January 16, 2025

Reviewing Officer, Michiko Martin, Regional Forester
USDA Forest Service, Southwest Region
333 Broadway Blvd SE, Albuquerque, NM 87102

Submitted via email to: objections-southwestern-regional-office@usda.gov
Submitted online at: https://cara.fs2c.usda.gov/Public//CommentInput?Project=51146

Re: OBJECTIONS Pursuant to 36 C.F.R. § 218.8 to South Sacramento Restoration Project Draft Record of Decision and Final Environmental Impact Statement (Lincoln National Forest)

To Ms. Martin:

The Center for Biological Diversity and WildEarth Guardians submit these objections to the U.S. Forest Service's draft Record of Decision ("Draft ROD") and final environmental impact statement ("Final EIS" or "FEIS") for the South Sacramento Restoration Project ("SSRP" or "Project") on the Lincoln National Forest.

Project Objected To

Pursuant to 36 C.F.R. § 218.8(d)(4), Center for Biological Diversity *et al*. object to the following project:

Project: South Sacramento Restoration Project, Lincoln National Forest

Responsible Official and Forest/Ranger District: Jason Freeman, Forest Supervisor of the Lincoln National Forest, Sacramento Ranger District

Timeliness

Notice of the Draft ROD and Final EIS was published in the Alamogordo Daily News (the newspaper of record) on December 17, 2024, making the deadline for filing January 16, 2025. These objections are therefore timely filed.

Lead Objector

Per 36 C.F.R. § 218.8(d)(3), the "Lead Objector" is as follows:

Brian Nowicki,
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bnowicki@biologicaldiversity.org

Interests and Participation of the Objectors

The Center for Biological Diversity is a non-profit environmental organization with more than 1.7 million members and online activists 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 Lincoln National Forest, and the lands proposed for logging within the South Sacramento Restoration Project area for recreation, photography, nature study, and spiritual renewal.

The Center has for decades been involved in forest restoration in the Southwest and the protection of rare and imperiled species. We've advocated, since the mid-1990s, for a restoration approach that combined appropriate mechanical thinning, a right-scaled restoration industry, prescribed burning, and community protection while maintaining or enhancing large and old trees, key ecological process such as fire, and protecting sensitive and listed species.

The Center submitted timely comments on the scoping for the South Sacramento Restoration Project on May 8, 2017, and on the Draft EIS on May 13, 2019, and has visited the project area repeatedly, most recently in September 2024. All of the issues raised below are address in these comment letters. WildEarth Guardians provided comments with the Center on the Draft EIS.

WildEarth Guardians is a nonprofit conservation organization headquartered in Santa Fe, NM with offices in several western states. With more than 204,000 members and supporters WildEarth Guardians work to protect and restore wildlife, wild places, wild rivers, and the health of the American West. For many years, WildEarth Guardians has advocated for a recovered and thriving Mexican spotted owl population, and an environmentally and economically sustainable transportation system on Forest Service lands.

Overview and Summary of the Issues

We support the active restoration projects in fire-adapted Southwestern ecosystems insofar as they (1) follow science-based methods of strategically placing thinning treatments to facilitate the use of prescribed and wild fire for restoration; (2) reduce and do not add to existing road systems; (3) develop and describe in detail science-based monitoring and adaptive management systems; (4) meet the requirements of the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), National Forest Management Act (NFMA), and in this case the Healthy Forests Restoration Act (HFRA); (5) follow core principles of forest restoration including the unambiguous retention of all large and old trees and forests; (6) utilize the best available site-specific scientific information for development of projects-specific desired conditions and natural range of variability; (7) develop management courses of action and prescriptions from relevant and recent field-based information; (8) maintain or increase protections for threatened, endangered, sensitive, or candidate species and roadless, unroaded or wilderness areas; and (9) address the impacts of livestock grazing on project success and ecological sustainability.

We strongly agree with the need to safely and quickly reintroduce fire in this landscape to reduce fire risk, and we had hoped that our extensive involvement would result in a project that would do so.

And while the South Sacramento Restoration Project makes steps in the direction of these shared objectives, the FEIS contains several provisions that contradict these objectives and the Project's stated goals. Specifically, the Project, as described in the Final EIS, would (1) construct 125 miles of new temporary roads, without defining where those roads would be; (2) remove large and mature trees up to 24 inches in diameter, across 33,500 acres, including within an inventoried roadless area; (3) utilize mechanical thinning across 14,000 acres within Mexican spotted owl Protected Activity Centers, and across an additional 21,000 acres within MSO recovery habitat; (4) utilize mechanical thinning by large machinery on slopes as steep as 80%; and (5) utilize herbicides on 2000 acres per year, for the foreseeable future.

If the project had adopted a default 18-inch diameter cap on logging, limited mechanical thinning in PACs, and analyzed specific locations for temporary roads, we would have been able to work with the Forest Service to mitigate impacts in implementation. But the blanket authority for such damaging activities over 33,500 acres, with no specific criteria for how and where they would be implemented, is an untenable and unproductive proposal.

By insisting on maximal authority for maximal logging and road building on maximal acres, the Forest Service succeeded in creating a project with a potential for maximum impacts. Further, lack of private industrial capacity to implement that logging raises real questions as to whether the Forest Service's maximal approach will ever be implemented. By choosing a maximal approach with maximal impacts, the Forest Service burdened itself with a more extensive and time-consuming analysis; this ultimately postponed, and may ultimately preclude, for lack of private implementation capacity, the critical work that is urgently needed to safely and quickly reintroduce ecologically beneficial fire, and reduce risk of large and severe fire, at landscape scales.

These are our principal objections to the FEIS:

1). The project does not meet the definition of a Healthy Forest Restoration Act (HFRA) project. The project has been modified to remove certain components of the proposed action that are inconsistent with HFRA. However, the proposed action fails to meet HFRA's requirement to "*fully maintain, or contribute toward the restoration of ... old-growth stands ... and retaining the large trees contributing to old-growth structure*."[1]

2). The Final EIS lacks the necessary site-specific detail to comply with NEPA. Specifically, the Final EIS does not disclose the location of proposed mechanical thinning treatments, road construction, other restoration methods, or herbicides. Further, baseline conditions for the current travel system, vegetation, and wildlife are not disclosed, and the Final EIS fails to disclose meaningful cumulative and other impacts relating to implementation capacity, road construction, herbicides and vegetation treatments on wildlife and watersheds.

3) The EIS appears to violate the Roadless Area Conservation Rule.

[1] 16 U.S.C. § 6512(e)(2).

4) The EIS fails to analyze a range of reasonable alternatives and reasonable and prudent measures that would reduce the impacts to threatened and endangered species.

5) The Forest Service's reliance on undefined monitoring and adaptive management plans violates NEPA, the ESA, and NFMA.

6). The proposed forest plan amendment would substantially lessen protections for species.

7) The EIS fails to take a hard look at the effects of livestock grazing on the impacts of the project.

OBJECTIONS

I. THE EIS FAILS TO ENSURE THAT OLD AND LARGE TREE RETENTION MEETS THE PROJECT PURPOSE AND NEED AND IS CONSISTENT WITH HFRA.

The Forest Service may implement the Project under HFRA only if it is implemented "*in a manner that maximizes the retention large trees, as appropriate for the forest type, to the extent that the trees promote fire resilient stands.*"[2] The EIS fails to demonstrate that the Project meets this definition.

Healthy Forests Restoration Act (HFRA) Section 102(e)(2) provides that the USDA Forest Service, when carrying out covered projects using HFRA authority, are to:

> "*fully maintain, or contribute toward the restoration of, the structure and composition of old-growth stands according to the pre-fire suppression old-growth conditions characteristic of the forest type, taking into account the contribution of the stand to landscape fire adaptation and watershed health, and retaining the large trees contributing to old-growth structure*."[3]

The Final EIS (at 48) states that "[T]*reatments would be aligned with old-growth development and large-tree retention objectives, which are ecosystem components that are generally lacking in the project area, as described in Chapter 1*." However, the Final EIS uses non-committal language such as "*emphasize the retention of large hardwoods,*"[4] "*emphasize the retention of the largest tree(s)*"[5] or "*retain most trees greater than 18 inches diameter at breast height when possible*."[6] These statements allow broad application of large and old tree removal and as such conflict with HRFA authority.

The Final EIS (at 94) confuses this issue even more by stating that "*the diameter cap would be removed where free thinning and individual tree selection with reserves treatments are prescribed.*" Instead of retaining the largest trees, the Project explicitly plans to remove large trees up to 24 inches diameter at breast height across as much as 53,910 acres of forest.[7]

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[2] 16 U.S.C. § 6591a(e). See also 16 U.S.C. § 6512(f)(1)(B) (HFRA projects shall be implemented "in a manner that … maximizes the retention of large trees, as appropriate for the forest type, to the extent that the trees promote fire resilient stands").

[3] 16 U.S.C. § 6512(e)(2).

[4] South Sacramento Restoration Project Final EIS at 35, 36, and 37.

[5] South Sacramento Restoration Project Final EIS at 117.

[6] South Sacramento Restoration Project Final EIS at 37.

[7] South Sacramento Restoration Project Final EIS at 50. Table 2-2 on page 51 and Table 2-3 on page 52 of the Final EIS prescribes "individual tree selection cutting with reserves," defined as cutting trees "5 to 24 inches diameter at breast height," for 7,500 acres of mixed conifer with aspen forest, 10,000 acres of mixed conifer-frequent fire forest, 2,000 acres of ponderosa pine forest, and 10,000 acres of pinyon-

Vague statements such as "*focus on preserving large, old legacy trees of the early-seral, fire-resistant species where they are present or preserving a cohort of the largest trees in a stand that are likely to develop into old growth*"[8] and "*Old-growth components will generally not be treated*"[9] are made meaningless when the project plans to cut trees up to 24 inches in diameter, without restriction. The vague statements in support of retaining large trees are made even more meaningless by the fact that the EA describes the thinning treatments to be designed as pursuing the desired conditions that "*are based on guidelines provided in General Technical Report GTR-RMRS-310.*"[10]

Aside from these indefinite and flexible statements, the EIS hardly provides assurances that large and old tree retention is a project priority. Until the Forest Service created GTR-310, large and old tree retention has been a fundamental principle of Southwestern forest restoration. Past timber management destroyed nearly all ponderosa pine and mixed conifer old growth forest in Arizona and New Mexico, including on most of the Lincoln National Forest. Even-aged or simplified forest has replaced the complex forests of the pre-settlement southwestern landscape.[11,12]

Old growth forests differ in structure and function from younger forests, providing the preferred habitat of many sensitive wildlife species as well as a host of ecological services including watershed function, water purification, soil retention, nutrient cycling, and storage of greenhouse gasses.[13,14] Old growth habitat consists of large trees with fire-resistant "plated" bark structure and tall canopies, snags with nesting cavities and broken tops valuable to wildlife, as well as vertical and horizontal structural diversity within stands. As noted above, most of the former old growth forests throughout the ponderosa pine and mixed conifer forests of the Southwest already have been destroyed by logging. This practice continues to this day, and without strict prohibitions we fear this could continue in the South Sacramento Restoration Project. The

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juniper grassland ERUs. In addition, the EIS prescribes "free thinning," defined as cutting "5 to 24 inches diameter at breast height" to 4,000 acres of additional ponderosa pine forest. FEIS at 52. These treatments total 33,500 distinct acres.

[8] South Sacramento Restoration Project Final EIS at 61.

[9] South Sacramento Restoration Project Vegetation, Fire and Fuels Specialist Report at 111. (emphasis added)

[10] South Sacramento Restoration Project Final EIS at 13.

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

[12] 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.

[13] 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.

[14] Luyssaert, S., E.D. Schulze, A. Börner, A. Knohl, D. Hessenmöller, B.E. Law, P. Ciais and J. Grace. 2008. Old-growth forests as global carbon sinks. *Nature* 455: 213-15.

ecological significance of old growth forest is amply documented, whereas a scientific basis for logging large trees in pursuit of forest health or fire management objectives is lacking.[15]

The South Sacramento Restoration Project must commit to retaining all old trees and forests that exist today and during the life of the project. Retention of large trees is fundamentally important to fire resistance of treated stands.[16] Mature conifers have a high capacity to survive and recover from crown scorch.[17] Large tree structure enhances forest resilience to severe fire effects[18,19,20] whereas removing them may undermine fire resilience.[21,22]

Research demonstrates no advantage in fire hazard mitigation resulting from mechanical forest treatments that remove large 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.[23]

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

[16] 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.

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

[18] 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.

[19] 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.

[20] 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.

[21] 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.

[22] 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.

[23] 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.

Thinning small trees and pruning branches of large trees to increase canopy base height significantly decreases the likelihood of crown fire initiation,[24,25,26,27] which is a precondition to active crown fire behavior.[28,29] Therefore, low thinning and underburning to reduce surface fuels and increase canopy base height at strategic locations effectively reduces fire hazard at a landscape scale and meets the purpose and need. Just 9,400 acres of the South Sacramento Restoration Project are proposed for "Thinning From Below" treatments, but we suspect many more acres are suited for this treatment approach.

Large 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.[30] The ecological significance of old growth forest habitat and large trees comprising it is widely recognized.[31,32] There is no agreed-upon scientific basis for removing large trees to promote fire resistance in southwestern forests.[33,34] In addition to their rarity, a variety of factors other than logging threatens the persistence of the remaining large trees in Southwestern conifer forests. Recruitment of large

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[24] Graham, R.T., S. McCaffrey, and T.B. Jain (Tech. Eds.). 2004. *Science Basis for Changing Forest Structure to Modify Wildfire Behavior and Severity*. USDA For. Serv. Rocky Mtn. Res. Sta. Gen. Tech. Rep. RMRS-120. Ft. Collins, CO.

[25] Keyes, C.R. and K.L. O'Hara. 2002. Quantifying stand targets for silvicultural prevention of crown fires. *Western Journal of Applied Forestry* 17: 101-09.

[26] Perry, D.A., H. Jing, A. Youngblood, and D.R. Oetter. 2004. Forest structure and fire susceptibility in volcanic landscapes of the eastern high Cascades, Oregon. *Conservation Biology* 18: 913-26.

[27] Omi and Martinson 2002, Pollett and Omi 2002.

[28] Agee, J.K. 1996. The influence of forest structure on fire behavior. Pp. 52-68 in: J.W. Sherlock (chair). *Proc. 17th Forest Vegetation Management Conference.* 1996 Jan. 16-18: Redding, CA. Calif. Dept. Forestry and Fire Protection: Sacramento.

[29] Van Wagner, C.E. 1977. Conditions for the start and spread of crown fire. *Canadian Journal of Forest Research* 7: 23-24.

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

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

[32] 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.

[33] 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.

[34] 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., 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.

trees, snags and large woody debris will become more limiting over time as climate change imposes chronic drought, reduced tree growth rates, and more widespread tree mortality.[35,36,37,38,39] A large tree retention design feature or alternative would maintain trees that are most likely to survive fire injury and supply recruitment structure that will support the recovery of old growth forest habitat in the future.

The Final EIS includes a "Large Tree Implementation Guide".[40] The document itemizes a number of situations in which trees larger than 18 inches diameter may be removed, but it fails to provide any guidance to encourage the retention of large trees. For example, in the case of "Heavily Stocked Mixed Conifer Stands Dominated by Large, Young Trees" the guidance states explicitly that the "removal of large trees may be necessary to protect against the potential for crown fire to spread into adjacent communities or areas containing important habitats that include Mexican spotted owl (MSO) and/or goshawk nest stands."[41] However, the guidance does not define such conditions, nor does it offer any additional guidance to reduce the removal of large trees. Similarly, the guidance states that "[in] stands where restoration objectives, community protection, or other ecological restoration objectives indicate much lower tree density and basal area would be desirable, large post-fire cessation conifers may need to be removed to achieve conditions consistent with a desired restoration trajectory."[42] Again, the guidance does not define such conditions, nor does it indicate when large trees may be retained. In all cases, the effect of the guidance is to offer a blanket, undefined exemption from any consideration to retain large trees.

This is in stark contrast to the large tree retention policy that was developed in the multi-party stakeholder group discussions in the Four Forests Restoration Initiative and since applied to four

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[35] Diggins, C., P.Z. Fulé, J.P. Kaye and W.W. Covington. 2010. Future climate affects management strategies for maintaining forest restoration treatments. *International Journal of Wildland Fire* 19: 903-13.

[36] Savage, M. P.M. Brown, and J. Feddema. 1996. The role of climate in a pine forest regeneration pulse in the southwestern United States. *Ecoscience* 3: 310-18.

[37] Seager, R., M. Ting, Y. Kushnir, J. Lu, G. Vecchi, H. Huang, N. Harnik, A. Leetmaa, N. Lau, C. Li, J. Velez and N. Naik. 2007. Model projections of an imminent transition to a more arid climate in southwestern North America. *Science* 316: 1181-84.

[38] van Mantgem, P.J., N.L. Stephenson, J.C. Byrne, L.D. Daniels, J.F. Franklin, P.Z. Fulé, M.E. Harmon, A.J. Larson, J.M. Smith, A.H. Taylor and T.T. Veblen. 2009. Widespread increase of tree mortality rates in the western United States. *Science* 323: 521-24.

[39] Williams, A.P., C.D. Allen, C.I Millar, T.W. Swetnam, J. Michaelsen, C.J. Still and S.W. Leavitt. 2010. Forest responses to increasing aridity and warmth in the southwestern United States. *PNAS* 107: 21289-94.

40 South Sacramento Restoration Project Final EIS, Volume 2, Appendix A. South Sacramento Restoration Project Large Tree Implementation Guide.

41 South Sacramento Restoration Project Final EIS, Volume 2, Appendix A at A-1.

42 South Sacramento Restoration Project Final EIS, Volume 2, Appendix A at A-2.

national forests in Arizona.[43] That guidance, called the Large Tree Implementation Policy explicitly defined the instances in which large trees might need to be removed to achieve project objectives, and quantitatively defined how to minimize the loss of large trees in such instances. That guidance defined ponderosa pine stands with an abundance of large trees as stands where greater than 40 square feet/acre of basal area (BA) in ponderosa pine trees greater than 18 inches diameter at breast height (DBH). The guidance is to treat such stands at the lowest range of intensity within the identified silvicultural prescription. The intention is to achieve the least intensive silvicultural objectives (e.g. the high end of the range of basal areas prescribed for that forest type) with the removal of the smallest proportion of large trees. For example, treatments would remove trees larger than 18 inches in diameter only when the basal area and canopy closure objectives cannot be achieved through the removal of trees smaller than 18 inches, and additional removals would then focus on the smallest trees larger than 18 inches diameter. The SSRP's Large Tree Implementation Guide offers no such guidance, no definitions and no quantitative prescriptions, that would result in the retention of large trees in any of the large array of poorly defined situations that the guide indicates would qualify as exempted from retaining large trees.

The Final EIS similarly fails to include any clear or meaningful guidance on the retention of old trees. The Final EIS describes general intentions to manage forest types for old growth characteristics but it contains no standard or guidance for the retention of old trees.44 Without a clear directive to retain old trees, the prescriptions and operations are likely to remove individual old trees in the service of broader silvicultural objectives, while further depleting the rare old growth component of the forest stand.

In forests with a variety of species and disturbance regimes, large tree removal reduces forest canopy and diminishes recruitment of large snags and downed logs, which in turn affects long-term forest dynamics, stand development and wildlife habitat suitability.[45,46,47] If significant reductions of crown bulk density are deemed necessary to meet the purpose and need then it is highly unlikely that the project will maintain habitat for threatened and sensitive wildlife species

43 Memo from the Four Forests Restoration Initiative (4FRI) Board, dated March 5, 2021, regarding Stands with a Preponderance of Large, Young Trees (SPLYT).

44 South Sacramento Restoration Project Final EIS at 14-16.

45 Quigley, T.M., R.W. Haynes and R.T. Graham. 1996. *Disturbance and Forest Health in Oregon and Washington*. USDA For. Serv. Pac. Nor. Res. Sta. Gen. Tech. Rep. PNW-GTR-382. Portland, OR.

46 Spies, T.A. 2004. Ecological concepts and diversity of old-growth forests. *Journal of Forestry* 102: 14-20.

47 van Mantgem, P.J., N.L. Stephenson, J.C. Byrne, L.D. Daniels, J.F. Franklin, P.Z. Fulé, M.E. Harmon, A.J. Larson, J.M. Smith, A.H. Taylor and T.T. Veblen. 2009. Widespread increase of tree mortality rates in the western United States. *Science* 323: 521-24.

associated with closed-canopy forest.[48,49] An unambiguous commitment to old and large tree retention would maintain wildlife habitat in the short-term and mitigate adverse effects of the proposed treatments.

In scoping comments, the Center identified old and large tree retention as an issue for analysis and specified the need for an unambiguous restriction on any form of cutting of any old growth tree of any species for any reason, and to implement a strict 18" (at DBH) diameter cap in spotted owl PACs *and* forested recovery nest/roost habitat.

The 2012 Mexican spotted owl Recovery Plan states:

> "*Because it takes many years for trees to reach large size, we recommend that trees ≥46- cm (18 inches) dbh not be removed in stands designated as recovery nest/roost habitat unless there are compelling safety reasons to do so or if it can be demonstrated that removal of those trees will not be detrimental to owl habitat*."[50]

The Final EIS fails to demonstrate that removal of large or old trees will not be detrimental to owl habitat. Instead, the Draft Record of Decision proposes to implement thinning treatments that remove trees up to 24 inches in diameter across 10,550 acres within MSO PACs, across several forest types.[51]

We note that the failure of the Final EIS to disclose the nature and extent of loss of old growth forest and mature trees violates the Forest Service's duty under NEPA to disclose all "irreversible and irretrievable" commitments of resources, given that these forests cannot regrow or be replaced on the scale of a human lifetime.[52]

> ***Proposed Remedy***: The Forest Service should adopt a meaningful large-tree retention design feature for the Project that sets a default cap of 18 inches in diameter across the project area, with specific, defined exceptions, and specific guidance for achieving

[48] Beier, P., and J. Maschinski. 2003. Threatened, endangered, and sensitive species. Pp. 206-327 in: P. Friederici (ed.). *Ecological Restoration of Southwestern Ponderosa Pine Forests*. Island Press: Washington, D.C.

[49] Keyes, C.R. and K.L. O'Hara. 2002. Quantifying stand targets for silvicultural prevention of crown fires. *Western Journal of Applied Forestry* 17: 101-09.

[50] Page 268 in USFWS. 2012. Recovery Plan for the Mexican Spotted Owl (*Strix occidentalis*), First Revision. U.S. Fish and Wildlife Service. Albuquerque, NM, USA. 413pp.

[51] Table 2-4 on page 53 of the Final EIS prescribes "individual tree selection cutting with reserves," defined as cutting trees "5 to 24 inches diameter at breast height," for 2,200 acres of mixed conifer with aspen forest and 7,600 acres of mixed conifer-frequent fire forest within MSO PACs. In addition, the Final EIS prescribes "free thinning," defined as cutting "5 to 24 inches diameter at breast height" for 750 acres of additional ponderosa pine forest within MSO PACs. These treatments total 10,550 distinct acres within MSO PACs.

[52] 42 U.S.C. § 4332(2)(C)(v) (every EIS must disclose "any irreversible and irretrievable commitments of Federal resources which would be involved in the proposed agency action should it be implemented").

silvicultural objectives at the stand scale while retaining the largest proportion of large trees.

The Forest Service should adopt a meaningful old-tree retention design feature for the Project that requires the retention of all trees 150 years old or older, and trees displaying old growth traits, with exceptions only for health and safety considerations.

II. THE EIS VIOLATES NEPA BY FAILING TO DISCLOSE THE PROJECT'S SITE-SPECIFIC IMPACTS.

A. NEPA Requires Agencies to Take a Hard Look at Site-Specific Impacts.[53]

NEPA is "'our basic national charter for protection of the environment.'"[54] In enacting NEPA, Congress recognized the "profound impact" of human activities, including "resource exploitation," on the environment and declared a national policy "to create and maintain conditions under which man and nature can exist in productive harmony."[55] The statute has two fundamental two goals: "(1) to ensure that the agency will have detailed information on significant environmental impacts when it makes decisions; and (2) to guarantee that this information will be available to a larger audience."[56]

"NEPA promotes its sweeping commitment to 'prevent or eliminate damage to the environment and biosphere' by focusing Government and public attention on the environmental effects of proposed agency action."[57] Stated more directly, NEPA's "'action-forcing' procedures . . . require the [Forest Service] to take a 'hard look' at environmental consequences"[58] *before* the agency approves an action. "By so focusing agency attention, NEPA ensures that the agency will

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[53] 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 as of July 14, 2020, unless otherwise noted. Although CEQ issued a final rulemaking in July 2020 rewriting those regulations, and amended those regulations again in 2022 and 2024, the 2020 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). The South Sacramento NEPA process began before September 2020; the Forest Service issued its scoping notice for the project on June 27, 2016, and a draft EIS was issued in October 2020. The Forest Service nowhere alleges it has chosen to apply the 2020 rules (or the later amendments) to this project.

[54] *Center for Biological Diversity v. United States Forest Serv*., 349 F.3d 1157, 1166 (9th Cir. 2003).

[55] 42 U.S.C. § 4331(a).

[56] *Envtl. Prot. Info. Ctr. v. Blackwell*, 389 F. Supp. 2d 1174, 1184 (N.D. Cal. 2004) (quoting *Neighbors of Cuddy Mt. v. Alexander*, 303 F.3d 1059, 1063 (9th Cir. 2002)); *see also Earth Island v. United States Forest Serv.*, 351 F.3d 1291, 1300 (9th Cir. 2003) ("NEPA requires that a federal agency 'consider every significant aspect of the environmental impact of a proposed action ... [and] inform the public that it has indeed considered environmental concerns in its decision-making process.'").

[57] *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 371 (1989) (quoting 42 U.S.C. § 4321).

[58] *Metcalf v. Daley*, 214 F.3d 1135, 1141 (9th Cir. 2000) (quoting *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989)).

not act on incomplete information, only to regret its decision after it is too late to correct."[59] To ensure that the agency has taken the required "hard look," courts hold that the agency must utilize "public comment and the best available scientific information."[60]

In *Natural Resources Defense Council v. U.S. Forest Service*, for example, the Court faulted the Forest Service for providing empty disclosures that lacked any analysis, explaining the agency "d[id] not disclose the effect" of continued logging on the Tongass National Forest and "d[id] not give detail on whether or how to lessen the cumulative impact" of the logging.[61] The Court explained that "general statements about possible effects and some risk do not constitute a hard look, absent a justification regarding why more definitive information could not be provided."[62] The court reasoned that the Forest Service also must provide the public "'the underlying environmental data' from which the Forest Service develop[ed] its opinions and arrive[d] at its decisions."[63] In the end, "vague and conclusory statements, without any supporting data, do not constitute a 'hard look' at the environmental consequences of the action as required by NEPA."[64] "The agency must explain the conclusions it has drawn from its chosen methodology, and the reasons it considered the underlying evidence to be reliable."[65]

At the project level, as compared to a programmatic decision, the required level of analysis is more stringent.[66] At the "implementation stage," the NEPA review is more tailored and detailed because the Forest Service is confronting "individual site specific projects."[67] Indeed, federal courts have faulted the Forest Service for failing to provide site-specific information in a landscape level analysis:

> This paltry information does not allow the public to determine where the range for moose is located, whether the areas open to snowmobile use will affect that range, or whether the Forest Service considered alternatives that would avoid adverse impacts on moose and other big game wildlife. In other words, the EIS does not provide the information necessary to determine how specific land should be allocated to protect particular habitat important to the moose and other big game

[59] *Marsh*, 490 U.S. at 371 (citation omitted).

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

[61] *Natural Res. Def. Council v. U.S. Forest Serv.,* 421 F.3d 797, 812 (9th Cir. 2005).

[62] *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").

[63] *WildEarth Guardians v. Mont. Snowmobile Ass'n*, 790 F.3d 920, 925 (9th Cir. 2015).

[64] *Great Basin Mine Watch v. Hankins*, 456 F.3d 955, 973 (9th Cir. 2006).

[65] *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1075 (9th Cir. 2011) (citation and internal quotation marks omitted).

[66] *See, e.g., Friends of Yosemite Valley v. Norton*, 348 F.3d 789, 800-01 (9th Cir. 2003).

[67] *Forest Ecology Ctr., Inc. v. U.S. Forest Serv.*, 192 F.3d 922, 923 n.2 (9th Cir. 1999).

> wildlife. Because the Forest Service did not make the relevant information available . . . the public was limited to two-dimensional advocacy—interested persons could argue only for the allocation of more or less land for snowmobile use, but not for the protection of particular areas. As a result, the Forest Service effectively stymied the public's ability to challenge agency action.[68]

When the Forest Service fails to conduct that site-specific analysis, the agency "does not allow the public to 'play a role in both the decision-making process and the implementation of that decision.'"[69] "Although the agency does have discretion to define the scope of its actions, . . . such discretion does not allow the agency to determine the specificity required by NEPA."[70] In *State of Cal. v. Block*, for example, the decision concerned 62 million acres of National Forest land, and the Ninth Circuit still required an analysis of "[t]he site-specific impact of this decisive allocative decision."[71] In short, NEPA's procedural safeguards are designed to guarantee that the public receives accurate *site-specific* information regarding the impacts of an agency's project-level decision *before* the agency approves the decision.

Analyzing and disclosing site-specific impacts is critical because where (and when and how) activities occur on a landscape strongly determines that 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."[72] 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.[73] Indeed, "location, not merely total surface disturbance, affects habitat fragmentation,"[74] 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.[75]

Courts in the Ninth Circuit have taken a similar approach. For example, the U.S. District Court for the District of Alaska in 2019 issued a preliminary injunction in the case *Southeast Alaska Conservation Council v. U.S. Forest Service,* halting implementation of the Tongass National

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[68] *WildEarth Guardians v. Montana Snowmobile Ass'n*, 790 F.3d 920, 927 (9th Cir. 2015).

[69] *Id*. at 928 (quoting Methow Valley Citizens Council, 490 U.S. at 349).

[70] *City of Tenakee Springs v. Block*, 778 F.2d 1402, 1407 (citing *California v. Block*, 690 F.2d 753, 765 (9th Cir. 1982)).

[71] *California v. Block*, 690 F.2d 753, 763 (9th Cir. 1982).

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

[73] *Id*. at 707.

[74] *Id*.

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

Forest's Prince of Wales Landscape Level Analysis Project.[76] The court did so because the Forest Service's "condition-based management" approach, which failed to disclose the site-specific impacts of that logging proposal, raised "serious questions" about whether that approach violated the National Environmental Policy Act (NEPA).

The district court explained the approach the Forest Service took in the Prince of Wales EIS:

> each alternative considered in the EIS "describe[d] the conditions being targeted for treatments and what conditions cannot be exceeded in an area, or place[d] limits on the intensity of specific activities such as timber harvest." But the EIS provides that "site-specific locations and methods will be determined during implementation based on defined conditions in the alternative selected in the . . . ROD . . . in conjunction with the . . . Implementation Plan . . . ." The Forest Service has termed this approach "condition-based analysis."[77]

The Prince of Wales EIS made assumptions "in order to consider the 'maximum effects' of the Project."[78] It also identified larger areas within which smaller areas of logging would later be identified, and approved the construction of 164 miles of road, but "did not identify the specific sites where the harvest or road construction would occur."[79]

The Court found the Forest Service's approach contradicted federal appellate court precedent, including *City of Tenakee Springs v. Block*, 778 F.2d 1402 (9th Cir. 1995). In that case, the appellate court set aside the Forest Service's decision to authorize pre-roading in a watershed without specifically evaluating where and when on approximately 750,000 acres it intended to authorize logging to occur. The district court evaluating the Prince of Wales project found the Forest Service's approach was equivalent to the deficient analysis set aside in *City of Tenakee Springs.*

> Plaintiffs argue that the Project EIS is similarly deficient and that by engaging in condition-based analysis, the Forest Service impermissibly limited the specificity of its environmental review. The EIS identified which areas within the roughly 1.8-million-acre project area could potentially be harvested over the Project's 15-year period, but expressly left site-specific determinations for the future. For example, the selected alternative allows 23,269 acres of old-growth harvest, but does not specify where this will be located within the 48,140 acres of old growth identified as suitable for harvest in the project area. Similar to the EIS found inadequate in *City of Tenakee Springs*, the EIS here does not include a determination of when and where the 23,269 acres of old-growth harvest will occur. As a result, the EIS also does not provide specific information about the amount and location of actual road construction under each alternative, stating

[76] *Southeast Alaska Conservation Council v. U.S. Forest Serv.*, 413 F. Supp. 3d 973 (D. Ak. 2019).

[77] *See id.* at 976-77 (citations omitted).

[78] *Id*. at 977.

[79] *Id*.

> instead that "[t]he total road miles needed will be determined by the specific harvest units offered and the needed transportation network."[80]

The district court concluded that plaintiffs in the case raised "serious questions" about whether the Prince of Wales EIS condition-based management approach violated NEPA because "the Project EIS does not identify individual harvest units; by only identifying broad areas within which harvest may occur, it does not fully explain to the public how or where actual timber activities will affect localized habitats."[81]

On March 11, 2020, the Alaska district court issued its merits opinion on the Prince of Wales Project, reaffirming its September 2019 preliminary injunction decision and holding that the Forest Service's condition-based management approach violated NEPA.[82] 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 proposed timber harvest and road construction within the Project Area falls short of that mandate."[83]

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."[84] 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.[85]

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[80] *Id*. at 982 (citations omitted).

[81] *Id*. at 983, 984.

[82] *Southeast Alaska Conservation Council v. United States Forest Serv*., 443 F. Supp. 3d 995 (D. Ak. 2020).

[83] *Id*. at 1009 (citations omitted).

[84] *Id*. at 1013.

[85] *Id*. at 1014-15 (internal citations and quotations omitted).

B. Law and Policy Concerning Adaptive Management Require that Agencies Designate Specific Thresholds and Disclose of Impacts of Mitigation Measures.

For the South Sacramento Restoration Project, the Forest Service discusses "adaptive management" as part of its condition-based management approach. Although different legal regimes address the two approaches, we will deal with them together as the Forest Service does.

Academic recommendations concerning adaptive management.

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

- Creation of management strategies (specific action alternatives in this case);
- Implementation of those strategies/actions;
- Monitoring of the effects (under the monitoring framework developed as part of the planning process); and
- Predetermined triggers for changes in management based on the results of monitoring.[86]

Forest Service experts in adaptive management have said that "[a]daptive management requires explicit designs that specify problem-framing and problem-solving processes, documentation and monitoring protocols, roles, relationships, and responsibilities, and assessment and evaluation processes."[87]

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

> The term trigger, as used here, is a type of pre-negotiated commitment made by an agency within an adaptive management or mitigation framework specifying what actions will be taken if monitoring information shows x or y. In other words, predetermined decisions, or more general courses of action, are built into an adaptive framework from the beginning of the process.[88]

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

[87] Stankey, G.H., R.N. Clark, and B.T. Bormann. 2005. Adaptive management of natural resources: theory, concepts, and management institutions. Gen. Tech. Rep. PNW-GTR-654. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 73 p., at page 58. Available at https://research.fs.usda.gov/treesearch/20657 (last viewed Jan. 13, 2025).

[88] Schultz and Nie, Decision-making triggers, adaptive management, and natural resources law and planning at 455.

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

Regulations concerning adaptive management.

This academic framing is reinforced by the Forest Service's NEPA regulations, adopted in 2008, which define adaptive management as "[a] system of management practices based on *clearly identified intended outcomes and monitoring* to determine if management actions *are meeting those outcomes*; and, if not, to facilitate management changes that will best ensure that those outcomes are met or re-evaluated. Adaptive management stems from the recognition that knowledge about natural resource systems is sometimes uncertain."[89] These regulations further state that:

> An adaptive management proposal or alternative must *clearly identify the adjustment(s) that may be made* when monitoring during project implementation *indicates that the action is not having its intended effect*, or is causing unintended and undesirable effects. The EIS must disclose not only the effect of the proposed action or alternative *but also the effect of the adjustment*. Such proposal or alternative must also *describe the monitoring that would take place* to inform the responsible official during implementation whether the action is having its intended effect.[90]

The preamble to the Forest Service's regulation that adopted the adaptive management definition states that the agency must identify the proposed changes, and their impacts, in the NEPA document. "When proposing an action the responsible official may identify possible adjustments that may be appropriate during project implementation. Those possible adjustments must be described and their effects analyzed in the EIS." 73 Fed. Reg. 43,084, 43,090 (July 24, 2008).

Federal caselaw concerning adaptive management.

Federal courts have found agencies violated NEPA or the Endangered Species Act (ESA) where the agency relied on an "adaptive management" plan that was vague, set no specific triggers for future action, failed to describe that future action, or failed to ensure that resources will be protected as the adaptive management plan asserts.

In *Natural Resources Defense Council v. U.S. Army Corps of Engineers*, 457 F. Supp. 2d 198 (S.D.N.Y. 2006), the court found that the Army Corps' attempt to supplement an inadequately-explained finding of no significant impact concerning a dredging project was arbitrary and capricious where the agency relied on ill-defined "adaptive management" protocols to conclude that impacts would be mitigated below the level of significance.

> The EA makes several promises that it will alter its monitoring plan should it prove necessary. For example, the EA relies on a general promise that it will "as appropriate, reevaluate, the need for altering its dredging methods" … through the use of its coordination plan and monitoring program. The EA also explains that

[89] 36 C.F.R. § 220.3 (emphasis added).

[90] 36 C.F.R. § 220.5(e)(2) (emphasis added).

> the Corps will follow "adaptive management practices as it moves through construction of its contracts," thus allowing it to change future contracts should the data indicate it is necessary. These promises, however, provide no assurance as to the efficacy of the mitigation measures. The Corps did not provide a proposal for monitoring how effective "adaptive management" would be.[91]

Mountaineers v. United States Forest Service, 445 F. Supp. 2d 1235 (W.D. Wash. 2006) set aside a Forest Service decision to open motor vehicle trails where the agency proposed to monitor impacts to wildlife and potentially change the trails later based on an adaptive management plan. The court stated that these adaptive management strategies "amount … to a 'build-first, study later' approach to resource management. This backward-looking decision making is not what NEPA contemplates."[92] Other cases similarly conclude that NEPA forbids the use of ill-defined adaptive management plans to assume away likely impacts of agency action.[93]

Courts also hold unlawful agency projects that may impact species protected by the Endangered Species Act where the biological opinion is based on the assumption that a vague and ill-defined monitoring and adaptive management plan will mitigate impacts to the species at issue. These cases provide a useful analogy to adaptive management in the NEPA context. *Natural Resources Defense Council v. Kempthorne*, 506 F. Supp. 2d 322 (E.D. Ca. 2007) is key precedent. There, plaintiffs challenged a proposed plan to manage water diversions in a manner that could adversely impact the delta smelt, a species listed as threatened under the Endangered Species Act. The Fish and Wildlife Service prepared a biological opinion (BiOp) on the proposal which concluded that the project would neither jeopardize the smelt nor adversely modify the smelt's critical habitat. "Although the BiOp recognize[d] that *existing* protective measures may be inadequate, the FWS concluded that certain proposed protective measures, including … a proposed 'adaptive management' protocol would provide adequate protection."[94]

Plaintiffs alleged, among other things, that the BiOp "relie[d] upon uncertain (and allegedly inadequate) adaptive management processes to monitor and mitigate the [project's] potential impacts."[95] They asserted that the adaptive management plan, which required a working group meet and consider adaptive measures in light of monitoring, failed to meet the ESA's mandate that mitigation be

> "'reasonably specific, certain to occur, and capable of implementation'" because: (1) the [working group] has complete discretion over whether to meet and

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[91] *NRDC v. United States Army Corps of Eng'rs*, 457 F. Supp. 2d at 234 (citations omitted).

[92] *Mountaineers v. United States Forest Serv.*, 445 F. Supp. 2d at 1250.

[93] *See, e.g., High Sierra Hikers Association v. Weingardt*, 521 F. Supp. 2d 1065, 1090-91 (N.D. Ca. 2007) (overturning a Forest Service decision to liberalize the rules limiting campfires in high country parts of a wilderness area on the grounds that the agency could not rely on adaptive management to overcome an inadequate response to the problems raised in the record).

[94] *NRDC v. Kempthorne*, 506 F. Supp. 2d at 333-34 (emphasis in original).

[95] *Id.* at 329.

> whether to recommend mitigation measures; (2) even if the [working group] meets and recommends mitigation measures, the [agency management team] group is free to reject any recommendations; (3) there are no standards to measure the effectiveness of actions taken; (4) reconsultation is not required should mitigation measures prove ineffective; and (5) ultimately, no action is ever required.[96]

The *Kempthorne* court cited prior caselaw holding that "a mitigation strategy [in the ESA context] must have some form of measurable goals, action measures, and a certain implementation schedule; i.e., that mitigation measures must incorporate some definite and certain requirements that ensure needed mitigation measures will be implemented."[97] The court found that adaptive management plan "does not provide the required reasonable certainty to assure appropriate and necessary mitigation measures will be implemented."[98] The court concluded that

> Adaptive management is within the agency's discretion to choose and employ, however, the absence of any definite, certain, or enforceable criteria or standards make its use arbitrary and capricious under the totality of the circumstances.[99]

C. The EIS Fails to Disclose the South Sacramento Restoration Project's Site-Specific Direct and Indirect Effects.

Although NEPA requires that analysis disclose specific information about the when, where, and how of any agency action, so that the impacts and alternatives can be described and weighed, the EIS contains almost no such data. Instead, in seeking flexibility to respond to changing conditions as part of its "toolbox approach," the Forest Service intends to postpone site-specific project design and analysis until *after* the agency decision is made. This upends NEPA's central purpose that agencies look before they leap.

i. The EIS Fails to Provide Required Detail on Road Construction

The Lincoln National Forest completed an Ecological Assessment in 2019 as part of the forest plan revision. In that, the Forest Service listed "*road construction*" as a system stressor. In that document, the Forest Service stated that:

> "*Forest activities (management actions) that remove soil surface cover, create soil compaction, or increase accelerated erosion have the potential to result in unsatisfactory soil conditions. Activities include timber harvesting, road construction and use, recreation facility construction and use, prescribed burning, fuelwood harvesting, and*

[96] *Id.* at 352. *See also id.* at 350 (explaining the "certain to occur" standard and citing *Ctr. for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1152 (D. Ariz. 2002)).

[97] *Id.* at 355, citing *Rumsfeld*, 198 F. Supp. 2d at1153.

[98] *Id.* at 356.

[99] *Id.* at 387.

herbivory. For example, poorly placed roads or roads constructed with poor drainage contribute to increased erosion and unsatisfactory soil conditions."[100]

The Ecological Assessment further asserts that:

"*System stressors that create major disturbances include natural events such as wildfires, mass movements, and human-induced disturbances such as road construction and timber harvesting. Soil erosion, combined with other impacts from forest disturbance, such as soil compaction, can reduce forest sustainability and soil productivity*."[101]

The proposed action includes new road construction that is likely to significantly impact soils, water quality, unfragmented habitat blocks, critical habitats, and fire risk. The proposed expansion of a roads system is a significant issue for environmental analysis, yet many details are lacking. Portions of the project area feature steep slopes where new roads and ground-based logging activities are likely to cause significant impacts to soil productivity.[102] New roads may permanently impair soil productivity even if their use is temporary.[103] Road-related soil erosion is a chronic source of sediment production that can limit water quality and affect habitat for riparian-dependent species. The distance that sediment travels is an important factor in determining how much eroded soil is delivered to a water body. Soil loss and erosion occurring closer to a stream have greater potential to deliver sediment and lead to water quality impairment than erosion triggered farther away from streams. For this reason, road-stream crossings have high potential to adversely impact water quality.[104] The Final EIS, however, fails to disclose the location of stream crossings, thus making it impossible to understand the project's effects.

Road construction and fuel treatments may combine to increase overland water flow and runoff by removing vegetation and altering physical and chemical properties of soil, which can permanently alter watershed function.[105/106] This has implications for the project purpose and

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[100] Lincoln National Forest Plan Assessment Report, Volume I. Ecological Resources. May 2019. At 261.

[101] Lincoln National Forest Plan Assessment Report, Volume I. Ecological Resources. May 2019. At 281.

[102] Gucinski, H., M.J. Furniss, R.R. Ziemer and M.H. Brookes (eds.). 2001. *Forest Roads: A Synthesis of Scientific Information.* USDA For. Serv. Gen. Tech. Rep. PNW-GTR-509. Portland, OR.

[103] Trombulak, S.C. and C.A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. *Conservation Biology* 14: 18-30.

[104] Endicott, D. 2008. *National Level Assessment of Water Quality Impairments Related to Forest Roads and Their Prevention by Best Management Practices*. Final report to U.S. Environmental Protection Agency, Contract No. EP-C-05-066, Task Order 002. Great Lakes Environmental Ctr.: Traverse City, MI. December. 259 pp.

[105] Elliot, W.J. 2010. Effects of forest biomass use on watershed processes in the western United States. *Western Journal of Applied Forestry* 25: 12-17.

[106] Robichaud, P.R., L.H. MacDonald and R.B. Foltz. 2010. Fuel management and erosion. Ch. 5 in: W.J. Elliot, I.S. Miller and L. Audin (eds.). *Cumulative Watershed Effects of Fuel Management in the Western United States.* USDA For. Serv. Rocky Mtn. Res. Sta. Gen. Tech. Rep. RMRS-GTR-231. Fort Collins, CO.

need to "reestablish and retain biodiversity, health and productivity, ecological function, and resilience of National Forest System lands."[107]

The extent and location of road construction and its effects to soil erosion, runoff channelization and suspended sediment loads merit a hard look in the environmental analysis. This should include detailed study (rather than mere mention and cursory dismissal) of an action alternative that foregoes road building on steep slopes and sensitive soils where it may increase erosion or impair productivity.

The EIS explains the proposed action will utilize approximately 240 miles of existing and new system roads, but fails to specify their designations, length or location.[108] The EIS lacks any associated maps illustrating the location of new road construction or existing roads that would be used under the proposed action. The proposed action will also utilize an undisclosed number of currently closed Maintenance Level 1 roads, as well as "unauthorized" roads that will be maintained and closed after project completion.[109] It also lacks the necessary information about other unauthorized roads and trails that may be decommissioned and rehabilitated under the proposed action. While we are certainly in support of their removal, the EIS lacked an inventory of unauthorized roads and trails, where they may be causing significant resource damage, or the corresponding treatment for restoring them to a more natural state.[110]

In place of this necessary information, the EIS simply states that "*[upon] completion of treatments, temporary roads would be decommissioned and rehabilitated while level 1 roads would be reclosed.*"[111]

Such an approach is haphazard and suggests the Forest Service may or may not treat unauthorized roads and trails as they are found during the life of the project. Nor is it clear at what point in time watershed restoration treatments would be deemed completed or how such a determination would be made.

In its proposal to construct an unspecified number of new and temporary roads, as well as skid trails, the Forest Service provides only general criteria for their location without actually illustrating where on the forest the criteria would apply.[112] For example, the Final EIS omits any

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[107] South Sacramento Restoration Project Final EIS at 2.

[108] South Sacramento Restoration Project Final EIS at 212.

[109] South Sacramento Restoration Project Final EIS at 82.

[110] South Sacramento Restoration Project Final EIS at 82, "An exact figure for how many miles of existing old road prisms that could be used to support commercial harvest activities cannot be provided because unauthorized road prisms are not inventoried."

[111] South Sacramento Restoration Project Final EIS at 85.

[112] South Sacramento Restoration Project Final EIS at 83, "When an existing system road or unauthorized route is unavailable for use, then a temporary road could be constructed to provide adequate access. New temporary roads would be up to 0.5 mile in length. The combination of temporary roads and skid trails up to 1,500 feet would allow access up to 0.75 mile from any system road in the project area. If harvest areas are beyond this distance, then alternative treatments, such as prescribed fire, mastication, and similar

information regarding how much of the project area could include road construction on slopes greater than 20 percent, or the location of skid trails extending off of temporary and new system roads. Especially problematic is the length of time temporary roads may remain on the ground after construction since the EIS ambiguously describes the project's temporal scale as lasting 10 – 20 years or more.[113]

Depending on the duration of awarded logging contracts, roads constructed under the proposed action could remain on the ground for 30 years or more. The Forest Service fails to provide any temporal constraints on the construction, utilization and obliteration of these temporary roads. Thirty years or more is an extended period of time for a temporary road to persist on the landscape, and the Final EIS fails to analyze the potential environmental consequences from the use or presence of temporary roads over such a long timeframe. These "temporary" roads therefore could become effectively "permanent."

The National Forest Management Act gives the Forest Service 10 years after project completion to revegetate temporary roads:

> "*Unless the necessity for a permanent road is set forth in the forest development road system plan, any road constructed on land of the National Forest System in connection with a timber contract or other permit or lease shall be designed with the goal of reestablishing vegetative cover on the roadway and areas where the vegetative cover has been disturbed by the construction of the road, within ten years after the termination of the contract, permit, or lease either through artificial or natural means. Such action shall be taken unless it is later determined that the road is needed for use as a part of the National Forest Transportation System*."[114]

Our comments raised several concerns with the proposed temporary road construction, and use of temporary, unauthorized and system roads. Those concerns included, but are not limited to, soil loss and erosion, potential impacts to water quality from road-related sedimentation, impacts to riparian habitats, and the long-term impacts of retaining unauthorized roads. We also raised concerns about permanent road construction, and the lack of clarity regarding the use of system roads.

In response to our comments, the Forest Service clarified there would be no new permanent road construction: "The proposed action has been revised to clarify that no new permanent roads would be constructed to support implementation of the South Sacramento Restoration

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methods that are not dependent on road access would be considered to meet project objectives. If other methods are not feasible to meet management objectives, then construction of a temporary road would be considered."

[113] South Sacramento Restoration Project Final EIS at 48, "the Forest Service proposes to conduct restoration activities…over the next 10 to 20 years to meet initial project objectives, with additional maintenance treatments beyond 20 years." See also id. at 370 (same).

[114] 16 U.S.C. § 1608(b).

Project."[115] We appreciate the clarification, but remain confused regarding the precise miles of system roads that may be utilized under the selected alternative given conflicting statements between the FEIS and draft decision: "Approximately 240 miles of existing National Forest System roads would be used to complete the proposed activities, and up to 125 miles of temporary roads could be constructed to support implementation of the proposed action."[116] However, the agency's decision appears to expand the available roads for use in the project area, including all currently closed roads, explaining "Level 1 roads may be temporarily opened and maintained as needed for project access and could be closed upon completion of projects or remain open as needed to meet other objectives, if warranted by further analyses."[117]

Table 8. Miles of roads in South Sacramento Restoration Project by jurisdiction and maintenance level

Road Jurisdiction	Miles	Estimated Regular Annual Maintenance (NFS)
SH - State Highway*	15.9	Not applicable
Otero County	59.4	Not applicable
National Forest System Road	460.7	42 to 52
1 - Basic custodial care (closed)	325.7	Not applicable
2 - High clearance vehicles	81.8	12 to 17
3 - Suitable for passenger cars	52.5	30 to 35
4 - Moderate degree of user comfort	1.6	Not applicable
5- High degree of user comfort *cross listed as State Highway, above.	0.0	Not applicable

By including all Maintenance Level (ML) 1 roads, the Forest Service expanded the number and mileage of system roads available for project implementation to 460.7 miles as shown in the table below, which was provided in the agency's draft Record of Decision and is significantly greater than 240 miles.[118] When combined with the proposal to construct up to 125 miles of temporary roads, the total amount of roads that could be utilized reaches 585.7 miles. The agency fails to account for the potential environmental consequences of such a significant amount of road use and temporary road construction, especially regarding impacts to soil conditions, water quality and watershed conditions despite the fact that the Forest Service explained the "principal issues of concern to soils and water resources from the action alternative is the increase in erosion and consequent impacts to water quality that may occur from implementation of the proposed treatments," which includes road-related impacts.[119]

In regards to the potential for soil erosion, the Forest Service provided a series of tables displaying watersheds (6th HUC) and their potential for erosion by specific categories, including

[115] South Sacramento Restoration Project Final EIS, Appendix C at C-44.

[116] *Id.*

[117] South Sacramento Restoration Project Draft Record of Decision at 22.

[118] *Id.* at Table 8.

[119] South Sacramento Restoration Project Soils and Watershed Resource Report at 10.

limits for off-highway vehicle, roads, gully erosion and sheet rill erosion.[120] The agency downplays the existing erosion potentials, noting all but one watershed is under 10 percent:

> The erosion limitations categories within the project area are summarized in Table 5 through Table 9 below. These tables show that currently very few watersheds have over 10 percent in any erosion category. In fact, the highest percentage of a watershed experiencing severe erosion is Cox Canyon-Rio Peñasco where the road limitation is severe on 12 percent of the area (see Table 7).

Such generalized descriptions do not meet the hard look mandate NEPA requires. Specifically, the Forest Service fails to disclose the miles of road by maintenance level occurring in each watershed that have moderate or high risk erosion potential, or how these risks would change under the proposed action. Particularly glaring is the omission of how erosion potentials may change by opening and utilizing so many miles of closed roads, in addition to the 125 miles of temporary road construction. The latter is particularly concerning given the agency proposes to locate temporary roads on unauthorized routes that are often user-created, poorly located and may be contributing to degraded soil conditions.[121] Additionally, the agency fails to account for soil impacts during the entire time temporary roads may persist on the landscape before becoming effectively revegetated, which for cumulative impacts could be up to 30 years.[122] The need for more detailed and robust analysis is best summed up in the agency's own words:

> In addition to land management, activities such as off-road vehicle use and roads contribute the most to loss of soil productivity and impacts to water quality within the project area. This analysis has identified 360 miles of roads and 108 miles of trails throughout the total area of all the watersheds. Excess roads and trails have the potential to contribute to the long-term loss of soil productivity through erosion and sedimentation. Most roads in the area are unsurfaced, primitive dirt roads with little or no drainage control. Many roads run along canyon bottoms and cross drainage channels. The watershed condition framework analysis shows that most of the roads and trails within the project area pose a risk to water quality, soil, wildlife, and other resources.[123]

It is unclear if the Forest Service meant there are a total of 360 miles of road total or just those within moderate and high erosion potentials, but it is clear that road and trail conditions are degrading watershed functions in the project area.

To analyze watershed conditions, the Forest Service identified a number of indicators from the Watershed Condition Framework (WCF):

> For this analysis, six of the 12 core watershed condition indicators were evaluated for all sixth hydrologic unit codes. The indicators used included 1) water quality condition, 2)

[120] *Id.* at 20 - 22, Tables 6-9.

[121] *Id.* at 39.

[122] *Id.* at 15.

[123] *Id.* at 23

> water quantity (flow regime) condition, 3) soil condition, 4) road and trail condition, 5) fire effect and regime condition, and 6) forest health condition.[124]

The WCF utilizes specific attributes described in the Watershed Condition Classification Technical Guide that the Forest Service utilizes in its project analysis.[125] The WCF and its condition class scores provide useful information, particularly in regards to specific indicators and their supporting attributes as shown in Figure 1 below. In describing the existing condition, the Forest Service disclosed the current status of select indicators, showing that the road and trail condition ranks poor for each of the 12 subwatersheds in the project area, and that 7 of them rank poor for water quality.[126] Taking a closer look at the road and trail indicator, it relies on four attributes: road density, road and trail maintenance, proximity to streams, and mass wasting. At no point in the project analysis did the Forest Service discuss these attributes or disclose how they may change under the proposed action. Our comments explained in detail the need for such analysis both in regards to the road and trail indicator, and for water quality limited stream segments where the agency explains the following:

> The Sacramento River from Scott Abel Canyon to the headwaters, which is a length of 7.30 miles, is impaired due to sedimentation/siltation. The Agua Chiquita perennial portions from McEwan Canyon to the headwaters, a total distance of 22.87 miles, is impaired due to turbidity (see Error! Reference source not found.). Both of these listings can be attributed to the poor condition of roads and trails in this area, which is highlighted in the watershed condition framework table above (see Table 11).[127]

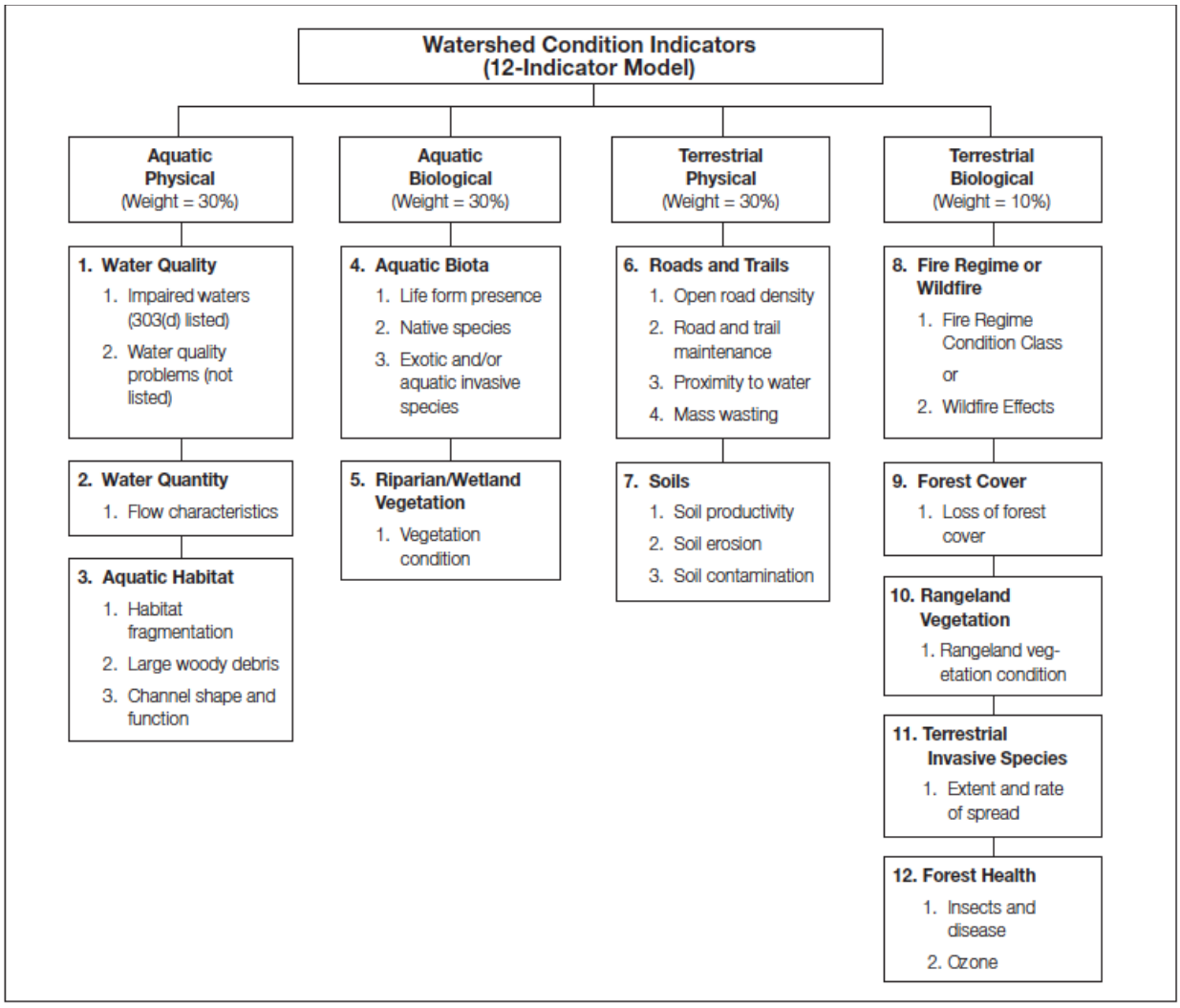
Figure 1. WCF Indicators and Attributes.

[124] *Id.* at 13.

[125] South Sacramento Restoration Project Final EIS at 265, and (SSRP) Environmental Impact Statement, Soils and Watershed Resource Report at 26.

[126] SSRP Environmental Impact Statement, Soils and Watershed Resource Report at 26, Table 11.

[127] *Id.* at 28.



Our comments urged the Forest Service to take a hard look at sediment delivery from existing roads by quantifying the amount of sedimentation using models such as the Water Erosion Prediction Project (WEPP) model or the Geomorphic Road Analysis and Inventory Package (GRAIP), the latter of which combines a road inventory with geographic information systems (GIS) analysis to predict sediment production and delivery, mass wasting risk from gullies and landslides, and fish passage at stream crossings. The agency failed to provide any measure of potential sedimentation or respond to these comments in any meaningful way. The lack of analysis and reliance on only cursory, qualitative descriptions precludes the agency from demonstrating compliance with the Clean Water Act and the NEPA.

> ***Proposed Remedy***: The Forest Service should prioritize treatments that do not require the construction of new roads; and in any subsequently prepared NEPA document should identify the minimum road use that would allow for operations to achieve the purpose and need at the landscape scale; and identify specific locations where temporary roads might be needed, and the specific reasons each road would be needed.

The Forest Service should commit to fully removing all temporary roads, within 3 years of their construction. This would be option 5 under the decommissioning levels: Full obliteration, and recontouring and restoring natural slopes.

The Forest Service should commit to fully removing all unauthorized roads or trails found during project implementation as part of this project decision, as doing so would not require additional analysis or authorization given these routes should not be present at all.

ii. The Draft EIS Fails to Provide Required Detail on Mechanical Vegetation Treatments and Other Restoration Methods

The Final EIS fails to disclose when many of the project's logging, road construction, and slash pile burning will take place, or over how long a period. The Final EIS also fails to disclose ***where*** logging or other treatments will occur, nor does it disclose where certain values may exist that vegetation treatments are designed to protect or avoid. A number of key questions remain unanswered in the Final EIS:

What is the extent, frequency, or type of "follow-up treatments and maintenance" that would be needed?

How were steep slope logging areas identified? What local evidence is there to support the viability of these techniques or any mitigation measures? What roads would need to be built to allow the use of this equipment? These systems have barely been tested in the Southwest on even the most accessible and easiest terrain. While approved for use in the Bill Williams Mountain EIS and the Flagstaff Watershed Protection Project EIS (FWPP) the likelihood that these systems will be deployed is extremely low, especially considering the difficulties FWPP is having in even progressing in the easiest working terrain in the entire project area[128]. Without regional demonstration, there is no way that the Forest Service can reasonably predict the impacts of such systems on soil hydrology or stability, calling into question the current analysis. Nor can the Forest Service be sure that Resource Protection Measures are adequate. The use of Cram et al. (2007) to support the use of steep-slope systems was an interesting choice. While this study was in a similar environment (Sacramento Mountains, New Mexico), their definition of "steep" is far less than that proposed for the Hassayampa Project. These authors classified "intermediate slopes" as those 10-25% slope, and "steep slopes" were those 26-43% slope, effectively not even making it into the proposed "steep slope" category for the Hassayampa Project (40-80%). Furthermore, the authors reported the following:

[128] http://azdailysun.com/news/local/flagstaff-area-forest-thinning-falters/article_c8b09d8b-98d4-5630-b03b-f21cf9504811.html#tracking-source=home-top-story: "By the end of December, 642 acres of ponderosa pine forest near Schultz Creek and the base of Mount Elden were supposed to have been mechanically thinned as part of the Flagstaff Watershed Protection Project, or FWPP. Area trails were closed and neighbors were notified as the logging contractor ramped up operations at the end of the summer. But after cutting trees on just 20 acres, the contractor stopped work and never picked back up. The contract ended Dec. 31 with just 3 percent of the acreage completed…."

> "*Percent slope affected harwarder [AKA "harvester forwarder"] travel-use patterns within a forest stand. Although overall percent disturbance caused by the harwarder was similar between steep and intermediate slopes, travel use on steep slopes often resulted in heavy disturbance… Results indicated increasing levels of disturbance, particularly where bare soil was exposed, had the greatest influence on runoff and sedimentation. Steep slopes with exposed mineral soil exhibited a fourfold increase in runoff and a 22 fold increase in sedimentation.*" [129]

Indeed, the authors made clear that if bare soil can be avoided, then impacts were not measurably worse than background erosion rates. However, this was on slopes up to a maximum of 43%, and the authors furthermore stated that "*the heavy disturbance we observed and recorded on steep slopes appeared to be directly correlated with slopes ≥30%. As slope increased above 30% on our study sites, deep tire rutting appeared inevitable."*[130]

The Final EIS also fails to disclose and analyze the effects of Special Use Authorization for in-forest log processing sites, which essentially amount to 10- to 15-acre clear cuts, with stumping, stump disposal, bulldozing, grading, erosion, and other impacts typical to intensive industrial sites, "where use is expected to be continuous on a regular basis for 10 to 20 years".[131] The impacts of these sites are substantial and those effects are not disclosed in the Final EIS. The Final EIS fails to analyze the social, ecological, and financial costs of the extensive construction, monitoring, enforcement, rehabilitation, and reforestation activities that these yards would require.

> ***Proposed Remedy*:** The Forest Service should comply with the current Forest Plan and limit mechanical thinning to slopes 40% or less.

iii. The Final EIS Fails to Take a Hard Look at Impacts to Roadless Lands and Appears to Violate the Roadless Area Conservation Rule.

The South Sacramento Restoration Project should maintain and restore roadless and unroaded lands, including inventoried-but-not-recommended and not-yet-inventoried lands. Maintaining and enhancing the roadless character of these lands will contribute to the achievement of the substantive provisions in sections 219.8, 219.9, and 219.10 of the 2012 planning rule, ensuring that the South Sacramento Restoration Project does not prematurely foreclose decisions in the upcoming plan revision. Roadless lands are ecologically important and play a critical role in ensuring the persistence of species, providing connectivity, and ensuring watershed functionality,

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[129] D.S. Cram, T.T. Baker, A.G. Fernald, A. Madrid, B. Rummer. Mechanical thinning impacts on runoff, infiltration, and sediment yield following fuel reduction treatments in southwestern dry mixed conifer forest. Journal of Soil and Water Conservation, Vol. 62(5): 359-366 (2007) At page 365. In Project file, and available at https://research.fs.usda.gov/treesearch/29404 (last viewed Jan. 13, 2025).

[130] *Id*. at 364.

[131] South Sacramento Restoration Project Final EIS at 81.

which is only more important in light of climate change. They also can be important for providing nature-based non-motorized recreational experiences.

Forest Service roadless lands are heralded for their conservation values. Those values are described at length in the preamble of the Roadless Area Conservation Rule[132] and in the Final Environmental Impact Statement (FEIS) for that rule.[133] They include: high quality or undisturbed soil, water, and air; sources of public drinking water; diverse plant and animal communities; habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land; primitive, semi-primitive non-motorized, and semi-primitive motorized classes of dispersed recreation; reference landscapes; natural appearing landscapes with high scenic quality; traditional cultural properties and sacred sites; and other locally identified unique characteristics (e.g., uncommon geological formations, unique wetland complexes, exceptional hunting and fishing opportunities).

Roadless lands are also responsible for higher quality water and watersheds. Anderson and others[134] assessed the relationship of watershed condition and land management status, and found a strong spatial association between watershed health and protective designations. DellaSalla and others[135] found that undeveloped and roadless watersheds are important for supplying downstream users with high-quality drinking water, and that developing those watersheds comes at significant costs associated with declining water quality and availability. Protecting and connecting undeveloped areas is also an important action agencies can take to enhance climate change adaptation.

The Final EIS addresses impacts to inventoried roadless areas, but that analysis is unclear and fails to acknowledge controlling law concerning such areas, which generally prohibits logging. Further, the Final EIS fails to disclose and analyze impacts to unroaded lands that the Forest Service does not classify as inventoried roadless areas.

The project area contains a single inventoried roadless area (IRA), the nearly 8,900-acre Jefferies Canyon IRA.[136] The Final EIS contains vague and sometime contradictory statements concerning what actions the Forest Service will allow in the IRA. For example, the document states that under the proposed action:

> The main treatment proposed in the Inventoried Roadless Area is prescribed fire in low or moderate conditions. Other restoration activities proposed include hand

[132] 66 Fed. Reg. at 3245-47.

[133] Roadless Area Conservation Rule Final Environmental Impact Statement, Vol. 1, 3–3 to 3–7, available at https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5057895.pdf.

[134] Anderson, H. Mike et al., 2012. Watershed Health in Wilderness, Roadless, and Roaded Areas of the National Forest System. The Wilderness Society, Washington DC. http://wilderness.org/resource/watershed-health-wilderness-roadless-and-roaded-areas-national-forest-system.

[135] DellaSala, D., J. Karr, and D. Olson. Roadless areas and clean water. Journal of Soil and Water Conservation, vol. 66, no. 3. May/June 2011.

[136] South Sacramento Restoration Project Final EIS at 366.

> and mechanical thinning; the use of herbicides to treat juniper resprouts; site rehabilitation and replanting; and road maintenance activities to address erosion issues Restoration methods [in the IRA] would be limited to those that are compatible with forest plan direction for inventoried roadless areas, e.g., no new roads would be built, and no motorized vehicles or staging areas would be permitted in the roadless area. However, prescribed fire, and overland travel by vehicles that do not require new roads to be constructed for access (e.g., masticators) would be compatible restoration activities…While forest restoration treatments would result in short-term, localized impacts to the naturalness, undeveloped, and outstanding opportunities for remoteness, due to the presence of workers, smoke from prescribed burns and managing wildland fires, and noise from equipment, the project is consistent with the 2001 Roadless Area Rule (36 CFR Part 294) guidance."[137]

The Final EIS makes clear that "*no new roads would be built*" in the IRA.[138] However, "approximately 7,300 acres of the 8,863-acre Jefferies Canyon Inventoried Roadless Area could be treated using a variety of restoration methods," including "hand and mechanical thinning."[139]

The passage above indicates that "*no motorized vehicles … would be permitted*" in the IRA but that "*overland travel by vehicles that do not require new roads to be constructed for access (e.g., masticators) would be compatible restoration activities*."[140] The Final EIS also states that "*Timber harvesting would be a small component of the project, focusing on small-diameter trees in the form of limited amounts of personal and commercial fuelwood use. Harvesting would be in accordance with 36 CFR 294.13, b.1 (ii) To 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.*"[141]

The Forest Service provides no support for its assertion that timber harvesting, mastication and hand logging are "*compatible with forest plan direction*." The Final EIS contains no citation to any provision of the Lincoln National Forest plan. We reviewed both the amended forest plan and amendments available on the Forest's website and found no direction related to inventoried roadless areas, and only a few passing mentions of the word "roadless" unrelated to substantive plan provisions.

[137] South Sacramento Restoration Project Final EIS at 374.

[138] South Sacramento Restoration Project Final EIS at 374.

[139] South Sacramento Restoration Project Final EIS at 373-74.

[140] South Sacramento Restoration Project Final EIS at 374.

[141] South Sacramento Restoration Project Final EIS at 374.

The Final EIS also fails to even mention or cite the law that governs management of the Jefferies Canyon IRA: the Roadless Area Conservation Rule.[142] That rule generally prohibits the use of both mastication and hand treatments. The Roadless Rule states:

> (a) Timber may not be cut, sold, or removed in inventoried roadless areas of the National Forest System, except as provided in paragraph (b) of this section.
>
> (b) 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, within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period.[143]

The Roadless Rule defines roadless area characteristics as:

> Resources or features that are often present in and characterize inventoried roadless areas, 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.[144]

[142] 36 C.F.R. § 294.10-14.

[143] 36 C.F.R. § 294.13.

[144] 36 C.F.R. § 294.11.

The rule requires a highly site-specific analysis, given the regulation's emphasis on "*locally identified* unique characteristics."[145]

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 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. ….
>
> 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.[146]

In adopting the Roadless Rule, the Forest Service thus anticipated that logging in IRAs under this specific exception would only occur following a project-level NEPA analysis that evaluated *stand-specific conditions*.

The Roadless Rule's general prohibition applies here because both hand and mastication treatments involve either logging or shredding – the "removal" – of trees. Thus, these proposed treatments can only take place within the Jefferies Canyon IRA if the Forest Service can demonstrate that:

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

[146] Forest Service, Roadless Area Conservation Rule, 66 Fed. Reg. 3244, 3257, 3258 (Jan. 12, 2001) (emphases added).

- The project is an "infrequent" occurrence on roadless forest; and
- The project removes only generally small diameter timber; and
- The project meets the exception's purpose (improving threatened, endangered, proposed, or sensitive species habitat, or maintaining or restoring the characteristics of ecosystem composition and structure); and
- The project "maintain[s] or improve[s] one or more of the roadless area characteristics."[147]

The Final EIS fails to make the showing required by law to allow tree removal, including either hand treatments or masticators to be used in the IRA. The Forest Service does not assert that these treatments will occur "infrequently" within IRAs. The Forest Service does not represent whether or not the trees to be chainsawed or shredded will be generally small in diameter. The EIS allows for an unspecified amount of "mechanical thinning" across 7,300 acres of the 8,863-acre Jeffries Canyon Inventoried Roadless Area.[148]

Further, the "Recreation, Infrastructure, and Inventoried Roadless Areas Report" (2018 Roadless Report) prepared to support the EIS does not even contain the word "diameter," indicating that the Forest Service failed to consider the Roadless Rule's limitation on logging to "generally small diameter" trees in that analysis.[149] The report does contend that: "Restoration methods would be limited to those that are compatible with forest plan direction for inventoried roadless areas, e.g., no new roads would be built, and no motorized vehicles or staging areas would be permitted in the roadless area."[150] But that description completely ignores the impact of tree removal, barred by the Roadless Rule unless limited to generally small diameter trees.

While the Final EIS does allege that timber removal would "focus[] on small-diameter trees," neither the EIS nor the 2018 Roadless Report defines the term "small diameter" for this site, nor explains how tree removal would be occur or be limited in such areas. The Draft Record of Decision contains no "resource protection measure" specific to roadless areas or limiting the size of trees to be removed in IRAs.

Further, any representations about the purpose or impact of logging and mastication treatments would be difficult because the EIS contains no description of the forest within the Jefferies Canyon IRA, and which trees, stands, or areas might be logged or masticated. In addition, the Final EIS does not state that the Jefferies Canyon IRA is overlapped by an area identified as Wildland-Urban Interface, nor does it mention that the Jim Jeffries MSO PAC occurs within the IRA.

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[147] *See Alliance for the Wild Rockies v. Krueger*, 950 F. Supp. 2d 1196, 1214 (D. Mont. 2013), affirmed on other grounds, 663 Fed. Appx. 515 (9th Cir. Nov. 1, 2016).

[148] South Sacramento Restoration Project Final EIS at 373 and 374.

[149] R. Rausch. South Sacramento Restoration Project Environmental Impact Statement, Recreation, Infrastructure, and Inventoried Roadless Areas Report. Feb. 15, 2018. In Project file.

[150] *Id*. at 25.

The EIS also fails to accurately address the potential for the logging and mastication of trees to degrade roadless character. That document states that "*Restoration methods would be limited to those that are compatible with Forest Plan direction for inventoried roadless areas, e.g., no new roads would be built, and no motorized vehicles or staging areas would be permitted in the roadless area.*"[151] While the project may not permit new roads to obliterate the area's road-free nature, the Roadless Rule recognizes that roadless characteristics are not limited to the lack of roads. For example, the Rule defines roadless characteristics to include "[n]*atural appearing landscapes with high scenic quality*."[152] Shredding and chainsawing trees across the landscape will denude the landscape and/or litter the area with stumps. This will degrade the area's naturalness and scenic quality.

The Final EIS fails to disclose whether and how mastication and hand treatments will comply with the Roadless Rule, and disclose the impacts of such treatments to roadless characteristics.

A recent federal appeals court decision demonstrates that this Project is likely to be found to violate the Roadless Rule. In *Los Padres ForestWatch v. United States Forest Serv*., 25 F.4th 649 (9th Cir. 2022), the Forest Service approved the Tecuya Ridge logging project in a roadless area, setting a limit of logging trees less than 21 inches diameter at breast height (dbh), arguing that trees of such width constituted "generally small diameter timber." *Los Padres ForestWatch*, 25 F.4th at 656-57. The court found that the Forest Service failed to support its conclusion that a 21inch DBH tree constituted a "small diameter" tree, noting among other things that "the Forest Service did not attempt to articulate this explanation or, indeed, provide any information at all on the average dbh of the trees located within the … Project area." *Id*. at 658. The court therefore found the agency violated the Roadless Rule and remanded the project back to the Forest Service for further explanation as to what constitutes a small diameter tree. *Id*. at 659.

Here, the Lincoln National Forest has done *even less* than the Forest Service in *Los Padres ForestWatch*. Neither the Final EIS nor any of the Lincoln National Forest's supporting documents purport to define what constitutes a "small diameter" tree for any of the stands within the project area, let alone within the Jefferies Canyon IRA. Nor does the Forest Service explain how any of the project's provisions will limit logging to small trees, whatever those might be, while some of those documents indicate just the opposite: that large conifers up to 24 inches dbh could be removed. The agency does not provide the average size of trees in individual stands or across the IRA that could be removed. Because the Forest Service provides no stand-level data for the project (including roadless areas), neither the public nor the decision-maker can discern the size of trees in stands in the project area, or the size of trees to be removed. Thus, as with the project at issue in the *Los Padres ForestWatch* case, a reviewing court is likely to set aside the South Sacramento Restoration project for violating the Roadless Rule.

The Final EIS also fails to disclose the location of, and the impacts of the proposed action to, unroaded forest lands outside of IRAs. Significant acreage of unroaded lands outside of the Jefferies Canyon IRA appears to exist within the project area. For example, the Forest Service MVUM for the Sacramento Ranger District shows what appears to be thousands of acres of

[151] South Sacramento Restoration Project Final EIS at 374.

[152] 36 C.F.R. § 294.11

lands untrammeled by Forest Service or County roads and directly to the east and north of the Jefferies Canyon IRA.[153]

In addition, New Mexico Wilderness Alliance submitted comments to the Lincoln National Forest which identified specific areas on the Lincoln which should be inventoried for wilderness characteristics.[154] These included:

> • The area bounded by Russia Canyon on the north, the Sunspot highway on the west, Penasco Canyon on the south, and Highway 130 on the east. Most routes here are cherry stemmed, and the area represents the true high country in the Cloudcroft District.
>
> • The very southwest corner LNF in the vicinity of Bug Scuffle Hill.
>
> • The area east of Mayhill and south of Highway 130, bounded by the LNF boundary on the east and south sides. This area is almost entirely roadless and trail-less. A similar area exists to the north of Highway 130, near Dry Burnt Canyon.
>
> • The very southeast corner of LNF south of Lick and Elk canyons.

New Mexico Wilderness Alliance has also completed a preliminary GIS analysis of un-inventoried roadless area for the Lincoln National Forest, which illustrates that a tremendous amount of the South Sacramento Restoration Project area is currently roadless or unroaded. See this map on the next page.

The construction of over 100 miles of new road throughout the project is likely to have a significant damaging impact on the natural values and scenic integrity of these unroaded lands that could become inventoried roadless lands or recommended wilderness through the ongoing forest planning process. Because the Final EIS fails to identify or map unroaded lands outside of the one IRA, the Forest Service has failed to take the required hard look at these lands or impacts to them. In addition, road development in these areas could compromise existing roadless or unfragmented values and diminish potential recommendations in the upcoming forest plan revision. To comply with NEPA's hard look mandate, any subsequently prepared NEPA document must analyze unroaded and potential roadless areas and exclude any form of temporary or permanent roadbuilding within them.

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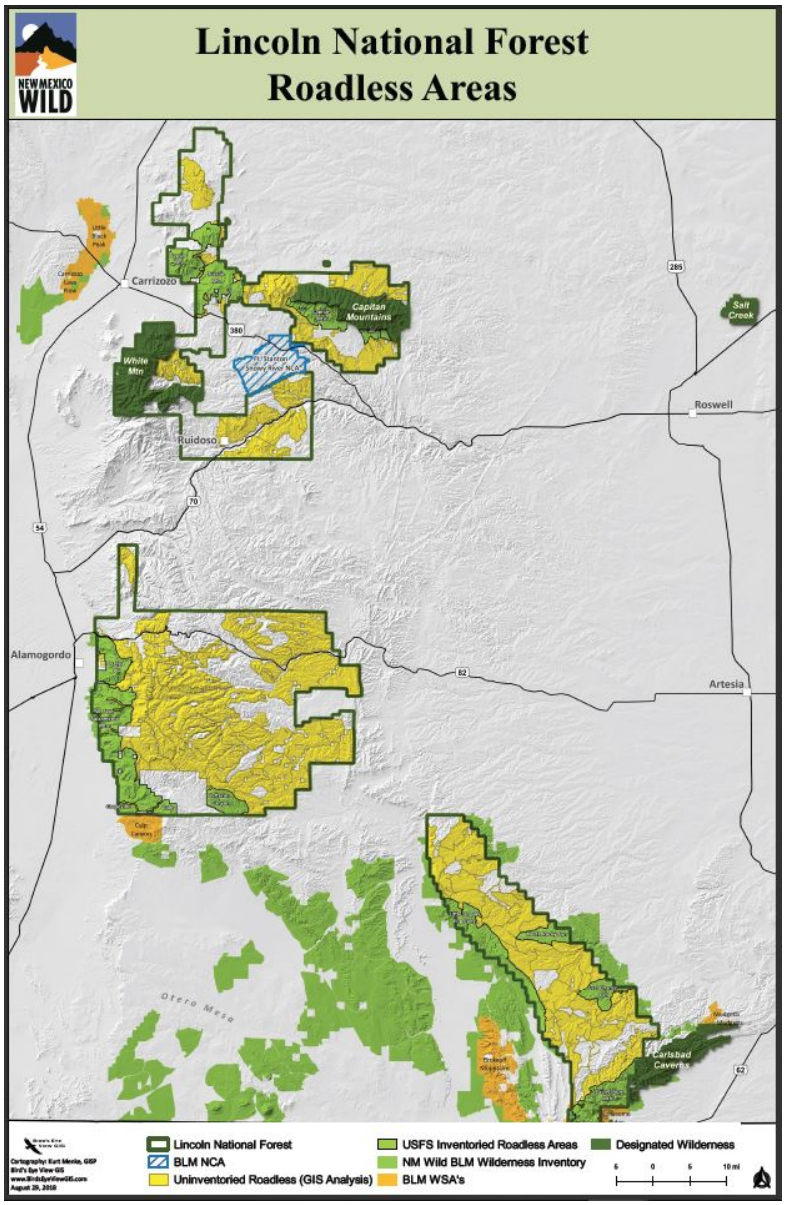
[153] *See* U.S. Forest Service, Motor Vehicle Use Map, Sacramento & Smokey Bear Ranger Districts, Lincoln National Forest (Feb. 22 , 2018), available at https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5413949.pdf (last viewed Jan. 13, 2025).

[154] New Mexico Wilderness Alliance to Lincoln National Forest Planning Team letter dated August 31, 2018. Submitted with prior comment letter.



The Final EIS declined to undertake this analysis, stating:

> Unroaded forested lands outside inventoried roadless or other designated areas are not protected by any formal authority. Resource impacts that would result from the construction, reconstruction, decommissioning, and management of roads during project implementation are evaluated in Final EIS Chapter 3.[155]

Whether the unroaded areas are "protected by any formal authority" is irrelevant to NEPA. This Project has the potential to destroy several large blocks of unroaded land that provide many of the same benefits and values as IRAs, values that the Lincoln NF Plan Revision could protect as recommended wilderness, or that could be provided protection under the Roadless Rule. The

[155] South Sacramento Restoration Project Final EIS, Vol. 2 at C-46.

Final EIS fails to disclose the impacts of the Project to these unroaded areas because, as discussed above, it fails to disclose the location of "temporary" (up to 30 years) or permanent road construction. The impacts of these routes depends heavily on their location and density, facts nowhere divulged in the EIS.

The Forest Service explains that "[t]he restoration methods applied within the inventoried roadless area would use equipment and vehicles that that do not require the use access roads (e.g., vehicles capable of overland travel)."[156] The agency further states, "No new roads would be created, and areas used to access the project area for conducting treatment activities would be rehabilitated to prevent future use as a road."[157] We remain concerned that activities establishing any new linear features such as firelines or off-road vehicle tracks will degrade roadless characteristics, and become unauthorized roads or trails subject to illegal use. Moreso, even though the analysis states no access roads within the IRA are necessary, the Forest Service should clearly state it will not be utilizing any currently closed or unauthorized roads.

Under the Roadless Rule, "[a] road may not be constructed or reconstructed in inventoried roadless areas of the National Forest System" unless a narrow set of exceptions apply. 36 C.F.R. § 294.12(a). The Rule defines both road "maintenance," which is generally permitted, and "road reconstruction" which is not:

> *Road maintenance.* The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective.
>
> *Road reconstruction.* Activity that results in improvement or realignment of an existing classified road defined as follows:
>
> > (1) *Road improvement.* Activity that results in an increase of an existing road's traffic service level, expansion of its capacity, or a change in its original design function.
> >
> > (2) *Road realignment.* Activity that results in a new location of an existing road or portions of an existing road, and treatment of the old roadway.[158]

The Jefferies Canyon IRA contains several miles of closed (ML 1) roads that would likely need reconstruction for any project use, which would violate the 2001 Roadless Rule. If the Forest Service truly does not intend on using these roads, it should say so in the final record of decision. Further, the agency disclosed there is one open system road (FSR 5549) that requires high-clearance vehicles to access. If the agency intends to utilize this road, it should disclose this in the final record of decision with direction that no road reconstruction would take place as the regulations require.

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[156]SSRP Environmental Impact Statement, Recreation, Infrastructure, and Inventoried Roadless Areas Resource Report at 25.

[157] South Sacramento Restoration Project Final EIS at 374.

[158] 36 C.F.R. § 294.11 (2001).

Proposed Remedy: The Forest Service should restrict the use of mechanical thinning within the Inventoried Roadless Area.

The Forest Service must determine what constitutes a "generally small diameter" tree for the Jefferies Canyon IRA, justify that determination with localized, site-specific data, and adopt in the Record of Decision a measure that limits tree removal in the Jefferies Canyon IRA to such small diameter trees.

The Forest Service should clarify that there will be no opening of closed roads within the Jefferies Canyon IRA, or reconstruction of FSR 5549.Further, the Forest Service must provide the location and impacts of any temporary roads and their impact on the unroaded landscapes identified by the New Mexico Wilderness Alliance.

D. The EIS Fails to Disclose Meaningful Information about Direct, Indirect, Cumulative Impacts

i. Roads & Transportation

The best available science shows that roads cause significant adverse impacts to National Forest resources. A 2014 literature review from The Wilderness Society surveys the extensive and best available scientific literature on a wide range of road-related impacts to ecosystem processes and integrity on National Forest lands.[159] Erosion, compaction, and other alterations in forest geomorphology and hydrology associated with roads seriously impair water quality and aquatic species viability. Roads disturb and fragment wildlife habitat, altering species distribution, interfering with critical life functions such as feeding, breeding, and nesting, and resulting in loss of biodiversity. Roads facilitate increased human intrusion into sensitive areas, resulting in poaching of rare plants and animals, human-ignited wildfires, introduction of exotic species, and damage to archaeological resources.

Under the proposed action, the Final EIS states, "[r]*oad construction, reconstruction, maintenance, and rehabilitation would be needed throughout the project area to support the proposed restoration treatments. Approximately 240 miles of existing and new roads would be used to complete the proposed activities*."[160] As we noted previously, this vague description does not differentiate between the construction of new roads (specified or temporary), and it fails to list the current status of existing roads the project would utilize, (i.e. maintenance level - ML) and their status after project completion. As such, the Final EIS fails to disclose the number of currently closed roads that would be opened under the proposed action, or a determination of whether the decommissioning treatment will be effective.

[159] *See* The Wilderness Society, *Transportation Infrastructure and Access on National Forests and Grasslands: A Literature Review* (May 2014).

[160] South Sacramento Restoration Project Final EIS at 414.

The Final EIS, in its infrastructure analysis, focuses only on 360 miles of "core routes" and 168 miles designated on the Forest Service Motor Vehicle Use Map.[161] It is unclear if these number represent the total transportation system, or just roads open to passenger vehicles (ML 3-5). In its methodology analysis the effects of the transportation system, the EIS focuses only on changes in traffic patterns and restoration methods that change existing infrastructure.[162] What these indicators fail to measure are changes to the number of ML 1-5 roads, the miles of temporary roads that will persist on the landscape before they are fully rehabilitated, (upwards of 30 years), and the resulting increased maintenance cost from adding new system roads, as well as, the cost and ability of the Forest Service to properly monitor and enforce the numerous road closures resulting under the proposed action. Further, using restoration methods as an indicator rather than the miles successfully treated, precludes the analysis from specifying the number of existing system roads receiving treatments, the treatment method, the resource concern being addressed, and if the road treatments have a history of success. For example, when evaluating the impacts of closing or decommissioning a road, the Final EIS lacks sufficient analysis or evidence that blocking the entrance is an effective treatment. The Final EIS fails to list the number and miles of road that have hydrological connections, or pose other resource risks, and the type of treatments the Forest Service will implement to address those risks. Such information should have been informed by the Forest Service forest-wide Travel Analysis Report (TAR) generated to support compliance with Subpart A of the Travel Management Rule, or by a project-specific TAR.[163] But the Final EIS does not include these reports.

Of particular concern is the construction of an unspecified number of temporary roads and the use of existing road prisms on non-system roads.[164] The Final EIS fails to explain the origin of these existing road prisms, particularly if they are remnants of previously decommissioned roads or rehabilitated temporary roads. Temporary and decommissioned roads are not meant to remain on the landscape for future use. To take the hard look NEPA requires, the Forest Service should provide the basis for the original decisions authorizing removal of these old, non-system roads. During the project, and for an additional 10 years after completion of the project, the temporary roads will continue to have very real impacts on the landscape, upwards of 30 years given the temporal scale of this project. For example, temporary roads will continue to allow for harassment of wildlife, littering, fires, invasive plant distribution, increased fire risk from vehicles and humans, and negative impacts to aquatic and riparian habitat, as well as the fish that depend on that habitat.

> ***Proposed Remedy***: The Forest Service must consider the effects of its proposal to use temporary roads when combined with the effects of its official road system. It must also consider how construction or reconstruction of temporary roads will detract from the purpose of subpart A of the agency's own rules, to "*identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of*

[161] South Sacramento Restoration Project Final EIS at 133.

[162] South Sacramento Restoration Project Final EIS at 363.

[163] See 36 C.F.R. § 212.5(b).

[164] South Sacramento Restoration Project Final EIS at 83, 312.

> *the National Forest System lands*."[165] This is especially a concern if the Forest Service fails to provide assurances that the proposed temporary roads will not in fact persist on the ground for 30 years. The Forest Service must set a timeframe for temporary road removal that ensures they will not cause long-term resource risks, and that rehabilitation treatments fully remove all road features.

The Forest Service must resolve conflicting temporary road removal directions, and address the presence of unauthorized roads.

Our comments urged the Forest Service to address our concerns regarding the length of time temporary roads may remain on the ground after construction since the Draft EIS ambiguously describes the project's temporal scale as lasting 10 – 20 years or more.[166] The Forest Service repeats this ambiguity in its draft decision stating, "The Forest Service will conduct restoration activities on approximately 140,000 acres in the southern Sacramento Mountains over the next 10 to 20 years to meet initial project objectives, with additional maintenance treatments beyond 20 years."[167]

The Final EIS and response to our comments did little to clarify how long temporary roads may persist on the ground or what actions the agency will implement to remove them. Consider the following statements:

> The Forest Service estimates that temporary roads used for the South Sacramento Restoration Project would be operational for 3 years or less in most cases.[168]
>
> All temporary roads would be decommissioned at the completion of the project. Decommissioning would return the road to more natural condition, removing culverts, grading to natural contours and revegetating with appropriate native seed mixes.[169]
>
> Temporary roads would be maintained as needed to complete project activities… Timber contractors typically have 15 days to close temporary roads after use. All decommissioning and site rehabilitation options could be considered to restore temporary roads. If access to the area is needed for follow-up treatments, such as prescribed fire, ***temporary*** and level 1 roads could be reopened and closed again following the second round of treatments.[170]
>
> Temporary roads shall be rehabilitated as soon as practical after they are no longer

[165] 36 C.F.R. § 212.5(b).

[166] Draft EIS at 43, ("…the Forest Service proposes to conduct restoration activities…over the next 10 to 20 years to meet initial project objectives, with additional maintenance treatments beyond 20 years.").

[167] South Sacramento Restoration Project Draft Decision at 1.

[168] South Sacramento Restoration Project Final EIS, Appendix C at C-45

[169] South Sacramento Restoration Project Draft Decision at 23.

[170] *Id.* at 25 (emphasis added)

needed for project implementation.[171]

> Temporary roads would be obliterated and rehabilitated after vegetation thinning, prescribed fire, and watershed restoration and site rehabilitation treatments are completed.[172]

> Temporary roads will be restored as part of the closing work. Remove any berm on the road edge that would hold or channel water. If compaction is evident, road will be ripped before seeding. Install water bars or similar to prevent water from following the decommissioned road. Seed areas of bare soil with certified, native plant rehabilitation mix. Slash may be pulled onto the road. Closure may be a berm, rocks, stumps, or similar barriers to block motorized access. Where temporary roads intersect existing roads or trails, native materials such as logs, slash, and/or boulders would be placed along the first 300 feet or along the line of sight, whichever is greater, to mask the presence of the road and discourage any additional motorized use.[173]

> Temporary roads would be obliterated and rehabilitated after vegetation thinning, prescribed fire, and watershed restoration and site rehabilitation treatments are completed.[174]

All together, these statements combine to say that a temporary roads are typically not needed after 3 years of operation, but may be closed and reused for as long as they are needed (up to 20 years given the length of the project), and that after use they may be obliterated, but may also just be restored to a more natural condition, which could leave the road bed intact. In other words, the Forest Service may leave a temporary road in place, in some kind of condition that allows for future use, for an indefinite period of time. Asserting then that these roads are in fact temporary is arbitrary and capricious, and failing to analyze their impacts over the life of the project, as we explained in our comments and herein in this objection, demonstrates a violation of NEPA.

In addition, we remain concerned about the use of unauthorized roads for temporary road construction as the agency explained:

> By using existing road prisms, disturbance from constructing temporary roads would be minimized on the landscape. These would be considered temporary roads and rehabilitated following implementation as described below. Any unauthorized routes that are not used for implementation would remain on the landscape unless rehabilitation is authorized under a separate NEPA decision.[175]

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[171] South Sacramento Restoration Project Final EIS at 111.

[172] *Id.* at 282.

[173] South Sacramento Restoration Project Final EIS at 112.

[174] South Sacramento Restoration Project, Soils and Watershed Resource Report at 39.

[175] South Sacramento Restoration Project Final EIS at 82.

The Forest Service appears to assert that unauthorized roads have sufficient intact existing road prisms that will preclude all the harmful effects of road construction, but the agency fails to provide evidence or analysis demonstrating unauthorized roads are in fact properly located, were originally built to Forest Service standards (and thus would need minimal ground disturbing activities), or would not require significant reconstruction. The agency provides no analysis, evidence or discussion to support such a conclusion.

The EIS fails to comply with NEPA due to over-reliance on Resource Protection Measures or Best Management Practices.

Rather than providing the requisite analysis necessary to demonstrate NEPA compliance, the Forest Service erroneously relies on best management practices or resource protection measures (RMPs) as a rationale for omitting proper analysis:

> However, the short-and long-term impacts to watershed resources due to the increased erosion and subsequent sedimentation of streams can be mitigated through proper design and maintenance, and the application of the designed resource protection measures (Appendix A).[176]
> --
> No short-or long-term adverse impacts are expected as the proposed action is implemented and the resource protection measures are followed (see Appendix A).[177]

Yet, the analysis fails to provide monitoring results or any other evidence to support these claims. Rather, the fact that so many watersheds are rated poor for roads/trails could illustrate a lack of effective past mitigation and maintenance. The Forest Service even suggests that road maintenance would improve watershed condition class rankings "from functioning impaired and at risk to a proper functioning condition, which is a desired condition of the project."[178] However, the analysis fails to disclose the changes in indicator scores or attribute rankings that would result from the project activities, which renders such conclusory remarks as arbitrary and capricious.

Given the lack of evidence or analysis demonstrating the success of the road-related resource protection measures, one must look at past Forest Service studies. Specifically, when considering how effective BMPs are at controlling nonpoint pollution on roads, both the rate of implementation, and their effectiveness should both be considered. The Forest Service tracked the rate of implementation and the relative effectiveness of BMPs from in-house audits. This information was summarized in the National BMP Monitoring Summary Report with the most recent data being the fiscal years 2013-2014.[179] The rating categories for implementation are

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[176] South Sacramento Restoration Project, Soils and Watershed Resource Report at 39-40.

[177] *Id.* at 42.

[178] *Id.*

[179] Carlson, J. P. Edwards, T. Ellsworth, and M. Eberle. 2015. National best management practices monitoring summary report. Program Phase-In Period Fiscal Years 2013-2014. USDA Forest Service. Washington, D.C.

"fully implemented," "mostly implemented," "marginally implemented," "not implemented," and "no BMPs." "No BMPs" represents a failure to consider BMPs in the planning process. More than a hundred evaluations on roads were conducted in FY2014. Of these evaluations, only about one third of the road BMPs were found to be "fully implemented." *Id.* at 12. The audit also rated the relative effectiveness of the BMP. The rating categories for effectiveness are "effective," "mostly effective," "marginally effective," and "not effective." "Effective" indicated there were no evident adverse impacts to water from projects or related activities. When treated roads were evaluated for effectiveness, almost half of the road BMPs were scored as either "marginally effective" or "not effective." *Id.* at 13.

Further, a technical report by the Forest Service entitled, "Effectiveness of Best Management Practices that Have Application to Forest Roads: A Literature Synthesis," summarized research and monitoring on the effectiveness of different BMP treatments for road construction, presence and use.[180] The report found that while several studies have concluded that some road BMPs are effective at reducing delivery of sediment to streams, the degree of each treatment has not been rigorously evaluated. Few road BMPs have been evaluated under a variety of conditions, and much more research is needed to determine the site-specific suitability of different BMPs.[181] The study cites several reasons for why BMPs may not be as effective as commonly thought. Most watershed-scale studies are short-term and do not account for variation over time, sediment measurements taken at the mouth of a watershed do not account for in-channel sediment storage and lag times, and it is impossible to measure the impact of individual BMPs when taken at the watershed scale. When individual BMPs are examined there is rarely broad-scale testing in different geologic, topographic, physiological, and climatic conditions. Further, the researchers observed, "[t]he similarity of forest road BMPs used in many different states' forestry BMP manuals and handbooks suggests a degree of confidence validation that may not be justified," because they rely on just a single study. *Id.* at 133. Therefore, ensuring BMP effectiveness would require matching the site conditions found in that single study, a factor land managers rarely consider.

Climate change will further put into question the effectiveness of many road BMPs.[182] While the impacts of climate will vary from region to region, more extreme weather is expected across the country which will increase the frequency of flooding, soil erosion, stream channel erosion, and variability of streamflow.[183] BMPs designed to limit erosion and stream sediment for current weather conditions may not be effective in the future. The researchers explained that "[m]ore-intense events, more frequent events, and longer duration events that accompany climate change may demonstrate that BMPs perform even more poorly in these situations. Research is urgently

[180] Edwards, P.J., F. Wood, and R. L. Quinlivan. 2016. Effectiveness of best management practices that have application to forest roads: a literature synthesis. General Technical Report NRS-163. Parsons, WV: U.S. Department of Agriculture, Forest Service, Northern Research Station. 171 p.

[181] *Id.*

[182] *Id.*

[183] Furniss, M.J.; Staab, B.P.; Hazelhurst, S.; Clifton, C.F.; Roby, K.B.; Ilhardt, B.L.; Larry, E.B.; Todd, A.H.; Reid, L.M.; Hines, S.J.; Bennett, K.A.; Luce, C.H.; Edwards, P.J. 2010. Water, climate change, and forests: watershed stewardship for a changing climate. Gen. Tech. Rep. PNW-812. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 75 p.

needed to identify BMP weaknesses under extreme events so that refinements, modifications, and development of BMPs do not lag behind the need."[184] Significant uncertainties persist about BMP or resource protection measures effectiveness as a result of climate change, compounded by the inconsistencies revealed by BMP evaluations, which suggests that the Forest Service cannot simply rely on them to mitigate project-level activities. This is especially relevant where the Forest Service (as it did here) relied on the use of resource protections measures instead of fully analyzing potentially harmful environmental consequences from road design, location, construction, use and maintenance.

It would be arbitrary and capricious for the Forest Service to assume 100 percent or even 80 - 90 percent proper BMP implementation and effectiveness as a rationale for not conducting proper environmental analysis, particularly for omitting any quantitative measure of sediment delivery to waterways, especially those that are impaired due to sedimentation and turbidity. Moreso, the Forest Service must demonstrate how BMP effectiveness will be maintained in the long term, especially given the lack of adequate road maintenance capacity, which is a serious omission given the agency has inadequate funding and often prioritizes roads open to passenger vehicles for annual maintenance.[185]

ii. Road Impacts to Mexican Spotted Owl

The Forest Service failed to provide the requisite site-specific analysis of the direct, indirect and cumulative effects from current road and trail conditions, and the proposed road management activities on the Mexican spotted owl and the New Mexico meadow jumping mouse. Much of this failure stems from the omission in the EIS of specific information related to the use of existing system roads and the proposed construction of new roads (specified and temporary), as well as skid trails.

The project area contains 43,400 acres within MSO Protected Activity Centers and 111,774 acres of MSO critical habitat.[186] Yet, the analysis lacks a complete map illustrating the current or proposed transportation system, or the location of temporary roads and skid trails. As we previously noted, the proposed action may utilize approximately 240 miles of existing and new roads, with an unspecified number of temporary and skid roads, yet the analysis fails to show the location of these roads in relation to MSO PACs or critical habitat.

The 2012 Mexican spotted owl Recovery Plan states that "*Construction of roads and trails can indirectly affect Mexican spotted owls through loss and fragmentation of habitat*," and "*on a local scale, roads and trails through PACs may fragment habitat continuity, alter natural*

[184] *Id.* at 136.

[185] See Lincoln National Forest Assessment Report, Volume 1 at 315. See also, Lincoln National Forest Travel Analysis Report 2008 at 25, Table 4-6 (stating, the "Forest Service budget can only support 9% of the road system.").

[186] South Sacramento Restoration Project Final EIS at 290, 291.

movement patterns, and increase disturbance to resident owls."[187] "*Roads in nest/roost, forested, and riparian recovery habitat may also result in loss of habitat components*," and, "*in sensitive riparian areas, roads and trail can inhibit hydrological processes that affect proper functioning ecological conditions*."[188] The Draft EIS fails to identify if the project area, or those adjacent to it, contain any riparian recovery habitat, which "*consists of riparian forests outside of PACs that could frequently be used by owls for foraging, roosting, daily movements, dispersal, and potentially for nesting. Riparian Recovery Habitat is considered to be a key habitat for owl recovery*."[189] The Final EIS fails to demonstrate that the proposed road system would not cause short or long-term effects on spotted owls.

The 2012 Mexican spotted owl Recovery Plan recommends against any new road or trail construction in PACs.[190] Nonetheless, the SSRP disregards this recommendation and proposes to construct an unspecified number, mileage, and location of temporary roads within MSO PACs and recovery habitat.[191] The Final EIS acknowledges the potential impacts to MSO as a result of road mainetneace, construction, and use. [192] However, the EIS fails to address the potential for habitat loss and fragmentation from new road construction, and it lacks sufficient analysis of movement pattern alterations and increased disturbance from road construction and use. The Final EIS states that, "*Forest Service would close out and rehabilitate these roads following completion of restoration activities*." [193] Such a statement assumes public closure and rehabilitation will be effective in preventing unauthorized use of closed roads absent the requisite supporting analysis and demonstration of the Forest Service's successful enforcement history and future capacity to prevent unauthorized use.

Our observations on the Lincoln National Forest indicate chronic and systemic use of closed or temporary roads by OHVs. For example, recently the Smokey Bear Ranger District invited pre-scoping comments for developing a proposal for managing recreation around the Hale Lake Area.[194] In that document the Lincoln National Forest stated that:

> • A recent inventory and mapping of the area shows that there are over 50 miles of user created/unauthorized roads and trails being used, which, in some places, can contribute to watershed and habitat degradation through increased sedimentation and vegetation loss.

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[187] U.S. Fish and Wildlife Service. 2012. Final Recovery Plan for the Mexican Spotted Owl (Strix occidentalis lucida), First Revision. U.S. Fish and Wildlife Service. Albuquerque, New Mexico, USA. At 45.

[188] *Id.*

[189] *Id.* at 270.

[190] *Id.* at 274, Table C.1.

[191] South Sacramento Restoration Project Final EIS at 301.

[192] South Sacramento Restoration Project Final EIS at 301.

[193] South Sacramento Restoration Project Final EIS at 301.

[194] USFS. 2019. Hale Lake management scoping document.

• The inventory also showed that about 75 miles of system roads that were either decommissioned or intended for administrative use only are also being used by motor vehicles.

While this example is north of the South Sacramento Restoration Project, we suspect that a similar situation exists on the Sacramento Ranger District. The EIS fails to identify baseline conditions on system and user-created roads that would allow for a more precise comparison.

The Final EIS states that "…*resource protection measures (Road-15, Wildlife-11) are in place to help minimize impacts to individual and local populations during road management activities*."[195] Yet, these measures still allow road and trail use, construction and maintenance within PACs and nest cores, even during breeding season with USFWS approval, all of which have the potential to fragment MSO habitat, alter natural movement patterns and increase disturbance to resident owls.

In addition, the Final EIS fails to account for the adverse effects from the construction, use and persistence of temporary roads, which provide opportunities for unauthorized use, as well as can fragment MSO habitat. Rather, the resource protection measure Road-15 simply states, "[t]*emporary roads shall be rehabilitated as soon as practical after they are no longer needed for project implementation*."[196] Such vague language potentially allows temporary roads to remain in place during the entire length of the project, which the Final EIS fails to address in its MSO analysis. Overall, the Final EIS fails to provide the site-specific analysis necessary to make any determinations in regards to road management activities and their effect on MSO PACs, nest cores, critical habitat, riparian recovery zones or on individuals.

> ***Proposed Remedy***: The Forest Service should disclose the precise location of existing and new temporary roads that will be needed to implement the project and analyze the impacts of those roads with respect to MSO PACs, nest cores, critical habitat, riparian recovery zones or on individual owls.

iv. The Draft EIS Fails to Disclose the Impacts of Logging Roads, Machinery, or Associated Logging Site Preparation to New Mexico Meadow Jumping Mouse.

Many of the same flaws with the Mexican spotted owl analysis apply to the New Mexico meadow jumping mouse analysis. The EIS shows there is approximately 1,082 acres of New Mexico meadow jumping mouse critical habitat within the project area, and it does provide a map illustrating the location of four recovery areas.[197]

The Biological Evaluation proposes to apply a buffer around occupied sites.

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[195] South Sacramento Restoration Project Final EIS at 291.

[196] South Sacramento Restoration Project Final EIS at 111.

[197] South Sacramento Restoration Project Final EIS at 294, 295.

> If any individuals of this species are found within any planned treatment area, all occupied sites will be protected by at least a 200-foot buffer, in addition to any other protection measures that may be needed to protect all individuals of this species from all types of treatment activities. [198]

The Final EIS does not include the 200-foot buffer in its design features. Instead, the Final EIS proposes to apply a 100-foot buffer, or farther, if necessary to extend to the edge of the riparian-upland forest ecotone.

> In New Mexico meadow jumping mouse critical habitat, follow the most current species recovery plan. Where the 100-foot aquatic management zone buffer (as defined in SOP-7) does not fully encompass New Mexico meadow jumping mouse critical habitat, extend the buffer in 50-foot increments to encompass the riparian-upland forest ecotone. [Note: The 100-foot aquatic management zone buffer is not intended to always encompass all the area designated as critical habitat; it is intended to encompass riparian vegetation as well as upland vegetation that may be required by the jumping mouse for all life history needs.][199]

However, the Final EIS fails to show the location of current roads and trails, or those under the proposed action, in relation to these areas. The EIS does not analyze the amount of critical habitat lost from new road and trails construction, yet arbitrarily asserts there will be no direct impacts to critical habitat from road management activities.[200]

"*Individual jumping mice need intact upland areas that are up gradient and beyond the floodplain of rivers and streams and adjacent to riparian wetland areas because this is where they build nests or use burrows to give birth to young in the summer and to hibernate over the winter*."[201] The Lincoln National Forest has previously stated that "*NMMJM utilizes riparian areas and nearby upland habitat. Riparian habitat is used for foraging and upland habitat is used for nesting. The downward decline of NMMJM indicates a problem with the habitat it relies upon, in this case riparian habitat*."[202]

The EIS does not disclose where and how logging roads or equipment would cross riparian areas which are the jumping mouse's required habitat, nor does it disclose the use of adjacent uplands. Any direct impact to these areas represents a dramatic reduction in the likelihood for species recovery and should be avoided. "*Currently unsuitable habitat that is adjacent to … where the jumping mouse has been located since 2005, needs to be protected and restored along streams,*

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[198] South Sacramento Restoration Project Biological Evaluation at 73.

[199] South Sacramento Restoration Project Final EIS at 120.

[200] South Sacramento Restoration Project Final EIS at 313.

[201] USDI Fish and Wildlife Service. 2014. Recovery Outline: New Mexico Meadow Jumping Mouse. N.M. Ecological Services Field Office, Albuquerque, New Mexico: p. 5.

[202] Lincoln National Forest Scoping Letter for the New Mexico Meadow Jumping Mouse (NMMJM) Habitat Improvement Project on the Agua Chiquita Grazing Allotment, dated August 2, 2017.

ditches, and canals to provide about 9 to 24 km (5.6 to 15 mi) including about 27.5 to 73.2 ha (68 to 181 ac) of continuous suitable habitat to support high levels of population viability."[203]

The analysis does acknowledge individual New Mexico meadow jumping mouse are, "…*likely to flee and may change behavior to avoid noise and ground-disturbing activities*."[204] The Draft EIS also recognizes, "*it is possible that direct effects on the New Mexico meadow jumping mouse may still occur because treatment activities during hibernation may disturb hibernating New Mexico meadow jumping mice*."[205] Further, the Draft EIS acknowledges road management activities have the potential to displace the New Mexico meadow jumping mouse, but then asserts individuals, "… *may be able to move to other parts of riparian habitat to avoid disturbance associated with the management of roads*."[206] However, the Draft EIS fails to discuss, analyze or provide any evidence to show the availability of suitable habitat in which the New Mexico meadow jumping mouse may find refuge. This is especially concerning given the limited availability of critical habitat, and the fact that the species, "*is a habitat specialist (Frey 2006). It nests in dry soils, but uses moist, streamside, dense riparian/wetland vegetation up to an elevation of about 8,000 feet (Frey 2006).*"[207]

The Final EIS fails to show where the New Mexico meadow jumping mouse may move to avoid disturbances from road construction or use, and the analysis lacks any discussion on the amount of critical habitat that may be lost to road management activities. In addition, the Draft EIS fails to address how the proposed action will affect connectivity, which is essential for the recovery of the species. "*Connectivity of habitat facilitates movement of jumping mice by providing cover while foraging or exploring for mates and promotes dispersal to new sites*."[208] The USFWS recovery outlines states, "[t]*o address the current status of the mouse and work toward long-term viability and recovery of the subspecies, recovery efforts should preferentially focus on restoring habitats and increasing the connectivity among suitable areas*."[209] This emphasis on restoring and connecting suitable areas is an issue the Final EIS fails to address.

> ***Proposed Remedy***: The Forest Service should identify roads that potentially intersect jumping mouse movement from riparian to upland habitat, and should restrict use of those roads during the summer months when jumping mice are active.

[203] USDI Fish and Wildlife Service. 2014. Recovery Outline: New Mexico Meadow Jumping Mouse. N.M. Ecological Services Field Office, Albuquerque, New Mexico at page 10.

[204] South Sacramento Restoration Project Draft EIS at 301.

[205] South Sacramento Restoration Project Draft EIS at 301.

[206] South Sacramento Restoration Project Draft EIS at 301.

[207] South Sacramento Restoration Project Draft EIS at 285.

[208] Recovery Outline, New Mexico Meadow Jumping Mouse (*Zapus hudsonius luteus*) U.S. Fish and Wildlife Service New Mexico Ecological Services Field Office, June 2014 at 5.

[209] Recovery Outline, New Mexico Meadow Jumping Mouse (*Zapus hudsonius luteus*) U.S. Fish and Wildlife Service New Mexico Ecological Services Field Office, June 2014 at 8.

v. The EIS fails to analyze, discuss, or mitigate effects relating to the unavailability of implementation capacity

The Forest Service's preferred alternative includes extensive thinning and logging whose implementation is predicated entirely upon the availability of private industrial logging capacity that, to our understanding, does not exist, and may not exist in the future.

The EIS violates NEPA by failing to adequately analyze, discuss, or disclose how the lack of available logging capacity would preclude project implementation, and it fails to analyze, discuss, or disclose the direct, indirect, and cumulative effects of that non-implementation.

The lack of available thinning and logging capacity further renders the EIS and ROD, insofar as they are predicated on project implementation, arbitrary and capacious.

Further, and related to the Forest Service's failure to analyze an adequate range of alternatives discussed in the section immediately following, the EIS provides no analysis or discussion of contingencies for implementation given the unavailability of private industrial logging capacity. Providing analysis of such contingencies in part motivated the Center;s scoping comments, where we urged the Forest Service to "*prescribe site-specific vegetation treatments"* which are "*efficiently located and prioritized to support fire use in the long-term*" so that "*restoration in the full range of cover types can be accomplished with the use of fire alone, particularly in areas where infrastructure is least developed*." This does not say that restoration across all acres should be by fire alone, but rather that "*restoration in the full range of cover types*" can be accomplished with fire, supported by a "*coherent restoration strategy*".

Lack of implementation capacity is not hypothetical. Other forest restoration projects in Region 3 have languished for years without implementation following NEPA decisions that falsely planned on private logging capacity. For example, stand-replacing fire burned nearly all of the Jack Smith-Schultz project area near Flagstaff before it was thinned.

> ***Proposed Remedy***: The EIS must analyze, disclose, and discuss effects relating to the lack of industrial logging capacity available to implement the preferred alternative and, in turn, the effects of failing to implement the preferred alternative. See also remedies discussed in the following section relating to alternative analysis.

IV. THE FINAL EIS FAILS TO ANALYZE A RANGE OF REASONABLE ALTERNATIVES.

A. NEPA Mandates That Agencies Analyze All Reasonable Alternatives.

When federal agencies prepare an EIS, NEPA requires that they take a "*hard look*" at the project's environmental impacts and the information relevant to its decision.[210] In taking the required "*hard look*," an EIS must "*study, develop, and describe*" reasonable alternatives to the

[210] *Wyoming v. U.S. Dep't of Agriculture*, 661 F.3d 1209, 1237 (10th Cir. 2011).

proposed action.[211] The alternatives analysis "*is the heart of the environmental impact statement*."[212]

As a result, "[*t*]*o comply with the National Environmental Policy Act and its implementing regulations,* [agencies] *are required to rigorously explore* <u>*all*</u> *reasonable alternatives ... and give each alternative substantial treatment in the environmental impact statement*."[213] "*Without substantive, comparative environmental impact information regarding other possible courses of action, the ability of an EIS to inform agency deliberation and facilitate public involvement would be greatly degraded*."[214]

When a federal agency prepares an EIS, it must consider "*a reasonable range of alternatives*" which are consistent with its stated purpose and need.[215] An agency may dismiss a reasonable alternative if it is not "*significantly distinguishable from the alternatives already considered.*"[216]

The Final EIS considers only two alternatives: the "no action" alternative, and the Forest Service's proposed action. These studied alternatives do not represent a range of reasonable alternatives which would accommodate the agency's stated purpose and need. The agency should consider at least one more alternative in order to comply with NEPA's alternatives mandates.

i. HFRA Mandates Analysis of an Additional Action Alternative Proposed During Scoping which Meets the Purpose and Need.

HFRA Sec. 104 establishes that "*the Secretary shall study, develop, and describe ... an additional action alternative, if the additional alternative ... (i) is proposed during scoping or the collaborative process under subsection (f); and (ii) meets the purpose and need of the project, in accordance with regulations promulgated by the Council on Environmental Quality*."[217]

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[211] 42 U.S.C. §§ 4332(2)(F); 4332(2)(C)(iii).

[212] *All Indian Pueblo Council v. United States*, 975 F.2d 1437, 1444 (10th Cir. 1992).

[213] *Custer County Action Ass'n v. Garvey*, 256 F.3d 1024, 1039 (10th Cir. 2001) (emphasis added). *See also New Mexico ex rel. Richardson v. Bureau of Land Management*, 565 F.3d 683, 703 (10th Cir. 2009) ("[A]n EIS must rigorously explore and objectively evaluate all reasonable alternatives to a proposed action, in order to compare the environmental impacts of all available courses of action."); *Colo. Envtl. Coalition v. Dombeck*, 185 F.3d 1162, 1174 (10th Cir. 1999) (explaining reasonable alternatives).

[214] *New Mexico ex rel. Richardson*, 565 F.3d at 708.

[215] 42 U.S.C. § 4332(2)(C)(iii). *See also Colorado Environmental Coal. v. Salazar,* 875 F. Supp. 2d 1233, 1245 (D. Colo. 2012) (stating that the agency's objectives dictate the range of reasonable alternatives).

[216] *Colorado Environmental Coal. v. Salazar,* 875 F. Supp. 2d at 1245 (quoting *New Mexico ex rel. Richardson,* 565 F.3d 683, 708-09 (10th Cir. 2009)).

[217] 16 U.S.C. § 6514(c).

ii. The Center Proposed Elements of an Action Alternative Which the Forest Service Chose Not to Analyze.

There is significant value in offering a range of alternatives for comparison, particularly in the context of forest restoration, where the imperative to maximize the efficiency and pace of implementation is so critical to safely restoring fire, and reducing fire risk, at landscape scales. The NEPA implementing regulations refer to the selection and review of alternatives as "*the heart*" of the environmental impact statement.[218] NEPA requires that a range of meaningful alternatives be explored in the environmental review process.[219] The comparison of the alternatives helps to "*sharply defin*[e] *the issues and provid*[e] *a clear basis for choice among options by the decision maker and the public.*"[220]

The Center offered two alternatives in scoping. The first was considered briefly but eliminated from further study. The Center suggested that the "*EIS should consider an Alternative whereby treatments across the project area should be designed to meet habitat requirements of the owl, and reduce or eliminate thinning within owl PAC's*." The Draft EIS determined that "*this proposed alternative would not meet various elements of the purpose and need*."[221]

The Draft EIS entirely missed the second alternative proposed by the Center, another recommendation that is distinct from the first that the Forest Service rejected, and distinct from the agency's preferred alternative.

In scoping, the Center stated that:

> "*A coherent restoration strategy will* ***identify opportunities to use fire at landscape and watershed scales, and then prescribe site-specific vegetation treatments that support the strategy*** *… It is critical that the EIS broaden the projects purpose and scope* ***to include strategically planned process-centered thinning treatments which will allow for expanded use of prescribed and natural fires in both spatial and temporal scales*** *(per Falk, 2006; Peterson & Johnson, 2007). The Center has repeatedly commented to the Forest Service in the context of similar projects that it is necessary to inform proposed actions with landscape-scale assessment of opportunities to manage unplanned natural ignitions for resource benefits.* ***Vegetation treatments must be efficiently located and prioritized to support fire use in the long-term****. We expect the Forest Service to supply in the EIS reasons why the location, timing and intensity of proposed actions will support a coherent restoration strategy. …* ***As such, the EIS should assess the viability of, and prepare elements of an Alternative wherein,***

[218] FSH 1905.15 – Ch. 20.

[219] 42 U.S.C. § 4332(C)(iii).

[220] FSH 1905.15 – Ch. 20 § 23.3 (5).

[221] South Sacramento Restoration Project Draft EIS at 111.

restoration in the full range of cover types can be accomplished with the use of fire alone, particularly in areas where infrastructure is least developed."[222]

This proposed alternative does not suggest prescribed fire as the sole tool in the toolbox to the exclusion of all mechanical intervention, but rather to "*prescribe site-specific vegetation treatments"* which are "*efficiently located and prioritized to support fire use in the long-term*" so that "*restoration in the full range of cover types can be accomplished with the use of fire alone, particularly in areas where infrastructure is least developed*." This does not say that restoration across all acres should be by fire alone, but rather that "*restoration in the full range of cover types*" can be accomplished with fire, supported by a "*coherent restoration strategy*".

Because thinning is time consuming and expensive, it should be designed and deployed strategically; it should be maximally efficient, in the pace and extent of implementation, at maximizing the pace and scale of fire applications in the project area. But the EIS lacks any coherent strategy or analysis describing how the location, sequence, and timing of thinning and logging will facilitate *and maximize* the pace, efficiency, and scale of safely restoring ecologically beneficial at landscape scales—which is a core, implicit purpose of the proposed action. Such a haphazard, undeveloped approach is every bit as unlikely to accomplish the project purpose as would be the alternative eliminated from study.

The Forest Service should disclose for public consideration and analyze the second alternative the Center proposed, incorporating the issues refined in this comment to flesh out more details of a reasonable alternative that avoids significant cumulative effects. The analysis of an additional alternative is critical as it ensures that the Forest Service does not "*prematurely foreclose options that might protect, restore, and enhance the environment.*"[223] To that end, we offered a refinement of our suggested alternative, which we called the Strategic Treatments for Fire Use Alternative.

> ***Proposed Remedies*:** Treatments should be strategically placed and prioritized temporally to efficiently facilitate restoration of fire regimes and reduction of fire risk.
>
> Treatment prescriptions should be based on site-specific reference conditions.
>
> The Project should utilize low impact techniques, without logging on slopes over 40% and without the construction of 125 miles of new roads.
>
> The Project should preserve old or large trees except under clearly defined exceptions that include requirements to remove the smallest number of large trees necessary to achieve the least intensive prescription.

[222] Letter from Center for Biological Diversity to Lincoln National Forest, May 8, 2017. Submitted with previous comments.

[223] FSH 1905.15 Ch. 20 § 14.

V. THE FOREST SERVICE'S RELIANCE ON UNDEFINED MONITORING AND ADAPTIVE MANAGEMENT PLANS VIOLATES NEPA, THE ESA, AND NFMA.

Science-based adaptive management involves "*treating management interventions as experiments, the outcomes of which are monitored and fed back into management planning.*"[224] We are pleased to see that a management action as risky as the South Sacramento Restoration Project seeks to incorporate a well-designed adaptive management and monitoring component. However, much is missing. Essentially, as outlined by land management experts, an adaptive management approach to forest management should include the following:[225]

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

It is clear in the Draft EIS that the Forest Service has an action alternative in mind, and it is clear that there is a willingness to implement the action. But the latter two components appear completely lacking. Forest Service experts in adaptive management have said that "[a]*daptive management requires explicit designs that specify problem-framing and problem-solving processes, documentation and monitoring protocols, roles, relationships, and responsibilities, and assessment and evaluation processes*."[226] These details are nowhere to be found.

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

> "*The term trigger, as used here, is a type of pre-negotiated commitment made by an agency within an adaptive management or mitigation framework specifying what actions will be taken if monitoring information shows x or y. In other words, predetermined decisions, or more general courses of action, are built into an adaptive framework from the beginning of the process.*"[227]

The literature cited here is clear in calling for detail and specifics, not ambiguity and vagueness. We are deeply concerned that the adaptive management and monitoring components of the Final EIS are severely lacking in details and specifics of what exactly would be monitored, when it would happen, under what framework, and what if any triggers exist. This comes as a surprise

[224] Gillson, L., T.P. Dawson, S. Jack, and M.A. McGeoch. 2013. Accommodating climate change contingencies in conservation strategy. Trends in Ecology & Evolution 28(3): 135-142.

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

[226] Page 58 in Stankey, G.H., R.N. Clark, and B.T. Bormann. 2005. Adaptive management of natural resources: theory, concepts, and management institutions. Gen. Tech. Rep. PNW-GTR-654. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 73 p.

[227] Id. at 455

given the amount of attention throughout the life of this project to an experimental framework regarding treatments within MSO PACs. Our concerns are explained below.

A. The Forest Service relies on "adaptive management" and mitigation measures to ensure that the project meets "desired conditions."

"Adaptive management" is an iterative process by which a decisionmaker sets clearly defined and measurable goals, conducts monitoring to assess whether they are being met, and then makes appropriate management changes where the desired outcomes are not being achieved.[228]

The EIS asserts that the Forest Service will apply an adaptive management approach, together with monitoring to "ensure management objectives are met at a both the site-specific and landscape scales."[229]

Monitoring is the necessary predicate to adaptive management because "*monitoring results would be documented and reviewed to determine whether adjustments in design features should be made to maintain or improve resource conditions*."[230]

Adaptive management is instrumental in achieving goals related to fire. "*Over time and through repeated fire occurrence and adaptive management, fire regimes would be reduced to a lower condition class across the ecological response units, with less departure from historic conditions*."[231] Adaptive management would also be used to establish prescriptions – the when, where, and how – for prescribed fire "*so that fire intensity is carefully managed to meet desired conditions characteristic of a mixed-severity fire regime*."[232] Such management would also be "*implemented to improve treatment effectiveness*" of broadcast burning, and to ensure that prescribed fire prescriptions "*are resulting in desired effects*."[233]

The Final EIS states that "[a]*daptive management would be applied to ensure that treatments are moving*" numerous forest types "*closer to desired conditions*."[234]

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[228] *See, e.g.*, U.S. Dep't of the Interior, Coordinating Adaptive Management and National Environmental Policy Act (NEPA) Processes (Jan. 7, 2013), available at https://www.doi.gov/sites/doi.opengov.ibmcloud.com/files/uploads/ESM13-11.pdf.

[229] South Sacramento Restoration Project Final EIS at 86.

[230] South Sacramento Restoration Project Final EIS at 168 (emphasis added).

[231] South Sacramento Restoration Project Final EIS at 155.

[232] South Sacramento Restoration Project Final EIS at 168.

[233] South Sacramento Restoration Project Final EIS at 176, 192; see also FEIS at 176 ("The continued application of broadcast burning, and the use of adaptive management concepts to improve treatment effectiveness, would result in long-term (decades) benefits"); *id*. at 184 (same re: broadcast burning).

[234] South Sacramento Restoration Project Final EIS at 168 (re: "moving Mixed Conifer with Aspen forests closer to desired conditions"); *id*. at 171 (re: "moving Montane Subalpine Grassland closer to desired conditions"); *id*. at 177 (re: "moving Mixed Conifer-Frequent Fire forests closer to desired conditions"); *id*. at 184 (re: "moving ponderosa pine forests closer to desired conditions"); *id*. at 192 (re: "moving pinyon-juniper communities closer to desired conditions").

The Final EIS also acknowledges that without adaptive management, some of its proposed actions would result in a failure to meet those conditions. For example, herbicide treatments "*would require long-term maintenance (every 2 to 3 years over the life of the project) and adaptive management to be successful in the long term*."[235]

In sum, the EIS explains that adaptive management is critical to undertaking and minimizing the project's impacts and to ensuring that the Forest Service complies with the ESA. Because adaptive management is necessary to ensure that the project will move the project area's forests toward desired conditions, adaptive management is also necessary to ensure that the Forest Service complies with the Lincoln National Forest Plan and the National Forest Management Act.

B. The Forest Service Fails to Define a Monitoring Plan or an Adaptive Management Plan.

The EIS refers to an adaptive management program to modify treatments in MSO PACs.

> *As part of the South Sacramento Restoration Project, the Forest Service will implement a management experiment within Mexican spotted owl protected activity centers. The purpose of the management experiment is to determine, through monitoring, how our treatments in protected activity centers will affect owl occupancy and reproduction, and how we can work through adaptive management to modify our treatments to meet desired conditions referred to in the Mexican Spotted Owl Recovery Plan (U.S. U.S. Fish and Wildlife Service 2012).*[236]

That adaptive management plan, in turn, refers to Appendix B of the Biological Opinion, which describes the proposed monitoring plan for activities within PACs.[237]

However, neither the EIS nor the Biological Opinion contain an adaptive management plan. Instead, the EIS refers to a collaborative group, to be formed at a later date, to develop an adaptive management plan. "*The collaborative group provides the structure that would be used during project implementation, including the development and application of adaptive management and monitoring protocols*."[238] The EIS states that this adaptive management process would determine if the resource protection measures identified in the Final EIS are minimizing impacts as expected. "*Adaptive management relies on monitoring to determine if treatments and prescriptions met or moved toward desired conditions; if resource protection measures were adequate to minimize impacts; or if changes in implementation are necessary to meet project objectives.*"[239]

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[235] South Sacramento Restoration Project Final EIS at 193.

[236] South Sacramento Restoration Project Final EIS at 58.

[237] Biological Opinion at 72 to 90. Appendix B- South Sacramento Restoration Project Mexican Spotted Owl Management Experiment Monitoring Plan.

[238] South Sacramento Restoration Project Final EIS at 90.

[239] South Sacramento Restoration Project Final EIS at 86.

Furthermore, the EIS catalogues a number of questions that the collaborative group would consider. Many of these questions indicate that the Forest Service does not yet know the impacts of the proposed project.

> ***The effectiveness of treatments at meeting the project purpose and need, and desired conditions (broadscale and long-term trends):***
>
> *• How effective are restoration treatments in reducing wildfire risk?*
>
> *• How effective are restoration treatments in shifting forest structure, composition, and diversity toward desired conditions within historic (or natural) range of variability for each ecological response unit?*
>
> ***The effectiveness of treatments and resource protection measures, and compliance with project requirements (short to mid-term timescales):***
>
> *• What are the effects of restoration treatments on ladder fuels, and fuel loading pre/post treatments?*
>
> *• What are the effects of restoration treatments on tree survival/mortality by diameter class?*
>
> *• How well are treatments achieving desired conditions on the landscape?*
>
> *• What are the effects of restoration treatments on focal species habitat across the SSRP project area?*
>
> *• How are restoration treatments impacting ground vegetation and soils?*
>
> *• How are restoration treatments impacting forest users, area residents, businesses, and communities via nuisance noise, smoke, restricted area access to system roads and trails, and altered traffic patterns?*
>
> *• Is the collaborative adaptive management process functioning as it was originally intended/expected by participants?*
>
> ***The effectiveness of resource protection measures and other project design features in limiting adverse resource impacts to specific resources where we have the greatest risks during treatment (short to mid-term timescales):***
>
> *• Did treatments within occupied protected activity centers during the breeding season disrupt critical life functions for the Mexican spotted owl?*
>
> *• What are the site-specific effects of restoration treatments on ladies' tresses orchid and tall milkvetch habitat within a project area?*
>
> *• What are the effects of project activities on water quality at stream crossings and within aquatic management zones?*
>
> *• Are Forest Plan standards and guidelines being followed?*
>
> ***The collaborative group would develop a set of refined monitoring questions and monitoring protocols for the entire South Sacramento Restoration Project within this framework prior to implementation. The following components would be defined for each monitoring question developed by the group:***

• Uncertainties: Regarding the potential impacts or outcomes from implementing the project or doubts on the effectiveness of resource protection measures.

• Risk: Probability and consequences of bad outcome with and without the mitigation, treatment, etc.

• Resource Management Objectives: Concrete, measurable outcomes.

• Study Populations and Sites: To be determined based on scientific methods.

• Indicators and Measures: Variable(s) measured during monitoring that would show the level of effectiveness or impacts occurring.

• Monitoring methods: Ways to assess changes in resource conditions.

• Monitoring frequency: Time period where adverse changes in resource conditions can be detected and management actions can be implemented to minimize impacts; may include how often and/or how long monitoring should occur to determine if significant adverse impacts could occur or are not likely to occur.

Management trigger or threshold: Specific point or range of values that if reached, would indicate a sustained or irreversible trajectory in resource condition. Alternative management activities may be warranted at this point before significant resource damage occurs (dependent on resource and scale). Must be able to distinguish if impacts are resulting from project activities or from other influences.

• Adaptive Management Options: In general, adaptive management options could range from modifying treatment prescriptions; selecting a different treatment action from the "toolbox;" developing additional resource protection measures to minimize resource impacts; or deferring treatment activities in the area.

• Personnel and Costs: Funding and personnel support needed to complete the proposed monitoring."[240]

C. Reliance on Vague Monitoring or Adaptive Management Plans Violates NEPA, the ESA, and NFMA.

Federal courts have found agencies violated NEPA or the ESA where, like the Forest Service here, the agency relies on an "adaptive management" plan that is too vague, sets no specific triggers for future action, fails to describe that future action, and fails to ensure that resource will be protected as the adaptive management plan asserts. Reliance on the adaptive management plan to achieve desired conditions also appears to violate the National Forest Management Act because amendments to the Forest Plan will not ensure the protection of values identified in the 2012 forest planning rule. Here, the Forest Service has come up with little more than a plan to develop a plan, something that clearly cannot be predicted to mitigate specific impacts, nor can the Forest Service disclose the impacts of such a plan for a plan because it cannot know what the plan is.

In *Natural Resources Defense Council v. U.S. Army Corps of Engineers*, 457 F. Supp. 2d 198 (S.D.N.Y. 2006), the court found that the Army Corps attempt to supplement an inadequately-

[240] South Sacramento Restoration Project Final EIS at 89.

explained finding of no significant impact concerning a dredging project was arbitrary and capricious where the agency relied on ill-defined "adaptive management" protocols to conclude that impacts would be mitigated.

> "*The EA makes several promises that it will alter its monitoring plan should it prove necessary. For example, the EA relies on a general promise that it will "as appropriate, reevaluate, the need for altering its dredging methods" ... through the use of its coordination plan and monitoring program. The EA also explains that the Corps will follow "adaptive management practices as it moves through construction of its contracts," thus allowing it to change future contracts should the data indicate it is necessary. These promises, however, provide no assurance as to the efficacy of the mitigation measures. The Corps did not provide a proposal for monitoring how effective "adaptive management" would be*."[241]

Similarly, the Forest Service here does not disclose what adaptive management measures it intends to adopt, how such measures might mitigate the project's impacts, or what the impacts could be absent adoption of those measures. Any Forest Service reliance on the adaptive management plan here would similarly be arbitrary and capricious.

Mountaineers v. United States Forest Service, 445 F. Supp. 2d 1235 (W.D. Wash. 2006) set aside a Forest Service decision to open motor vehicles trails where the agency proposed to monitor impacts to wildlife and potentially change the trails later based on an adaptive management plan. The court stated that these adaptive management strategies "*amount ... to a 'build-first, study later' approach to resource management. This backward-looking decision making is not what NEPA contemplates*."[242] Similarly, the Forest Service here proposes to review the impacts of its experimental and potentially damaging logging proposals in Mexican spotted owl habitat after those treatments have been approved and while they are underway via its vague adaptive management plan, an approach that violates NEPA.[243] Other cases similarly conclude that NEPA forbids the use of ill-defined adaptive management plans cannot be used to assume away likely impacts of agency action.[244]

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[241] *NRDC v. United States Army Corps of Eng'rs*, 457 F. Supp. 2d at 234 (citations omitted).

[242] *Mountaineers v. United States Forest Serv.*, 445 F. Supp. 2d at 1250.

[243] While some courts have upheld less than precise monitoring or adaptive management plans, they have done so largely where the NEPA analysis at issue was programmatic in nature and where the agency would be required to comply with NEPA, and thus re-assess mitigation, at a later stage when more site-specific data was available. *See, e.g.*, *San Juan Citizens Alliance v. Stiles*, 654 F.3d 1038, 1055 (10th Cir. 2011) (agreeing with case that held the development of more specific mitigation measures was not required at the "early stage of a multi-step process"). That is not the case here where the Forest Service has made clear that the EIS at issue is the final and only disclosure of environmental impacts for this 20-year project.

[244] *See, e.g., High Sierra Hikers Association v. Weingardt*, 521 F. Supp. 2d 1065, 1090-91 (N.D. Ca. 2007) (overturning a Forest Service decision to liberalize the rules limiting campfires in high country parts of a wilderness area on the grounds that the agency could not rely on adaptive management to overcome an inadequate response to the problems raised in the record).

Courts also find unlawful agency projects that may impact species protected by the Endangered Species Act where the biological opinion is based on the assumption that a vague and ill-defined monitoring and adaptive management plan will somehow mitigate impacts to the species at issue. *Natural Resources Defense Council v. Kempthorne*, 506 F. Supp. 2d 322 (E.D. Ca. 2007) is key precedent. There, plaintiffs challenged a proposed plan to manage water diversions in a manner that could adversely impact the delta smelt, a species listed as threatened under the Endangered Species Act. The Fish and Wildlife Service prepared a biological opinion (BiOp) on the proposal which concluded that the project would neither jeopardize the smelt nor adversely modify the smelt's critical habitat. "*Although the BiOp recognize[d] that existing protective measures may be inadequate, the FWS concluded that certain proposed protective measures, including … a proposed 'adaptive management' protocol would provide adequate protection.*"[245]

Plaintiffs alleged, among other things, that the BiOp "*relie*[d] *upon uncertain (and allegedly inadequate) adaptive management processes to monitor and mitigate the* [project's] *potential impacts*."[246] They asserted that the adaptive management plan, which required a working group meet and consider adaptive measures in light of monitoring, failed to meet the ESA's mandate that mitigation be

> "'*reasonably specific, certain to occur, and capable of implementation'" because: (1) the [working group] has complete discretion over whether to meet and whether to recommend mitigation measures; (2) even if the [working group] meets and recommends mitigation measures, the [agency management team] group is free to reject any recommendations; (3) there are no standards to measure the effectiveness of actions taken; (4) reconsultation is not required should mitigation measures prove ineffective; and (5) ultimately, no action is ever required*.[247]

The Forest Service's adaptive management plan here shares many of the same characteristics as the plan in the *Kempthorne* case: it relies on annual meetings of an interdisciplinary team; the agency provides no standards to measure the effectiveness of "adaptive" actions; and nothing requires the Forest Service to take any action on its monitoring data.

The *Kempthorne* court cited prior caselaw holding that "*a mitigation strategy* [in the ESA context] *must have some form of measurable goals, action measures, and a certain implementation schedule; i.e., that mitigation measures must incorporate some definite and certain requirements that ensure needed mitigation measures will be implemented.*"[248] The court found that adaptive management plan "*does not provide the required reasonable certainty to*

[245] *NRDC v. Kempthorne*, 506 F. Supp. 2d at 333-34 (emphasis in original).

[246] *Id.* at 329.

[247] *Id.* at 352. See also *id*. at 350 (explaining the "certain to occur" standard and citing *Ctr. for Biological Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1152 (D. Ariz. 2002)).

[248] *NRDC v. Kempthorne*, 506 F. Supp. 2d at 355, citing *Rumsfeld*, 198 F. Supp. 2d at1153.

assure appropriate and necessary mitigation measures will be implemented."[249] The court concluded that

> "*Adaptive management is within the agency's discretion to choose and employ, however, the absence of any definite, certain, or enforceable criteria or standards make its use arbitrary and capricious under the totality of the circumstances*."[250]

Here, the Forest Service's monitoring and adaptive management plan also lacks "*any definite, certain, or enforceable criteria or standards*."

Finally, the Forest Service's apparent reliance on adaptive management to ensure that the forest can meet desired conditions appears to violate the National Forest Management Act (NFMA). The 2012 forest planning rules were revised in 2016 to address how forest plans can be amended. The revision provides that the Forest Service "*shall* ... [d]*etermine which specific substantive requirement(s) within [36 C.F.R.] §§ 219.8 through 219.11 are directly related to the plan direction being added, modified, or removed by the amendment*," and then "*apply such requirement(s) within the scope and scale of the amendment.*"[251]

Here, the Final EIS at Appendix B identifies a number of substantive requirements of the forest planning rules that are directly related to the plan amendment that the Lincoln National Forest proposes to adopt to facilitate the South Sacramento Restoration Project. These include mandates in the planning rule to ensure ecological sustainability and integrity and to ensure the diversity of plant and animal communities.[252] The proposed amendments, however, do not ensure these ecological and diversity goals will be met because the project relied on adaptive management plan "*to ensure that* [logging, burning, and herbicide] *treatments are moving*" numerous forest types "*closer to desired conditions.*"[253] Because the adaptive management plan is ill-defined, and fails to include triggers, criteria, or other means to "ensure" that this massive experiment in logging old growth, large trees, and steep slopes in habitat for imperiled wildlife will actually move numerous forest types toward "desired conditions," the project and the forest plan amendments cannot ensure that the amendments meet the substantive requirements of the forest

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[249] *Id.* at 356.

[250] *Id.* at 387.

[251] 36 C.F.R. § 219.13(b)(5). *See also Sierra Club, Inc. v. United States Forest Serv.*, 897 F.3d 582, 601 (4th Cir. 2018).

[252] *See* Draft EIS Appx. B at B-1; *see also* 36 C.F.R. § 219.8(a)(1) ("The plan must include plan components, including standards or guidelines, to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area, including plan components to maintain or restore structure, function, composition, and connectivity"); 36 C.F.R. § 219.9(a)(2) ("The plan must include plan components, including standards or guidelines, to maintain or restore the diversity of ecosystems and habitat types throughout the plan area.").

[253] South Sacramento Restoration Project EIS at 168 (re: "moving Mixed Conifer with Aspen forests closer to desired conditions"); *id*. at 171 (re: "moving Montane Subalpine Grassland closer to desired conditions"); *id*. at 177 (re: "moving Mixed Conifer-Frequent Fire forests closer to desired conditions"); *id*. at 184 (re: "moving ponderosa pine forests closer to desired conditions"); *id*. at 192 (re: "moving pinyon-juniper communities closer to desired conditions").

planning regulations. The amendments and the project thus violate NFMA. Federal courts have set aside agency decisions that fail to comply with NFMA regulations regarding plan amendments, and have also overturned Forest Service decisions where the reliance on adaptive management resulted in violations of substantive NFMA mandates.[254]

C. The EIS Fails to Address Scientific Uncertainty over the Impacts of Logging on Mexican Spotted Owl.

In scoping and in comments on the Draft EIS, the Center argued that the effects of mechanical thinning on the Mexican spotted owl have not been extensively studied and are not well understood. Prominent owl scientists have recently stated that "*Existing studies on the effects of fuels reduction treatments on spotted owls universally suggest negative effects from these treatments*"[255] and that "*forest restoration and thinning activities also may threaten owls and their existing habitat*."[256]

Unfortunately the FEIS assumes that treatments will yield desired results and eventually all 80 PACs in the project may be logged, despite the stark fact that "*No empirical studies have evaluated these management activities* [restoration thinning or logging] *on the Mexican spotted owl.*"[257] As discussed earlier, the current iteration of the monitoring plan does not provide adequate assurances that real science-based learning will be achieved. The Forest Service's failure to address these studies, which undermine the basis for this project, violates NEPA.

Some relevant studies from dry, frequent fire adapted forests of southern California have published findings indicating deleterious effects of thinning of spotted owls. Stephens and colleagues[258] 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

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[254] *Cowpasture River Pres. Ass'n v. Forest Serv.*, 911 F.3d 150, 160-63 (4th Cir. 2018) (finding Forest Service decision to construct a gas pipeline through parts of a national forest violated NFMA by failing to analyze whether the substantive requirements of the 2012 Forest Planning Rule were related to the forest plan amendment); *Sierra Club, Inc. v. United States Forest Serv*., 897 F.3d at 601-03 (finding Forest Service was arbitrary and capricious in failing to follow forest plan amendment regulations concerning analysis of a plan amendment to facilitate a pipeline); W. Watersheds Project v. United States Forest Serv., 2006 U.S. Dist. LEXIS 37857, *26-*28 (D. Idaho Feb. 7, 2006) (finding Forest Service violated NFMA by relying on an ill-defined adaptive management plan to ensure consistency of proposed action with the applicable forest plan).

[255] Page 11 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.

[256] Page 8 in 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.

[257] Id. at 8.

[258] Scott L. Stephens, Seth W. Bigelow, Ryan D. Burnett, Brandon M. Collins, Claire V. Gallagher, John Keane, Douglas A. Kelt, Malcolm P. North, Lance Jay Roberts, Peter A. Stine, Dirk H. Van Vuren. 2014. California Spotted Owl, Songbird, and Small Mammal Responses to Landscape Fuel Treatments. *BioScience* 64(10): 893-906.

treatment owls redistributed across the landscape. A study by Lee and colleagues[259] 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[260] 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. Other researchers have concluded that thinning effects would be less impactful than severe wildfire,[261] leading to uncertainty of the true impacts of thinning on spotted owls.

The Forest Service also has information—based on recent 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 a post-fire environment.[262] This information 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, 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.

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*

[259] 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.

[260] Tempel, Douglas J., R.J. Gutierrez, Sheila A. Whitmore, Matthew J. Reetz, Ricka E. Stoelting, William J. Berigan, Mark E. Seamans, and Zachariah Peery. 2014. Effects of forest management on California spotted owls: implications for reducing wildfire in fire-probe forests. *Ecological Applications* 24(8):2089-2106.

[261] 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.

[262] 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").

owl habitat, with the goal of identifying treatment types that successfully reduce fire risk while maintaining suitable habitat conditions for spotted owls."[263]

A similar meta-analysis 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*."[264] In another recent paper, scientists reiterate our concern that:

"*Commercial 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.*"[265]

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 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*."[266]

None of the relevant scientific information we presented appears to have been addressed in the Final EIS. The Forest Service casts the proposed Forest Plan amendment affecting management of Mexican spotted owl as a "one-time" variance. Already, the agency has advanced similar or identical plan amendments in other projects in the region that may cumulatively unravel existing management direction for Mexican spotted owl and the basis of FWS no-jeopardy opinions. The Forest Service is required to give a hard look to the overall cumulative effect of Forest Plan amendments that affect management of the threatened species and its critical habitat. Until a true hard look is given, we cannot support the SSRP's proposed throwback to the 'good old days' of widespread logging - especially not in one of the highest concentration of spotted owl PACs in the southwest.

Proposed Remedy: If the Forest Service intends to rely on an adaptive management plan, it must ensure that it adopts, in the Final EIS and Record of Decision, a defined plan, with

[263] 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.

[264] Page 1 in 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.

[265] Page 1 in 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.

[266] Id. at 7.

defined triggers, and discloses the impacts of implementing that plan if the triggers are tripped.

The Project should prohibit mechanical thinning operations within Mexican spotted owl PACs.

VI. THE FINAL EIS FAILS TO TAKE A HARD LOOK AT THE EFFECTS OF LIVESTOCK GRAZING ON THE IMPACTS OF THE PROJECT.

The Final EIS states that the project is needed to, among other things:

- Address forest health issues, hazardous fuels, and declining wildlife habitat quality on the Sacramento Ranger District at a landscape scale;
- Accelerate ecosystem recovery with respect to ecological health (productivity), integrity (species composition, community and ecosystem structure), and sustainability (resistance and resilience to disturbance);
- Assist the recovery of degraded ecosystems; and
- Restore frequent-fire forests with a characteristic uneven-aged structure consisting of a temporally shifting mosaic of different-aged tree groups and scattered individual trees in an open grass-forb-shrub matrix.[267]

Achieving each of these goals will be made more difficult by the continuation of livestock grazing; each goal could be achieved in part by reducing livestock grazing numbers and distribution. It is thus critical that the Forest Service consider both the synergistic and cumulative impacts of continued livestock grazing together with the tree removal and burning the project proposes. Further, continued livestock grazing will interfere with, or undercut the efficacy of, restoration projects, and reducing livestock grazing numbers and distribution could make other mitigation measures less necessary or more effective. The Forest Service, however, fails to take the required hard look at the impacts of livestock grazing, the interaction of livestock grazing with those caused by the South Sacramento Project.

Livestock grazing is a primary driver of fire regime disruption. Livestock grazing decreases understory biomass and density, reducing competition with conifer seedlings and reducing the ability of the understory to carry low-intensity fire, contributing to dense forests with altered species composition.[268] Livestock grazing directly contributes to fire hazard in the project area by impairing soil productivity and altering vegetation communities, which indirectly contribute to delayed fire rotations, increased forest density, and reduced forage opportunities for herbivorous species and predators. Cattle grazing also negatively impacts high elevation montane riparian meadows and creeks through hydrologic changes, soil compaction, erosion, bank

[267] South Sacramento Restoration Project Final EIS at 1, 2.

[268] Belsky A.J. and D.M. Blumenthal. 1997. Effects of livestock grazing on stand dynamics and soils in upland forests of the Interior West. *Conservation Biology* 11:316-27.

instability, and siltation.[269] Often, these impacts can have greater effects on wildlife than do wildfires.[270]

Continued livestock grazing risks post-treatment invasion of exotic plants. Livestock facilitate the spread of exotic species, particularly in combination with fire, and reduce the competitive and reproductive capacities of native species.[271] Exotic plant species, once established, can displace native species, in part, because native grasses are not adapted to frequent and close grazing in combination with fire disturbance.[272]

The Final EIS acknowledges the need to protect riparian areas and streams and, in particular, to "decrease the potential for soils to erode and create sediment problems within streams and riparian areas."[273] The Final EIS also acknowledges the impacts of altered hydrology on plants associated with springs, wetlands, and riparian areas.[274] A wealth of scientific literature confirms that livestock grazing (and the roads, fences, water developments, and predator eradication that come with it) harms riparian areas, consumes vegetation used by native wildlife, fouls water, causes erosion, and significantly damages natural resource values in a plethora of ways.[275]

The Final EIS identifies approximately 500 acres of riparian habitat within the South Sacramento Project area, and identifies riparian areas as a target for restoration.

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[269] Federal Register Vol. 57 No. 225, November 20, 1992, Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for the Plant "*Salix arizonica*" (Arizona willow), with Critical Habitat.

[270] Horncastle, V.J., C.L. Chambers, and B.G. Dickson. 2019. Grazing and Wildfire Effects on Small Mammals Inhabiting Montane Meadows. Journal of Wildlife Management 83(3): 534-543.

[271] Brooks, M.L., C.M. D'Antonio, D.M. Richardson, J. B. Grace, J.E. Keeley, J. M. DiTomaso, R.J. Hobbs, M. Pellant and D.Pyke. 2004. Effects of invasive alien plants on fire regimes. *BioScience* 54(7):677-688.

[272] Mack, R. N., and J. N. Thompson. 1982. Evolution in steppe with few large, hooved mammals. *American Naturalist* 119:757-72. *See also* Melgoza, G., R.S. Nowak and R.J. Tausch. 1990. Soil water exploitation after fire: competition *between Bromus tectorum* (cheatgrass) and two native species. *Oecologica* 83:7-13. *See also* Belsky, A.J., and J.L. Gelbard. 2000. Livestock Grazing and Weed Invasions in the Arid West. Oregon Natural Desert Association: Portland, OR. April. 31 pp.

[273] South Sacramento Restoration Project Final EIS at 222. "Mechanical treatments and other restoration activities on the forest, adjacent state lands, and tribal lands should further increase long-term forest health as a result of reduced uncharacteristic wildfire risk, which could improve the forest's resiliency in a changing climate and decrease the potential for soils to erode and create sediment problems within streams and riparian areas."

[274] South Sacramento Restoration Project Final EIS at 227. "Any activities that alter local hydrological processes may adversely affect plants associated with springs, wetlands, and riparian areas."

[275] *See, e.g.*, Lynn B. Jacobs, *Waste of the West: Public Lands Ranching* (1991); Thomas Fleischner, *Ecological Costs of Livestock Grazing in Western North America*, Conservation Biology, Volume 8, No. 3 (Sep. 1994), pp. 629-644; Joseph M. Feller, *What Is Wrong with the BLM's Management of Livestock Grazing on the Public Lands?*, 30 Idaho L. Rev. 556, 560-563 (1993).

> Restoration activities would occur in all ecosystems in the area, including mixed conifer, ponderosa pine, pinyon-juniper, riparian areas, meadows, and aspen habitat types. Restoration activities would focus on thinning and burning treatments to improve forest health and resiliency by reducing stand density, continuity and homogeneity (sameness of forest structure and species composition) and increasing heterogeneity (diverse forest structure and species composition) at a landscape scale, mid-scale, and fine scale. [276]

The Draft EIS acknowledged that livestock grazing, generally, can degrade and alter hydrology, damage soils, and can favor and promote non-native invasive species at the expense of native plants.[277] The DEIS states:

> "*Domestic livestock grazing directly results in the removal of native vegetation, primarily perennial grasses, and changing vegetation species compositions, trampling and exposure of soil surfaces, and the spread of nonnative plant species … Domestic livestock grazing is probably the most significant cumulative factor potentially adversely affecting native vegetation communities across the project area. Livestock grazing not only directly impacts current vegetation, but also alters long-term plant succession by changing the plant species compositions of early seral stages*."[278]

The Final EIS also acknowledges that grazing is a major factor in pinyon juniper encroachment in grasslands.

> Grassland encroachment has been attributed to periods of drought, overgrazing, fire exclusion, and climate change (Romme and others 2009).[279]

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[276] South Sacramento Restoration Project Final EIS, Vol. 1, at 48.

[277] *See* Draft EIS at 8 (identifying "grazing activities" as a factor can "change … hydrology"); *id*. at 40 ("Ground disturbance from … livestock grazing, could cause nonnative species to outcompete native plants."); *id*. at 157 ("Domestic livestock grazing is generally intense in … montane grasslands, and has caused changes in dominant grass species compositions, especially the replacement of Thurber fescue by Arizona fescue and Kentucky bluegrass"); *id*. at 176 ("Most pinyon-juniper associations have grassy understories, which have been much depleted by overgrazing"); *id*. at 180 ("Grassland encroachment has been attributed to" numerous factors, including "overgrazing"); *id*. at 259 ("Current domestic and wild ungulate grazing contributes to reducing herbaceous vegetative ground cover, which contributes to accelerated soil loss, soil compaction, and declined soil productivity, especially during periods of drought.").

[278] Draft EIS at 192. *See also id*. at 254-55 ("The primary management action that would have potential adverse cumulative effects on these rare plant species [in the Project area] is livestock grazing. Domestic livestock grazing is a serious threat to the species due to trampling and consumption of individual plants by livestock, trampling and compaction of wetland soils that damages habitat for the species, and livestock and livestock management (supplemental feeding and transportation of animals) introducing nonnative invasive plant species.").

[279] South Sacramento Restoration Project Final EIS at 188.

In our comments on the Draft EIS, we expressed our expectation that the SSRP would "address the impacts of livestock grazing on project success and ecological sustainability."[280] We explicitly named livestock grazing as a primary factor that led to degraded forest health, diminished ecological integrity, and reduced resilience to climate change and other disturbances, such as fire.[281] In our comments on the Draft EIS, we noted that the Draft EIS failed to disclose the baseline conditions of the project area, with respect to the impacts of livestock grazing on fire regime, among other factors.[282] Those comments recommended that the EIS analyze the connection between livestock grazing, and water resources, and the resulting impacts related to fire, insect and disease.[283] We further recommended that the Forest Service consider alternatives to reduce the number of livestock within overgrazed allotments, close overgrazed allotments, and rest overgrazed allotments.[284]

The Final EIS fails to comply with NEPA in a number of important ways. The Final EIS fails to disclose the environmental baseline by failing to address livestock grazing's role as a key driver in the current fire regime. Despite the myriad and well understood destructive impacts of livestock grazing on forests and landscapes in the American West, the Final EIS fails to adequately disclose the role of livestock grazing in the current degraded upland and riparian conditions within the project area. The Final EIS fails to adequately describe livestock grazing as a significant cause of impaired ecological function or departed structure in grasslands and savannas. The Final EIS fails to address that livestock grazing is a significant cause of the conditions that the Forest Service asserts high-intensity logging is needed to address, and that

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[280] Center Comments to DEIS at 2.

[281] Center Comments to DEIS at 63. The origin of the contemporary health crisis affecting Southwestern forests 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, diverse groups of stakeholders have united across the American west in search of solutions.

[282] Center Comments to DEIS at 43. Conditions that underlay the need for ecological restoration in the project area result from high-grade logging, fire suppression and livestock grazing, encroachment of human civilization into fire-adapted ecosystems and effects of climate change to fire regime. A proactive landscape-scale restoration approach must deal with fundamental ecological problems.

[283] Center Comments to DEIS at 7. While the Draft EIS alleges (without adequate support in the record) that a lack of water sources in some parts of the forest *may* limit the distribution of livestock and ungulates, with resulting impacts on native and non-native grasses and, these proposed developments appear unrelated to efforts "*to reduce the risk or extent of, or increase the resilience to, insect or disease infestation"* or *"to reduce hazardous fuels*."

[284] Center Comments to DEIS at 26. The notion that artificial water developments will prevent "overgrazing" also highlights the Forest Service's failure to consider a range of reasonable alternatives and mitigation measures that could be used instead to address poor grazing practices. Rather than attempting to make available the small proportion of lands that are undamaged by cattle grazing through construction of water development, the Forest Service should consider, among other things, the reasonable alternatives of: Reducing the number of livestock within overgrazed allotments. Closing overgrazed allotments. Resting overgrazed allotment.

increased grazing pressure will likely lead to a repeat of those conditions. Further, the Final EIS ignores that livestock will worsen conditions if not carefully managed, and that the Forest Service cannot address the problem of overstocked forests without addressing livestock grazing, one of its root causes.

> ***Proposed Remedy***: The Forest Service should assess the conditions of allotments within the project area and restrict grazing as necessary to allow for the restoration of ground vegetation that contributes to ecological integrity and fire regime restoration.

CONCLUSION

The Center for Biological Diversity appreciates your consideration of the information and concerns raised in our comments and highlighted in this objection.

We request a meeting to discuss potential resolution of issues raised in this objection, pursuant to 36 C.F.R. § 218.11(a). We hope that the Forest Service will use the objection process and such a meeting as opportunities to engage with stakeholders, including the objectors here, to develop a project that is legally and ecologically sound.

Sincerely,

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Literature cited in this objection and attached as exhibits

Exhibit 1. Memo from the Four Forests Restoration Initiative (4FRI) Board, dated March 5, 2021, regarding Stands with a Preponderance of Large, Young Trees (SPLYT).

Exhibit 2. USFS. 2019. Hale Lake management scoping document.

Exhibit 3. Lincoln National Forest Travel Analysis Report 2008 at 25, Table 4-6.

Exhibit 4. Lincoln National Forest Scoping Letter for the New Mexico Meadow Jumping Mouse (NMMJM) Habitat Improvement Project on the Agua Chiquita Grazing Allotment, dated August 2, 2017.

Exhibit 5. Federal Register Vol. 57 No. 225, November 20, 1992, Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for the Plant "*Salix arizonica*" (Arizona willow), with Critical Habitat.

Exhibit 6. US Fish and Wildlife Service. 2014. Recovery Outline: New Mexico Meadow Jumping Mouse. N.M. Ecological Services Field Office, Albuquerque, New Mexico: p. 5.

Exhibit 7. Agee, J.K. 1996. The influence of forest structure on fire behavior. Pp. 52-68 in: J.W. Sherlock (chair). *Proc. 17th Forest Vegetation Management Conference.* 1996 Jan. 16-18: Redding, CA. Calif. Dept. Forestry and Fire Protection: Sacramento.

Exhibit 8. Agee, J.K. and C.N. Skinner. 2005. Basic principles of forest fuel reduction treatments. *Forest Ecology and Management* 211: 83-96.

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Exhibit 12. Belsky A.J. and D.M. Blumenthal. 1997. Effects of livestock grazing on stand dynamics and soils in upland forests of the Interior West. *Conservation Biology* 11:316-27.

Exhibit 13. Brooks, M.L., C.M. D'Antonio, D.M. Richardson, J. B. Grace, J.E. Keeley, J. M. DiTomaso, R.J. Hobbs, M. Pellant and D.Pyke. 2004. Effects of invasive alien plants on fire regimes. *BioScience* 54(7):677-688.

Exhibit 14. 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.

Exhibit 15. Carlson, J. P. Edwards, T. Ellsworth, and M. Eberle. 2015. National best management practices monitoring summary report. Program Phase-In Period Fiscal Years 2013-2014. USDA Forest Service. Washington, D.C

Exhibit 16. Covington, W.W., and M.M. Moore. 1994. Southwestern ponderosa forest structure: Changes since Euro-American settlement. *Journal of Forestry* 92: 39-47.

Exhibit 17. Cram, D.S., T.T. Baker, A.G. Fernald, A. Madrid, B. Rummer. Mechanical thinning impacts on runoff, infiltration, and sediment yield following fuel reduction treatments in southwestern dry mixed conifer forest. Journal of Soil and Water Conservation, Vol. 62(5): 359-366 (2007) At page 365.

Exhibit 18. 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.

Exhibit 19. DellaSala, D., J. Karr, and D. Olson. Roadless areas and clean water. 2011. Journal of Soil and Water Conservation, vol. 66, no. 3. May/June 2011.

Exhibit 20. Diggins, C., P.Z. Fulé, J.P. Kaye and W.W. Covington. 2010. Future climate affects management strategies for maintaining forest restoration treatments. *International Journal of Wildland Fire* 19: 903-13.

Exhibit 21. Edwards, P.J., F. Wood, and R. L. Quinlivan. 2016. Effectiveness of best management practices that have application to forest roads: a literature synthesis. General Technical Report NRS-163. Parsons, WV: U.S. Department of Agriculture, Forest Service, Northern Research Station. 171 p.

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Exhibit 26. Fleischner, Thomas, *Ecological Costs of Livestock Grazing in Western North America*, Conservation Biology, Volume 8, No. 3 (Sep. 1994), pp. 629-644.

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Exhibit 28. 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.

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Exhibit 34. 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.

Exhibit 35. 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.

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Exhibit 39. McCune, Bruce. "Ecological diversity in North American pines." American Journal of Botany (1988): 353-368.

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