

Four-Forest Restoration Initiative, Coconino and Kaibab National Forests

Coconino County, Arizona

Lead Agency: U.S. Forest Service

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Abstract: The Coconino and Kaibab National Forests (NFs) are proposing to conduct restoration activities over a 10-year period. Four alternatives were considered in detail. **Alternative A** proposes no action. There would be no changes in current management. **Alternatives B–D** would mechanically treat up to 593,211 acres of vegetation and treat up to 587,923 acres with prescribed fire. **Alternative C** is the preferred alternative. All action alternatives include other activities that would provide access to the project or improve soil and watershed function. All action alternatives require nonsignificant forest plan amendments.

It is important that reviewers provide their comments at such times and in such a way that they are useful to the Agency's preparation of the final environmental impact statement. Therefore, comments should be provided prior to the close of the comment period and should clearly articulate the reviewer's concerns and contentions. The submission of timely and specific comments can affect a reviewer's ability to participate in subsequent administrative review or judicial review.

Comments received in response to this draft environmental impact statement (DEIS) solicitation, including names, addresses, and phone numbers of those who comment, will be part of the public record for this proposed action. Comments submitted anonymously will be accepted and considered; however, anonymous comments will not provide the respondent with standing to participate in subsequent administrative review or judicial review.

Send Comments to:

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Date Comments Must Be Received: The 60-day public comment period begins on the day after the Environmental Protection Agency publishes a notice of availability for the draft EIS in the Federal Register. Comments **MUST** be received before the close of business on the last day of the comment period.

Summary

The Coconino and Kaibab National Forests (NFs) are proposing to conduct a suite of restoration activities on approximately 587,923 acres over a period of 10 years. Of this total, approximately 356,115 acres would be treated on the Flagstaff, Mogollon, and Red Rock districts of the Coconino NF and 231,809 acres would be treated on the Williams and Tusayan districts of the Kaibab NF.

The purpose of the project is to reestablish and restore forest structure and pattern, forest health, and vegetation composition and diversity. There is a need to increase forest resiliency and sustainability, protect soil productivity, and improve soil and watershed function. Resiliency increases the ability of the ponderosa pine forest to survive natural disturbances such as fire, insect and disease, and climate change (FSM 2020.5).

Over 50 percent of the ponderosa pine is even-aged and lacks age class diversity. The single-age forest structure has reduced the health of the ponderosa pine forest. Large, old ponderosa pine trees are rare across the landscape. The remaining old pines are at risk of mortality from the increased overcrowding of trees (stand density related mortality) and the potential for severe fire effects.

In contrast to having a ponderosa pine ecosystem consisting of groups of trees mixed with interspaces, approximately 74 percent of the ponderosa pine forest type within the project area is departed from desired conditions. Non-forested openings have been invaded by ponderosa pine since fire exclusion and this has changed the natural (and desired) spatial pattern.

The dense, single-age forest structure combined with the lack of non-forested openings has affected function related to the presence of grass, forbs, and shrubs (vegetation composition and diversity). There is reduced understory productivity and function throughout the forest and within grasslands and meadows where trees have encroached. Ephemeral stream function has been affected by reduced ground cover, the presence of noxious weeds, tree encroachment, and the lack of fire. Spring function has been affected by drought, the lack of fire, and closed forest canopies, which increase evapotranspiration.

The existing forest structure has reduced forest health. This has affected resiliency or the ability of ponderosa pine to withstand natural disturbances including fire, insect and disease, and changing climatic conditions, such as drought. Over 200,000 acres (34 percent) are at risk from crown fire. Additional acres, primarily within or adjacent to Mexican spotted owl habitat are at risk from high intensity surface fire that can result in high-severity effects.

Approximately 71 percent of the ponderosa pine in the project area has a high hazard rating for bark beetle. About 34 percent of the ponderosa pine is moderately to heavily infected with dwarf mistletoe (see silviculture report). The current deficiency in resiliency is attributed to closed forest conditions and the associated buildup of forest fuels.

The project was posted in the Coconino NF and Kaibab NFs' schedule of proposed actions (SOPA) in January of 2011 and the notice of intent (NOI) to prepare an environmental impact statement was published in the Federal Register on January 25, 2011 (Vol. 76 FR 4279–4281). A draft proposed action was sent to a mailing list (hard copy and electronic mail) of 1,331 individuals, local government, State government, Federal and State agencies, and organizations. Fifty-four scoping responses (emails and letters) were received through May 5, 2011. A scoping report that included a summary of the scoping process was posted on the 4FRI Web site on June

29, 2011 (<http://www.fs.usda.gov/4fri>). In 2011, five public workshops were held during the informal scoping period, and two public meetings were held after the close of the scoping period. On March 11, 2011, the Arizona Game and Fish Department (AGFD) was designated a cooperating agency. The agency provided a habitat specialist to serve as an interdisciplinary team member and assist with the wildlife analysis.

A revised proposed action was sent to a mailing list of 213 parties (169 electronic mail and 44 hard copy recipients) and a second 14 day informal scoping period began with publication of a second revised NOI in the Federal Register on August 19, 2011 (Vol. 76 FR. 51936–51938). Less duplicates, 42 scoping responses (emails and letters) were addressed in content analysis.

Four key issues focused the analysis or drove alternative development:

- **Issue 1: Prescribed Fire Emissions**, was raised primarily by residents in the Verde Valley and Snowflake, Arizona, area. Residents are concerned that project emissions will degrade air quality. Degraded air quality would affect tourism, their quality of life, and their health. Social controversy related to this issue is centered on whether radioactive nuclides would be emitted when prescribed fire is used, creating additional health risks.
- **Issue 2: Conservation of Large Trees**, was specifically raised after the August 2011 revised proposed action excluded the stakeholder developed Large Tree Retention Strategy (LTRS). The LTRS represented social agreement between parties and was developed as a means to support landscape restoration and reduce conflict. The social controversy associated with this issue is that support for landscape-scale restoration may be withdrawn if the LTRS concepts are ignored.
- **Issue 3: Post-treatment Canopy Cover and Landscape Openness**, is an issue that reflects concerns related to conducting landscape restoration. The scale and intensity of the proposed restorative treatments would result in more lands being in an open condition. The treatments needed to provide for “openness” could increase the logging of mature and old trees and negatively affect wildlife, including goshawk and its prey species. Nonsignificant forest plan amendments (included in each action alternative) are needed to achieve desired conditions. The social controversy is a concern that National Forest Management Act (NFMA) requirements would not be met.
- **Issue 4: Increased Restoration and Research**, reflects recommendations to increase the acres of grassland restoration, include opportunities for wildlife and water yield research, increase habitat restoration in Mexican spotted owl habitat, and have treatments in alignment with the “Mexican Spotted Owl Recovery Plan, First Revision” (USDI 2012).

Other comments and recommendations (not considered key issues) were raised during the public workshops and/or submitted via email or letter. Many comments requested additional detail on what vegetation and prescribed fire treatments would look like once implemented. In response, a summary of design criteria complete with visuals was developed and included in the revised proposed action and an implementation plan was developed. Many commenters provided recommendations on identifying and prioritizing resources and infrastructure at risk from high-severity fire. This input was used to develop the initial prioritization and treatment location assessment matrix, which can be found in the project record. Stakeholders provided input on the

use of the best available science and recommended additional literature references and citations. These changes were incorporated into the purpose and need. Another topic that emerged during scoping was the conservation of old trees. In response to recommendations, key concepts from the stakeholder-developed Old Tree Protection Strategy were incorporated into the purpose and need and all alternatives. Some comments were resolved by addressing the topic in environmental consequences. See the “Public Involvement” section (chapter 1) for additional information and the 2011 scoping report for the complete evaluation of comments and responses.

Alternatives

Five alternatives were considered but eliminated from detailed study (see chapter 2) and four alternatives were evaluated in detail (see table 1 and chapter 2). The alternatives evaluated in detail include:

- **Alternative A** is the no action alternative as required by 40 CFR 1502.14(c). There would be no changes in current management and the forest plans would continue to be implemented. Alternative A is the point of reference for assessing action alternatives B–D.
- **Alternative B** is the **proposed action**. This alternative would mechanically treat 388,489 acres of vegetation and utilize prescribed fire on 587,923 acres. It incorporates comments and recommendations received during 8 months of collaboration with individuals, agencies, and organizations. It proposes mechanically treating up to 16-inch d.b.h. in 18 Mexican spotted owl (MSO) protected activity centers (PACs) and includes low severity prescribed fire within 72 MSO PACs, including 56 core areas. Three nonsignificant forest plan amendments on the Coconino NF and two nonsignificant forest plan amendments on the Kaibab NF would be required to be in compliance with the plans (see table 2).
- **Alternative C** is the **preferred alternative**. This alternative would mechanically treat 434,001 acres of vegetation and utilize prescribed fire on 593,211 acres. It responds to Issue 2 (conservation of large trees) and Issue 4 (increased restoration and research). It adds acres of grassland treatments on the Kaibab NF, incorporates wildlife and watershed research on both forests, and mechanically treats and uses prescribed fire within the proposed Garland Prairie Research Natural Area on the Kaibab NF. It proposes mechanically treating up to 18-inch d.b.h. in 18 MSO PACs and includes low severity prescribed fire within 72 MSO PACs, including 56 core areas. Key components of the stakeholder created Large Tree Retention Strategy are incorporated into the alternative’s implementation plan. Three nonsignificant forest plan amendments on the Coconino NF and three nonsignificant amendments on the Kaibab NF would be required to be in compliance with the plans (see table 2).
- **Alternative D** would mechanically treat 388,489 acres of vegetation and utilize prescribed fire on 178,790 acres. This alternative was developed in response to Issue 1, Prescribed Fire Emissions. It decreases the acres that would receive prescribed fire by 30 percent when compared to alternative B (proposed action). It proposes mechanically treating up to 16-inch d.b.h. in 18 Mexican spotted owl (MSO) protected activity centers (PACs) but the PACs would not be treated with prescribed fire. Three nonsignificant forest plan amendments on the Coconino NF and two amendments would be required on the Kaibab NF to be in compliance with the plans (see table 2).

Actions Common to Alternatives (B–D)

- All action alternatives (B–D) propose additional actions including restoring springs and ephemeral channels, constructing protective fencing in select aspen stands, constructing (and decommissioning) temporary roads, reconstructing and improving roads, relocating a minimal number of road miles, and decommissioning existing roads and unauthorized routes (table 1).
- On those acres proposed for prescribed fire, two fires would be conducted over the 10-year period.
- Design features, best management practices (BMPs), and mitigation to be used as part of alternatives B–D are located in appendix C.
- All action alternatives incorporate key components of the Old Tree Protection Strategy into the alternative’s design features (appendix C), implementation plan (appendix D), and monitoring and adaptive management plan (appendix E). The Forest Service worked collaboratively with stakeholders to develop the monitoring and adaptive management and implementation plan.
- All action alternatives include adaptive management actions that would be taken as needed to restore springs, ephemeral channels, and naturalize decommissioned and unauthorized roads (see table 16 in chapter 2).
- All action alternatives address Issue 3, post-treatment canopy cover and landscape openness. Alternatives B–D are designed to meet canopy cover in VSS 4 to VSS 6 in compliance with the forest plans, with the exception of those acres treated for an open reference condition (savanna). Each alternative addresses the interrelationship between canopy cover and old and large trees.

Table 1. Summary of alternatives analyzed in detail

Proposed Activity	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Preferred)	Alternative D
Vegetation Mechanical Treatment (acres)	0	388,489	434,001	388,489
Prescribed Fire (acres)*	0	587,923	593,211	178,790
MSO PAC Habitat Treatments	NA	Mechanically treat up to 16-inch d.b.h. in 18 PACs (excluding core areas) Utilize prescribed fire in 72 MSO PACs (excluding core areas)	Mechanically treat up to 18-inch d.b.h. in 18 PACs Utilize prescribed fire in 56 MSO PACs (including core areas) Utilize prescribed fire in 16 MSO PACs (excluding core areas)	Mechanically treat up to 16-inch d.b.h. in 18 PACs (excluding core areas) Utilize prescribed fire in 72 MSO PACs (excluding core areas)

Proposed Activity	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Preferred)	Alternative D
Springs Restored (number)	0	74	Same as alternative B	
Springs Protective Fence Construction (miles)	0	Up to 4	Same as alternative B	
Aspen Protective Fencing (miles)		Up to 82	Same as alternative B	
Ephemeral Stream Restoration (miles)	0	39	Same as alternative B	
Temporary Road Construction and Decommission (miles)	0	517	Same as alternative B	
Road Reconstruction/ Improvement (miles)	NA	Up to 30	Same as alternative B	
Road Relocation (miles)	NA	Up to 10	Same as alternative B	
Existing Road Decommission (miles)	NA	770	Same as alternative B	
Unauthorized Route Decommission (miles)	NA	134	Same as alternative B	

*On those acres proposed for prescribed fire, two fires would be conducted over the 10-year period.

Table 2. Summary of forest plan amendments by alternative and theme

Forest Plan Amendment Theme: Management in MSO Habitat						
Alternative	Mechanical Treatments in PACs – CNF Only	Treatments in PAC Core Areas – CNF Only	Restricted Habitat Management – KNF Only	Basal Area in Restricted Target and Threshold Habitat – CNF and KNF	Population and Habitat Monitoring – CNF and KNF	Habitat Treatment in Incremental Percentages
A	NA	NA	NA	NA	NA	NA
B	Coconino NF Amendment 1 Allows mechanical treatment up to 16-inch d.b.h. in 18 PACs	NA	Coconino NF Amendment 1 Kaibab NF Amendment 2: Adds definitions for target and threshold habitat, allows managing for less than 10% target or threshold habitat	NA—basal area in restricted target and threshold habitat remains 150 on both forests	Coconino NF Amendment 1 Kaibab NF Amendment 2 Defers monitoring to the project's U.S. Fish and Wildlife Service (FWS) biological opinion	Coconino NF Amendment 1 Kaibab NF Amendment 2: Defers treatment design to the project's FWS biological opinion
C	Coconino NF Amendment 1 Allows mechanical treatment up to 18-inch d.b.h. in 18 PACs	Coconino NF Amendment 1 Allows prescribed fire in 56 core areas	Coconino NF Amendment 1 Kaibab NF Amendment 3: Adds definition of restricted and threshold habitat, allows managing for less than 10% target or threshold on Coconino NF and Kaibab NF	Coconino NF Amendment 1 Kaibab NF Amendment 3 Allows for managing 6,321 acres on the Coconino NF and 2,090 acres on the Kaibab NF of restricted target and threshold habitat for a range of 110 to 150 BA	Coconino NF Amendment 1 Kaibab NF Amendment 3 Defers monitoring to the project's FWS biological opinion	Coconino NF Amendment 1 Kaibab NF Amendment 3: Defers treatment design to the project's FWS biological opinion

Forest Plan Amendment Theme: Management in MSO Habitat						
Alternative	Mechanical Treatments in PACs – CNF Only	Treatments in PAC Core Areas – CNF Only	Restricted Habitat Management – KNF Only	Basal Area in Restricted Target and Threshold Habitat – CNF and KNF	Population and Habitat Monitoring – CNF and KNF	Habitat Treatment in Incremental Percentages
D	Coconino NF Amendment 1 Allows mechanical treatment up to 16 inch d.b.h. in 18 PACs	NA	Coconino NF Amendment 1 Kaibab NF Amendment 2: Adds definitions for target and threshold habitat, allows managing for less than 10% target or threshold habitat on the Coconino NF and Kaibab NF	NA—basal area in restricted target and threshold habitat remains 150 on both forests	Coconino NF Amendment 1 Kaibab NF Amendment 1 Defers monitoring to the project’s FWS biological opinion	Coconino NF Amendment 1 Kaibab NF Amendment 2: Defers treatment design to the project’s FWS biological opinion
AlternativeDescription						
Forest Plan Amendment Theme: Management of Canopy Cover and Ponderosa Pine with an Open Reference Condition within Goshawk Habitat on the Coconino NF and Kaibab NF						
A	NA					
B–D	Coconino NF Amendment 2 and Kaibab NF Amendment 1: (1) adds the desired percentage of interspaces within uneven-aged stands to facilitate restoration; (2) adds the interspace distance between tree groups; (3) adds language clarifying where canopy cover is and is not measured; (4) allows 29,017 acres on Coconino NF (alts B-D) and 27,637 acres on Kaibab NF (Alts B, D), 27, 675 acres (Alt C only) to be managed for an open reference condition (up to 90 percent open with less than 3 to 5 reserve trees); and (5) adds a definition to the forest plan glossary for the terms: interspaces, open reference condition, and stands.					
Forest Plan Amendment Theme: Management of the Proposed Garland Prairie Research Natural Area on the Kaibab NF (Only)						
A	NA					
B	NA					

Summary

Alternative	Description
C	Kaibab NF Amendment 2: The amendment would add language to allow prescribed fire and mechanical treatments in order to maintain and/or restore the ecological qualities of the proposed research natural area.
D	NA
Forest Plan Amendment Theme: Effect Determination for Cultural Resources on the Coconino NF (Only)	
A	NA
B–D	Coconino NF Amendment 3: The amendment deletes the standard that would require achieving a “no effect” determination and adds the words “or no adverse effect” to the remaining standard. In effect, management strives to achieve a “no effect” or “no adverse effect” determination.

Major Conclusions

To varying degrees, all action alternatives meet forest structure and pattern, forest health, and vegetation composition and diversity elements of the purpose and need by:

- Improved representation in the grass/forb/shrub, seedling/sapling, mature, and old structural stages, and trending toward a balance of structural stages;
- Attaining a mosaic of interspaces and tree groups on 41 to 44 percent of treatment acres;
- Creating landscape heterogeneity (while still meeting fire behavior objectives) with alternative C providing the highest percentage (17 percent) of closed canopy conditions;
- Reducing stand density below the density related mortality zone (less than 56 percent of maximum stand density index (SDI) in all goshawk habitat and in restricted MSO habitat;
- Reducing the percentage of the landscape with a high bark beetle hazard rating (reduced from 83 percent (alternative A) to a range of 26 to 45 percent) resulting in increased resiliency to future attacks;
- Reducing the trajectory of dwarf mistletoe infection from intensifying and spreading (alternative A) to a lower rate of spread in alternatives B, C, and D;
- Reducing the potential for crown fire below 10 percent;
- Promoting vegetation composition and diversity with alternatives B and D improving the most large oak (84,177 acres);
- Creating and enhancing grassland inclusions in over 300,000 acres of MSO and goshawk habitat;
- Moving historic grasslands toward desired conditions with alternative C moving the most (11,230) acres; and
- Improving soil condition and function, and protecting soil productivity and watershed function.

In alternative A, over 200,000 acres (34 percent of the project area) would continue to have the potential for high-severity fire effects from crown fire. In alternatives B, C, and D, the potential for high-severity effects from crown fire in the project area would be reduced to approximately 23,000 to 41,000 acres (4 to 7 percent). In the short term (2020), all action alternatives would move toward desired conditions for fire regime condition class (FRCC) at the project area scale. However, in the long term (2050), over 50 percent of the project area in alternative D would revert to FRCC 3, resembling current conditions.

All action alternatives would cause soil disturbance and erosion rates below tolerance level and would improve herbaceous understory productivity and nutrient cycling. Soil productivity and soil and watershed function would move toward desired conditions. There is a risk of severe soil effects from fire in alternative A. All action alternatives propose to use prescribed fire at different levels that would comply with Arizona Department of Environmental Quality (ADEQ) requirements. Emissions from the action alternatives are lower than predicted under a wildfire scenario in alternative A.

All action alternatives provide and sustain long term MSO nesting and roosting habitat and reduce the risk of high severity wildland fire and other natural disturbances. For management indicator species (MIS), alternative A has the potential to decrease the quantity and quality of the habitat (fire risk) and decrease the population trend in the long term as canopies close, understory production decreases, and Gambel oak is shaded out from pine. Alternatives B, C, and D may increase the quality and quantity of the habitat and increase the population trend. However, for Abert's squirrel (Coconino NF) and the tassel-eared squirrel (Kaibab NF), there may be a short-term decrease in habitat quantity and quality and population trend that changes to increasing in the long term. There would be no measurable negative effects to migratory bird populations, and habitats for which important bird areas (IBAs) were established would benefit from alternatives B, C, and D.

Overall, alternative A would not prevent, delay, or decrease the predicted effects of climate change. Forest density would continue to increase, heightening the risk of stand density and insect and disease related mortality. The ponderosa pine forest would have limited resilience to survive and recover from potential large-scale impacts. Alternatives B and C affect fire behavior, forest structure, and forest health, and increase resilience to natural disturbances associated with climate change on over 500,000 acres in both the short and long term. Alternative D increases forest resiliency to large-scale impacts (including climate) in the short term. In the long term, however, over 300,000 acres would return to pretreatment conditions and would be susceptible to high-severity surface effects, which equates to reduced resiliency to natural disturbances.

In alternative A, carbon stocks would remain high. In a current management scenario, large-scale fire events would release significant amounts of carbon into the atmosphere. In alternatives B, C, and D, individual tree growth would improve, resulting in larger average trees size and increased carbon storage over time, offsetting short-term losses of carbon removed through the mechanical thinning.

Decision Framework

The Coconino and Kaibab NF supervisors are the Forest Service officials responsible for deciding whether to select the actions as proposed (alternative B), select one of the other action alternatives including alternative C and alternative D, select an alternative that combines attributes from the alternatives or another variation, or, select no action (alternative A). Their decision includes determining: (1) the location and treatment methods for all restoration activities; (2) design criteria, mitigation, and monitoring requirements; (3) the components that will be included in the monitoring and adaptive management plan; (4) the components that will be included in the implementation checklist and plan; (5) the estimated products or timber volume to make available from the project; and (6) whether the forest plans will be amended.