no tree larger than 16 inches diameter at breast height or older than 150 years should be cut.

4. The Forest Service Must Demonstrate That Logging Will Maintain or Improve Roadless Area Characteristics.

The Forest Service may avail itself of the Roadless Rule's exceptions barring timber removal within a roadless areas only if that logging "will maintain or improve one or more of the roadless area characteristics as defined in § 294.11."[87] For this project, the Forest Service must, at a site-specific level, evaluate the impacts of logging treatments on *each* of the roadless area characteristics identified in the Rule.

5. The Forest Service Must Demonstrate That Any Logging Will "Improve Threatened, Endangered, Proposed, or Sensitive Species Habitat."

To avail itself of exceptions to the Roadless Rule's prohibition on timber removal, the Forest Service must demonstrate not only that the proposed action will log generally small diameter timber and will maintain or restore roadless characteristics. It must also meet the requirements of

[85] 66 Fed. Reg. at 3258 (emphasis added).

[86] 66 Fed. Reg. at 3257.

[87] 36 C.F.R. § 294.13(b)(1).

individual exceptions, one of which is that timber removal will "improve threatened, endangered, proposed, or sensitive species habitat."[88]

The Forest Service fails to indicate which exception (if any) the Forest Service intends to invoke. The Scoping Letter states that one of the project purposes is to "[p]rovide protection to values at risk within the project area, including, but not limited to … threatened and endangered wildlife habitat …."[89] In any subsequently prepare NEPA document, the Forest Service must disclose which the specific threatened, endangered, proposed, or sensitive species has habitat within IRAs, and how tree removal in IRAs is meant to "improve" the habitat for each individual species.

6. The Forest Service Must Demonstrate That Any Logging Will "Maintain or Restore the Characteristics of Ecosystem Composition and Structure."

Another individual exception permits tree removal in IRAs where the agency can show that such treatments will "maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects, within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period."[90]

Any subsequently prepared NEPA document must address whether the Forest Service intends to invoke this exception to authorize tree removal in IRAs. It is possible that the agency will attempt to rely on this exception because one the Scoping Letter states that one of the project's purposes is to "[r]educe fuel accumulations and treat vegetation composition and structure in the Pinaleño EMA created by the absence of naturally occurring fires."[91] In any subsequently prepare NEPA document, the Forest Service must disclose whether it intends to invoke this exception, and explain precisely how tree removal is necessary to "maintain or restore the characteristics of ecosystem composition and structure" on a site-specific scale.

7. The Forest Service Must Identify the Transportation Network It Intends to Use to Facilitate Any Treatments in IRAs.

Because the Roadless Rule prohibits the construction or reconstruction of roads in IRAs, it is critical that any subsequently prepared NEPA document specifically identify the transportation system that the Forest Service intends to authorize for use adjacent to or within each roadless area. At least one federal court has reinforced this duty.

On July 1, 2020, the U.S. District Court for the District of Montana ruled that the Forest Service's approval of a logging project violated the Roadless Rule, ruling that the agency cannot

[88] 36 C.F.R. § 294.13(b)(1)(i).

[89] Scoping Letter at 3.

[90] 36 C.F.R. § 294.13(b)(1)(ii).

[91] Scoping Letter at 3.

approve logging in inventoried roadless areas without demonstrating that mechanical equipment can access roadless forest without constructing (or reconstructing) roads.[92]

In *Helena Hunters & Anglers*, the Helena-Lewis and Clark National Forest's Tenmile-South Helena Project proposed mechanical logging treatments within the Lazyman Gulch IRA. The Forest Service made the "steadfast representation … that 'no road construction or reconstruction will occur'" within the IRA.[93] "The Forest Service repeatedly contend[ed] that only 'existing routes' or 'existing road templates' [would] be used to access the roadless area."[94] But the final EIS the agency prepared failed to contain "any documents, surveys, photographs, or any other information detailing the physical condition of these existing routes."[95] Nor did the EIS "disclose with any detail the purportedly minimal work necessary to bring heavy logging equipment into the area," thus making it impossible to verify the agency's representations.[96] The court concluded that the agency showed "bad faith" by "conceal[ing] the scope of roadwork intended in the IRA."[97]

Specifically, the court found that the Forest Service failed to:

- Properly classify the type of work needed on routes within the IRA to allow mechanical equipment to access the area;

- Portray the location of any route maintenance on any map; and

- "[C]learly disclose the routes it intends to use" within the IRA.[98]

The court noted that "[b]ecause Federal Defendants … do not disclose a comprehensive travel plan[,] … it is difficult to say precisely where the Forest Service intends to perform roadwork."[99] The court decided that "the Forest Service's conclusion that the Lazyman Gulch [IRA] contains a robust road network that can support large equipment [for logging] without even maintenance is arbitrary and capricious under the APA and in violation of the Roadless Rule."[100]

This decision is relevant to the Pinaleño Project because more than half of the project area appears to fall within IRAs, but the Scoping Letter fails to identify the transportation system for the project, or whether that system will involve the use, maintenance, or reconstruction of routes

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[92] *Helena & Anglers Ass'n v. Marten*, 2020 U.S. Dist. LEXIS 115652 (D. Mont. July 1, 2020) at *32-*38, attached as Ex. 6.

[93] *Id*. at *10-*11.

[94] *Id*. at *23.

[95] *Id*.

[96] *Id*.

[97] *Id*. at *24.

[98] *Id*. at 25.

[99] *Id*. at *35.

[100] *Id*. at *38. *See also id*. at 11 (Forest Service's representation that an existing road network could support mechanical treatment without road construction held "to be false, or at best, a gross misrepresentation.").

within or adjacent to IRAs. The Forest Service must remedy this lack of necessary information in any subsequently prepared NEPA document.

III. THE FOREST SERVICE MUST ENSURE THAT THE PINALEÑO PROJECT COMPLIES WITH FOREST PLAN DIRECTION CONCERNING MANAGEMENT OF 'WILD BACKCOUNTRY' AREAS.

The 2018 Coronado National Forest Plan includes a map indicating that much of the roadless area acreage within the Pinaleño project area is managed under the "Wild Backcountry" management prescription.

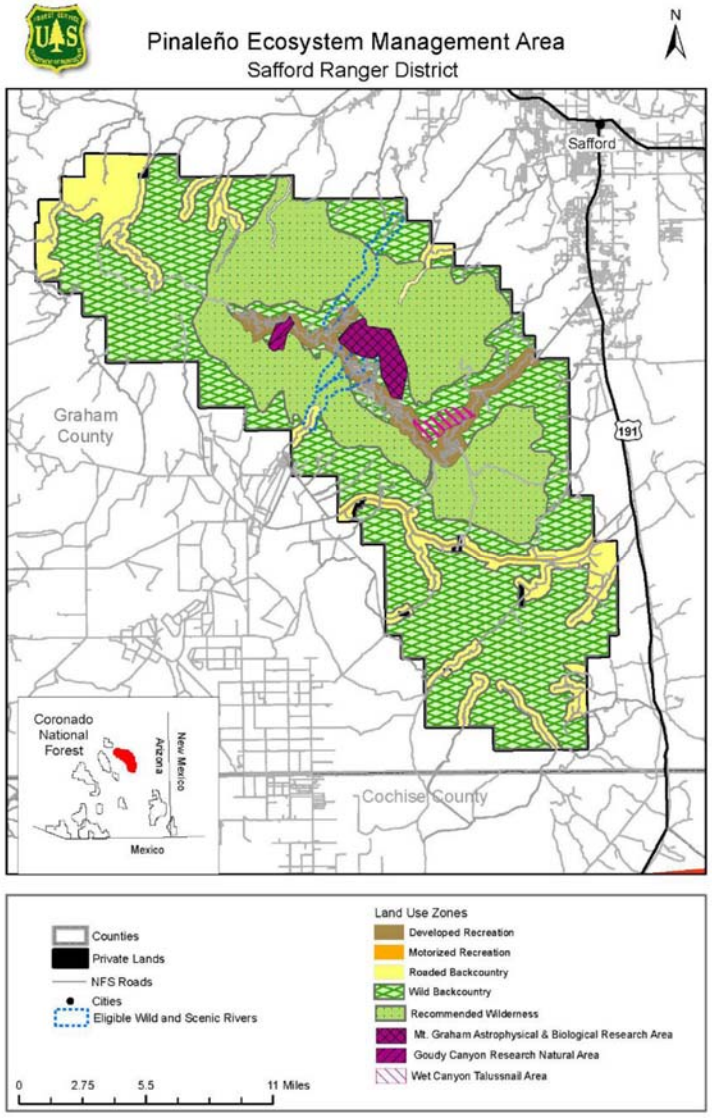

Figure 13 from the Coronado Forest Plan (2018) at 154.
"Pinaleño Ecosystem Management Area land use zones and special areas."

The "desired conditions" for these "Wild Backcountry" areas include: "The wild undeveloped character of these areas is preserved. Settings are natural, and the sights and sounds of motorized

vehicles are infrequent along roads and nonexistent in unroaded areas…. Opportunities for solitude and quiet recreation are readily found…. Quiet experiences are available in this entire zone, with the exception of areas directly adjacent to the small number of access roads."[101] Further, in these areas, "[m]otorized access is available via primitive, infrequently maintained roads."[102]

In any subsequently prepared NEPA document, the Forest Service must disclose whether and how hand thinning and mechanical treatments, occurring over a period of 20 years, may conflict with Forest Plan direction concerning the wild, undeveloped nature of the areas, road use, road management, quiet recreation, and quiet experiences within Wild Backcountry areas.

IV. THE FOREST SERVICE MUST ENSURE THAT THE PINALEÑO PROJECT COMPLIES WITH LAWS AND THE FOREST PLAN CONCERNING MANAGEMENT OF THE MOUNT GRAHAM WILDERNESS STUDY AREA.

The Arizona Wilderness Act of 1984 established the approximately 62,000-acre "Mount Graham Wilderness Study Area," and mandated that it shall be "administered by the Secretary so as to maintain [the area's] presently existing wilderness character and potential for inclusion in the National Wilderness Preservation System."[103] The Scoping Letter acknowledges that the project area includes this Congressionally-protected area.[104]

In order to ensure that the Forest Service complies with this statutory requirement, the Forest Service must include in any subsequently prepared NEPA document an evaluation of the wilderness character of the Mount Graham WSA as of 1984. Only then can the Forest Service understand whether its proposed management activities will "maintain" the then-existing wilderness character of the area.

Recognizing this unique mandate, the Coronado National Forest's 2018 Forest Plan provides specific requirements and guidelines for the WSA. For example, the Forest Plan states that:

- the following activities are *not* suitable to occur within the WSA: "Motorized access," "Timber harvest (*for ecosystem restoration*)," and forest (commercial) and fuelwood products.[105]

- "Wilderness study areas … should be managed to maintain and enhance their wilderness character, which includes scenic resources, primitive recreation settings and fish and wildlife habitats."[106]

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[101] Coronado National Forest Plan (2018) at 99.

[102] *Id*.

[103] Public Law 98-406, §§ 102(a), (b) (Aug. 28, 1984), available at https://uscode.house.gov/statutes/pl/98/406.pdf (last viewed Sep. 4, 2020).

[104] Scoping Letter at 2.

[105] Coronado National Forest Plan (2018) at 168 (Table 14) (emphasis added).

[106] *Id*. at 120 (management guidelines for WSAs).

- "Wilderness study areas … should be managed to preserve or enhance scenic resources."[107]

- "Timber harvest should not be permitted" in WSAs.[108]

- "New roads should not be constructed" in WSAs.[109]

The Forest Plan also describes the "desired conditions" for the Mount Graham WSA and other WSAs:

> Wilderness study areas and recommended wilderness are natural in appearance. They provide unconfined opportunities for exploration, solitude, natural risk, challenge, and primitive recreation. When traveling on trails, human encounters are generally limited; when traveling cross country, almost no human encounters are expected. There is little evidence of human developments or human activities. Ecological disturbance processes such as fire, insects, and disease are the primary factors affecting landscape patterns in wilderness study areas. There is little or no evidence of camping activity, unauthorized trails, or trash. Where needed, outfitters and guides provide services to visitors seeking a wilderness experience. Visitor use is in balance with wilderness characteristics.[110]

In any subsequently-prepared NEPA document, the Forest Service must explain whether and how any treatments within the Mount Graham WSA will comply with these Forest Plan requirements and guidance. For example, if the proposal authorizes any hand thinning or mechanical treatments in the WSA, the NEPA document must explain, among other things: (1) whether and how such actions may conflict with the Forest Plan provisions finding the WSA not suitable for timber harvest for ecological restoration; (2) how logging will "maintain and enhance" the area's wilderness character; (3) how the proposed timber removal will "preserve or enhance scenic resources" within the WSA; and (4) how such treatments are compatible with the direction that "[t]here is little evidence of human developments or human activities" within the WSA.

V. ANY NEPA DOCUMENT MUST DISCLOSE SITE-SPECIFIC IMPACTS, AND CANNOT UTILIZE "CONDITION-BASED MANAGEMENT."

NEPA's review obligations are more stringent and detailed at the project level, or "implementation stage," given the nature of "individual site specific projects."[111] "[G]eneral

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[107] *Id*.

[108] *Id*.

[109] *Id*.

[110] *Id*. at 119.

[111] *Ecology Ctr., Inc. v. United States Forest Serv*., 192 F.3d 922, 923 n.2 (9th Cir. 1999); *see also Friends of Yosemite Valley v. Norton*, 348 F.3d 789, 800-01 (9th Cir. 2003); *New Mexico ex rel. Richardson v. Bureau of Land Management*, 565 F.3d 683, 718-19 (10th Cir. 2009) (requiring site-specific NEPA analysis when no future NEPA process would occur); *Colo. Envtl. Coal. v. Ofc. of Legacy Mgmt*., 819 F. Supp. 2d 1193, 1209-10 (D. Colo. 2011) (requiring site-specific NEPA analysis even when future NEPA would occur because "environmental impacts were reasonably foreseeable").

statements about possible effects and some risk do not constitute a hard look, absent a justification regarding why more definitive information could not be provided."[112]

NEPA requires site-specificity to fulfill two basic purposes: 1) to ensure agencies are making informed decisions prior to acting and 2) to ensure the public is given a meaningful opportunity to participate in those decision-making processes.[113] Federal courts apply these touchstone criteria when evaluating whether an EIS is adequately site-specific.[114]

Analyzing and disclosing site-specific impacts is critical because where (and when and how) activities occur on a landscape strongly determines the nature of the impact. As the Tenth Circuit Court of Appeals has explained, the actual "location of development greatly influences the likelihood and extent of habitat preservation. Disturbances on the same total surface area may produce wildly different impacts on plants and wildlife depending on the amount of contiguous habitat between them."[115] The Court used the example of "building a dirt road along the edge of an ecosystem" and "building a four-lane highway straight down the middle" to explain how those activities may have similar types of impacts, but the extent of those impacts – in particular on habitat disturbance – is different.[116] Indeed, "location, not merely total surface disturbance, affects habitat fragmentation,"[117] and therefore location data is critical to the site-specific analysis NEPA requires. Merely disclosing the existence of particular geographic or biological features is inadequate; agencies must discuss their importance and substantiate their findings as to the impacts.[118]

Courts in the Ninth Circuit have taken a similar approach. For example, in March 2020, the U.S. District Court held that the Forest Service's condition-based management approach to a large logging proposal on the Tongass National Forest violated NEPA.[119] The court explained that "NEPA requires that environmental analysis be specific enough to ensure informed decision-making and meaningful public participation. The Project EIS's omission of the actual location of

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[112] *Or. Natural Res. Council Fund v. Brong*, 492 F.3d 1120, 1134 (9th Cir. 2007) (citation omitted); *see also Or. Natural Res. Council Fund v. Goodman*, 505 F.3d 884, 892 (9th Cir. 2007) (holding the Forest Service's failure to discuss the importance of maintaining a biological corridor violated NEPA, explaining that "[m]erely disclosing the existence of a biological corridor is inadequate" and that the agency must "meaningfully substantiate [its] finding").

[113] *Stein v. Barton*, 740 F. Supp. 743, 749 (D. Alaska 1990).

[114] *See WildEarth Guardians*, 790 F.3d at 921-25 (holding EIS inadequate for failure to disclose location of moose range); *Or. Nat. Desert Ass'n v. Rose*, 2019 WL 1855419 (9th Cir. 2019) (holding environmental analysis violated NEPA by failing to establish "the physical condition of [roads and trails] and authorizing activity without assessing the actual baseline conditions").

[115] *New Mexico ex rel. Richardson*, 565 F.3d at 706.

[116] *Id*. at 707.

[117] *Id*.

[118] *Or. Natural Res. Council Fund v. Goodman*, 505 F.3d 884, 892 (9th Cir. 2007).

[119] *Southeast Alaska Conservation Council v. United States Forest Serv*., 2020 U.S. Dist. LEXIS 43499 (D. Alaska Mar. 11, 2020), attached as Ex. 7. The Forest Service has appealed this decision.

proposed timber harvest and road construction within the Project Area falls short of that mandate."[120]

The district court also concluded that the Forest Service's "worst case analysis" was insufficient, explaining: "This approach, coupled with the lack of site-specific information in the Project EIS, detracts from a decisionmaker's or public participant's ability to conduct a meaningful comparison of the probable environmental impacts among the various alternatives."[121] Consequently, the court concluded that

> By authorizing an integrated resource management plan but deferring siting decisions to the future with no additional NEPA review, the Project EIS violates NEPA. The Forest Service has not yet taken the requisite hard look at the environmental impact of site-specific timber sales on Prince of Wales over the next 15 years. The Forest Service's plan for condition-based analysis may very well streamline management of the Tongass ... however, it does not comply with the procedural requirements of NEPA, which are binding on the agency. NEPA favors coherent and comprehensive up-front environmental analysis to ensure ... that the agency will not act on incomplete information, only to regret its decision after it is too late to correct.[122]

The Pinaleño Project is apparently a project-level decision. There is no indication that the Forest Service intends the project to be a programmatic decision, or that the agency intends to undertake additional NEPA analysis. As a result, the agency cannot adopt a "condition-based" management approach in its NEPA analysis, and any analysis must include the detailed information and analysis that NEPA and the CEQ regulations require because there will evidently be no further NEPA analysis.

VI. ISSUES FOR ANALYSIS

The Center has identified the following significant issues for analysis in any subsequent NEPA document. The Forest Service is obligated to respond to this public comment.

A. Herbicides

The Pinaleño Project proposed action states that the Forest Service proposes spraying chemicals across the project area "to reduce re-sprouting of trees and shrubs to prevent regrowth after fire, thinning, mastication, or grubbing treatments and/or a primary treatment to address broad-scale invasion (generally into grasslands) of woody species that are difficult to control with fire or

[120] *Id*. at *19 (citations omitted).

[121] *Id*. at *27.

[122] *Id*. at *27-*28 (internal citations and quotations omitted). The Forest Service should not interpret the Alaska District's decision to somehow endorse the use of condition-based analyses for environmental assessments. Where the exercise of site-specific discretion is material to a project's environmental consequences, NEPA requires consideration of site-specific proposals and alternatives, *regardless* of whether the effects are "significant." 42 U.S.C. § 4332(2)(C), (E).

mechanical means."[123] We appreciate that "herbicide would not be applied indiscriminately nor uniformly," but this is hardly sufficient guidance for project implementers. Herbicides are poisons that should be used with maximum restraint on our public lands. Until the Forest Service analyzes and discloses the extent and severity of the noxious weed problem on the Pinaleño Project, it should not be considering project-wide permissions for herbicide use, and the Center cannot support widespread herbicide use on natives like mesquite, acacia, oak spp., juniper spp., manzanita, and New Mexico locust.

Which chemicals are proposed for use? The scoping letter doesn't say. Do they include dicamba, picloram and aminocyclopyrachlor (ACP) — potentially devastating chemicals? Even when used as instructed, these chemicals pose grave risks to people, wildlife and native plants. Dicamba, often sprayed on genetically engineered soybeans and cotton, is known to drift from where it's applied, leading to more than 5 million acres of damaged crops, trees and backyard gardens over the past few years.[124] Its toxic spread is so common that BASF and Bayer were ordered to pay $265 million to Missouri peach farmers whose trees were damaged.[125] Roadside application of ACP in Oregon unintentionally killed more than 2,000 ponderosa pines, including cherished old growth trees. That led the state to ban most uses of ACP. And DuPont was ordered in a class-action lawsuit to pay landowners when the herbicide kills their trees.[126]

Many herbicides are highly resistant to breakdown, sometimes taking years to decay. Due to their persistence, wood chips from poisoned trees and grass clippings cannot be used for compost because the toxins can continue to kill vegetables and flowers. In response, states have warned consumers and farmers that feed and compost may include persistent chemical residues.[127] Many of the toxic herbicides that the Forest Service has proposed to spray on nearby Forests have not been studied in more than a decade, so the true risk to plants and animals is unknown. The Environmental Protection Agency has ignored the Endangered Species Act's requirement to study the potential harms from these chemicals to endangered species, so the public cannot know how species that cling to existence will fare when faced with herbicides.

NEPA is "our basic national charter for protection of the environment."[128] Its purpose is to "encourage productive and enjoyable harmony between man his environment" and to "promote efforts which will prevent or eliminate damage to the environment . . . ."[129] As a threshold matter, the Forest Service must establish a purpose or need for the herbicide spraying proposals.

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[123] Scoping Letter at 7.

[124] See https://www.npr.org/sections/thesalt/2018/09/27/651262491/a-drifting-weedkiller-puts-prized-trees-at-risk (last viewed Sep. 4, 2020).

[125] https://cen.acs.org/business/BASF-Bayer-held-liable-dicamba/98/i8 (last viewed Sep. 4, 2020).

[126] https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=257938 (last viewed Sep. 4, 2020); https://www.reuters.com/article/dupont-lawsuits/judge-approves-dupont-settlement-of-herbicide-lawsuits-idUSL1N0BD38420130213 (last viewed Sep. 4, 2020).

[127] https://www.maine.gov/dacf/php/pesticides/documents2/messages/Important%20Warning%20Regarding%20Persistent%20Herbicides.pdf (last viewed Sep. 4, 2020).

[128] 40 C.F.R. § 1500.1(a).

[129] 42 U.S.C. § 4321. 71.

A proposal to use herbicides when there isn't even an established problem necessitating their use would be arbitrary, capricious and contrary to the law.[130]

As described above, any subsequent NEPA document should articulate a range of reasonable alternatives. NEPA analysis "shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made."[131] NEPA requires agencies to "[s]tudy, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."[132] In fact, the alternatives section is considered the heart of an environmental analysis.[133] At least one alternative should forego the use of herbicides.

In using herbicides, the Forest Service must comply with the principles of Integrated Pest Management (IPM). The Forest Service must consider an actual IPM approach. If the Forest Service deployed an IPM approach in addressing noxious weed issues, it would have to include an alternative that addressed the role of grazing in the spread of weeds and other alternatives for addressing concerns around the role of juniper and oak around fire. Simply deploying herbicides while continuing to allow cows to spread noxious weeds fails to comport with IPM.

NEPA's core function is to "help public officials make decisions that are based on understanding of environmental consequences,"[134] by requiring federal agencies to take a "hard look" at potential environmental consequences and environmentally enhancing alternatives "as part of the agency's process of deciding whether to pursue a particular agency action."[135]

The Forest Service must give more than a perfunctory glance at potential impacts of herbicide use in order to meet NEPA's hard look mandate. For example, the analysis should disclose the herbicides to be used, the cost of the herbicides, the equipment needed to deploy them including personal protective equipment for those spraying them, the cost of herbicide trainings including associated travel and time away from other tasks, the cost of secure herbicide storage, the cost of implementing procedures in the event of herbicide poisoning or really any of the costs associated with herbicide use, and the cumulative costs associated with government subsidy and underwriting of the grazing program which is ostensibly the source of most noxious weeds on the forest.

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[130] The APA confers a right of judicial review on any person that is adversely affected by a federal agency action. 5 U.S.C. § 702. Upon review, the Court shall "hold unlawful and set aside agency actions . . . found to be arbitrary, capricious, and abuse of discretion, or otherwise not in accordance with law." Id. § 706(2)(A).

[131] 40 C.F.R. § 1502.02(g); *see id*. § 1500.1(c) ("NEPA's purpose is not to generate paperwork—even excellent paperwork—but to foster excellent action").

[132] 42 U.S.C. § 4331(2)(E).

[133] 40 C.F.R. § 1502.14.

[134] 40 C.F.R. § 1500.1(c).

[135] *Baltimore Gas & Elec. Co. v. Nat. Res. Def. Council*, 462 U.S. 87, 100 (1983); *see also* 42 U.S.C. § 4332(1) ("[T]he policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in [NEPA].").

In any NEPA analysis, an agency must adequately describe the affected environment, and disclose the environmental consequences of the proposed action and each of the alternatives to the proposed action.[136] The Forest Service must adequately describe the unitswithin the project area that it seeks to deploy toxic herbicides on, or the consequences of action under the various alternatives on these many unique zones.

The Forest Service is also required to consider three types of environmental effects: those that are direct, indirect, and cumulative.[137] Direct effects "are caused by the action and occur at the same time and place."[138] Indirect effects "are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable."[139] A cumulative impact results from the incremental impact of the proposed action "when added to other past, present, and reasonably foreseeable future actions regardless of what agency . . . undertakes such other actions."[140] "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."[141] Under NEPA, "effects" and "impacts" are synonymous terms that include "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health."[142] The agency's statements "shall be supported by evidence that the agency has made the necessary environmental analyses."[143]

The Forest Service must look at the direct, indirect and cumulative effects of herbicide use. For example, one direct effect of herbicide use will be dead flowering plants and less food available for pollinators. The Coronado is home to countless species (literally, as there has been no thorough survey) of native bees and other pollinators, so we expect an analysis of this direct effect. Sticking with the example of pollinators, we also expect an analysis of the indirect effects of reduced forage for pollinators. For example, how might this affect the rare and imperiled plants on Mt. Graham? And finally, there must be a cumulative effects analysis of herbicide use with all the other impacts that are directly foreseeable, such as grazing, OHV use, wildfire, logging, road maintenance, climate change, etc.

The Forest Service must provide adequate analysis of how this herbicide use might affect Native American cultural uses of Mt. Graham. While the Forest Service recognizes cultural values, will the analysis analyze impacts to Native American communities or practices, or will it incorporate that analysis in to the NEPA documents? For example, how would herbicide use affect traditional uses of the Mt. Graham? Would important tribal resources and gathering places be treated with herbicides? Would tribal members continue to feel comfortable gathering food, medicine, and plant materials from areas treated with herbicides? How would tribal hunting and

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[136] 40 C.F.R. § 1502.1.

[137] *Id*. § 1508.25(c).

[138] *Id*. § 1508.8(a).

[139] *Id*. § 1508.8(b).

[140] *Id*. § 1508.7.

[141] *Id*.

[142] *Id*. § 1508.8 (emphasis added); see also id. § 1508.14. 74.

[143] *Id*. § 1502.1.

fishing be affected? Does the Forest Service know what areas it would need to avoid in order to reduce impacts to tribal traditional uses? What would be the health impacts of tribal members using recently herbicide-treated areas, and how would bioaccumulation of herbicides in soils and foods affect their long-term health? All of these impacts must be considered.

In considering permitting the use of herbicides on the Pinaleño Project, the Forest Service must comply with its substantive mandates under the Endangered Species Act ("ESA" or "Act"). In looking at the impacts of the various herbicides to be proposed, the Forest Service must recognize that the EPA has never completed Section 7 consultation under the ESA for any pesticides. In the wake of EPA's failure to complete ESA consultations on pesticides, the Forest Service and U.S. Fish and Wildlife Service cannot simply rely on other risk assessments unrelated to ESA consultation to determine effects to species.

For decades, the EPA has refused to comply with its substantive and procedural ESA duties when it registers pesticides. Despite the clear and unambiguous command of the ESA, the EPA has never implemented a nationwide pesticide consultation with the Services on the registration of any pesticide. Indeed, absent litigation forcing the EPA to comply with the law, the EPA has never voluntarily consulted on the impacts of any pesticide or pesticide product on any species.[144] Restricting herbicide use formulations to those containing either EPA or Forest Service risk assessments cannot meet ESA requirements for this project. These risk assessments fail to comply with the basic mandates of the Act, as their purpose is pesticide registration, and they do nothing to actually look at effects on individual listed species, as the ESA requires.

The Endangered Species Act was enacted to provide a "means whereby the ecosystems upon which endangered species and threatened species depend may be conserved…[and] a program for the conservation of such endangered species and threatened species."[145] As the Supreme Court has unequivocally summarized, the ESA's "language, history and structure" make clear and "beyond doubt" that "Congress intended endangered species to be afforded the highest of priorities," and endangered species should be given "priority over the 'primary missions' of federal agencies."[146] Simply put, "[t]he plain intent of Congress in enacting this statute was to halt and reverse the trend toward species extinction, whatever the cost."[147] 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."[148]

The EPA and Forest Service risk assessments do not afford endangered species the highest of priorities, and cannot be used to analyze the effects of herbicides on listed species. To fulfill the

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[144] EPA has voluntarily implemented conservation measures for four listed species over the past 50 years: (1) measures to protect Attwater's prairie chicken from thiram, (2) measures to protect the Delmarva fox squirrel from carboxin, (3) measures to protect the Karner blue butterfly from methoxyfenozide, and (4) measures to protect the Hine's emerald dragonfly from methoxyfenozide.

[145] 16 U.S.C. §§ 1531-1544; 16 U.S.C. § 1531(b).

[146] *Tenn. Valley Auth. V. Hill*, 437 U.S. 153, 174-75 (1978).

[147] *Id.* at 184.

[148] 16 U.S.C. § 1532(3).

substantive purposes of the ESA, each federal agency is required to engage in consultation with the Services to "insure that any action authorized, funded, or carried out by such agency ... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the adverse modification of habitat of such species ... determined ... to be critical…."[149] The obligation to "insure" against a likelihood of jeopardy or adverse modification requires the agency to give the "benefit of the doubt" to endangered species and to place the burden of risk and uncertainty on the agency taking the proposed action.[150]

Section 7 "consultation" is required for "any action [that] may affect listed species or critical habitat."[151] Agency "action" means "all activities or programs of any kind authorized, funded or carried out in whole or in part by Federal agencies."[152] This definition is meant to be expansive and includes, but is not limited to, "(a) actions intended to conserve listed species or habitat; (b) the promulgation of regulations; (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air."[153]

Under the Services' joint regulations implementing the ESA, an action agency such as the Forest Service must initiate consultation under Section 7 whenever its discretionary action "may affect" a listed species or critical habitat.[154] Only where the action agency determines that its action will have "no effect" on listed species or designated critical habitat is the consultation obligation lifted.[155]

Adoption of any herbicide use as contemplated in the scoping letter triggers the need for Section 7 consultation for the unique and incredibly diverse assortment of threatened and endangered plants and animals that cling to existence in the Pinaleños.

Section 7(a)(2) requires that the action agency determine at the earliest possible time whether the action "may affect" listed species, or else issue a "no effect" determination.[156] The "may affect" threshold is "relatively low" to ensure that "actions that have any chance of affecting listed species or critical habitat—even if it is later determined that the actions are not likely to do so—require at least some consultation under the ESA."[157] If the "may affect" threshold is met, the agency must determine if the action is "likely to adversely affect" (LAA) or "not likely to adversely affect" (NLAA) listed species and obtain concurrence from the Services. When a LAA determination is made, formal consultations with the Services are required.

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[149] *Id.* § 1536(a)(2).

[150] *See Sierra Club v. Marsh*, 816 F.2d 1376 1385 (9th Cir. 1987).

[151] 50 C.F.R. § 402.14

[152] *Id.* at § 402.02.

[153] *Id.*

[154] 50 C.F.R. § 402.14(a); *See also Ass'n of Home Builders v. Defenders of Wildlife*, 551 U.S. 644 (2007).

[155] 50 C.F.R. § 402.14(a).

[156] 50 C.F.R. § 402.14(a).

[157] *Karuk Tribe of Cal. v. U.S. Forest Serv.*, 681 F.3d 1006, 1028 (9th Cir. 2012).

When the Forest Service initiates consultation on this action, it must not only consider the direct effects when making this threshold call of whether the herbicides may affect listed species, but it also must consider indirect and cumulative effects. For example, for a listed bird, the Forest Service must not only consider the direct effect of lost habitat if herbicides are used to kill trees they nest in, but it also must consider indirect effects such as the loss of plants that provide habitat for the insects that the bird consumes. And it must consider the cumulative effects, like of bioaccumulation of the herbicide in soil and associated effects on insects and soil microbes.

Adopting any of the alternatives that would allow for herbicide use will in effects to listed species, and in addition to passing the "may affect" threshold, this action would also likely exceed the "likely to adversely affect" threshold as well, thereby triggering the requirement to conduct formal consultation with the U.S. Fish and Wildlife Service. The Forest Service may not move forward with any final decisions on this project until it completes formal ESA consultation.

In addition to requiring consultation under Section 7, Section 9 prohibits any person—whether a private or governmental entity—to "take" any endangered species of fish or wildlife listed under the ESA.[158] "Take" is defined to mean "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in such conduct."[159] FWS has defined "harm" to include "significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering."[160] Only an incidental take statement issued along with a final biological opinion can shield the action agency from the prohibition against take. If the Forest Service allows any herbicide use prior to completing formal consultation with the U.S. Fish and Wildlife Service, it will very likely be committing unauthorized take, and will be subject to the consequences provided under the Act.

To be clear, we recognize the ecological threats posed by non-native, invasive plants, and we understand that sometimes the only viable control method involves herbicides. Below, we discuss how the treatment of noxious weeds should proceed within a robust and well-defined Integrated Pest Management approach. We also recognize the need to reduce fuels and thin some areas with high levels of shrubs. We support small-diameter tree thinning as one step in restoring fire to the landscape, but remind the Forest Service that the current densities of these trees reflects a century and a half of overgrazing and fire suppression, and no restoration treatment will be effective if those stressors are not mitigated.

However, we cannot at this time support the use of herbicides on native plants under the current proposal. The species listed in the scoping letter for treatment with herbicide are native, early successional and fire adapted species that provide many ecosystem services, including wildlife habitat and food, carbon sequestration, and soil stabilization, among other benefits. These species are common, native plants that have never been considered noxious or invasive species.

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[158] 16 U.S.C. § 1538(a)(1)(B).

[159] *Id.* § 1532(19).

[160] 50 C.F.R. § 222.102.

Removing native plants with chemicals that have complex and at-times unpredictable cumulative effects will lead to additional cumulative ripple effects throughout the ecosystem. Treatments that rely on herbicide as an essential next step following a forest thinning will not benefit the overall health of the ecosystem, and because of significant risk of drift and persistence, there are many cumulative impacts to wildlife and native plants which cannot be easily quantified.

Thinning treatments are commonly proposed in many forests as mitigation against drought and climate change with the goal to remove biomass so it is less likely to be removed by fire. Promoting massive herbicide use following thinning treatments ignores the cumulative effects of thinning and chemicals on the health of the forest and its biota.

The likely costs to water quality, wildlife habitat, and cumulative herbicide use associated with removing these native species from the environment are not worth the amount of reduction in wildfire risk that we would expect to see. Herbicide use on native plants is not ecological restoration, and is not supported by best available science.

The scoping letter suggests (under the Purpose and Need) that herbicide use, as one component of the proposed action, will have many benefits. We request that any subsequent NEPA document provide any proof or published science to support these claims

The negative consequences of herbicide use for restoration might outweigh any benefits. Plus, there is no social license for this kind of herbicide use to begin with. Mechanical treatments and managed burns are fine for thinning oaks and junipers but taking up herbicides against these native trees is unsupported. Their re-sprouting ability is one indication of their fire and drought resistance. In a warmer, drier climate they may do well. They are survivors and their resilience is evident. Native trees and shrubs should be viewed not as a problem but as part of a long-term climate resiliency solution.

Our previous comments to the Forest Service on numerous projects have outlined the need to take more preventative action on noxious weeds such as: limiting and reevaluating cattle grazing, road construction, timber harvesting, ATV use, and other uses. In particular, we are concerned that the Forest Service has avoided any analysis of the role of livestock and livestock production systems on the spread and persistence of noxious weeds, and the subsequent impacts of herbicide use on at-risk species.

Livestock grazing is the most likely way that noxious weeds will become introduced into the National Forest and spread into native ecosystems.[161] Livestock grazing as a vector for the introduction of alien plants must be addressed in this analysis as it is consistently downplayed as a threat in forest plans and projects throughout the West. Weeds can travel in multiple ways, but livestock have by far the largest reach because they are allowed to range freely, carrying seeds in their hair, on their hooves, and in their guts.[162] In addition, horses and elk move weed seeds around the landscape in an unquantified amount. Livestock also aid the spread of alien plants by

[161] A J Belsky, A Matzke, and S Uselman, "Survey of Livestock Influences on Stream and Riparian Ecosystems in the Western United States," *J. Soil Water Conserv.* 54, no. 1 (1999): 9–10.

[162] Belsky, Matzke, and Uselman, 9.

degrading native plant communities through trampling and selective grazing,[163] especially along riparian corridors. Developing a noxious weed plan without considering the impact of livestock is inconsistent with NEPA's "hard look" mandate, and with the holistic principles of IPM, and commits the Forest Service to spending more money on less effective mitigation through suppression.

Any subsequent NEPA document must analyze the relationship between livestock production and invasive plant occurrence and persistence, and provide project direction that reduces or eliminates the functional pathways between livestock and invasive plants.

Prevention is the most cost-effective action that the Forest Service can perform to maintain the health and integrity of the forest. Reliance on herbicide means that the Forest Service has failed their mandate to follow Integrated Pest Management protocols.[164]

The Natural Resources Conservation Service (NRCS) defines Integrated Pest Management as "*a site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies*."[165] IPM was developed as a process for addressing pests of all kinds as a response to the overuse of chemical pesticides and their associated environmental harms.[166] Pesticide overuse threatens environmental health, disrupts food webs, contaminates drinking water, and undermines pesticide effectiveness.[167]

IPM has become the standard framework for using pesticide on public lands across the Federal government and the Federal, Insecticide, Fungicide, and Rodenticide Act (FIFRA) states that "…the [Environmental Protection Agency] Administrator in cooperation with the Secretary of Agriculture shall develop approaches to the control of pests based on integrated pest management…".[168] IPM practice is codified into the laws and regulations of agencies that manage public lands including: the Department of Interior (DOI)[169], and its Bureau of Land

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[163] Belsky, Matzke, and Uselman, 12–13.

[164] U.S. Forest Service, "FSM 2100 - Environmental Management Chaper 2150 - Pesticide Management and Coordination," 2014.

[165] NRCS, "Integrated Pest Management Code 595" (Natural Resource Conservation Service, 2010), https://efotg.sc.egov.usda.gov/references/public/NY/nyps595.pdf.

[166] Gerrit Cuperus, Richard Berberet, and Phillip Kenkel, "The Future of Integrated Pest Management," in *E. B. Radcliffe,W. D. Hutchison & R. E. Cancelado [Eds.], Radcliffe's IPM World Textbook* (St. Paul, MN: University of Minnesota, n.d.), https://ipmworld.umn.edu.

[167] John Peterson Myers et al., "Concerns over Use of Glyphosate-Based Herbicides and Risks Associated with Exposures: A Consensus Statement," *Environmental Health* 15 (February 17, 2016), https://doi.org/10.1186/s12940-016-0117-0; Maarten Bijleveld van Lexmond et al., "Worldwide Integrated Assessment on Systemic Pesticides," *Environmental Science and Pollution Research* 22, no. 1 (January 1, 2015): 1–4, https://doi.org/10.1007/s11356-014-3220-1; Gregor J. Devine and Michael J. Furlong, "Insecticide Use: Contexts and Ecological Consequences," *Agriculture and Human Values* 24, no. 3 (September 1, 2007): 281–306, https://doi.org/10.1007/s10460-007-9067-z.

[168] "Federal Insecticide, Fungicide, and Rodenticide Act," 7 U.S. Code § 136w–3 (c) (2012).

[169] U.S. Department of the Interior, "Department of the Interior Departmental Manual," Chapter 1: Integrated Pest Management Policy, Section 1.5, Part 517, Series 31: Environmental Quality Programs (U.S. Department of the Interior, May 31, 2007).

Management (BLM)[170] as well as the United States Department of Agriculture's United States Forest Service (USFS)[171] and the National Parks Service (NPS)[172].

The most important use of IPM on public land is for the management of invasive species as directed by Executive Orders 13112[173] and 13751,[174] which instruct Federal Agencies to prevent the introduction and spread of invasive species. There are approximately 50,000 alien species in the United States that impact the survival of 42% of all threatened and endangered species.[175] Alien species degrade ecosystems by suppressing natural biodiversity, altering food webs, changing nutrient cycling, introducing novel diseases, and can cause significant economic damage.

Alien species cause up to $120 billion a year in environmental damages[176] and the U.S. government spends billions of dollars a year to mitigate and control alien species.[177] IPM is essential to stopping the spread and introduction of alien species on public land, and per the basic tenants of IPM, efforts must focus on the root causes of species spread. We believe that pesticides should only be used as a last resort, and the Forest Service must not rely on reflexive or reactive pesticide use. Already, there are countless examples of federal land management agencies claiming to adhere to the tenets of IPM but in reality deploying dangerous pesticides as a first line of attack. In the absence of clear direction for herbicide use, the Forest Service unwittingly lays the groundwork to be another example of this tragic phenomenon.

IPM is a process that requires planning that is land-use- and pest-specific that uses the minimum level of pest suppression necessary.[178] IPM relies on prevention, avoidance, monitoring, and suppression (PAMS) techniques in order to decrease pest pressure from a combination of

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[170] U.S. Bureau of Land Management, "BLM Vegetation Treatments Using Herbicide Final Programmatic EIS Record of Decision" (U.S. Bureau of Land Management, 2007), 4–6, https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=70300&dctmId=0b0003e880de5eb8.

[171] U.S. Forest Service, "Forest Service Manual 2100-Environmental Management," Chapter 2150 (U.S. Forest Service, March 19, 2013), page 6. Departmental Regulation 9500-4.

[172] U.S. National Park Service, "Management Policies 2006" (Washington, D.C.: U.S. National Park Service, 2006), 48, https://www.nps.gov/policy/MP_2006.pdf.

[173] William Clinton J, "Executive Order 13112 Invasive Species" (Federal Register, February 3, 1999), https://www.govinfo.gov/content/pkg/FR-1999-02-08/pdf/99-3184.pdf.

[174] Barack Obama, "Executive Order 13751 Safeguarding The Nation From the Impacts of Invasive Species" (Federal Register, December 8, 2016).

[175] David Pimentel, Rodolfo Zuniga, and Doug Morrison, "Update on the Environmental and Economic Costs Associated with Alien-Invasive Species in the United States," *Ecological Economics*, Integrating Ecology and Economics in Control Bioinvasions, 52, no. 3 (February 15, 2005): 273–88, https://doi.org/10.1016/j.ecolecon.2004.10.002.

[176] Pimentel, Zuniga, and Morrison.

[177] National Invasive Species Council, "National Invasive Species Council Crosscut Budget" (Washington, D.C.: National Invasive Species Council, January 25, 2018), https://www.doi.gov/sites/doi.gov/files/uploads/crosscut_25january2018.pdf.

[178] NRCS, "Integrated Pest Management Code 595."

biological, cultural, and chemical controls.f[179] Successful management requires the preparation and implementation of strategic, long-term plans with defined threshold values for pest control actions that rely on prevention, education, and restoration that enhance the overall health of an ecosystem.[180] Early Detection and Rapid Response (EDRR) is essential to identifying, monitoring, and removing new alien species from an environment.[181] In IPM, chemical control may only be the last line of defense after preventative and avoidance practices have been implemented, and in IPM, even when pesticides are used, the least toxic options are deployed.

We oppose widespread permissions for herbicide use on public land. We challenge the Forest Service to develop meaningful use-criteria for herbicides in order to fulfill its mandate to use integrated pest management principles and protocols to reduce the likelihood of default reliance on herbicides. The analysis should present a strategic, long-term plan with defined thresholds and PAMS techniques that would address noxious weeds now and in the future; these must be developed. The Coronado National Forest should remain vigilant for the spread of noxious weeds and deal with them as necessary with the least amount of herbicide.

In order to ensure the Forest Service has access to the best available science regarding the risks posed by herbicides to wildlife, water, and ecosystems (as required by NEPA and Forest Planning regulations), we have reviewed essential information and summarized it here for a selection of commonly used herbicides.

Aminocyclopyrachlor (ACP)

ACP is extremely harmful to plants, particularly dicots. EPA found that if used according to the label, nearby, non-target plants could be exposed to as much as 18,000 times the level of ACP known to cause harm.[182] The EPA's risk level of concern (a comparison of the estimated exposure concentration and the concentration known to cause harm) was exceeded by 3,600 and 18,200 for ESA-listed dicot plants for ground and aerial non-crop applications, respectively, and by 37 and 189 for non-listed dicot plants for ground and aerial non-crop applications, respectively.[183] And that is just when measuring how *spray drift only* will affect the vegetative vigor of plants. When modelling how the combination of spray drift and runoff could impact seedling emergence, EPA found that both listed and non-listed dicots could be exposed to nearly 300 times the concentration known to cause harm.[184]

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[179] NRCS.

[180] Joseph M. DiTomaso, "Invasive Weeds in Rangelands: Species, Impacts, and Management," *Weed Science* 48, no. 2 (April 2000): 255–65, https://doi.org/10.1614/0043-1745(2000)048[0255:IWIRSI]2.0.CO;2.

[181] Lindy Garner, "Early Detection and Rapid Response to New Invasive Grasses in North Central Wyoming" (U.S. Fish and Wildlife Service, April 2019), https://www.doi.gov/sites/doi.gov/files/uploads/wyoming_invasive_grasses_report.pdf.

[182] EPA. Memorandum. Transmittal Memo regarding the "Ecological Risk Assessment for the Section 3 New Chemical Registration of Aminocyclopyrachlor on Non-crop Areas and Turf." January 22, 2010. Pgs 50-51. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2009-0789-0004.

[183] *Id.*

[184] *Id.*

Harm to listed and non-listed dicot plants from ACP spray drift was found to occur at distances greater than 1000 feet from ground applications – even when modelled at a reduced application rate – and greater than 2,600 feet from aerial applications.[185] As such, the EPA has stated that the use of ACP may affect any ESA-listed species of plant and animal if its use overlaps with a species' range.[186]

This estimated harm from the EPA-approved, labelled uses of ACP is significant and clearly explains why there have been many extremely adverse incidents associated with its use. When ACP first came on the market ten years ago, its maker was besieged by at least 30,000 claims from homeowners, golf courses, municipalities and landscapers that the herbicide damaged non-target trees.[187] It is estimated that hundreds of thousands of trees were killed or damaged by ACP in the first two years of its use.[188] In Oregon, all formulations containing ACP have been highly restricted in the state following years of damage to 2,000 ponderosa pines in the state.[189] Many of the dead and dying trees were 150-300 years old.[190] Environmental sampling found the presence of ACP in dead and dying trees 6 years since the last nearby application was made.[191] An investigation by the Oregon Department of Agriculture found that all ACP applications were made according to the EPA-approved label.[192]

In addition to harm to trees and other plants, EPA also found significant weight reduction in birds exposed to ACP for short periods of time and the agency did not have enough data to sufficiently analyze chronic risk to birds from ACP exposure. Therefore, birds appear to be at risk of acute harm due to ACP exposure and there is not enough information to indicate that chronic, long-term exposures are safe.

2,4-D

2,4-D is a persistent, mobile herbicide used for control of broadleaf plants. It is a widespread water contaminant with monitoring data from the USGS, EPA, USDA, the California

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[185] *Id.* at 53-54.

[186] *Id.* at 57.

[187] Robbins, J. DuPont Facing 30,000 Claims for Tree Deaths. New York Times. June 22, 2012. Available here: https://green.blogs.nytimes.com/2012/06/22/dupont-facing-30000-claims-for-tree-deaths/.

[188] *Id.*

[189] Cureton, E. Oregon Becomes 1st State To Sharply Restrict Herbicide Linked To Tree Deaths. Oregon Public Broadcasting. May 10, 2019. Available here: https://www.opb.org/news/article/oregon-herbicide-restriction-aminocyclopyrachlor-perspective-acp-sisters/.

[190] Oregon Department of Agriculture. PESTICIDE ADVISORY Permanent Rule Impacting the Use of Aminocyclopyrachlor on Specific Sites. Available here: https://www.oregon.gov/ODA/programs/Pesticides/RegulatoryIssues/Documents/Documents/2019/ACPPesticideAdvisory.pdf.

[191] Oregon Department of Agriculture. Natural Resources Pesticides Program. Notice Of Proposed Rulemaking Filing Including Statement Of Need & Fiscal Impact. Available here: https://www.oregon.gov/ODA/programs/Pesticides/RegulatoryIssues/Documents/Documents/2019/ACPRuleJustification.pdf.

[192] *Id.*

Department of Pesticide Regulation and the Washington Department of Agriculture finding traces of the pesticide in 37-59 percent of all surface water samples tested.[193] 2,4-D is highly prone to pesticide drift events due to its volatility and toxicity and has consistently been the most common pesticide involved in drift complaints.[194]

The labeled, aquatic use of 2,4-D can kill aquatic plants and invertebrates that endangered fish rely on for food and shelter, resulting in the U.S. National Marine Fisheries Service concluding that the use of 2,4-D was likely to jeopardize the continued existence of endangered Pacific salmon and steelhead species.[195] In addition the EPA determined that nearly all current labeled uses of 2,4-D were likely to adversely affect endangered amphibians and reptiles like the endangered California Red-legged Frog and Alameda Whipsnake.[196]

In a 2016 evaluation, EPA found that 2,4-D can cause direct harm to all plants and animals if used according to the EPA-approved label.[197] Harms found specifically for non-crop uses, like the ones proposed, are to ESA-listed vascular aquatic plants,[198] chronic harm to all species of birds that feed on short grasses,[199] acute harm to all species of mammals,[200] sublethal effects to pollinators such as bees,[201] and all terrestrial plants.[202] The potential for harm to non-target plants from spray drift extends up to 250 ft away from the site of application at an application rate of 2 lb/acre (the maximum application rate for non-crop uses is twice as high at 4 lb/acre).[203]

There have been a high number of incidents involving human harm from 2,4-D. From 2007 to 2012, there were over 2,000 incidents reported to the EPA involving neurological, respiratory, liver, and kidney dysfunctions.[204] EPA also identified occupational exposure risks of concern via

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[193] EPA. Preliminary Ecological Risk Assessment for Registration Review of 2,4-D. June 29, 2016. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2012-0330-0047. Pg 24.

[194] AAPCO. Association of American Pesticide Control Officials. 2005 Pesticide Drift Enforcement Survey Report. 2005; Available from: https://www.centerforfoodsafety.org/files/aapco-2005_29712.pdf.

[195] NMFS. National Marine Fisheries Service Endangered Species Act Section 7 Consultation. Biological Opinion Environmental Protection Agency Registration of Pesticides 2,4-D, Triclopyr BEE, Diuron, Linuron, Captan, and Chlorothalonil. June 30, 2011. Available here: https://www3.epa.gov/pesticides/endanger/litstatus/final-4th-biop.pdf.

[196] EPA. Risks of 2,4-D Use to the Federally Threatened California Red-legged Frog (Rana aurora draytonii) and Alameda Whipsnake (Masticophis lateralis euryxanthus). Pesticide Effects Determination. Feb. 20, 2009. Available from: https://www3.epa.gov/pesticides/endanger/litstatus/effects/redleg-frog/2-4-d/analysis.pdf.

[197] *Id.*

[198] *Id.* at 45-46.

[199] *Id.* at 47-48.

[200] *Id.* at 48-49.

[201] *Id.* at 50-51.

[202] *Id.* at 51-55.

[203] *Id.* at 63.

[204] EPA. 2,4-D: Tier II Incident Report. June 28, 2016. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2012-0330-0046. Pgs 2-3.

inhalation.[205] The EPA also found that "Based on currently available toxicity data, which demonstrate effects on the thyroid and gonads following exposure to 2,4-D, there is concern regarding its endocrine disruption potential."[206] Altered hormone levels have also been associated with urinary 2,4-D levels in human epidemiological studies.[207,208]

Clethodim

Clethodim poses a risk to many non-target organisms, including freshwater fish and amphibians, for every single approved use of the pesticide.[209] Mammals are also estimated to experience chronic harms from many uses of clethodim.[210] Terrestrial plants, particularly monocots, are expected to experience reduced seedling emergence more than 1000 ft away from the treated area and experience growth impairment nearly 500 ft from the treated area.[211]

Clopyralid

EPA has found that some clopyralid uses can expose small and medium-sized mammals to levels of clopyralid that can decrease body weight and food consumption.[212] Risks of concern were also identified for endangered herbivorous birds, reptiles and terrestrial amphibians, and terrestrial invertebrates, based on short-term exposures from the labelled uses of clopyralid.[213] The EPA found that clopyralid spray drift can result in harm to ESA-listed and non-ESA listed plants at a distance of more than 1,000 ft from where it is sprayed.[214] When modelling the *lowest approved application rate*, EPA found that plants can be harmed more than 1000 feet away from aerial applications and nearly 500 feet away from ground applications.[215]

Dicamba

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[205] EPA. 2,4-D. Revised Occupational and Residential Exposure Assessment for Registration Review. Nov. 15, 2016. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2012-0330-0085.

[206] EPA. *Reregistration Eligibility Decision for 2,4-D*. 2005; Available from: http://www.epa.gov/pesticides/reregistration/REDs/24d_red.pdf.

[207] Garry, V.F., et al., Biomarker correlations of urinary 2,4-D levels in foresters: genomic instability and endocrine disruption. Environ Health Perspect, 2001. 109(5): p. 495-500.

[208] Schreinemachers, D.M., Perturbation of lipids and glucose metabolism associated with previous 2,4-D exposure: a cross-sectional study of NHANES III data, 1988-1994. Environ Health, 2010. 9: p. 11.

[209] EPA. Clethodim: Preliminary Ecological Risk Assessment for Registration Review. January 13, 2014. Pgs 51-52. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2008-0658-0020.

[210] *Id.* at 59.

[211] *Id.* at 61.

[212] EPA. Clopyralid: Draft Ecological Risk Assessment for Registration Review. Dec. 14, 2018. Pg. 7. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2014-0167-0032.

[213] *Id.* at 33, 39.

[214] *Id.* at 41.

[215] *Id.* at 42.

Dicamba does not adsorb to soil and is highly mobile with the potential to contaminate and persist in groundwater.[216] A nationwide sampling of surface waters by the EPA indicated 40% were contaminated with dicamba[217] and dicamba is known to run off into water bodies following rainfall.[218] It was one of the most frequently detected herbicides in water and sediment samples in California,[219] and 90 percent of air samples throughout Canada's agricultural region contained dicamba with distributions being suggestive of both local and long-distance transport.[220] Dicamba is characterized as a volatile compound and prone to extensive spray drift, which can severely impact non-target crops and wild plants.[221,222] Bottom line: Dicamba doesn't stay put, it migrates away from the area of application and contaminates the surrounding environment.

This is exemplified by the unprecedented amount of damage to crop fields, backyard gardens, century-old trees, and natural landscapes that has occurred in the recent years. It is estimated that nearly 5 million acres of crop fields were damaged by dicamba drift in 2017 and 2018 alone.[223,224] 200-year old cypress trees,[225] oak trees,[226] and fruiting trees[227] have not escaped the onslaught of damage from this pesticide. A federal USDA advisory committee has recommended that a buffer of no less than one mile be implemented between dicamba and any sensitive, non-target plant.[228]

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[216] EPA. Reregistration Eligibility Decision (RED) Document for Dicamba and Associated Salts. 2006. Available from: http://www.epa.gov/pesticides/reregistration/REDs/dicamba_red.pdf.

[217] EPA. Office of Drinking water. Dicamba: health advisory. 1987.

[218] Carroll, M. J., Hill, R. L., Pfeil, E., & Herner, A. E. Washoff of Dicamba and 3,6-Dichlorosalicylic Acid from Turfgrass Foliage. Weed Technology, 1993. 7(2): p. 437-442.

[219] Ensminger, M.P., et al. Pesticide occurrence and aquatic benchmark exceedances in urban surface waters and sediments in three urban areas of California, USA, 2008-2011. Environ Monit Assess, 2013. 185(5): p. 3697-710.

[220] Yao, Y., et al. Spatial and temporal distribution of pesticide air concentrations in Canadian agricultural regions. Atmosperic Environment, 2006. 40(23): p. 4339-4351.

[221] Behrens, R. and W. Lueschen. Dicamba Volatility. Weed Science, 1979. 27(5): p. 486-493.

[222] Egan, J.F. and D.A. Mortensen. Quantifying vapor drift of dicamba herbicides applied to soybean. Environ Toxicol Chem, 2012. 31(5): p. 1023-31.

[223] Bradley, K. A Final Report on Dicamba-injured Soybean Acres. University of Missouri. October 30, 2017. Available here: https://ipm.missouri.edu/ipcm/2017/10/final_report_dicamba_injured_soybean/.

[224] Bradley, K. July 15 Dicamba injury update. Different Year, same questions. July 19, 2018. Available here: https://ipm.missouri.edu/IPCM/2018/7/July-15-Dicamba-injury-update-different-year-same-questions/.

[225] Charles, D. A Drifting Weedkiller Puts Prized Trees At Risk. National Public Radio. September 27, 2018. Available here: https://www.npr.org/sections/thesalt/2018/09/27/651262491/a-drifting-weedkiller-puts-prized-trees-at-risk.

[226] Hettinger, J. Complaints surge about weed killer dicamba's damage to oak trees. Midwest Center for Investigative Reporting. October 9, 2017. Available here: https://investigatemidwest.org/2017/10/09/complaints-surge-about-weed-killer-dicambas-damage-to-oak-trees/.

[227] Ruff, C. Jury Awards Missouri Peach Farmer $15 Million In Damages In Dicamba Suit. St. Louis Public Radio. February 14, 2020. Available here: https://news.stlpublicradio.org/post/jury-awards-missouri-peach-farmer-15-million-damages-dicamba-suit#stream/0.

[228] Fruit and Vegetable Industry Advisory Committee (FVIAC). 2018 – 2020 Recommendations. Available here: https://www.ams.usda.gov/sites/default/files/media/2018_2020FVIACRecommendations.pdf.

Doses of dicamba meant to approximate herbicide drift reduced and delayed the flowering of multiple plant species, reducing the floral resources that pollinators rely on in farmed regions.[229] Dicamba levels far below those estimated to be contained in particle and vapor drift are known to reduce plant diversity.[230] Similarly, drift-level rates of dicamba were found to reduce flowering of multiple plants, a reduction scientists have found coincides with reduced visitation by pollinators.[231] Studies have also shown dicamba to be particularly harmful to milkweed, a plant the monarch caterpillar uses as its only food source, putting the monarch butterfly at risk of harm.[232]

The EPA has determined that small birds and mammals would exceed the agency's level of concern for dicamba if they foraged on plants or insects in treated fields following treatment and that dicamba had the potential for causing risk to endangered birds, mammals, and non-target plants.[233] Furthermore, the EPA stated that "mammals could potentially be at risk for developmental/reproductive effects or for direct effects on foraging behavior when chronically exposed to dicamba as a result of the labeled uses of the herbicide."[234] Dicamba has also been shown to disrupt behavioral patterns in fish[235] and low doses were shown to induce mortality in coho salmon that were given a biologically-appropriate seawater challenge.[236]

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[229] Bohnenblust, E.W., et al. Effects of the herbicide dicamba on non-target plants and pollinator visitation. Environ Toxicol Chem, 2015.

[230] Egan, J.F, Bohnenblust, E, Goslee, S, Mortensen, D.A, and Tooker, J. Herbicide drift can affect plant and arthropod communities. Agriculture, Ecosystems, and Environment, 2014. 185: p. 77-87.

[231] Bohnenblust, E.W, Vaudo, A.D, Egan, J.F, Mortensen, D.A, Tooker, J.F. Effects of the herbicide dicamba on nontarget plants and pollinator visitation. Environ Toxicol Chem, 2016. 35(1): p. 144–151

[232] Donley, N. A Menace to Monarchs Drift-prone Dicamba Poses a Dangerous New Threat to Monarch Butterflies. Center for Biological Diversity. March 2018. Available here: https://www.biologicaldiversity.org/species/invertebrates/monarch_butterfly/pdfs/Menace-to-Monarchs.pdf.

[233] EPA. Reregistration Eligibility Decision (RED) Document for Dicamba and Associated Salts. 2006. Available from: http://www.epa.gov/pesticides/reregistration/REDs/dicamba_red.pdf.

[234] *Id.*

[235] Ruiz de Arcaute, C., S. Soloneski, and M.L. Larramendy, Evaluation of the genotoxicity of a herbicide formulation containing 3,6-dichloro-2-metoxybenzoic acid (dicamba) in circulating blood cells of the tropical fish *Cnesterodon decemmaculatus*. Mutat Res Genet Toxicol Environ Mutagen, 2014. 773: p. 1-8.

[236] Lorz, H., et al., EPA. Corvallis Environmental Research Laboratory. Office of Research and Development. Effects of selected herbicides on smolting of coho salmon. 1979.

There are early indications that dicamba may affect hormone signaling[237,238] and induce developmental toxicities[239] at biologically-relevant doses. Multiple studies have also indicated that it is a mutagen.[240,241,242]

Endothall

The EPA has identified many harms to non-target organisms from the labelled uses of endothall. Acute harm to mammals was identified from all terrestrial uses of endothall and reproductive harm, resulting in decreased birth weight of pups and pup death, was also identified for a subset of uses.[243] Some uses of endothall were found to expose birds that feed on grasses, broad leaf plants, and small insects to nine times the amount known to cause early embryonic mortality.[244] As with many herbicides, endothall was also found to result in harm to non-target plants.

Endothall is considered "highly toxic" to "very highly toxic" to freshwater fish and invertebrates by the EPA.[245] EPA has concluded that all uses including direct water application and terrestrial application resulted in risks of concern to fish and aquatic invertebrates.[246]

Fluazifop-P-Butyl

Using fluazifop according to the pesticide label can expose mammals to concentrations that are known to cause reduced pup viability and pup weight.[247] Fluazifop can also cause chronic harm to bee larva following every use of the pesticide that was modelled by EPA.[248] Terrestrial plants

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[237] Zhu, L., et al. Dicamba affects sex steroid hormone level and mRNA expression of related genes in adult rare minnow (Gobiocypris rarus) at environmentally relevant concentrations. Environ Toxicol, 2015. 30(6): p. 693-703.

[238] Goldner, W.S., et al. Hypothyroidism and pesticide use among male private pesticide applicators in the agricultural health study. J Occup Environ Med, 2013. 55(10): p. 1171-8.

[239] Greenlee, A.R., T.M. Ellis, and R.L. Berg. Low-dose agrochemicals and lawn-care pesticides induce developmental toxicity in murine preimplantation embryos. Environ Health Perspect, 2004. 112(6): p. 703-9.

[240] Ruiz de Arcaute, C., S. Soloneski, and M.L. Larramendy, Evaluation of the genotoxicity of a herbicide formulation containing 3,6-dichloro-2-metoxybenzoic acid (dicamba) in circulating blood cells of the tropical fish *Cnesterodon decemmaculatus*. Mutat Res Genet Toxicol Environ Mutagen, 2014. 773: p. 1-8.

[241] Cenkci, S., et al. Evaluation of 2,4-D and Dicamba genotoxicity in bean seedlings using comet and RAPD assays. Ecotoxicol Environ Saf, 2010. 73(7): p. 1558-64.

[242] Gonzalez, N.V., et al. A combination of the cytokinesis-block micronucleus cytome assay and centromeric identification for evaluation of the genotoxicity of dicamba. Toxicol Lett, 2011. 207(3): p. 204-12.

[243] EPA. Reregistration Eligibility Decision for Endothall. September 2005. Pg. 18. Available here: https://archive.epa.gov/pesticides/reregistration/web/pdf/endothall_red.pdf.

[244] *Id.*

[245] *Id.* at 19.

[246] *Id.* at 19-20.

[247] EPA. Fluazifop-p-butyl: Draft Ecological Risk Assessment for Registration Review. June 27, 2019. Pg. 61. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2014-0779-0017.

[248] *Id.* at 64-65.

can be exposed to levels of fluazifop via spray drift that can cause harm, anywhere from 100 to 1,000 ft from the treated area.[249]

Fluridone

Fluridone is an aquatic use herbicide primarily applied directly to water to control unwanted aquatic vegetation. The EPA found that aquatic use of fluridone can result in acute harm to aquatic invertebrates, and aquatic plants were found to be harmed at distances of more than 1,000 feet from the use site.[250]

Glyphosate

A 2015 EPA analysis found multiple environmental harms from glyphosate use. Use of glyphosate in accordance with the label was found to:

1) Result in concentrations that can potentially impact the survival and biomass of aquatic plants, upland plants, and riparian/wetland plants.[251]
2) Result in residues on foliage that can potentially impact the growth of herbivorous birds, reptiles and terrestrial amphibians.[252]
3) Potentially impact the growth and reproduction of terrestrial mammals following ground applications of glyphosate.[253]

This analysis also indicated that considerable no-spray buffers would be needed to keep off-target plants from being harmed by glyphosate use, more than 1000 feet for certain aerial applications and nearly 400 feet for certain ground applications.[254] The states of California and Arkansas both adopted mandatory no-spray buffers of 500 feet for aerial applications.[255]

Ecological incident data also reinforce the finding that the current labelled uses of glyphosate are having devastating effects to plant and animal life outside of the sprayed field.[256] Approximately 600 incidents have been reported and logged on the Ecological Incident Information System (EIIS) and Avian Monitoring Information System (AIMS) databases. A separate Incident Data System (IDS) database has identified 269 separate aggregate incident reports. Ecological

[249] *Id*. at 67.

[250] EPA. Fluridone: Preliminary Ecological Risk Assessment for Registration Review. September 8, 2017. Pgs 3-4. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2009-0160-0065.

[251] EPA. Preliminary Ecological Risk Assessment for Glyphosate and Its Salts. Sept. 8, 2015 page 2. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2009-0361-0077.

[252] *Id.*

[253] *Id.*

[254] *Id.* page 92.

[255] EPA. Drinking Water Assessment for the Registration Review of Glyphosate. June 15, 2017. Pg. 16.

[256] EPA. Preliminary Ecological Risk Assessment for Glyphosate and Its Salts. Sept. 8, 2015. Pgs 59-62. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2009-0361-0077.

incidents are also significantly underreported for pesticides so this should be viewed as the absolute bare minimum of ecological incidents that involve glyphosate.

The EPA has found that glyphosate poses a risk to a federally listed amphibian, the California Red-legged frog, making a Likely to Adversely Affect determination for the species.[257] Some glyphosate formulations and co-formulants have been found to be "highly toxic" to certain species of fish.[258]

Researchers have found negative associations between glyphosate use and monarch population size.[259] Use of glyphosate has been tied to widespread declines of milkweed, which is essential to monarch butterfly survival.[260]

The World Health Organization's International Agency for Research on Cancer ("IARC") conducted an exhaustive review of the publicly available scientific literature in 2015 and concluded that glyphosate is "probably carcinogenic to humans" (Group 2A).[261] IARC carefully weighed evidence in three areas, and found that: 1) There was sufficient evidence to conclude that glyphosate causes cancer in animal studies; 2) There was limited evidence that exposure to glyphosate causes cancer (non-Hodgkin lymphoma) in humans; and 3) There was strong evidence that glyphosate can damage DNA and induce oxidative stress,[262] two well characterized pathways that can lead to cancer.[263]

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[257] EPA. Risks of Glyphosate Use to Federally Threatened California Red-legged Frog (Rana aurora draytonii). Pesticide Effects Determination. October 17, 2008. Available here: https://www3.epa.gov/pesticides/endanger/litstatus/effects/redleg-frog/glyphosate/determination.pdf.

[258] *Id.* at 82, 84.

[259] Semmens, B. X., D. J. Semmens, W. E. Thogmartin, R. Wiederholt, L. Lopez-Hoffman, J. E. Diffendorfer, J. M. Pleasants, K. S. Oberhauser and O. R. Taylor (2016). "Quasi-extinction risk and population targets for the Eastern, migratory population of monarch butterflies (Danaus plexippus)." Sci Rep 6: 23265.

[260] Center for Biological Diversity, Petition to Protect the Monarch Butterfly (*Danaus Plexippus Plexippus*) Under the Endangered Species Act, 7 (2014), available at http://www.biologicaldiversity.org/species/invertebrates/pdfs/Monarch_ESA_Petition.pdf ("A primary threat to the monarch is the drastic loss of milkweed caused by increased and later season use of the herbicide glyphosate in conjunction with widespread planting of genetically engineered, herbicide-resistant corn and soybeans in the Corn Belt region of the United States and to planting of genetically-engineered cotton in California. In the Midwest, nearly ubiquitous adoption of, glyphosate-resistant 'Roundup Ready' corn and soybeans has caused a precipitous decline of common milkweed, and thus of monarchs, which lay their eggs only on milkweeds. The majority of the world's monarchs originate in the Corn Belt region of the United States where milkweed loss has been severe, and the threat that this habitat loss poses to the resiliency, redundancy, and representation of the monarch cannot be overstated.").

[261] WHO. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Volume 112: Some Organophosphate Insecticides and Herbicides. Glyphosate. 2017. Available at: http://monographs.iarc.fr/ENG/Monographs/vol112/mono112.pdf

[262] *Id.*

[263] Klaunig, J.E., et al., The role of oxidative stress in chemical carcinogenesis. Environ Health Perspect, 1998. 106 Suppl 1: p. 289-95; and Lee, S.J., et al., Distinguishing between genotoxic and non-genotoxic hepatocarcinogens by gene expression profiling and bioinformatic pathway analysis. Sci Rep, 2013. 3: p. 2783.

IARC's finding that glyphosate causes cancer in animals prompted California's Office of Environmental Health Hazard Assessment to list glyphosate as a known carcinogen under California's Proposition 65 law.[264] The agency has also finalized a No Significant Risk Level for glyphosate, which estimated the daily exposure level that will result in a 1/100,000 chance of developing cancer, of 1.1 mg/day.[265]

Hexazinone

EPA has found that approved hexazinone uses can expose non-target terrestrial plants to as much as 500 times the concentration needed to cause harm and that harmful exposures can exist greater than 1,000 feet from the treated area.[266] EPA found that non-agricultural uses of hexazinone can result in risks of concern to small herbivorous and insectivorous birds, reptiles and terrestrial amphibians[267] and that mammals can be exposed to as much as 80-times the amount known to cause reduced female pup body weights at birth and during lactation.[268]

For the granular uses of the herbicide, EPA found that large birds, reptiles and terrestrial amphibans would only need to ingest one granule to exceed EPA's risk of concern for ESA-listed species and three granules for non-ESA-listed species.[269] The outlook is even worse for mammals, needing to ingest less than one granule to trigger the EPA's risk of concern for ESA-listed and non-ESA-listed mammals.[270]

The EPA has found that the labelled uses of hexazinone can potentially harm a federally listed amphibian, the California Red-legged frog, making a Likely to Adversely Affect determination for the species.[271]

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[264] OEHHA. The California Environmental Protection Agency's Office of Environmental Health Hazard Assessment. Glyphosate Listed Effective July 7, 2017, as Known to the State of California to Cause Cancer. Available at: https://oehha.ca.gov/proposition-65/crnr/glyphosate-listed-effective-july-7-2017-known-state-california-cause-cancer.

[265] OEHHA. The California Environmental Protection Agency's Office of Environmental Health Hazard Assessment. Amendment to Section 25705 No Significant Risk Level - Glyphosate April 10, 2018. Available at: https://oehha.ca.gov/proposition-65/crnr/amendment-section-25705-no-significant-risk-level-glyphosate-april-10-2018.

[266] EPA. Registration Review – Preliminary Ecological Risk Assessment for Hexazinone. September 17, 2015. Pgs. 69, 79. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2009-0755-0021.

[267] *Id*. at 62-63.

[268] *Id.* at 49, 67.

[269] *Id.* at 76-77.

[270] *Id*. at 77.

[271] EPA. Risks of Hexazinone Use to Federally Threatened California Red-legged Frog (Rana aurora draytonii). Pesticide Effects Determination. February 20, 2008. Available here: https://www3.epa.gov/pesticides/endanger/litstatus/effects/redleg-frog/hexazinone/analysis.pdf.

Hexazinone is designated as Toxicity Category 1 for acute eye irritation – the most severe category – causing corneal opacity and irritation to humans that are exposed.[272] Consistent with its known harm to human health, occupational exposures from the labelled uses of hexazinone were estimated by EPA to expose workers to levels known to cause harm.[273] This was the case for multiple uses modelled with more protective PPEs than required by the label.[274]

Picloram

Picloram is highly persistent, with a half-life that can range from one month to 116 years.[275] It is one of the most mobile pesticides still used in the U.S. and a known water contaminant that has been detected in water systems in 43 different states.[276][277] EPA found that 136 water systems servicing more than 8 million people across the country had detections of picloram above the health safety threshold.[278]

EPA also found that picloram has a "very high potential" to leach into groundwater, and that once it reaches groundwater will be unlikely to degrade for multiple years.[279] EPA goes so far as to state:

> Eventual contamination of ground water is virtually certain in areas where picloram residues persist in the overlying soil. Once in ground water, picloram is unlikely to degrade, even over a period of several years.[280]

USGS found that 10% of groundwater testing sites had detections of picloram in Wyoming and that picloram was detected at the highest concentration of any other pesticide tested.[281]

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[272] EPA. Hexazinone: Draft Human Health Risk Assessment for Registration Review. June 3, 2015. Pg. 5. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2009-0755-0019.

[273] *Id.* at 37-44.

[274] *Id.*

[275] California Office of Environmental Health Hazard Assessment. Public Health Goals: Carbofuran, Diquat, Endrin, Picloram, Thiobencarb in Drinking Water. September 2016. Available here: https://oehha.ca.gov/media/downloads/water/chemicals/phg/pesticidebatch092316.pdf.

[276] EPA. R.E.D. FACTS Picloram. August 1995. Available here: https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_PC-005101_1-Aug-95.pdf.

[277] EPA. The Analysis of Regulated Contaminant Occurrence Data from Public Water Systems in Support of the Second Six-Year Review of National Primary Drinking Water Regulations. September 2010. Available here: https://www.epa.gov/sites/production/files/2014-12/documents/815b09006.pdf.

[278] *Id.*

[279] EPA. R.E.D. FACTS Picloram. August 1995. Available here: https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_PC-005101_1-Aug-95.pdf.

[280] *Id.* at 5.

[281] United States Geological Survey, Wyoming Department of Agriculture and Wyoming Department of Environmental Quality. Pesticides in Ground Water - Fremont County, Wyoming, 1998-99. March 2000. Available here: https://pubs.usgs.gov/fs/fs03500/fs03500.pdf.

Picloram's main effect to humans is liver toxicity. Picloram acid is also designated highly toxic through inhalation exposure, meaning it has a high potential to cause harm to humans through the airway.[282]

Picloram is a restricted use pesticide based on its extreme toxicity to non-target plants. EPA found that estimated concentrations from the labelled use of picloram are hundreds to thousands of times the amount known to cause harm to non-target plants.[283]

Tebuthiuron

EPA found that the current, labelled uses of tebuthiuron resulted in acute and chronic risks of concern to:

- Mammals
- Terrestrial-phase amphibians
- Reptiles
- Small-sized birds
- Terrestrial and aquatic plants

Nearby birds, amphibians, and reptiles were estimated to be exposed to levels of tebuthiuron that cause chronic harm for 140 days out of the year and at a distance of up to 139 ft from the site of application.[284] Mammals were estimated to be exposed to a level of tebuthiuron that was 45 times higher than the level known to cause harm.[285] Harm to mammals from tebuthiuron could extend up to 100 days out of the year at a distance of up to 479 ft.[286] The labelled uses of tebuthiuron can expose terrestrial plants to over 1000 times the level known to cause harm. Harm to plants can also extend 1000 ft from the site of use.[287]

EPA found that bystanders could be exposed to concerning levels of tebuthiuron at distances of up to 150 ft away.[288] And that occupational users can be harmed by some uses of the pesticide, even when wearing the label-required PPEs.[289]

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[282] EPA. R.E.D. FACTS Picloram. August 1995. Available here: https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_PC-005101_1-Aug-95.pdf.

[283] *Id.* at 6.

[284] EPA. Transmittal of the Draft Environmental Fate and Ecological Risk Assessment in Support of the Registration Review of Tebuthiuron. May 20, 2014. Pg. 3. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2009-0327-0042.

[285] *Id.*

[286] *Id.*

[287] *Id.*

[288] EPA. Tebuthiuron: Draft Human Risk Assessment. June 12, 2014. Pg 25. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2009-0327-0041.

[289] *Id.* at 26-27.

Triclopyr

EPA has found that the range, pastureland, and rights-of-way uses of triclopyr can expose birds, reptiles and terrestrial amphibians to levels of the herbicide that cause reduced survival of offspring.[290] The same uses can expose mammals to 37 times the amount of triclopyr known to reduce litter size.[291] All labelled uses of triclopyr were found to expose adult and larval bees to levels estimated to reduce survival and larval emergence.[292] Harm to bee larva was estimated more than 1000 feet from the application site.[293] Terrestrial plants were also estimated to be exposed to levels of triclopyr that were known to cause harm more than 1000 feet away from the site of application, even for ground applications.[294]

Triclopyr butoxyethyl ester (BEE) is classified as "highly toxic" to aquatic organisms. Range, pastureland and meadow uses of BEE can expose fish and aquatic invertebrates to levels of the pesticide known to cause acute harm.[295] The EPA has found that triclopyr poses a risk to a federally listed amphibian, the California Red-legged frog, making a Likely to Adversely Affect determination for the species.[296]

The best available science reviewed here must be incorporated into any analyses of herbicide use on the Pinaleño Project. These herbicide risk reviews are not inclusive of all herbicides because the scoping letter does not specify which chemicals are proposed for use. Many others not discussed here have equally as disastrous risks to ecosystems, water, people, and wildlife. We do not endorse the use of any of those herbicides under the current proposal framework subject to these comments. For these reasons and more, we have identified herbicides as an issue for analysis.

B. Old and Large Tree Retention and Protection

The Pinaleño Project must provide protections for old and large trees. No tree over 16" diameter or 150 years old should be cut. Old growth forests and large and old trees are socially and ecologically valuable assets that this project must protect. These trees are the backbone of fire-resistant ecosystems and support some of the rarest wildlife in the Southwest, including the Mexican spotted owl, northern goshawk, and Mt. Graham red squirrel. Without firm protections for these trees and the irreplaceable habitat they support the Pinaleño Project will fail. Large and old trees are key characteristics of the pre-fire suppression forest that once blanketed the Southwest. The only way to maintain or restore the diversity of ecosystems and habitat types

[290] EPA. Triclopyr (Acid, Choline salt, TEA salt, BEE): Draft Ecological Risk Assessment for Registration Review. Sept. 30, 2029. Pg. 6. Available here: https://www.regulations.gov/document?D=EPA-HQ-OPP-2014-0576-0026.

[291] *Id.* at 8.

[292] *Id.* at 9.

[293] *Id.* at 90.

[294] *Id.* at 94-95.

[295] *Id.* at 9.

[296] EPA. Risks of Triclopyr Use to Federally Threatened California Red-legged Frog (Rana aurora draytonii) Pesticide Effects Determination. October 19, 2009. Available here: https://www3.epa.gov/pesticides/endanger/litstatus/effects/redleg-frog/triclopyr/analysis.pdf.

throughout the plan area, and the wildlife that rely on them, is to require that trees over a certain diameter and age not be cut except in cases of safety. To that end, we recommend a 16" diameter limit and an age limit of 150 years on tree cutting, consistent with the majority of forest restoration literature.

Retention of old and large trees is a core management approach that will allow the Coronado National Forest to achieve restoration objectives and move towards desired conditions. Past timber management destroyed nearly all ponderosa pine and mixed conifer old growth forest in Arizona and New Mexico, including on much of Mt. Graham. Even-aged or simplified forest has replaced the complex forests of the pre-settlement southwestern landscape.[297,298] Retention of large trees is fundamentally important to fire resistance of treated stands.[299] Mature conifers have a high capacity to survive and recover from crown scorch.[300] Large tree structure enhances forest resilience to severe fire effects[301,302,303] whereas removing them may undermine fire resilience.[304,305] Research demonstrates no advantage in fire hazard mitigation resulting from mechanical forest treatments that remove large or old trees compared to treatments that retain them. Modeled treatments that removed only trees smaller than 16-inches diameter were marginally more effective at reducing long-term fire hazard than so-called "comprehensive" treatments that removed trees in all size classes.[306]

Large or old trees are not abundant at any scale in Southwestern forests and they are the most difficult of all elements of forest structure to replace once removed.[307] The ecological

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[297] Covington, W.W., and M.M. Moore. 1994. Southwestern ponderosa forest structure: Changes since Euro-American settlement. *Journal of Forestry* 92: 39-47.

[298] Sesnie, S. and J. Bailey. 2003. Using history to plan the future of old-growth ponderosa pine. *Journal of Forestry* 99(7) (Oct/Nov): 40-47.

[299] DellaSala, D.A., J.E. Williams, C.D. Williams and J.F. Franklin. 2004. Beyond smoke and mirrors: a synthesis of fire policy and science. *Conservation Biology* 18: 976-86.

[300] McCune, Bruce. "Ecological diversity in North American pines." American Journal of Botany (1988): 353-368.

[301] Arno, S.F. 2000. Fire in western ecosystems. Pp. 97-120 in: J.K. Brown and J.K. Smith (eds.). *Wildland Fire in Ecosystems, Vol. 2: Effects of Fire on Flora*. USDA For. Serv. Gen. Tech. Rep. RMRS-42-vol.2. Ogden, UT.

[302] Omi, P.N., and E.J. Martinson. 2002. *Effect of Fuels Treatment on Wildfire Severity*. Unpubl. report to Joint Fire Science Program. Fort Collins: Colorado State Univ. Western Forest Fire Research Ctr. March 25. 36 pp.

[303] Pollett, J. and P.N. Omi. 2002. Effect of thinning and prescribed burning on crown fire severity in ponderosa pine forests. *International Journal of Wildland Fire* 11: 1-10.

[304] Brown, R.T., J.K. Agee, and J.F. Franklin. 2004. Forest restoration and fire: principles in the context of place. *Conservation Biology* 18: 903-12.

[305] Naficy, C., A. Sala, E.G. Keeling, J. Graham and T.H. DeLuca. 2010. Interactive effects of historical logging and fire exclusion on ponderosa pine forest structure in the northern Rockies. *Ecological Applications* 20: 1851-64.

[306] Fiedler, C.E., and C.E. Keegan. 2003. Reducing crown fire hazard in fire-adapted forests of New Mexico. Pp. 29-38 in: P.N. Omi and L.A. Joyce (tech. eds.). *Fire, Fuel Treatments, and Ecological Restoration: Conference Proceedings*. 2002 April 16-18: Fort Collins, CO. USDA For. Serv. Rocky Mtn. Res. Sta. Proc. RMRS-P-29. Fort Collins, CO.

[307] Agee, J.K. and C.N. Skinner. 2005. Basic principles of forest fuel reduction treatments. *Forest Ecology and Management* 211: 83-96.

significance of old growth forest habitat and large trees comprising it is widely recognized.[308,309] There is no agreed-upon scientific basis for removing large trees to promote fire resistance in southwestern forests.[310,311] Any NEPA document prepared for this project must address the need for retaining these components on the landscape through addition of meaningful plan components.

One of the most often cited scientific articles on Southwestern ponderosa pine restoration stated that a core ecological restoration principle is:

> Retain trees of significant size or age.—Large and old trees, especially those established before ecosystem disruption by Euro-American settlement, are rare, important, and difficult to replace. Their size and structural complexity provide critical wildlife habitat by contributing crown cover, influencing understory vegetation patterns, and providing future snags. Ecological restoration should protect the largest and oldest trees from cutting and crown fires, focusing treatments on excess numbers of small young trees. Given widespread agreement on this point, it is generally advisable to retain ponderosa trees larger than 41 cm (16 inches) dbh and all trees with old-growth morphology regardless of size (i.e., yellow bark, large drooping limbs, twisted trunks, flattened tops).[312]

For these reasons and more, we have identified old and large tree retention and protection as an issue for analysis. At an absolute minimum, the Forest Service must analyze in detail at least one action alternative that bars the removal of trees 16-inch diameter at breast height or greater and 150 years old.

C. Watershed Improvement

The scoping letter briefly describes what could be a lengthy and varied mix of activities under the heading of Watershed Improvement. The way the section is presented, it appears that the Forest Service has not identified specific problems at specific locations, and in turn cannot prescribe specific actions. Thus, this is another example of condition-based management, discussed above. Based on the core principles and objectives listed in the scoping letter, we might expect the Forest Service to enter the habitat for an imperiled species with a bulldozer

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[308] Friederici, P. (Ed.). 2003. *Ecological Restoration of Southwestern Ponderosa Pine Forests*. Island Press: Washington, DC.

[309] Kaufmann, M.R., W.H. Moir, and W.W. Covington. 1992. Old-growth forests: what do we know about their ecology and management in the Southwest and Rocky Mountain regions? Pp. 1-10 in: M.R. Kaufmann, W.H. Moir, and R.L. Bassett (eds.). *Old-Growth Forests in the Southwest and Rocky Mountain Regions: Proceedings from a Workshop* (1992). Portal, AZ. USDA For. Serv. Gen. Tech. Rep. RM-213. Fort Collins, CO.

[310] Allen, C.D. M.A. Savage, D.A. Falk, K.F. Suckling, T.W. Swetnam, T. Schulke, P.B. Stacey, P. Morgan, M. Hoffman, and J.T. Klingle. 2002. Ecological restoration of southwestern ponderosa pine ecosystems: A broad perspective. *Ecological Applications* 12: 1418-33.

[311] Brown et al. 2004, Dellasala et al. 2004

[312] Page 1425 in Allen, C.D. M.A. Savage, D.A. Falk, K.F. Suckling, T.W. Swetnam, T. Schulke, P.B. Stacey, P. Morgan, M. Hoffman, and J.T. Klingle. 2002. Ecological restoration of southwestern ponderosa pine ecosystems: A broad perspective. *Ecological Applications* 12(5): 1418-1433.

without any site-specific analysis of those effects. The scoping letter says that "Upland restoration needs would be determined on a site-specific basis."[313] The Forest Service must therefore provide in any subsequently prepared NEPA document the site-specific evaluation of problems and analyze the effects of a proposed solution. This is an example of where the Forest Service must disclose to the public accurate and detailed description of baseline conditions, and a hard look at the effects of proposed treatments. We are particularly concern with the objective of aiding livestock distribution. Is livestock management identified as the purpose of this project? We suggest elimination of livestock if watershed improvement is the objective of this project. For these reasons and more, we have identified Watershed Improvement as an issue for analysis.

D. Mechanical Treatments

The scoping letter describes a vast array of tools and systems with this brief paragraph:

> This type of treatment includes specialized mechanical-harvesting and slash treatment equipment, mastication, and grubbing. Mechanical treatment reduces woody biomass across a larger area than is typically treated by hand thinning. Mastication is used to eliminate shrubs and small trees for ecological or fuel reduction purposes. In areas where mastication is ineffective (for example, where vegetation re-sprouts quickly), grubbing would be used as an alternative. Grubbing uses a tracked or rubber-tired machine to uproot shrubs and small trees, removing the rooting zone of the plant and limiting re-sprouting and survival.[314]

Any subsequent NEPA document must expand on this very cursory description. The use of mechanical systems has potentially significant impacts on terrestrial and aquatic wildlife. The season of use for some systems (mastication, for example) can have significant effects on ground-nesting birds. All mechanical systems can increase the spread of invasive species. The scoping letter is short on detail on where and why mechanical methods would be used. We expect to see detailed vegetation maps, assessments of current vegetation class and conditions, and proposed treatment systems identified at the site-specific level with consideration of steep slopes, aspect, precipitation regime, soils (erosion), rare plants, wildlife, recreation, fire hazard, and an economic analysis of mechanical systems, particularly commercial logging. For these reasons and more, we have identified Mechanical Treatments as an issue for analysis.

Logging is implicated in the listing of the Mexican spotted owl under the ESA. Logging threatened this imperiled species. Any subsequent NEPA document must not ignore key facts: chiefly, that the best available science clearly demonstrates that the short-term impacts of restoration-based thinning are negative, and there is no definitive conclusion on whether the long-term effects are beneficial, detrimental, or negligible. As described in the literature cited below, the issue will remain unresolved as "no empirical studies have evaluated these management activities [restoration thinning or logging] on the Mexican spotted owl."[315]

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[313] Scoping Letter at 8.

[314] Scoping Letter at 7.

[315] Yi Wan, H., J.L. Ganey, C.D. Vojta, and S.A. Cushman. 2018. Managing emerging threats to spotted owls. *The Journal of Wildlife Management.* DOI: 10.1002/jwmg.21423, p. 8.

Prominent spotted owl scientists in 2017 concluded that "[e]xisting studies on the effects of fuels reduction treatments on spotted owls universally suggest negative effects from these treatments."[316] In another paper, these leading spotted owl scientists said that "forest restoration and thinning activities also may threaten owls and their existing habitat,"[317] and that "[c]ommercial timber harvesting remains a potential threat for all 3 spotted owl subspecies, but effects from forest thinning may be increasing because of the heightened emphasis on fuels reduction and forest restoration treatments on public lands. Owl response to mechanical tree removal, especially forest thinning, remains understudied."[318]

The Mexican spotted owl is the least understood subspecies of the spotted owl taxa. Generally, all three spotted owls share similar habitat preferences, and show similar responses to forest management, so there are important lessons to glean from studies of the other species. We recognize that the Coronado National Forest is different than the wet forests of the Pacific Northwest where the northern spotted owl resides, so we will focus here on some relevant studies from dry, frequent fire-adapted forests of southern California. Several researchers have published findings indicating deleterious effects of thinning on spotted owls in dry forest of California, summarized here:

- Stephens and colleagues[319] reported that, in the Plumas National Forest of California, spotted owl territorial sites declined 43% within 3-4 years of landscape-scale thinning treatments, and following treatment, owls redistributed across the landscape.

- A study by Lee and colleagues[320] reported that in the San Bernardino and San Jacinto of southern California, post-fire salvage logging further reduced California spotted owl occupancy rates beyond the initial impacts of wildfire, leading the authors to recommend that burned stands be monitored for occupancy prior to salvage logging.

- Elsewhere in the Sierra Nevada, Tempel and colleagues[321] found that, as expected, canopy cover and demographic rates were strongly positively related, and that medium intensity fuels reduction harvest were negatively related to owl reproduction.

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[316] Ganey, J.L., H.Yi Wan, S.A. Cushman, And C.D. Vojta. 2017. Conflicting Perspectives on Spotted Owls, Wildfire, and Forest Restoration. *Fire Ecology* 13(3) doi: 10.4996/fireecology.130318020, p.11

[317] Yi Wan, H., J.L. Ganey, C.D. Vojta, and S.A. Cushman. 2018. Managing emerging threats to spotted owls. *The Journal of Wildlife Management.* DOI: 10.1002/jwmg.21423, p. 8.

[318] *Id*, p. 1.

[319] Stephens, S.L., S.W. Bigelow, R.D. Burnett, B.M. Collins, C.V. Gallagher, J. Keane, D.A. Kelt, M.P. North, L.J. Roberts, P.A. Stine, and D.H. Van Vuren. 2014. California Spotted Owl, Songbird, and Small Mammal Responses to Landscape Fuel Treatments. *BioScience* 64(10): 893-906.

[320] Lee, D.E., M.L. Bond, M. I. Borchert, and R. Turner. 2012. Influence of fire and salvage logging on site occupancy of spotted owls in the San Bernardino and San Jacinto Mountains of southern California. *The Journal of Wildlife Management* 77(7):1327-1341.

[321] Tempel, D.J., R.J. Gutierrez, S.A. Whitmore, M.J. Reetz, R.E. Stoelting, W.J. Berigan, M.E. Seamans, and Z. Peery. 2014. Effects of forest management on California spotted owls: implications for reducing wildfire in fire-probe forests. *Ecological Applications* 24(8):2089-2106.

- Other researchers have concluded that thinning effects would be less impactful than severe wildfire,[322] leading to uncertainty of the true impacts of thinning on spotted owls.

The Forest Service also has information—based on monitoring of Mexican spotted owls in the area of the Nuttall-Gibson Fire of 2004 in the Coronado National Forest—that Mexican spotted owls appear to survive and thrive in some post-fire environments.[323]

The information reported in these sources directly undercuts the 2012 Mexican spotted owl revised Recovery Plan's assumptions with respect to Mexican spotted owl responses to fire and, more importantly, the conclusion that the risk to Mexican spotted owl habitat posed by the threat of fire justifies large-scale restoration projects which is itself associated with significant negative effects to the Mexican spotted owl and its habitat. Indeed, in some cases the evidence suggests that wildfire may actually promote the recovery of the Mexican spotted owl despite the 2012 Revised Recovery Plan's suggestion to the contrary.

Lee and Irwin, in their 2018 meta-analysis published in Ecosphere, concluded that "mixed-severity fire does not appear to be a serious threat to owl populations; rather, wildfire has arguably more benefits than costs for Spotted Owls."[324] To further support our argument here, a recent paper published by owl experts asserts that the 'debate' over the impacts of fire or logging to spotted owls is not settled:

> Here, we argue that the existing literature is not sufficient to unambiguously quantify the response of spotted owls to high-severity wildfire, and that high-severity fire is pervasive enough within the range of the spotted owl to constitute a potential threat to owl habitat. We also provide evidence that forest restoration and fuels reduction treatments can mitigate fire behavior, but acknowledge that these treatments also can degrade spotted owl habitat. Based on these findings, we argue for cautious implementation of restoration treatments in or near spotted owl habitat, with the goal of identifying treatment types that successfully reduce fire risk while maintaining suitable habitat conditions for spotted owls.[325]

Notably, these researchers identified that threats to Mexican spotted owl are comparatively less studied than for other spotted owl subspecies:

> Mexican spotted owl papers represented a small fraction of manuscripts among major research topics, except for habitat selection … Because the Mexican

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[322] Lee, D.C., and L.L. Irwin. 2005. Assessing risks to spotted owls from forest thinning in fire-adapted forests of the western United States. *Forest Ecology and Management* 211:191-209.

[323] *See* "Occupancy and Reproductive Success of Mexican Spotted Owls in the Pinaleno Mountains, Safford Ranger District, Arizona: 2011" ("the owl population in the Pinaleno Mountains has demonstrated the capability of reproducing well, despite of or even with the aid of effects promulgated by the large, and in some areas, severely burning Nuttall-Gibson fire of 2004").

[324] Lee, D.E. 2018. Spotted Owls and forest fire: a systematic review and meta-analysis of the evidence. *Ecosphere* 9(7):e02354. 10.1002/ecs2.2354, p. 1.

[325] Page 4 in Ganey, J.L., H. Yi Wan, S.A. Cushman, and C.D. Vojta. 2017. Conflicting Perspectives on Spotted Owls, Wildfire, and Forest Restoration. *Fire Ecology* 13(3) doi: 10.4996/fireecology.130318020.

> spotted owl was listed as Threatened primarily because of concerns over habitat loss, it is understandable that a relatively high proportion of Mexican spotted owl studies have focused on characterizing habitat. The general lack of population dynamics studies for the Mexican spotted owl, however, is notable, and severely limits our understanding of factors causing population fluctuations in this owl and how it might respond to emerging threats.[326]

Any subsequent NEPA documents prepared for this project should acknowledge that restoration treatments that involve substantial tree cutting and removal can have deleterious effects that are similar to commercial timber harvest: the roads, the noise, the soil disturbance, the dust, human presence in the forest, and the direct loss and removal of forest structural elements all impact the owl.

The 2012 MSO Recovery Plan states:

> Construction of roads and trails can indirectly affect Mexican spotted owls through loss and fragmentation of habitat (we discuss the effects of increased noise potential, human access, and direct fatality in Part II.H.3.e.iii below). In general, habitat loss to road construction is minor on a rangewide scale when compared to more massive habitat losses observed from other causes (e.g., wildland fires, past harvest practices); however, on a local scale, roads and trails through PACs may fragment habitat continuity, alter natural movement patterns, and increase disturbance to resident owls. Roads in nest/roost, forested, and riparian recovery habitat may also result in loss of habitat components (e.g., large logs, large snags, hardwoods) as people access these areas for fuelwood cutting, and in sensitive riparian areas, roads and trail can inhibit hydrological processes that affect proper functioning ecological conditions.[327]

As long as the Forest Service refuses to protect old and large trees; as long as the Forest Service aims to thin every acre to 40-80 square feet of basal area; as long as the Forest Service refuses to measure or retain canopy cover; and as long as the measure of success is "interspace;" the agency is fundamentally using the same tools of historical silvicultural failings, and as such, can have similar impacts on wildlife.

A project monitoring plan must be developed that provides adequate assurances that real science-based learning will be achieved as the Forest Service's increases the pace, scale, and intensity of mechanical treatments in spotted owl habitat in the Pinaleños.

Recovery of the Mexican spotted owl is only possible if the Forest Service fully commits to implementing and complying with the 2012 Recovery Plan.[328] The 2012 Recovery Plan lists specific criteria that must be met before the Mexican spotted owl can be delisted and

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[326] *Id*., p. 7.

[327] MSO Recovery Plan, 2012, p. 45.

[328] *See* U.S. Fish and Wildlife Service, Mexican Spotted Owl Recovery Team. 2012. Mexican Spotted Owl Recovery Plan, First Revision (*Strix occidentalis lucida*). Albuquerque, NM: U.S. Fish and Wildlife Service, Southwest Region.

acknowledges that "[m]eeting two of those criteria will require large-scale monitoring of trends in owl abundance and habitat quantity and distribution."[329]

Landscape-level project planning offers the Forest Service an opportunity to employ such commitment by providing one or more design features that require forest-wide contribution to and participation in range-wide Mexican spotted owl monitoring.

Monitoring limited to only PACs neglects the need to monitor the abundance and distribution of MSO on the entire Coronado National Forest as part of the larger effort to determine the range wide trends in owl abundance and distribution. In addition to monitoring abundance and distribution. the Forest Service must identify, map, and manage for MSO recovery habitat as defined in the 2012 Recovery Plan.

In any subsequent NEPA document prepared for the Pinaleño Project the Forest Service must:

- Identify, map, and manage for Mexican spotted owl recovery habitat as defined in the 2012 Recovery Plan.
- Provide clear plans for monitoring abundance and distribution.
- Reflect the outcome of any ESA Section 7 consultation under the ESA.
- Delineate required pre- and post-project monitoring consistent with the 2012 Recovery Plan for all activities, including, but not limited to, forest management activities (e.g. thinning, logging, prescribed burns), livestock grazing, oil and gas development, mining, and recreation (in particular, motorized recreation). This is especially relevant to the agency's unsupported claim that timber management will benefit Mexican spotted owl and its habitat. Such scientific experiments remain unproven, as described above.
- Use the best available science and information and share that science and information with the public as part of the required processes under the ESA and NEPA.
- Analyze the cumulative impacts of all management activities on Mexican spotted owl and include the results of any and all monitoring data collected as part of those activities, as required by the existing Forest Plan and Mexican spotted owl Biological Opinions. This includes pre- and post- project monitoring and population and habitat monitoring.
- Add a project design feature that requires contribution to range-wide population trend monitoring per the Recovery Plan requirements and recommendations.
- Pursuant to the adaptive management framework of the Recovery Plan, the Forest Service will use the information and assessments of effects of management experiments and scientific studies (or the best available science) to inform and modify ongoing forest management actions and future decisions.[330] Further, monitoring and management requirements, and plan components should be updated based on additional publication of best available science and any new or revised recovery plans.
- Add a project design feature that requires that, for all management activities, implementation of the monitoring plans identified in any Biological Opinions is an integral and mandatory part of any management action assessed in the BO.

[329] *Id.*, p. 93.

[330] *See* the 2012 Recovery Plan at 297 and 379.

- Add a project design feature that requires that the Forest Service comply with the Area Limitation on mechanical treatment of non-core PAC habitat as detailed in the Recovery Plan.[331]
- Add a project design feature that ensures mechanical thinning in spotted owl PACs and recovery habitat do not decrease forest structural attributes below levels specified in Tables C.2 and C.3 in the Recovery Plan.
- Incorporate, summarize, and cite the best available science referenced here into the analysis of the effects of plan approval and/or proposed or possible actions on the Mexican spotted owl.
- Discuss the threats posed to Mexican spotted owl by logging, including mechanical forest restoration thinning operations, and associated disturbance caused by road building and human intrusion into owl habitats.
- Provide design features to maintain or protect the canopy cover needed by MSO, or other canopy dependent species like the northern goshawk. Owl experts have suggested that forests revise Desired Conditions to emphasize canopy cover requirements in spotted owl habitat.[332]
- The MSO Recovery Plan is clear that the owl relies on old and large trees. We recommend that any subsequent NEPA document ensure protections for the large and old trees and old growth structure needed by spotted owls and northern goshawk.

E. Wildland Urban Interface

The scoping letter states that the "wildland urban interface in the project area comprises of recreation residences, the Mount Graham International Observatory, and other critical infrastructure."[333] The Forest Service is aware of our numerous interventions into and our concerns regarding (1) the inappropriate placement and tenure of these sites on mount graham, (2) the Forest Service's consistent, documented an confirmed, inappropriate prioritization of protection of structures over protection of forest and endangered species, and (3) the documented historically inappropriate unnecessary, July 8, 2004, torching of approximately 250 acres of rare spruce-fir forest by the Forest Service of the spruce-fir forest extending from east of the Columbus telescope (now called the LBT) across Hawk Peak to just west of High Peak. The Forest Service has consistently serviced the desires of university of Arizona, cabin and camp renters sacrificing the needs and rights of Native Americans, the forest and endangered species. The Western Apache in particular continue to suffer daily harm as a result of the University of Arizona's and the Forest Service's efforts. The Mount Graham red squirrel is on the brink of extinction in good part owing to these efforts. And the University of Arizona, with the help and facilitation of the Forest Service, has never kept a promise starting from the codified EIS height being raised nearly 50%, now lighting up every morning over southern San Carlos Apache lands reflecting the morning sun, as the University of Arizona's middle finger salute to the Apache.

The Forest Service has capitulated to pressure from these institutions and in so doing has violated the sovereignty of Indigenous people and risked the loss of a species. The Design Features and Goals document states that "[a]ll known historic and cultural sites would be

[331] See the 2012 Recovery Plan at 262.

[332] Ganey et al., 2016. Evaluating desired conditions for Mexican spotted owl nesting and roosting habitat. *Forest Science* 62.

[333] Scoping Letter at 2.

surveyed, protected, and/or avoided."[334] We suggest that the entire mountain be "avoided." These facilities should be closed, decommissioned, dismantled, and hauled away permanently. The sites should be recontoured and restored to native forest. The so-called protection of these sites from past fires is directly responsible for the loss of significant portion of the red squirrel's habitat. The continued operation of these unlawfully authorized facilities will further imperil rare wildlife and leave the Forest Service fully responsible for what is likely to be an extinction.

Decisions made with effects on rare wildlife and high elevation forest habitat should be made with primary consideration of those species, not of the illegal occupation of this sacred mountain. Any subsequent NEPA document must provide detailed maps of all WUI sites, facilities, and infrastructure; provide a clear definition of the WUI; provide up-to-date baseline conditions for forest structure and fuel loads; and prescribe site-specific treatments consistent with criteria established in species recovery plans and the best available science for rare species habitat restoration. The Forest Service should also live up to its lofty "all hands, all lands" rhetoric and provide a plan for how facility operators and permittees will fund, implement, and monitor fuel reduction treatments within the perimeter of their facilities. Aside from the controversial facilities placed near the summit of one of the most scared mountains in Arizona, there are private lands bordering Forest Service land around the base of the mountain range. These lands are confined to a handful of small inholdings, none of which have anything more than stock ponds or corrals located on them. These private lands should not receive any special treatment from the Forest Service in developing burn plans or conducting burn operations.

F. Livestock Grazing

The Center supports the reintroduction of fire to the Pinaleño Mountains. These ecosystems evolved with fire, and prior to Euro-American settlement, rare species were not threatened by fire because the natural cycle had not been interrupted by damaging stressors of logging, fire suppression, and livestock grazing. The continuation of livestock grazing in the project area is inconsistent with the objectives or restoring functional fire regimes. According to The Nature Conservancy,[335] the Pinaleño's contain one of the largest blocks of former grasslands in the state of Arizona, and that "with steady grazing pressure for more than a century, lack of fine fuels…has limited the spread of any fires that ignite. The result has been encroachment of woody shrubs like mesquite and juniper into areas previously dominated by grasses, along with reductions in plant species diversity."[336] The Coronado National Forest contains more former grassland than any other National Forest in Region 3. Why is this? It's attributed entirely to fire suppression and livestock grazing. This project seeks to address the first of those problems, but the Forest Service cannot hope to fully address grassland issues without also addressing in any subsequent NEPA document the issue of livestock grazing.

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[334] Scoping, Design Features and Goals, at 2.

[335] Arizona Statewide Grassland Assessment (Schussman and Gori 2004, Gori and Enquist 2003; available at http://www.azconservation.org).

[336] Page 60 in Marshall, R.M., D. Turner, A. Gondor, D. Gori, C. Enquist, G. Luna, R. Paredes Aguilar, S. Anderson, S. Schwartz, C. Watts, E. Lopez, and P. Comer. 2004. *An Ecological Analysis of Conservation Priorities in the Apache Highlands Ecoregion.* Prepared by The Nature Conservancy of Arizona, Instituto del Medio Ambiente y el Desarrollo Sustentable del Estada de Sonora, agency and institutional partners. 152 pp.

In helping the Forest Service prepare for the revision of the Coronado Forest Plan, The Nature Conservancy wrote:

> According to the Arizona Grasslands Assessment, grasslands that have exceeded a threshold of 35% shrub cover have undergone a type conversion from grassland to shrubland. Statewide, nearly 22% of historic grasslands have been lost while on the Coronado, just over 10% of historic grasslands have been converted to shrublands. A predominance of this former grassland area occurs on the Safford District. Even given long periods (50 years) of grazing rest (Hennessey and others 1983), it is unlikely that these former grasslands can be restored to open native conditions. While increases in perennial grass cover may occur (Valone and others. 2002) at certain sites based upon soil type, erosion and shrub species composition, it is unlikely that these sites will accumulate sufficient fine fuels to carry a fire intense enough to reduce shrub cover.[337]

This seems like an insurmountable problem; that these grasslands have drifted so far from their natural range of variability that there is no return. Yet, the Scoping Letter indicates hope for restoring these grasslands by spending millions of taxpayer dollars on mastication, grubbing, plucking, hand thinning, and ultimately, poison. "Application of herbicides is proposed to reduce re-sprouting of trees and shrubs to prevent regrowth after fire, thinning, mastication, or grubbing treatments and/or a primary treatment to address broad-scale invasion (generally into grasslands) of woody species that are difficult to control with fire or mechanical means."[338]

Nowhere in the Scoping Letter is reduction in livestock grazing discussed. So, the cycle continues. The Forest Service will burn up taxpayer dollars subsidizing unsustainable ranching, burn up taxpayer dollars degrading the landscape to prop up the ranchers, and in the end, they will burn up the whole mountain too, chasing the impossible fantasy of multiple use. The TNC report also says:

> The potential to restore shrub-invaded grasslands is affected by a complex web of interacting physical and biological factors that include climate, topography, grazing, introduced/invasive species, and fire … Often, the fuels required to allow fires of adequate intensity to achieve this goal are lacking, and areas must be rested from grazing to allow fuels to accumulate. The number of growing seasons of rest needed to accumulate these fuels varies from site to site. Schussman and Gori (2004) estimated that 44% of sites in Arizona could be burned with three growing seasons or less of rest, while the remainder of grasslands would need longer periods of rest.[339]

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[337] Bruce Vander Lee, Ruth Smith, and Joanna Bate. TNC Coronado Forest Planning report, page 4-35. Available on the Forest Service website at: https://www.fs.usda.gov/detail/r3/landmanagement/planning/?cid=fsbdev3_022067.

[338] Scoping Letter at 7.

[339] TNC Coronado Forest Planning report at page 4-34.

What does this mean for the Pinaleño Project? The Design Features and Goals document states: "Burned areas would be rested from grazing for specified periods after treatment."[340] What is a "specified period?" One season? If this project is anything like other projects on Region 3, we suspect that insufficient rest will be prescribed, if any at all, solely attributable to the Forest Service's unfailing commitment to prop up the beef industry and subsidize a tiny fraction of the population. As cited in the two quotes above, a large portion of the state needs more than 3 years of rest, and even fifty years of rest from grazing may not be enough.

But instead of facing this issue head on, the Forest Service intends to provide more facilities and handouts to the beef industry under the guise of "Watershed Improvement" and "aiding the distribution of livestock." We suggest aiding livestock distribution by telling the beef industry to go home and take their cows with them. The Pinaleño Mountains are exceptionally biodiverse and critical to the survival of hundreds of species of plants and animals. The Nature Conservancy has ranked the Pinaleño Mountains as the fifth highest conservation priority in the entire Apache Highlands Ecoregion,[341] which spans 30 million acres in Arizona, New Mexico, Sonora, and Chihuahua. Ignoring the science and failing to address the ravages of livestock grazing will lead this project to failure. Again, The Nature Conservancy has stated that in the Apache Highlands Ecoregion, 37% of historic grasslands have converted to shrubland, and an additional 32% of grassland have levels of shrub encroachment that "without grazing rest and reintroduction of fire, would be converted to shrubland in the near future."[342]

Livestock grazing is also implicated with the occurrence and spread of exotic, invasive species. The Nature Conservancy, in partnership with the Forest Service, has written that:

> The spread of non-native perennial grasses has substantially reduced the occurrence of native grasslands in Arizona. Statewide, non-native grasslands comprise 9% of current grasslands, primarily due to the spread of Boer lovegrass (Eragrostis chlorodelas) and Lehmann lovegrass (Eragrostis lehmanniana) in southeastern Arizona. Over 157,000 acres (20.8% of all Coronado grasslands) of non-native grasslands occur on the Coronado. This conversion to dominance by non-native species can result in significant negative impacts to grassland-dependent organisms. Bock and others (1986), for example, documented that 26 species including plants, birds, rodents, and grasshoppers, were less abundant in grasslands dominated by lovegrasses compared to native grasslands.[343]

Despite this widespread problem, the scoping letter says next to nothing about invasive species. Any subsequent NEPA document must provide an inventory of invasive plants and animals on

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[340] Scoping, Design Features and Goals, at 1.

[341] Marshall, R.M., D. Turner, A. Gondor, D. Gori, C. Enquist, G. Luna, R. Paredes Aguilar, S. Anderson, S. Schwartz, C. Watts, E. Lopez, and P. Comer. 2004. *An Ecological Analysis of Conservation Priorities in the Apache Highlands Ecoregion.* Prepared by The Nature Conservancy of Arizona, Instituto del Medio Ambiente y el Desarrollo Sustentable del Estada de Sonora, agency and institutional partners. 152 pp.

[342] Arizona Statewide Grassland Assessment (Schussman and Gori 2004, Gori and Enquist 2003; available at http://www.azconservation.org).

[343] Bruce Vander Lee, Ruth Smith, and Joanna Bate. TNC Coronado Forest Planning report, page 4-35. Available on the Forest Service website at: https://www.fs.usda.gov/detail/r3/landmanagement/planning/?cid=fsbdev3_022067.

the project area, correlate their occurrence with livestock distribution, and provide design features that reduce or eliminate the threat of invasives to the environment.

For these reasons, and more, we have identified livestock grazing as a significant issue for analysis. The effects of grazing are clearly interrelated with the proposed use of mechanical and chemical shrub control methods, and grass consumption by cattle is clearly associated with the success of burn operations. If the Forest Service is to "Restore, sustain, and promote ecological processes to retain and enhance the overall health and resiliency of watersheds and desired native plant and animal species and communities" or "Improve habitat quality, quantity, and connectivity of threatened, endangered, and sensitive wildlife species and forage for range and wildlife," as stated in the project's "purpose and need" statement, then livestock grazing must be addressed.[344]

G. Wildlife

The Pinaleño Mountains are among the most ecologically significant landscapes in the Southwest. Any subsequently prepared NEPA document must acknowledge this and treat the landscape in a manner commensurate with such a distinction. A wide variety of rare and imperiled species occur within the project area. We are concerned with all wildlife, but particularly concerned with the project's effects on the following species:

Amphibians and Reptiles
Lowland leopard frog (*Rana yavapaiensis*)
Chiricahua leopard frog (*Rana chiricahuensis*)
Plains leopard frog (*Rana blairi*)
Twin-spotted rattlesnake (*Crotalus pricei*)
Gila monster (*Heloderma suspectum*)

Birds
Northern goshawk (*Acipiter gentilis*)
Scaled quail (*Callipepla squamata*)
Peregrine falcon (*Falco peregrinus anatum*)
Mexican spotted owl (*Strix occidentalis lucida)*
Baird's sparrow (*Ammodramus bairdii*)
Lucifer hummingbird (*Calothorax lucifer*)
Broad-billed hummingbird (*Cynanthus latirostris*)
Buff-breasted flycatcher (*Empidonax fulvifrons*)
Yellow-eyed junco (*Junco phaeonotus*)
Abert's towhee (*Melozone aberti*)
Sulphur-bellied flycatcher (*Myiodynastes luteiventris*)
Rose-throated becard (*Pachyramphus aglaiae*)
Varied bunting (*Passerina versicolor*)
Arizona woodpecker (*Picoides arizonae*)
Gray vireo (*Vireo vicinior*)

[344] Scoping Letter at 3.

Fish
Apache Trout (*Oncorhynchus apache*)

Insects
Giant waterbug (*Abedus herberti*)
Pinaleno monkey grasshopper (*Eumorsea pinaleno*)

Mammals
Mount graham red squirrel (*Tamiasciurus hudsonicus grahamensis*)
Yellow-nosed cotton rat (*Sigmodon ochrognathus*)
Black bear (*Ursus americanus*)
Northern pygmy mouse (*Baiomys taylori ater*)
American pronghorn (*Antilocapra americana*)
Pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)
Spotted bat (*Euderma maculatum*)
Allen's lappet-browed bat (*Idionycteris phyllotis*)
Western red bat (*Lasiurus blossevillii*)
Western yellow bat (*Lasiurus xanthinus*)
Hooded skunk (*Mephitis macroura milleri*)
White-bellied long-tailed vole (*Microtus longicaudus leucophaeus*)
Arizona shrew (*Sorex arizonae*)

Mollusks
Pinaleno mountainsnail (*Oreohelix grahamensis*)
Clark Peak talussnail (*Sonorella christianseni*)
Pinaleno talussnail (*Sonorella grahamensis*)
Mimic talussnail (*Sonorella imitator*)
Wet Canyon talussnail (*Sonorella macrophallus*)

Plants
Pinalenos fleabane (*Erigeron heliographis*)
Bigelow thoroughwort (*Eupatorium bigelovii*)
Pinaleno mountain plummera (*Hymenoxys ambigens var. ambigens*)
White-flowered cinquefoil (*Potentilla albiflora*)
Blummer's dock (*Rumex orthoneurus*)
Broad-leaf ground-cherry (*Physalis latiphysa*)

In addition, we refer the Forest Service to the attached report titled "Biogeography of the High Peaks of the Pinaleños"[345] which should be useful in identifying species which the proposed action may affect. As stated above, we are concerned with the endemic species which occur on this mountain range, some of which are discussed in the Biogeography report.

[345] Maricopa Audubon Society, Biogeography of the High Peaks of the Pinaleños, attached as Ex. 8.

VII. THE FOREST SERVICE MUST CONSIDER PREPARING AN EIS.

A. An Agency Must Prepare an EIS If There Are Questions as to Whether Impacts May Be Significant.

NEPA requires federal agencies to prepare a full environmental impact statement (EIS) before undertaking "major Federal actions significantly affecting the quality of the human environment."[346] The Ninth Circuit agrees.

> We have held that an EIS *must* be prepared if 'substantial questions are raised as to whether a project ... *may* cause significant degradation to some human environmental factor.' To trigger this requirement a 'plaintiff need not show that significant effects *will in fact occur*,' [but instead] raising 'substantial questions whether a project may have a significant effect' is sufficient.[347]

The Tenth Circuit concurs. "If the agency determines that its proposed action *may* 'significantly affect' the environment, the agency must prepare a detailed statement on the environmental impact of the proposed action in the form of an EIS."[348]

If an agency "decides not to prepare an EIS, 'it must put forth a convincing statement of reasons' that explains why the project will impact the environment no more than insignificantly. This account proves crucial to evaluating whether the [agency] took the requisite 'hard look.'"[349]

"Significance" under NEPA requires consideration of the action's context and intensity.[350] An agency must analyze the significance of the action in several contexts, including short- and long-term effects within the setting of the proposed action (including site-specific, local impacts).[351] Intensity refers to the severity of the impact and requires consideration of ten identified factors that may generally lead to a significance determination, including:

> (1) unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas;
>
> (2) whether the action is likely to be highly controversial;

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[346] 42 U.S.C. § 4332(C).

[347] *Idaho Sporting Cong. v. Thomas*, 137 F.3d 1146, 1149-50 (9th Cir. 1998) (citations omitted) (emphasis original). *See also Ocean Advocates v. U.S. Army Corps of Eng'rs*, 402 F.3d 846, 864-65 (9th Cir. 2005) ("To trigger this [EIS] requirement a plaintiff need not show that significant effects will in fact occur, but raising substantial questions whether a project may have a significant effect is sufficient." (internal quotations, citations, and alterations omitted)).

[348] *Airport Neighbors Alliance v. U.S.,* 90 F.3d 426, 429 (10th Cir. 1996) (citation omitted) (emphasis added).

[349] *Ocean Advoc.*, 402 F.3d at 864.

[350] 40 C.F.R. § 1508.27.

[351] *Id.* § 1508.27(a).

(3) whether the action may have cumulative significant impacts; and

(4) the degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.[352]

With respect to the degree to which the environmental effects are likely to be highly controversial, the word "controversial" refers to situations where "'substantial dispute exists as to the size, nature, or *effect* of the major federal action.'"[353]

B. If the Project Is Likely to Have Significant Impacts, the Forest Service Must Prepare An EIS.

Because the outlines of the Forest Service has only vaguely described the Pinaleño Project, it is difficult to hazard a guess as to the relatively level of impacts. However, this 20-year project, encompassing treatments on up to 200,000 acres, is likely to meet that threshold. The Forest Service should consider preparing an EIS because even as vaguely described, this project appears to meet numerous standards for "significance."

First, the project overlaps or is in proximity to numerous historic or cultural resources, park lands, and ecologically critical areas.[354] These areas include proximity to:

- The Mount Graham WSA, which the project area overlaps and thus which the project will apparently directly impact.

- The Mount Graham Astrophysical and Biological Research Area, which the project area overlaps and thus which the project will apparently directly impact.

- The Wet Canyon Talussnail Zoological Area, which the project area overlaps and thus which the project will apparently directly impact.

- 13.4 miles of eligible wild, scenic, and recreational rivers, which the project area overlaps and thus which the project will apparently directly impact.[355]

- Numerous endemic species, including the sole population of the critically endangered Mount Graham red squirrel, the globally rare Pinaleño monkey grasshopper, several

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[352] *Id.* § 1508.27(b).

[353] *Town of Cave Creek v. FAA,* 325 F.3d 320, 331 (D.C. Cir. 2003) (quoting *North American Wild Sheep v. U.S. Department of Agriculture*, 681 F.2d 1172, 1182 (9th Cir. 1982)) (emphasis in original). *See also Middle Rio Grande Conservancy Dist. v. Norton*, 294 F.3d 1220, 1229 (10th Cir. 2002) (same); *Town of Superior v. U.S. Fish and Wildlife Serv.*, 913 F. Supp. 2d 1087, 1120 (D. Colo. 2012) (same).

[354] 40 C.F.R. § 1508.27(b)(3). *See also* 40 C.F.R. § 1508.27(b)(8) (significance includes "the degree to which the action may adversely affect districts, sites … or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant … cultural, or historical resources.").

[355] Scoping Letter at 2.

imperiled snails, and the globally imperiled plants Pinaleño fleabane, Pinaleño mountain plummera and Pinaleño mountain rubberweed.

- "A canyon believed to support the highest diversity of lizard species in the United States."[356]

Further, the Forest Service has recognized Mount Graham "as a traditional cultural property important to the Western Apache and has … determined [the mountain] eligible for listing on the National Register of Historic Places."[357]

Second, the effects of this project have the potential to be highly controversial.[358] In this context, the term "controversial" refers to "cases where a substantial dispute exists as to the size, nature, or effect of the major Federal action rather than to the existence of opposition to a use."[359] Courts explain:

> A substantial dispute exists when "evidence, raised prior to the preparation of an EIS or FONSI, casts serious doubt upon the reasonableness of the agency's conclusions." *Nat'l Parks* [*& Conservation Ass'n v. Babbitt,* 241 F.3d 722, 736 (9th Cir. 2001)] (internal citation omitted). Such evidence generally challenges the scope of the scientific analysis, the methodology used, or the data presented by the agency. *See Blue Mountain* [*Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212-13 (9th Cir. 1998)] (citing the Forest Service's failure to consider the recommendations and data of an independent scientific report that ran contrary to the proposed action as evidence of controversy).[360]

Forest restoration projects in the Southwest have involved scientific controversy, particularly because the Forest Service has often ignored science requiring the protection of key values, including large and old trees and critical habitat for imperiled species such as the Mexican spotted owl. Of particular concern is the Forest Service continually ignoring the findings of the agencies own scientists that suggest that large trees must not be cut as part of restoration thinning. If not for the Center's recent threat of litigation on this matter, and the subsequent "MSO Working Group" process, the Forest Service would still be cutting large trees in violation of the recommendations of the MSO Recovery Plan.

Third, the Pinaleño Project is related to other actions with cumulatively significant impacts.[361] "Significance exists if it is reasonable to anticipate a cumulatively significant impact on the

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[356] Coronado Forest Plan (2018) at page 119.

[357] Coronado National Forest, Record of Decision and Finding of Nonsignificant Forest Plan Amendment for the Pinaleño Ecosystem Restoration Project (Nov. 2011) at 1, excerpts attached as Ex. 9.

[358] 40 C.F.R. § 1508.27(b)(4).

[359] *Sierra Club v. United States Forest Serv*., 843 F.2d 1190, 1193 (9th Cir. 1988) (finding that where Sierra Club presented evidence from experts showing the EA's inadequacies and casting doubt on the agency's conclusions, "this is precisely the type of 'controversial' action for which an EIS must be prepared.").

[360] *Anglers of the Au Sable v. United States Forest Serv*., 565 F. Supp. 2d 812, 827-828 (E.D. Mich. 2008).

[361] 40 C.F.R. § 1508.27(b)(7).

environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts."[362] Significant cumulative effects may occur when this project is viewed together with the Pinaleño Ecological Restoration Project, approved in November 2011, which proposed to treat more than 3,000 acres within the Pinaleño FireScape Project Boundary.[363]

Fourth, the Pinaleño Project may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.[364] As discussed above, the proposed action may adversely affect the Mexican spotted owl and Mount Graham red squirrel, among other threatened and endangered species.

CONCLUSION.

Thank you for this opportunity to comment. We would be happy to discuss these comments in a phone call. We look forward to reviewing any subsequently prepared NEPA document.

Sincerely,

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[362] *Id.*

[363] *See* Record of Decision for the Pinaleño Ecosystem Restoration Project (Ex. 9) at 2.

[364] 40 C.F.R. § 1508.27(b)(9).

TABLE OF EXHIBITS

Exhibit 1. R. Silver, Notice of Intent to Sue (Dec. 22, 2010)

Exhibit 2. Complaint, *Center for Biological Diversity v. Christiansen*, Docket No. 4:20-cv-00251-BGM (D. Ariz. June 10, 2020)

Exhibit 3. Kaibab Nation Forest, Environmental Assessment, Kaibab Plateau Ecological Restoration Project (June 2020)

Exhibit 4. Forest Service, Rocky Mountain Region, Medicine Bow Landscape Vegetation Analysis Project (LaVA), Reviewing Officer's Response to Eligible Objections (June 10, 2020) (excerpts)

Exhibit 5. Medicine Bow National Forest, Medicine Bow Landscape Vegetation Analysis Project Record of Decision (Aug. 2020) (excerpts)

Exhibit 6. *Helena & Anglers Ass'n v. Marten*, 2020 U.S. Dist. LEXIS 115652 (D. Mont. July 1, 2020)

Exhibit 7. *Southeast Alaska Conservation Council v. United States Forest Serv*., 2020 U.S. Dist. LEXIS 43499 (D. Alaska Mar. 11, 2020),

Exhibit 8. Maricopa Audubon Society, Biogeography of the High Peaks of the Pinaleños

Exhibit 9. Coronado National Forest, Record of Decision and Finding of Nonsignificant Forest Plan Amendment for the Pinaleño Ecosystem Restoration Project (Nov. 2011) (excerpts)