Chapter 2. Alternatives, Including the Proposed Action

This chapter describes and compares the alternatives considered for the Rim Country Project. It includes a description of each alternative considered. Maps for the alternatives can be found in appendix A. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social, and economic effects of implementing each alternative.

Alternative Development Process

As a result of scoping, and extensive collaboration and public involvement since June 2016, the proposed action was modified as allowed by 36 CFR 220.7(b)(2)(iii). Modifications to the Proposed Action include dropping the even-aged shelterwood treatments originally proposed and replacing them with regular restoration treatments, modifying to propose treatments with a broader range of openness in some stands, defining the proposed treatments and terms in more detail, and detailing the acreages and miles of proposed treatments.

Those concerns that could not be addressed through modifications and additions to the Proposed Action were considered significant issues (see the Issues section in Chapter 1). Three of these issues drove the development of an additional action alternative in this DEIS.

Alternatives Considered in Detail

This DEIS documents the analysis of three alternatives, including the no action (Alternative 1), the Modified Proposed Action (Alternative 2), which is the preferred alternative, and one additional alternative (Alternative 3). Alternatives 2 (as modified) and 3 respond to issues by the public during the scoping period. The alternatives are described below.

Alternative 1 – No Action

Alternative 1 is the no action alternative as required by 40 CFR 1502.14(c).[3] It represents no changes to current management, and current forest plans would continue to be implemented. Ongoing vegetation treatments and fire management activities, as well as road maintenance, recreation, firewood gathering, authorized livestock grazing, and other activities already authorized in separate NEPA decisions would continue. There would be no other restoration activities approved with the Rim Country Project. The potential direct, indirect, and cumulative effects from no action will be analyzed. The no action alternative is the baseline for assessing the action alternatives (Alternatives 2 and 3).

Alternative 2 – The Modified Proposed Action

Alternative 2, the preferred alternative, is the Proposed Action as presented for scoping, with additional detail, clarifications, corrections, and modifications in response to public comments received. Changes made to the Proposed Action in response to public comment include:

1. Modifications to acreages and mileage of treatments based on additional modeling.
2. Additional clarity, details, and definitions of key terms used.

[3] http://ww.nepa.gov/nepa/regs/ceq/1502.htm#1502.14

3. Elimination of even-aged shelterwood silvicultural prescriptions to address dwarf mistletoe infections, replaced with regular restoration treatments.

In addition, the proposal to mechanically thin trees and implement prescribed fire on approximately 1,260 acres in the Long Valley Experimental Forest was dropped from this alternative, as well as from the Rim Country Project. In discussions with researchers with the Rocky Mountain Research Station, it was decided that experimental treatments for the experimental forest would be analyzed in a separate NEPA analysis.

This alternative, as modified, responds to the Dwarf Mistletoe Mitigation issue through the use of intermediate thinning (IT) treatments and/or the application of prescribed fire to address moderate and high levels of mistletoe infection. The presence of dwarf mistletoe will not be used to prioritize areas for treatment, but it will be addressed where it exists. Considerations for implementing IT treatments and prescribed fire will be included in the implementation plan as they continue to be developed with the 4FRI Stakeholder Group. Other restoration activities in Alternative 2 include vegetation treatments (mechanical thinning and burning) using the Flexible Toolbox Approach for Mechanical Treatments (see appendix D of the DEIS), as well as comprehensive restoration treatments for meadows, springs, streams, and riparian habitat using the Flexible Toolbox Approach for Aquatic and Watershed Restoration Activities (see appendix D of the DEIS). Alternative 2 also includes treatments to restore habitat for wildlife and rare species (Table 10, Table 11, Figure 5, Figure 6, and Figure 7). Proposed activities include:

Mechanically thin trees and/or implement prescribed fire on up to 953,130 acres.

- Implement mechanical thinning and prescribed fire on approximately 454,020 acres including:
  - Approximately 152,270 acres of intermediate thinning
  - Approximately 62,720 acres of stand improvement
  - Approximately 12,510 acres of single tree selection
  - Approximately 226,520 acres of uneven-aged group selection
- Implement prescribed fire alone on approximately 54,070 acres in target vegetation cover types
- Mechanically thin and/or implement prescribed fire on approximately 82,280 acres (in target and non-target vegetation cover types) of Mexican spotted owl (MSO) protected activity centers (PACs) including --
  - Approximately 23,550 acres of mechanical thinning and/or prescribed fire
  - Approximately 58,730 acres of prescribed fire only
- Mechanically thin and/or implement prescribed fire on approximately 25,290 acres of MSO replacement nest/roost recovery habitat.
- Conduct facilitative operations in non-target cover types to support treatments in target cover types, including –
  - Approximately 123,400 acres of facilitative thinning and prescribed fire outside of PACs
  - Approximately 1,260 acres of facilitative prescribed fire only outside of PACs
  - Approximately 6,880 acres of facilitative prescribed fire only in PACs
  - Approximately 300 acres of facilitative thinning and prescribed fire in PACs

- Restore aspen on approximately 1,230 acres, including about 30 acres in PACs.
- Restore approximately 132,240 acres that have experienced severe disturbance, including about 3,610 acres in PACs.
- Restore approximately 18,570 acres of savanna.
- Protect private property and critical infrastructure on approximately 63,930 acres within a ½ mile of non-Forest System lands with structures and critical infrastructure
- Restore approximately 36,320 acres of grassland, including –
  - Maintaining or restoring montane meadow connectivity in pronghorn corridors.
- Restore hydrologic function and vegetation on approximately 6,720 acres of meadows.
- Restore approximately 14,560 acres of riparian areas for aquatic stream habitat

The additional actions below are in both Alternative 2 and 3.

- Restore approximately 184 springs.
- Restore function and habitat in up to 777 miles of streams, including stream reaches with habitat for threatened, endangered, and sensitive aquatic species.
- Decommission up to 200 miles of existing system roads on the Coconino and Apache-Sitgreaves National Forests, and up to 290 miles on the Tonto National Forest.
- Decommission up to 800 miles of unauthorized roads on the Apache-Sitgreaves, Coconino, and Tonto National Forests.
- Construct or improve approximately 330 miles of temporary roads (new and/or occurring on existing unauthorized roads) to facilitate mechanical treatments; decommission all temporary roads when restoration treatments are completed.
- Relocate and reconstruct existing open roads adversely affecting water quality and natural resources, or of concern to human safety.

Construct up to 200 miles of protective barriers around springs, aspen, native willows, and big-tooth maples, as needed for restoration.

Table 10. Alternatives 2 (Preferred Alternative) and 3 Mechanical and Fire Treatment Descriptions and Objectives

Treatment Type	Treatment Description/Objective
Intermediate Thin (IT)	Mechanical and fire treatments that thin stands with up to moderate infection levels of dwarf mistletoe, thins tree groups to an average of 70 to 90 square feet of basal area (BA) in pine cover types and 40-100 BA in dry mixed conifer cover type, and establishes non-forested grass/forb interspace/openings between residual tree groups or individual randomly-spaced trees. Manages for improved tree vigor and growth by retaining the best growing dominant and co-dominant trees with the least amount of dwarf mistletoe and as many old and/or large trees as possible.
Single Tree Selection (ST)	Mechanical and fire treatments that leaves fewer tree groups and more randomly spaced trees. Designed to increase or maintain age class diversity and reduce understory brush and shrub response, creating small openings less than or equal to ¼-acre in size where seedlings and saplings are underrepresented and brush cover is greater than 40%. Maintains higher basal area where brush competition is expected to be strong to suppress woody understory response.
Stand Improvement (SI)	Mechanical and fire treatments that thin young, even-aged stands dominated by trees less than 8.5 inches in diameter. Establishes tree groups and interspace adjacent to tree groups. Manages for improved tree vigor and growth by retaining the best growing dominant and co-dominant trees within each group and as many old and/or large trees as possible, and establishes non-forested grass/forb interspace/openings between residual tree groups or individual randomly-spaced trees. Begins conversion to uneven-aged structure.
Uneven-aged (UEA)	Mechanical and fire treatments designed to develop uneven-aged structure and a mosaic of interspaces and tree groups of varying sizes. Thins tree groups to an average of 20-80 BA in pine cover types and 30-100 BA in dry mixed conifer cover type, and establishes non-forested grass/forb interspace/openings between residual tree groups or individual randomly-spaced trees. Manages to enhance growing space for younger trees, while retaining as many old or large trees as possible. Establishes regeneration openings where seedlings and saplings are underrepresented. Locates interspace in currently non-forested areas and lacking pre-settlement evidence.
Prescribed Fire Only (in and outside of PACs)	Prescribed burning to improve structure, maintain and develop large trees, and reduce risk of high-severity. Retain old growth attributes, protect large oaks, and ensure snags and coarse woody debris post-fire. Reduce conifer litter/duff at ground level to promote increased herbaceous species cover and species richness. Restore/regulate vegetation mosaics, including woody and herbaceous species

Treatment Type	Treatment Description/Objective
Aspen Restoration (in and outside of PACs)	Mechanical treatments that removes post-settlement conifers within 66 feet (one chain) of the aspen clone. Managed to stimulate suckering by removing aspen, disturbing the ground, and/or applying fire as needed.
Facilitative Operations (FO) – Mechanical (in and outside of PACs)	Mechanical and fire treatments in non-target cover types to support the use of prescribed fire in cover types targeted for restoration. Includes mastication/chipping; lop and scatter; thinning/limbing; and moving, rearranging, or removal of jackpots or excessive surface fuels. Designed to improve safety, improve treatment effectiveness, expand burn windows, decrease undesirable fire behavior and effects, and minimize disturbance from fireline construction.
Facilitative Operations (FO) – Prescribed Fire Only (in and outside of PACs)	Fire treatment in non-target cover types to support the use of prescribed fire in cover types targeted for restoration. Includes broadcast burning, jackpotting, pile burning, and blacklining. Designed to improve safety, improve treatment effectiveness, expand burn windows, decrease undesirable fire behavior and effects, and minimize disturbance from fireline construction.
MSO Recovery – Replacement Nest/Roost	Mechanical and fire treatments designed to develop uneven-aged structure, irregular tree spacing, and a mosaic of interspace and tree groups of varying size. Intent is to continue to develop replacement Nest/Roost where possible, and to develop a diverse mix of heterogeneous stand structures and densities to provide for owl dispersal and foraging.
MSO PAC Mechanical	Mechanical and fire treatments outside core areas that thins to improve structure, maintain and develop large trees, and reduce hazard of high-severity fire in PACs. Designed to increase tree vigor and health, to promote irregular tree spacing, and to create canopy gaps more conducive to fire treatment (reduce fire risk). Retain old growth attributes, protect large oaks, and ensure snags and coarse woody debris post-treatment.
Savanna Restoration (70 to 90% interspace)	Mechanical and fire treatments that restore pre-settlement tree density and pattern by removing encroaching post-settlement conifers. Manages for a range of 70 to 90 percent interspace (grass/forb) between tree groups or individual trees using pre-settlement tree evidence as guidance. Retains all pre-settlement trees and the largest post-settlement trees as replacement trees adjacent to pre-settlement tree evidence (stumps, dead and down).
Severe Disturbance Area Treatment (in and outside of PACs)	Combination of restoration treatments: reforestation, prescribed fire, lopping/scattering, mastication, and other mechanical methods. Objective is to identify treatments that would be effective in restoring the fuel structure that produces the types of fire to which ponderosa pine is adapted.

Treatment Type	Treatment Description/Objective
Wildland-Urban Interface (WUI) and Infrastructure Protection	Mechanical treatments that allow maintenance of a more open structure and/or lower fuel load than elsewhere in the project area, up to but not exceeding 70 percent interspace within a ½-mile buffer surrounding critical infrastructure (transmission lines and communication sites) and high value Forest Service infrastructure (buildings and recreation sites), and around non-Forest System lands where structures are present. Treatments are designed to: reduce fire transmission to and from communities, improve firefighter safety and effectiveness, increase evacuation time in emergencies, reduce ember production, increase decision space for fire managers, and allow for more frequent prescribed fires.
Grassland and Wet Meadow Restoration	Mechanical and fire treatments to reduce or eliminate woody species encroachment (pines, junipers and various shrubs). Remove trees established since interruption of the historic fire regime. Promote and re-establish the historic meadow edge. Retain all pre-settlement trees and leave replacement trees where evidence of historical large trees exist.
Riparian Restoration	Combination of restoration treatments, including mechanical and fire treatments to maintain riparian vegetation and habitat. Remove encroaching upland tree and shrub species. Remove noxious or invasive plants. Promote, protect, or plant native aquatic or riparian species. Prescribed fire to regenerate riparian species and reduce fuels accumulation.

Table 11. Alternative 2 (Preferred Alternative) Mechanical and Fire Treatment Categories and Acres

Treatment Type	Acres
Intermediate Thin (IT) 10-25 (10 to 25% interspace)	30,210
IT 25-40 (25 to 40% interspace)	60,000
IT 40-55 (40 to 55% interspace)	62,060
Single Tree Selection (ST)	12,510
Stand Improvement (SI) 10-25 (10 to 25% interspace)	13,660
SI 25-40 (25 to 40% interspace)	34,590
SI 40-55 (40 to 55% interspace)	14,460
Uneven-aged (UEA) 10-25 (10 to 25% interspace)	77,820
UEA 25-40 (25 to 40% interspace)	109,210
UEA 40-55 (40 to 55% interspace)	39,490
Prescribed Fire Only	3,240
Prescribed Fire Only in PACs	50,830
Aspen Restoration	1,200
Aspen Restoration in PACs	30
Facilitative Operations (FO) Mechanical	123,400
FO Mechanical in PACs	300
FO Prescribed Fire Only	1,260
FO Prescribed Fire Only in PACs	6,880
MSO Recovery – Replacement Nest/Roost	25,290
MSO PAC Mechanical	17,460
Savanna Restoration (70 to 90% interspace)	18,570
Severe Disturbance Area Treatment	128,630
Severe Disturbance Area – in PACs	3,610
Wildland-Urban Interface (WUI) and Infrastructure Protection	63,930
Grassland Restoration	36,320
Wet Meadow Restoration	6,720
Riparian Restoration	14,560

Spring Restoration

Specific treatments to restore springs would be identified prior to mechanical and fire treatments in the vicinity, using the Flexible Toolbox Approach for Aquatic and Watershed Restoration Activities (see appendix D). Treatments could include: removing tree canopy close to the spring, applying fire, re-plumbing the spring improvements to conserve water, protecting the spring with fencing, and removing or relocating adjacent roads or trails.

Stream Restoration

Specific treatments to restore riparian streams and stream channels and their function would likely be identified prior to mechanical and fire treatments in the vicinity, using the Flexible Toolbox Approach for

Aquatic and Watershed Restoration Activities (see appendix D). Treatments could include: reestablishing former drainage patterns, stabilizing slopes, restoring vegetation, protecting sites from grazing ungulates, removal of upland species that compete with riparian species, returning fire to the system (prescribed fire), and/or removing stock tanks. The emphasis will be on non-structural rather than structural methods.

Riparian Habitat Restoration

Proposed stream habitat treatments may be needed within all or some portion of the fish-bearing streams. Specific treatments to restore riparian streams and stream channels and their function would likely be identified prior to mechanical and fire treatments in the vicinity, using the Flexible Toolbox Approach for Aquatic and Watershed Restoration Activities (see appendix D). Restoration treatments may include channel restoration (one rock dams, grade control or induced meandering) and channel structural improvements (felling or girdling trees to provide large woody debris for cover and habitat complexity).

Road and Trail Relocation/Reconstruction

Specific treatments for roads, trails, and unauthorized routes that are affecting water resources would be evaluated prior to mechanical and fire treatments in the vicinity, using the Flexible Toolbox Approach for Aquatic and Watershed Restoration Activities (see appendix D). Generally, routes crossing and those within 300 feet of streams and waterbodies are the highest priority for evaluation and treatment. Treatments could include: adding gravel to the road surface of existing authorized routes, stabilizing slopes, and restoring vegetation; closing roads, trails, or unauthorized routes by blocking the entrance or installing water bars; removing culverts, reestablishing drainages, removing unstable fills, pulling back road shoulders, and scattering slash on the roadbed; and obliterating the roadbed by restoring natural contours and slopes.

Specific treatments for improving stream crossings that are affecting water resources would be evaluated prior to mechanical and fire treatments in the vicinity. Treatments could include: armoring downstream outlets of culverts, upsizing existing culverts, installing culverts or additional culverts, installing culvert arrays to mimic existing channel width, installing low water crossings, installing bridges, restoring downstream channels created from crossings, using sediment reduction methods on connected disturbed areas upstream from roads that connect to the drainage, paving crossings, and relocating the segment of the road that has the crossing issue out of the stream.

Figure 6 and Figure 7 display the locations of Grassland, Meadow, and Riparian and Stream Restoration activities for both Alternative 2 and Alternative 3.

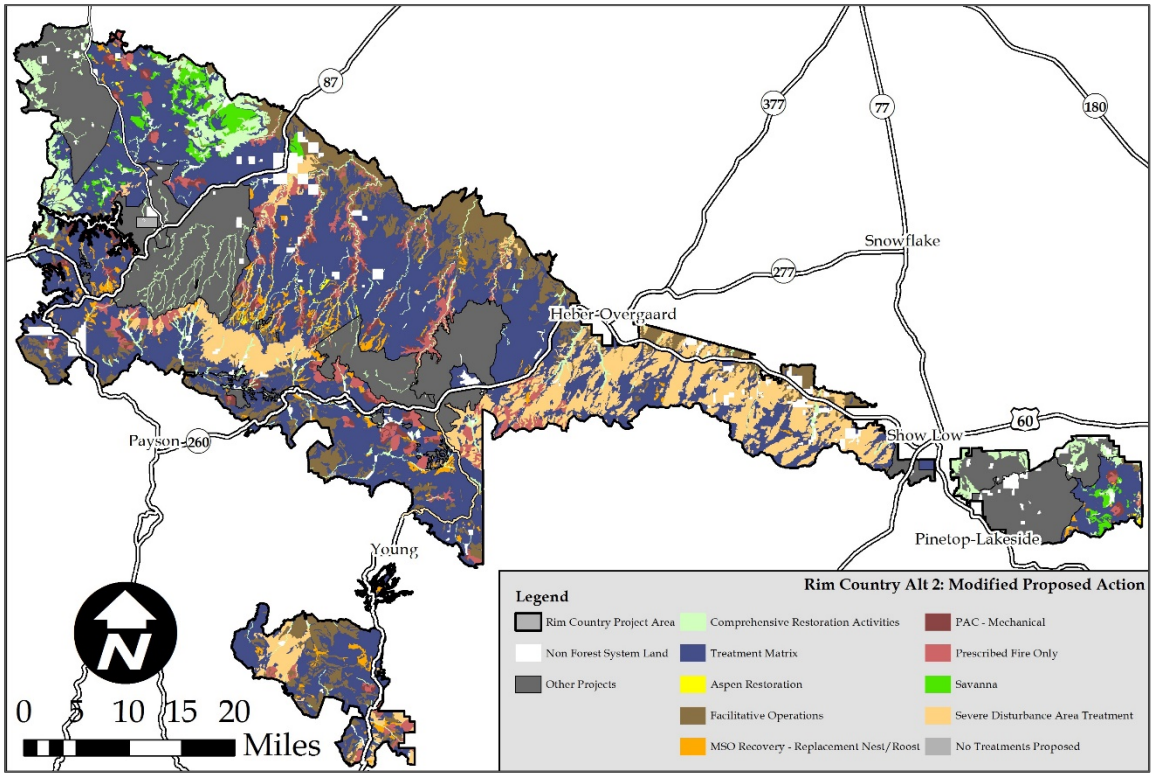

Figure 5. Alternative 2 proposed mechanical and fire treatments

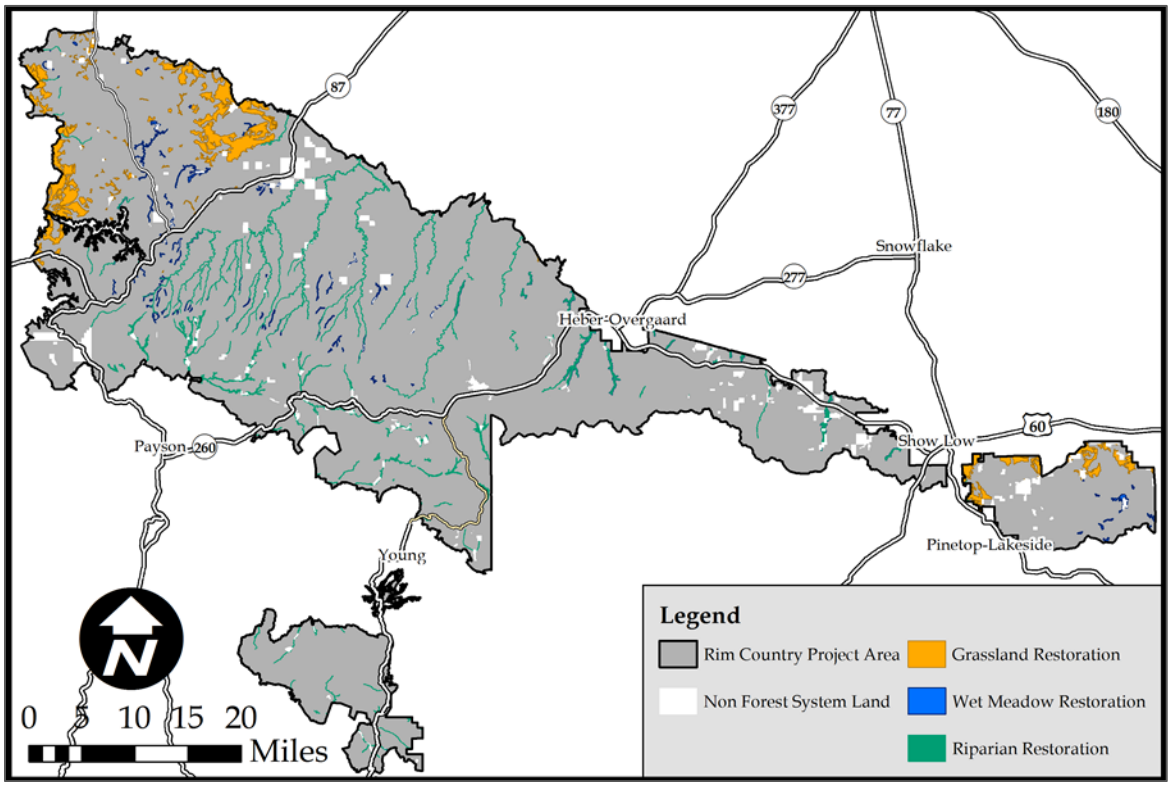

Figure 6. Alternatives 2 and 3 grassland, meadow, and riparian restoration activities

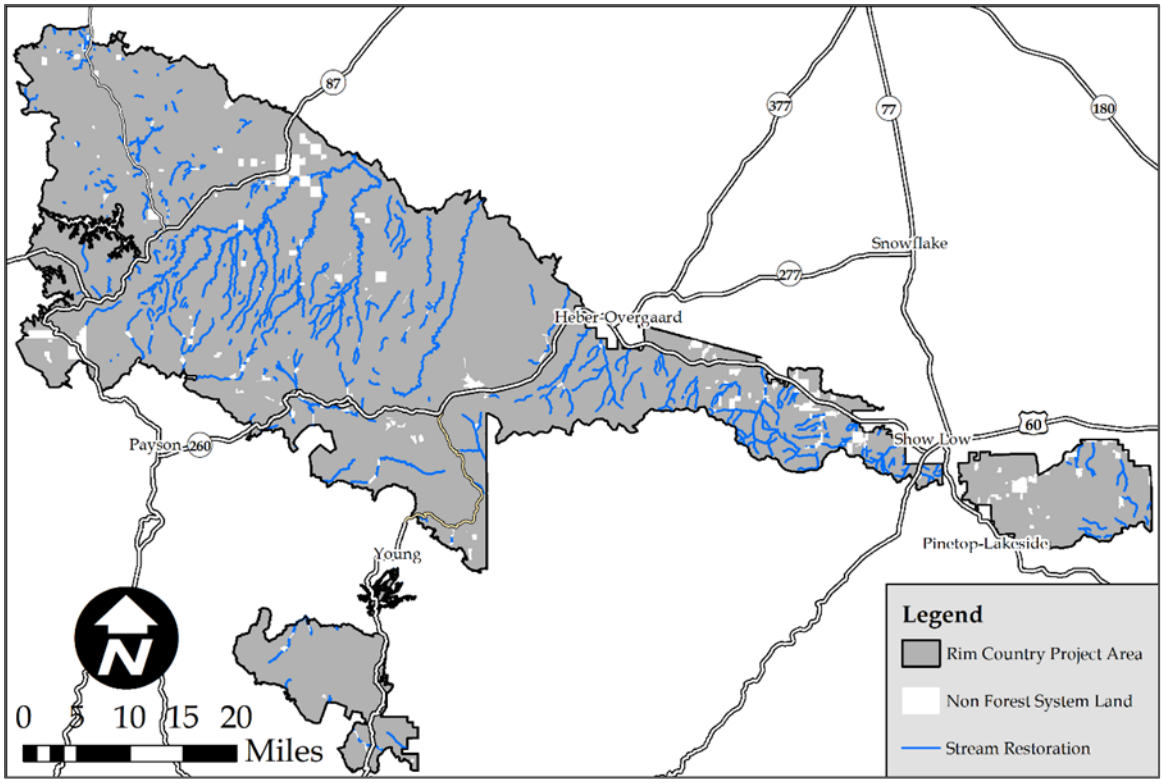

Figure 7. Alternatives 2 and 3 stream restoration activities

Alternative 3 – Focused Restoration

This alternative is designed to focus restoration treatments in areas that are the most highly departed from the natural range of variation (NRV) of ecological conditions, and/or that put communities at risk from undesirable fire behavior and effects. High value assets will be better protected and burn boundaries will be designed to create conditions safe for personnel and to ensure fire can meet objectives. Treatment areas would be chosen to optimize ecological restoration, those areas that are most important to treat and can be moved the furthest toward desired conditions. Focusing on the higher priority ecological restoration will result in fewer acres being treated.

The intermediate thinning (IT) treatments and/or the application of prescribed fire proposed in Alternative 3 will be used to address moderate and high levels of mistletoe infection, similar to Alternative 2, but to a lesser extent on the fewer acres proposed for mechanical treatment and fire. The presence of dwarf mistletoe will not be used to prioritize areas for treatment, but it will be addressed where it exists, using the same types of treatments as Alternative 2. Considerations for implementing IT treatments and prescribed fire will be included in the implementation plan as they continue to be developed with the 4FRI Stakeholder Group.

Alternative 3 responds to the Smoke/Air Quality, Economics, Roads, and Dwarf Mistletoe Mitigation issues. The restoration activities listed for Alternative 3 include vegetation treatments (mechanical thinning and burning) (Figure 8), using the Flexible Toolbox Approach for Mechanical Treatments (see appendix D); as well as the same comprehensive restoration treatments as proposed in Alternative 2 for grassland and meadows, springs, streams, riparian habitat, using the Flexible Toolbox Approach for Aquatic and Watershed Restoration Activities (see appendix D), wildlife habitat, and rare species restoration (Table 10, Table 12, Figure 6, and Figure 7). Proposed activities include:

Mechanically thin trees and/or implement prescribed fire on up to 529,060 acres.

- Implement mechanical thinning and prescribed fire on up to 265,540 acres.
  - Approximately 114,280 acres of intermediate
  - Approximately 32,290 acres of stand improvement
  - Approximately 5,630 acres of single tree selection
  - Approximately 113,350 acres of uneven-aged group selection
- Implement prescribed fire alone on approximately 40,630 acres in target vegetation cover types
- Mechanically thin and/or implement prescribed fire on approximately 61,700 acres (in target and non-target vegetation cover types) of Mexican spotted owl (MSO) protected activity centers (PACs) including:
  - Approximately 19,650 acres of mechanical thinning and/or prescribed fire
  - Approximately 42,050 acres of prescribed fire only
- Mechanically thin and/or implement prescribed fire on approximately 19,590 acres of MSO replacement nest/roost recovery habitat.
- Conduct facilitative operations in non-target cover types to support treatments in target cover types, including:
  - Approximately 47,580 acres of facilitative thinning and prescribed fire outside of PACs
  - Approximately 630 acres of facilitative prescribed fire only outside of PACs
  - Approximately 3,070 acres of facilitative prescribed fire only in PACs
  - Approximately 300 acres of facilitative thinning and prescribed fire in PACs
- Restore aspen on approximately 1,010 acres, including about 30 acres in PACs.
- Restore approximately 31,750 acres that have experienced severe disturbance, including about 1,420 acres in PACs.
- Restore approximately 2,470 acres of savanna.
  - Protect private property and critical infrastructure on approximately 46,260 acres within a ½ mile of non-Forest System lands with structures and critical infrastructure
- Restore approximately 36,320 acres of grassland, including:
  - Maintaining or restoring montane meadow connectivity in pronghorn corridors.
- Restore hydrologic function and vegetation on approximately 6,720 acres of meadows.
- Restore approximately 14,560 acres of riparian areas for aquatic stream habitat.

The additional actions below are in both Alternative 2 and 3.

- Restore approximately 184 springs.
- Restore function and habitat in approximately 777 miles of streams, including stream reaches with habitat for threatened, endangered, and sensitive aquatic species.

- Decommission approximately 200 miles of existing system roads on the Coconino and Apache-Sitgreaves National Forests, and approximately 290 miles on the Tonto National Forest.
- Decommission approximately 800 miles of unauthorized roads on the Apache-Sitgreaves, Coconino, and Tonto National Forests.
- Construct or improve approximately 170 miles of temporary roads (new and/or occurring on existing unauthorized roads) to facilitate mechanical treatments; decommission all temporary roads when restoration treatments are completed.
- Relocate and reconstruct existing open roads adversely affecting water quality and natural resources, or of concern to human safety.
- Construct approximately 200 miles of protective barriers around springs, aspen, native willows, and big-tooth maples, as needed for restoration.

Table 12. Alternative 3 Mechanical and Fire Treatments

Treatment Type	Acres
Intermediate Thin (IT) 10-25 (10 to 25% interspace)	24,260
IT 25-40 (25 to 40% interspace)	40,290
IT 40-55 (40 to 55% interspace)	49,730
Single Tree Selection (ST)	5,630
Stand Improvement (SI) 10-25 (10 to 25% interspace)	7,480
SI 25-40 (25 to 40% interspace)	17,120
SI 40-55 (40 to 55% interspace)	7,690
Uneven-aged (UEA) 10-25 (10 to 25% interspace)	48,500
UEA 25-40 (25 to 40% interspace)	53,740
UEA 40-55 (40 to 55% interspace)	11,110
Prescribed Fire Only	2,670
Prescribed Fire Only in PACs	37,960
Aspen Restoration	980
Aspen Restoration in PACs	30
Facilitative Operations (FO) Mechanical	47,580
FO Mechanical in PACs	300
FO Prescribed Fire Only	630
FO Prescribed Fire Only in PACs	3,070
MSO Recovery – Replacement Nest/Roost	19,590
MSO PAC Mechanical	15,750
Savanna Restoration (70 to 90% interspace)	2,470

Treatment Type	Acres
Severe Disturbance Area Treatment	30,340
Severe Disturbance Area – in PACs	1,420
Wildland-Urban Interface (WUI) and Infrastructure Protection	46,260
Grassland Restoration	36,320
Wet Meadow Restoration	6,720
Riparian Restoration	14,560

The same amount of comprehensive restoration activities: spring restoration, stream restoration, riparian habitat restoration, and road and trail relocation/reconstruction, are proposed in Alternatives 2 and 3. These activities are described above for Alternative 2 and will be implemented using the Flexible Toolbox Approach for Aquatic and Watershed Restoration Activities (see appendix D of the DEIS).

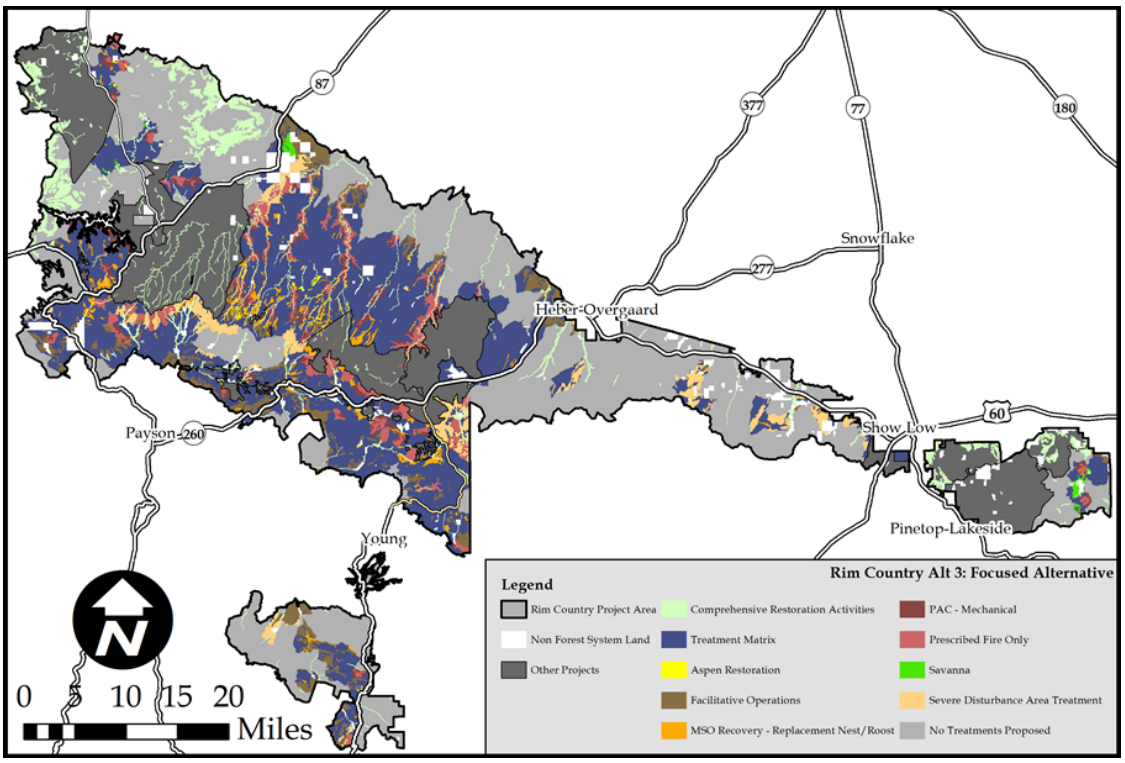

Figure 8 Alternative 3 proposed mechanical and fire treatments

Elements Common to Alternatives 2 and 3

Forest Plan Amendments

Three project-specific plan amendments for the Tonto National Forest are proposed for both action alternatives. The purpose of Amendment 1 is to bring Alternatives 2 and 3 into alignment with the revised Mexican Spotted Owl Recovery Plan and defer monitoring to the FWS biological opinion that is specific to this project. Amendment 2 clarifies existing direction related to managing canopy cover and interspace in the Forest Plan. The purpose of Amendment 2 is to bring the project into alignment with the best available science (Reynolds et al. 2013) that provides desired conditions for restoring fire-adapted ponderosa pine in the Southwest. Amendment 3 removes the restrictive language related to 40 percent slopes and the language identifying slopes above 40 percent as inoperable, to allow mechanical treatments

with new methods and equipment on slopes greater than 40 percent without adverse environmental effects (see appendix B for the full amendment text).

A project-specific plan amendment is a one-time variance in current Forest Plan direction for a project; Forest Plan direction reverts back to its original language/direction upon completion of the specified project. The language proposed does not apply to any other project.

Comprehensive Restoration

The overall goal of 4FRI is landscape-scale restoration that provides for fuels reduction, forest health, and wildlife and plant diversity. All kinds of restoration work, in addition to thinning and prescribed burning, are proposed in the Rim Country Project. Comprehensive restoration is the term used for these other types of restoration activities. The two action alternatives include the same amount of comprehensive restoration activities throughout the project area: grassland restoration, meadow restoration, spring restoration, stream restoration, and aquatics habitat restoration.

The Flexible Toolbox Approach

The flexible toolbox approach is a condition-based management strategy that allows predetermined treatments to be aligned, prior to implementation, with current conditions on the ground. A combination of selection criteria and vegetation conditions are used to determine habitat and forest cover filters and modifiers, as well as the appropriate treatments for each. Using existing stand data, these conditions and criteria are quantified to estimate the acreages of specific treatments to propose in a project area. These estimates are used to analyze the effects from those treatments. Site-specific field reviews are conducted before implementation to verify that ground conditions match those predicted. If they do not, the same selection criteria are applied again based on the actual ground conditions to be sure that the right treatment occurs on the right acre.

The flexible toolbox approach:

- Gives the ability to obtain more detailed site-specific information.
- Adapts to changes in environmental conditions.
- Uses expected conditions to make an informed decision about what types of treatments would work best in those conditions.
- Encourages application of the appropriate tool based on site conditions at time of implementation.
- Uses site-specific landscape features and current site conditions during implementation to guide selection of specific treatments or tools to move areas toward desired conditions and put the right treatment in the right place.
- Gives resource specialists flexibility to increase heterogeneity across the landscape by varying the extent, type, or intensity of treatments within the extent of the treatment.

The flexible toolbox approach is used to:

- Identify forest cover and habitat types that warrant special consideration and require additional management constraints before prescribing treatments are “filtered” out of the decision matrix treatment considerations. These include MSO PACs, MSO Nest/Recovery Habitat, Aspen Restoration, Grassland, Savanna, Severe Disturbance Areas, and Non-target Cover Types. (The Aquatics FTA allows specialists to choose from a variety of tools designed for specific site conditions.)

- Develop decision matrices to display the different site conditions that would lead to different treatments in areas outside of filters. While treatments in some cover and habitat types will not be determined by the decision matrices, others will make use of the decision matrices with added design features or "modifiers" to ensure resource protection. These include: MSO Recovery Habitat, NOGO Nest Stands, NOGO PFAs, SPLYT, and Sensitive Soils.
- Estimate the number of acres of each type of treatment proposed in each of the action alternatives. Proposed treatments, each with a defined range of openness, are analyzed at the higher end of openness or intensity, in order to analyze the maximum potential effects from these treatments.
- Prescribe appropriate treatments during implementation. Pre-implementation surveys will determine site-specific cover and habitat types and current conditions. Selection criteria for these types as spelled out in the FTA will be used to prescribe the appropriate treatments.

Two flexible toolbox approaches (FTAs) are being used in the Rim Country Project: one for mechanical treatments (and fire), and one for aquatics and watershed restoration activities. The two FTAs use different types of decision matrices. The mechanical treatments FTA uses decision matrices based on vegetation or stand conditions to determine the appropriate mechanical and/or fire treatments to prescribe. The aquatics FTA uses a different type of decision matrix for implementation of and prioritizing restoration projects. These two FTAs are included in appendix D of this EIS, the Implementation Plan, in their entirety.

Figure 9 diagrams the process used in the Flexible Toolbox Approach for Mechanical Treatments for assigning mechanical and fire treatments. Table 13 lists the considerations used in the Flexible Toolbox Approach for Aquatics and Watershed Restoration Activities to prioritize these activities.

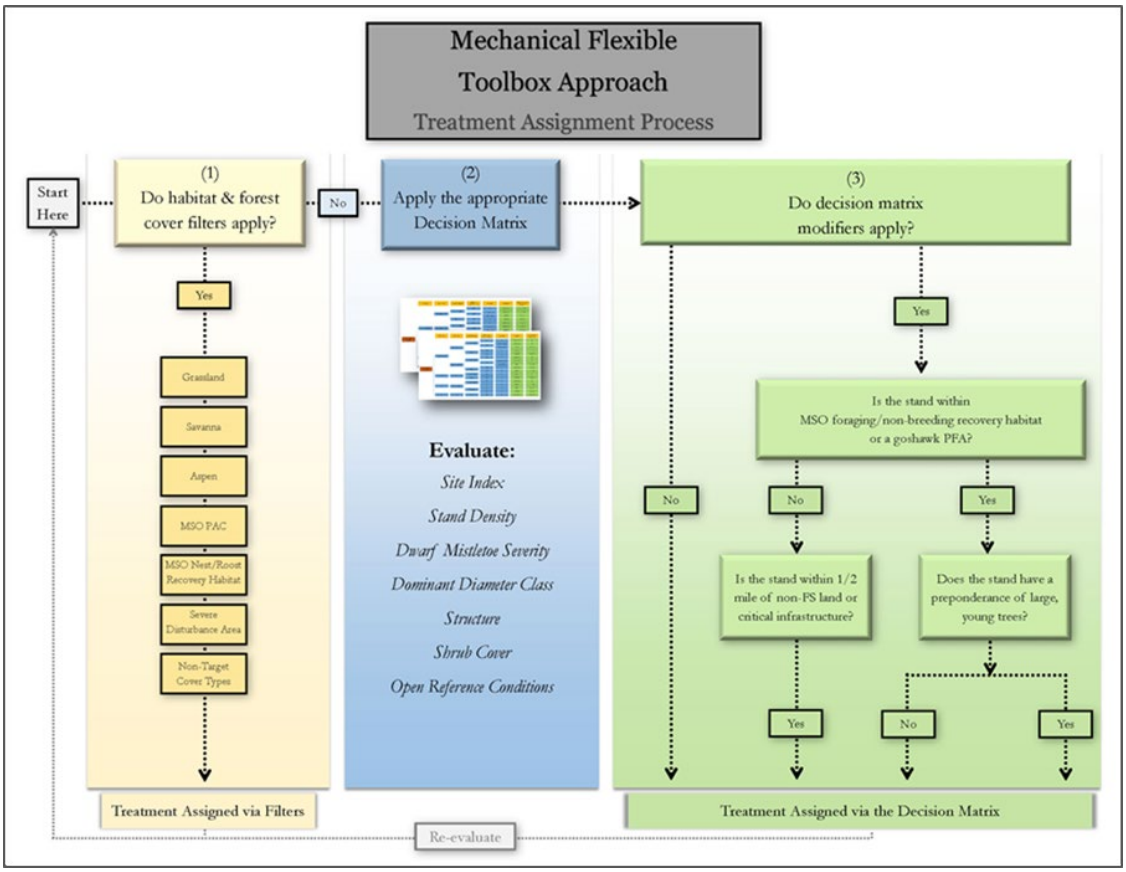

Figure 9. Mechanical flexible toolbox approach treatment assignment process

Table 13. Considerations for Prioritizing Aquatics and Watershed Restoration Activities

Consideration	Description
Watershed Condition Framework and priority watersheds.	Areas or activities within existing Watershed Restoration Action Plans can increase opportunities to move watersheds into a higher condition class. Maintaining or improving watershed condition where feasible should be taken into consideration. Projects in priority watersheds should be considered.
Projects that improved impaired waters	Projects that improve water quality in ADEQ TMDL (water quality improvement plan) or 303b listed streams,
Vegetation restoration activities within the area.	Incorporating aquatic and watershed restoration activities in an area with other restoration treatments whenever possible is one way to create efficiencies with heavy equipment and personnel.
Partner Interest	Projects that already have partners or interested partners, particularly if funding is available, should be considered.
Presence of federally listed or candidate species	The presence of these species and improving their habitat could increase the prioritization of a project over a site that had none present.
Wet meadows, cienegas, and other similar habitats.	These habitat types store water in upper watersheds and maintain baseflow to other aquatic habitats. They also cool water and can provide for lower stream water temperatures. Maintaining and improving these areas can have great downstream beneficial impacts.
Upper watershed vs. lower	Restoration in upper portions of watersheds can have beneficial impacts downstream such as reduced sedimentation, maintaining baseflow, and cooling stream temperatures. They will have a larger range of beneficial impacts than projects lower in a watershed.
Issues that are new, easily treated, or could quickly spread.	Newer issues have not yet caused that much damage; restoration treatments of these are more cost and time effective as well as preventing more degradation. Projects such as these are 'low-hanging fruit' when compared to larger or more widespread issues. In addition, new infestations of noxious weeds or aquatic invasive plants are easier to treat early rather than after they spread.
Federal employee, contracted, and partner implementation	All three categories have merit, but may have differing financial or oversight costs. These should be considered differently amongst options and assessed. Prioritization may depend upon which category a project occurs in when weighed against work load, capacity, and financial considerations.
Process versus form-based projects	Projects that enhance site conditions, but do not restore the processes that create habitat or site conditions are considered form-based. These types of projects can require more maintenance than projects that restore the processes that create and maintain habitat. Projects that restore processes may be more of a priority than those that address a specific issue rather than the larger problem.

Facilitative Operations

Facilitative operations (FO) are vegetation treatments proposed in non-target cover types in the Rim Country project area to support the use of prescribed fire in target cover types (those targeted for restoration). FO would be used in non-target cover types that are adjacent to or between target cover types, or where existing features can be used as prescribed fire unit boundaries. FO treatments would either move these non-target cover types toward Forest Plan desired conditions or maintain their current condition.

FO treatments would not have to be implemented to meet Rim Country objectives, but would be available as needed to facilitate the use of prescribed fire. The use of FO would:

1. Improve safety by expanding burn units to existing natural or man-made features that could serve as effective firelines (roads, cliffs, ridges, powerlines, etc.) This would reduce firefighter exposure to risks encountered during fireline construction. These existing barriers are usually

more effective than a fire line made by firefighters and heavy machinery, or can be made so with less risk, less time, less effort, and lower costs.

a. Improve treatment effectiveness and the timeframes for which prescribed fire treatments can be applied

b. Under some conditions, heavy fuel loading in chaparral or dense pinyon/juniper (particularly with a significant dead component) has the potential to produce extreme fire behavior, spotting, or other undesirable fire behavior. Where these kinds of fuels exist between target cover types and logical fuel breaks, undesirable fire behavior and effects could be decreased by manipulating fuel loading and structure. This would allow prescribed fire to be implemented under a broader range of conditions, while producing the desired fire effects.

c. Minimize the disturbance associated with fireline construction, such as soil disturbance, branch breakage, or bole damage caused by bulldozers, ATV draglines, handlines, and other means. Using existing features would result in less disturbance than other methods of creating a functional burn unit.

Types of FO Treatments

The expectation is that most FO treatments would be only prescribed fire with no mechanical treatments. Mechanical FO treatments would be the exception.

Fire

All areas proposed for FO would be available for prescribed fire, including:

- Broadcast burning
- Jackpotting (process of adding to and igniting small accumulations of woody debris)
- Pile burning
- Blacklining

Mechanical

Where mechanical FO treatments are needed, they would be site-specific and consider the requirements for all resources. Mechanical treatments could be combined with prescribed fire include:

- Mastication/chipping
- Lop and scatter
- Thinning/limbing
- Moving, rearranging, or removal of jackpots or excessive surface fuels
- Any combination of the above

Figure 10 shows an idealized landscape in which the existing features that would make a good fireline are some cliffs, two Forest Service roads, a highway, and a trail. In this case, all of the burn units that could be outlined with these features would include pinyon/juniper. Excluding pinyon/juniper from a burn unit would require a fireline. If the pinyon/juniper was included in the burn units, the need for ground disturbing activities would be minimized, and decrease the risk of injury for fire managers building firelines.

In this case, the use of FO would allow the inclusion of the pinyon/juniper area between the ponderosa pine and the road to be included in the prescribed burn unit, as shown in Figure 11. Fire managers would identify areas where there would be a potential need for mechanical treatments, and work with other resource specialists to identify the appropriate mechanical treatments.

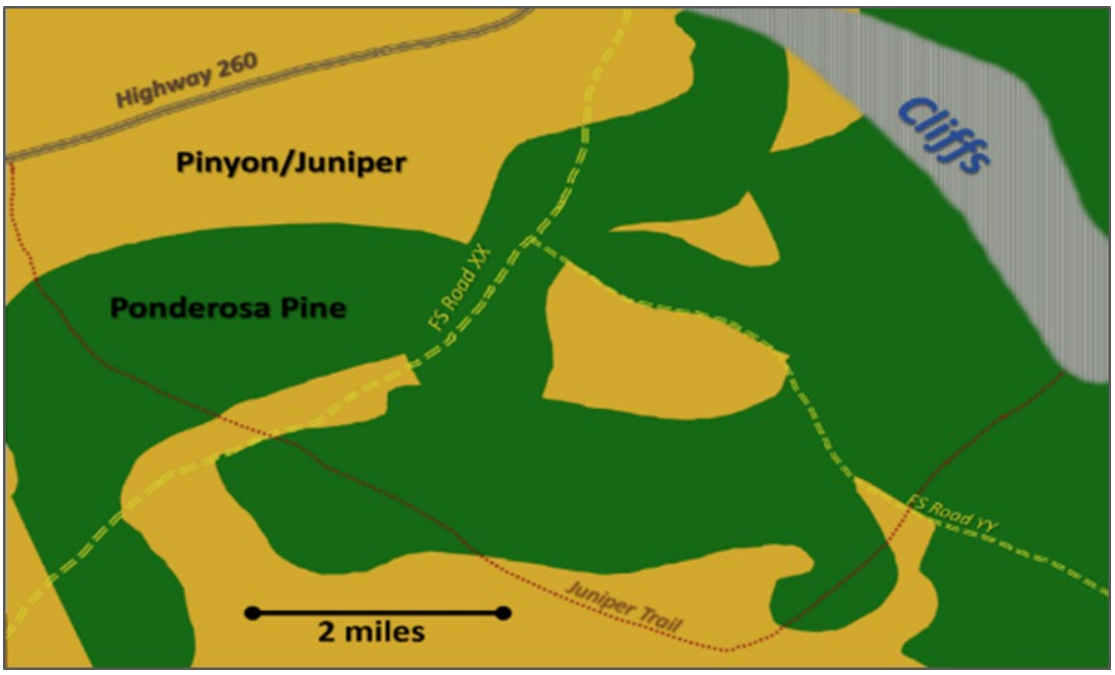

Figure 10. Idealized landscape of target and non-target cover types and fireline features

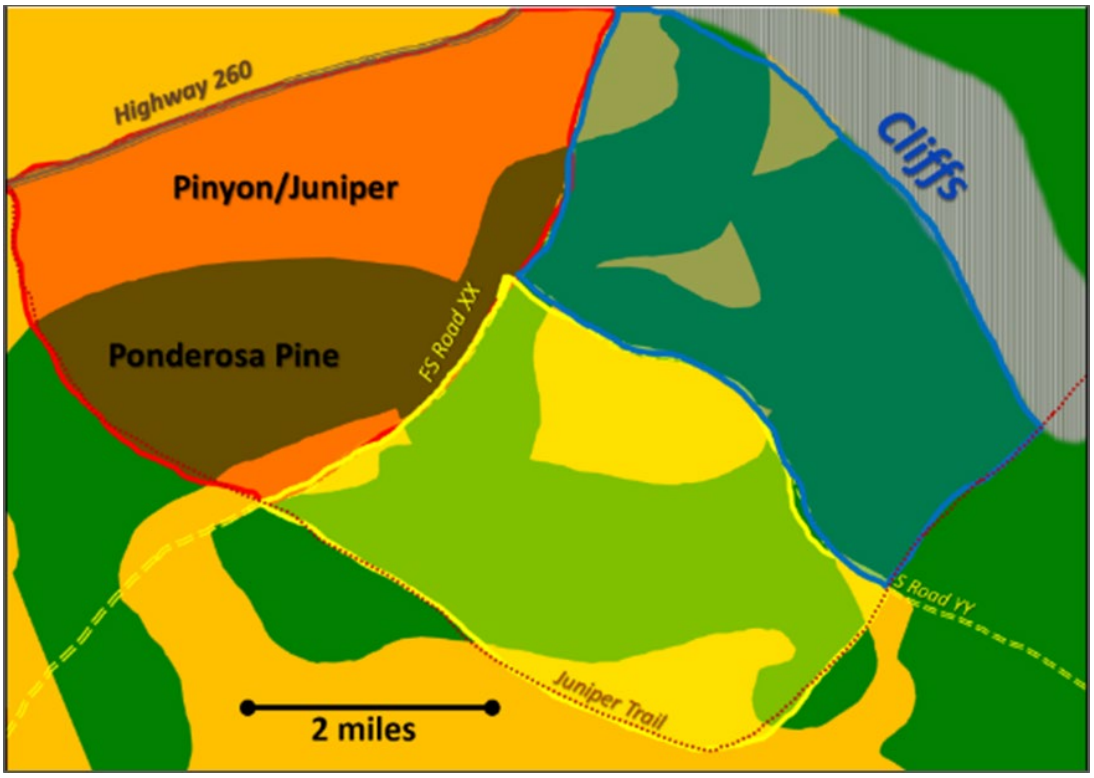

Figure 11. Same landscape with three burn units

Severe Disturbance Area Treatments

Severe disturbance areas (approximately 125,800 acres) are those where the spatial extent or the pattern of high severity fire effects is not within NRV. In some places this has resulted in aggressively sprouting species, such as alligator juniper and various species of oak dominating the vegetative response, making it difficult or impossible for ponderosa pine to establish or thrive. In other areas, extensive, overly dense patches of ponderosa pine regeneration have put stands on a trajectory toward stagnation, density-related mortality, or additional severe disturbance. Those severe disturbance areas known and included in this acreage for Rim Country are:

- Bray Fire (Coconino, Tonto)
- Breed Fire (Apache-Sitgreaves)
- Coon Fire (Tonto)
- Crossing Fire (Apache-Sitgreaves)
- Dude Fire (Apache-Sitgreaves, Coconino, Tonto)
- Durfee Fire (Apache-Sitgreaves)
- February Fire (Tonto)
- Five Mile Fire (Coconino, Tonto)
- Juniper Fire (Tonto)
- Mistake Peak Fire (Tonto)
- Packrat Fire (Coconino, Tonto)
- Picture Fire (Tonto)
- Pot Fire (Coconino)
- Potato Fire (Apache-Sitgreaves)
- Promontory Fire (Tonto)
- Rodeo-Chediski Fire (Apache-Sitgreaves, Tonto)
- Rim Fire (Tonto)
- Slim Fire (Apache-Sitgreaves)
- Tanner Fire (Tonto)
- Webber Fire (Tonto)
- Tinder Fire (Coconino)
- Pivot Rock Fire (Coconino)

Restoration treatments in severe disturbance areas will include combinations of reforestation, prescribed fire, lopping/scattering, mastication, and other mechanical methods with the objective of identifying treatments that would be effective in restoring the fuel structure that produces the types of fire to which ponderosa pine is adapted. In areas of extensive, pure ponderosa pine regeneration, the decision matrix in the flexible toolbox approach for mechanical treatments will be applied.

In-woods Processing and Storage Sites (Processing Sites)

The distance of the western part of the Rim Country project area from businesses that can process wood products from mechanical thinning prompted the identification of potential processing sites for use as needed by contractors during implementation. If primary processing can be accomplished in the project area, it would facilitate more utilization of forest resources, increase transportation efficiencies, reduce implementation costs, and generally make it easier to complete implementation.

The identification of potential processing sites was initially done using spatial analysis techniques and followed up with on-the-ground validation and input from subject matter experts. Variables such as current road system, slopes and landforms, economics of transportation, recreation sites, visual aesthetics, and wildlife and hydrological concerns were factored into the analysis process.

The closest mill to Rim Country is the Lumberjack Mill, approximately 13 miles from Heber, Arizona, just north of the eastern edge of the project area. The Lumberjack Mill is operated by Good Earth Power. The mill underwent an extensive upgrade in 2017 and is currently processing dry kilned and finished lumber.

On the western side of Rim Country, the closest wood processing facility is Canyon Wood Supply, approximately 25 miles from the western boundary of the project area in Camp Verde, Arizona. Canyon Wood Supply processes ponderosa pine into bundled fuelwood for retail consumption.

A fully loaded log truck at a gross weight of 80,000 pounds can typically transport 5,000 board feet of raw logs. In comparison, a tractor trailer with a 45-foot trailer can typically transport 40,000 board feet of green logs and be within the 80,000-pound threshold. Drying ponderosa pine wood for 60 days results in a weight reduction of 23 percent, which results in considerable haul cost savings. These figures put into perspective the underlying economics of transporting forest products in Arizona.

Processing sites serve many purposes. Some log sorting would be done on all processing sites, for various reasons such as increased log value and decreased hauling cost, taking advantage of available log markets, and providing a better log mix to consuming mills. Concentration log yards would provide a central point for accumulating logs for drying, debarking, and processing, and later shipment to mill yards. Small diameter timber or residue from log processing may be chipped and hauled to mills or other businesses. The advantage of having strategically-located processing sites over sorting logs at a landing is that logs can be more easily moved, bucked, and sorted by quality characteristics (species, size, and grade) for allocation to their highest values use (Dramm et al. 2002).

Tasks done by equipment at processing sites would include drying, debarking, chipping stems and bark, cutting logs, manufacturing and sorting logs to size, producing wood cants4, scaling and weighing logs, and creating poles from suitable sized logs. Equipment commonly used at processing sites would include circular or band saws, various sizes and types of front-end loaders, log loaders, and several types of chippers. Equipment may include timber processors, planers and mechanized cut to length systems, associated conveyers, and log sorting bunks for accumulation and storage of logs. Electric motors and gas or diesel generators would also be used to provide power. Large processing sites, 10 or more acres in size, would allow for more flexibility in their design and allow for more area to process, grade, scale and sort logs, and manufacture cants, poles, and chip and haul products. Larger sites would handle surges in incoming logs and would protect workers better by providing better separation between processing and transport functions. Medium-sized processing sites, five to 10 acres in size, would allow log processing

4 A **cant** is a piece of **wood** usually over 2" thick and sawn flat on one to three sides. Most pallet shops want cants to re-saw into pallet parts because they have more options on what sizes they can cut from them.

equipment use with more limited storage (Dramm et al. 2002). Landings for mechanical thinning contracts would be considerably smaller than log sort yards, typically about 1/3 of an acre.

Eight processing sites were proposed and analyzed for environmental effects in the Cragin Watershed Protection Project (CWPP) (Table 14). These sites are carried forward for potential use in implementing the Rim Country Project. In addition, 12 in-woods processing sites are being proposed and the environmental effects from their use analyzed in the Rim Country EIS (Table 15). For both projects, processing site location and siting considerations include: flat uplands less than 5 percent slope; more than 200 feet from perennial, intermittent, and ephemeral stream channels/ more than 300 feet from meadows, springs, and karst features; more than ¼ mile from MSO PACs and outside of NOGO PFAs; more than ¼ mile from system hiking trails, campgrounds, and group event recreation sites; more than ¼ mile from private lands, residences, or offices; and adjacent to roads that are open year-round for product removal. Processing sites were located to provide a buffer of 100 to 300 feet from forest roads and state highways to provide for visual screening from Concern Level 1 and 2 travel ways. Figure 12 displays the processing sites already analyzed in the CWPP Environmental Analysis (EA) and the additional sites being analyzed in this EIS.

Table 14. Processing Sites Analyzed in CWPP

Site Name	Acres
FR 141, 9398	5
FR 147, 6096/6097	5
211 Revised	15
613F	15
9033H	15
FR 95, North 9032C	10
FR 95F/396	9
9729A	5
Total (8)	79

Table 15. Processing Sites Analyzed in 4FRI Rim Country

Site Name	Acres
FR 117, 1321	4
FR 139, 9729D	14
FR 145A, 9615X	7
FR 288, 2781	4
FR 294, 294D	18
3238, 512	20
FR 582, Hwy 87	5
FR 609, 1938	7
FR 74, 64	8
FR 81, 81E	7
9364L, FH 3	21
9731G, Hwy 87	9
Total (12)	128

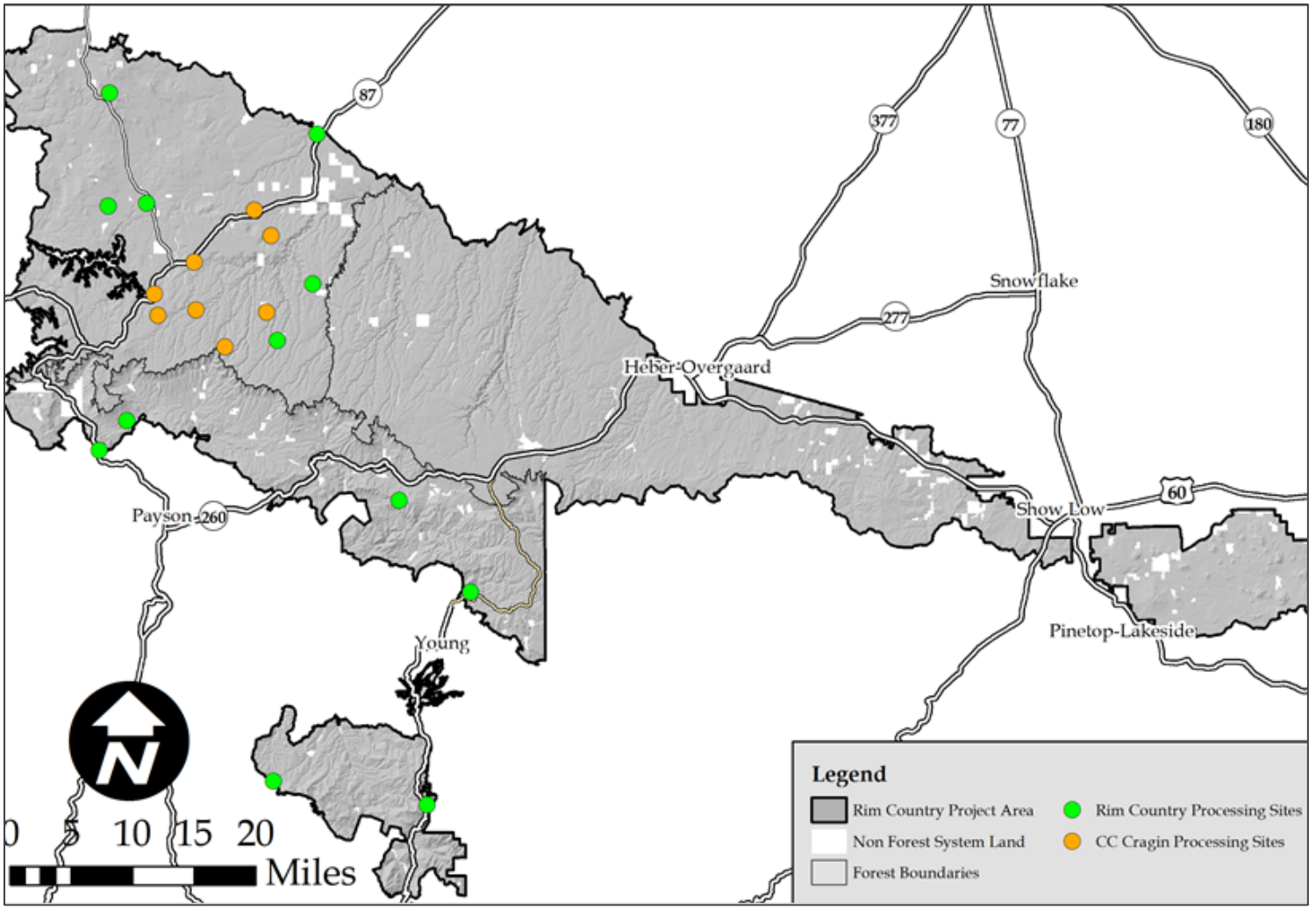

Figure 12. Proposed in-woods processing sites

These 20 in-woods processing and storage sites may be used for implementation of the Rim Country Project over its implementation period for 20 years, or until implementation is completed. Continuous-use processing sites are those where use is expected to be continuous on a regular basis for 10-20 years. These sites are typically the larger 10 to 21-acre areas located close to major highways. Sites originally developed and operated for continuous use will frequently change to intermittent use or occasional use following initial harvest activities in the area. Intermittent use processing sites are those where use is expected to be shorter term and used for one or multiple contract periods, lasting from 3-10 years.

The design features for in-woods processing sites are listed in appendix C of this DEIS.

Rock Pit Use

The Rim Country Project will analyze the effects from the use of several rock pits in the project area. On the Coconino National Forest, the development, expansion, and use of nine rock pits in the Rim Country project area were analyzed in the Rock Pits Environmental Assessment for the Coconino and Kaibab National Forests (June 2016). One additional rock pit, Park Knoll, is currently being developed by Coconino County under permit. The Forest Service will have a reserve of approximately 20,000 cubic yards of material in this pit, so the potential effects from the use of this rock pit will be analyzed in the Rim Country EIS.

On the Apache-Sitgreaves National Forest, two ranger districts are in the Rim Country project area, the Lakeside and Black Mesa Ranger Districts. Surfacing material needs on the Lakeside Ranger District are met by a large county-operated rock pit under special use permit, as well as other commercial sources. On the Black Mesa Ranger District, 11 existing rock pits in the Rim Country project area are proposed for expansion to provide future material for implementation of Rim Country. Each of these rock pits are considered for 30 percent expansion of their current footprint. The potential environmental effects from the anticipated expansion of these rock pits, as well as those from their use, will be analyzed in the Rim Country EIS.

On the Tonto National Forest, all road surface material needs would be met by local commercial sources. Therefore, no effects from rock pit use on the Tonto would be analyzed in the Rim Country EIS. Figure 13 displays the locations of these rock pits in the Rim Country project area.

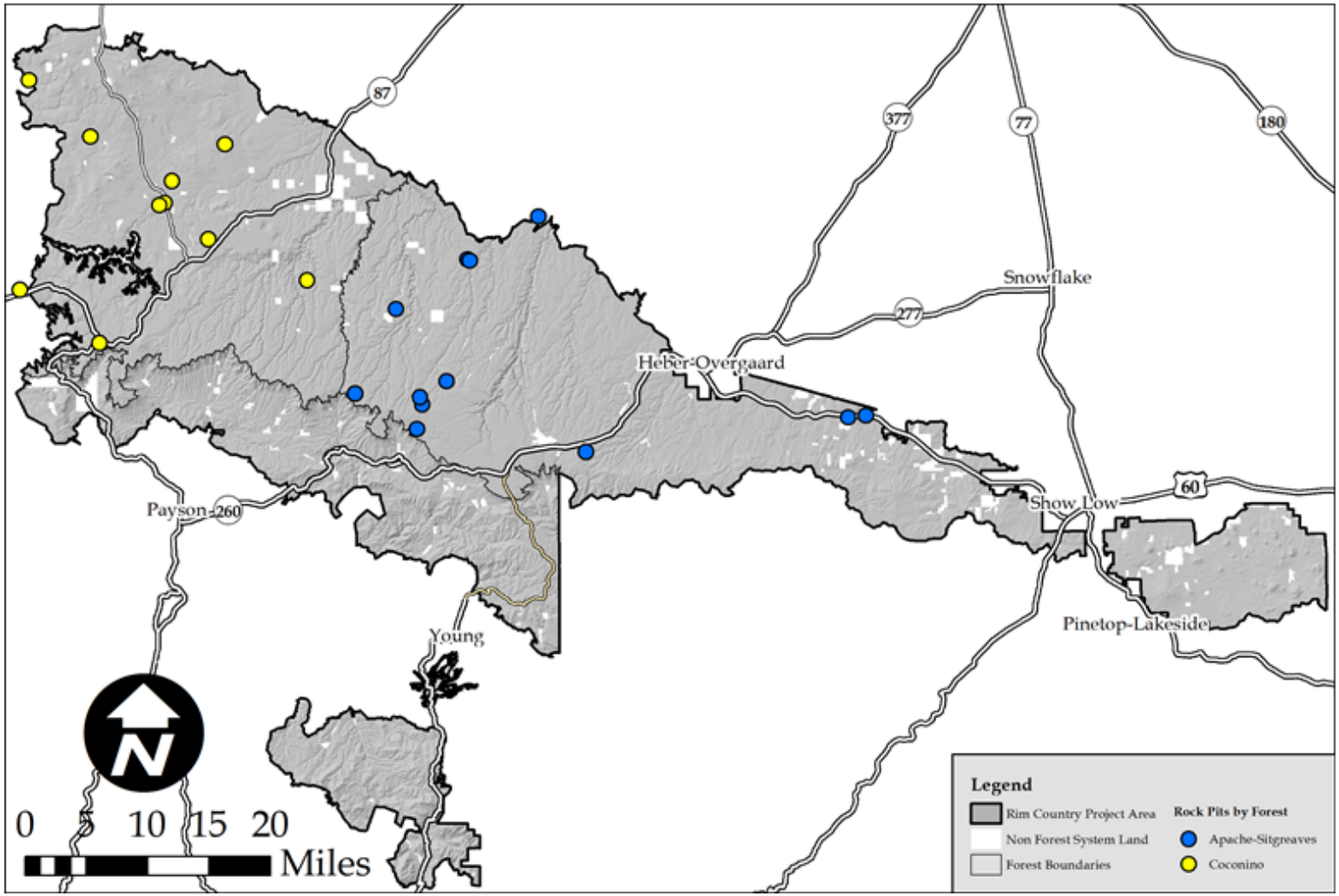

Figure 13. Coconino and Apache-Sitgreaves National Forests rock pits

Alternatives Considered but Eliminated from Detailed Study

This DEIS documents four (4) alternatives recommended in public comments that have been considered and eliminated from detailed study. Public comments suggested four alternative methods to meet the purpose and need, including alternatives that would: (1) eliminate the use of prescribed fire, (2) use the original Large Tree Retention Strategy, (3) return the forest to historic reference conditions, and (4) prioritize strategic treatments for fire use.

Each alternative was evaluated to determine how well the proposal would meet the purpose and needs for the Rim Country Project. The purpose of the project is to reestablish and restore forest structure and pattern, forest health, and vegetation composition and diversity in ponderosa pine ecosystems to conditions within the natural range of variation, thus moving the project area toward the desired conditions established in the Apache-Sitgreaves, Coconino, and Forest Plan Tonto National Forest Plans. The needs are to increase forest resiliency and sustainability, reduce the risk of undesirable fire effects, improve terrestrial and aquatic species habitat, improve the condition and function of streams and springs, restore woody riparian vegetation, preserve cultural resources, and support sustainable forest products industries. 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).

Eliminate the Use of Prescribed Fire

Some public comments suggested eliminating all prescribed fire (broadcast burns, pile burns, jackpot burning) to reduce hazards from particulate matter and other substances released during burning, to protect the health of the public, to provide cleaner air, and to reduce carbon emissions. Recommendations for alternatives to prescribed fire include logging for fire breaks, chipping, thinning, and goat or cattle grazing.

After an initial review, it was determined that it would not meet various elements of the purpose and need for the Rim Country Project or move toward the desired conditions in the Forest Plans, such as:

Eliminating the use of prescribed fire would negatively affect forest structure in terms of moving toward age and size class diversity and desired conditions for forest health. Without the thinning effects of fire on canopy fuels, seedlings, and young saplings, denser conditions could slow stand development and growth (Waring et al 2016). This would result in more of the landscape continuing in the young forest stage. Contrary to the restoration purpose and need, development of the mature and old forest stages would be impeded.

Mechanical treatments would address the majority of conditions associated with density-related mortality, bark beetle hazard, and dwarf mistletoe infections (Conklin and Geils 2008). However, the pruning effect of fire that would potentially reduce dwarf mistletoe infection severity (Wasserman and Waltz 2018) and reduce tree densities (due to the thinning effect of fire) would not occur. This could lead to slight increases in bark beetle infestation (Kenaley 2008) and density-related mortality, and would move the project area away from the desired conditions for resiliency and sustainability.

Without the use of prescribed fire, patterns of surface vegetation would further depart from the natural range of variation as fire-adapted shrubs and herbaceous species decline (Huffman and Moore 2008, Moir 1988). Eliminating fire would also have an effect on Gambel oak growth forms and densities. Currently, the Gambel oak population throughout the project area is dominated by seedlings and saplings. Without fire as a regulator of these smaller size classes, both the variety of oak growth forms and densities of seedlings and saplings would continue to be outside of the natural range of variation (Waring et al 2016).

This would move the project area away from the desired conditions for forest structure, pattern, and vegetation composition and diversity.

Mechanical treatments in the project area would be effective initially at restructuring most of the canopy bulk density, canopy base heights, tree density, and the arrangement of trees in the short term (immediately after treatment). Additionally, mechanical treatments have only a minimal effect on seedlings, and provide mineral soil that can increase seedling germination. In order to avoid seedling re-growth that would support undesirable fire behavior and effects, much of the forested areas of the Rim country project area would need some kind of treatment every 10 years, roughly 90,000 acres annually.

Mechanical treatments alone would not be sufficient to produce effects that simulate regeneration and growth of native herbaceous understory vegetation (move toward desired conditions for vegetation composition and diversity) or reduce the natural surface fuels that have accumulated since the interruption of fire on the landscape (Puhlick et al 2013). Mosaics created by patterns of litter/duff and other surface vegetation could not be recreated by mechanical means, and species that benefit from the heat or smoke of fire, such as Beardtongue Penstomon, Fendler's Ceanothus, several species of Grama grass, and various species of legumes (Abella et al. 2007, Huffman and Moore 2008, Lata 2015). The negative effects of the head and smoke of fire on species such as Pineland Dwarf Mistletoe or non-native crabgrasses are beneficial for the native ecosystems they inhabit.

Accumulations of litter, duff, dead and down woody debris, seedlings, and small saplings would not be reduced. These accumulations, in addition to the debris from mechanical treatments, could result in surface fires that burn at high intensities and lethally scorch tree crowns. It could also result in mortality of large and old trees in the project area.

High severity fires have the potential to cause second-order fire effects (such as flooding, debris flows, and erosion). This would be contrary to the need to reduce the risk of undesirable fire behavior and effects and move toward forest ecosystems with increased resiliency to wildfires.

Nutrients would increasingly become locked up in litter layers, and soil productivity would decline, affecting species composition and patterns (Moir 1988; Laughlin et al. 2011; Abella et al. 2007).

Depending primarily on mechanical means for project implementation, whether it was grazing or machines, this alternative would not meet the purpose and need of the Rim Country Project. The Guidance for Implementation of Federal Wildland Fire Management Policy states:

Fire, as a critical natural process, is integrated into land and resource management plans and activities on a landscape scale, and across agency boundaries. Response to wildland fire is based on ecological, social, and legal consequences of fire. The circumstances under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected, dictate the appropriate management response to fire.

Fire is a critical natural process, and not including prescribed fire in the Rim Country Project would not meet the purpose and need of the project. The effectiveness of using prescribed fire as a tool, alone or combined with mechanical treatments, to restore ponderosa pine to healthier, more sustainable and resilient conditions is well documented (Fulé et al. 2012).

Grazing was suggested as a method to reduce fuel loading. Grazers would remove the herbaceous vegetation that helps carry a fire across the majority of the project area.

To replace the use of prescribed fire, livestock (cattle and goats) would be authorized to graze on up to 899,340 acres (Alternative 2). This type of increased use would exceed what is currently permitted in the existing allotment management plans in the Rim Country project area. There would likely be a decline in herbaceous species production and diversity, and possibly an increase in soil compaction across the project area. This is contrary to the purpose and need to improve the abundance, diversity, distribution, and vigor of native understory vegetation to provide food and cover for wildlife, as well as move toward the desired conditions of improved condition and function of streams and springs, grasslands and connected montane meadows, watersheds, and forest ecosystems.

This alternative would respond to Issue 6—Smoke/Air Quality. It would be possible to use mechanical treatments to move biomass offsite and reduce surface fuels that would have been burned and produced smoke The costs to implement this would be significant and there would be a large increase in truck traffic that would increase emissions, dust, and degradation to roads however, mechanical treatment would not replace the role fire has in improving vegetation composition and diversity.

It is estimated that the project area would move away from the desired conditions for forest structure and pattern and resiliency within 10 years of mechanical treatments without the ability use prescribed fire to: (1) stimulate understory vegetation growth; (2) reduce excessive fuel loadings (accumulated since the interruption of fire on the landscape); (3) maintain desired canopy base heights; (4) reduce ladder fuels (attained through mechanical treatment); (5) thin seedlings and small saplings to maintain a mosaic of age classes; and (6) reduce threats to cultural resources and terrestrial and aquatic species habitat.

The use of alternative fuel reduction methods in lieu of prescribed fire could reduce some surface fuels, but would not meet the ecological need for a fire-adapted landscape and would add significantly to the cost of restoration. Fire that did occur on the landscape would be wildfire, and the effects and behavior would be more severe than on a landscape which prescribed fire had been part of the restoration treatments.

Use the Original Large Tree Retention Strategy (LTRS)

Scoping comments recommended incorporating the LTRS as written by the 4FRI stakeholders. In the 1st 4FRI EIS analysis, it was determined that incorporating and implementing the original LTRS would not meet various elements of the purpose and need. The Forest Service modified the original strategy, developing the Large Tree Implementation Plan (LTIP), which was included in that EIS and is brought forward with modifications into this EIS and is part of the Implementation Plan

Return the forest to historic reference conditions (an aggressive strategy to achieve comprehensive landscape restoration)

An alternative that analyzes the effects of "returning the forest to a state closely approximating historic reference conditions, and which incorporates an aggressive strategy to achieve the stated goal of comprehensive landscape restoration while complying with requirements such as the Endangered Species Act was recommended during scoping.

The comments suggested a full restoration alternative is needed to consider treating the landscape to the fullest extent that mimics historic conditions that based on studies were projected to have had far less trees per acre on the landscape. Historic conditions are also considered to have a larger number of large trees due to estimated historic fire return intervals.

This type of alternative was considered similar to the evidence-based full restoration alternative considered and evaluated in the 1st 4FRI EIS, except that it provided additional provisions to meet

current direction for retention and improvements to certain habitat types (such as in the Endangered Species Act). Also included would have been the flexible tool box approach, including the Old Tree/Large Tree (OT/LT) retention strategies

This alternative would meet the purpose of and need to increase ecosystem resiliency and sustainability. It would be compliant with Forest Plans, ESA, and other direction for species preservation.

Having an industry that is sustainable over time helps the Forest Service gain and retain desired forest conditions, provides jobs, and provides products to the American people. The best model for industry sustainability is to provide flow of wood. There is concern this alternative would demand treatment of a large amount near term then there would be a small amount longer term (boom-bust model). This does not provide for long-term sustainability which is needed to maintain the forest over time.

It was found when all the conditions were applied to meet ESA, habitat and species preservation, OT/LT retention strategy, the projection for treatments did not vary by a lot to warrant detailed study. In addition there was concern by some that while the numbers didn't vary by much, that the stands that would be available for this type of treatment would warrant more open conditions than desired, and may lead to removal of larger trees to meet the prescription. Therefore the alternative was dropped from detailed study.

Strategic Treatments for Fire Use Alternative

This alternative was recommended after public scoping and initial development of the alternatives. This suggested alternative proposes "expanded use of prescribed and resource benefit fire, coupled with strategic placement of mechanical treatments...," and a "spatially-explicit means to prioritize the Rim Country landscape and identify optimal treatment actions." The project area would be divided into three types of management areas:

2. Community Protection (1/2 mile around homes and critical infrastructure, highest priority for mechanical treatment)
    d. Strategic Thinning Treatment (approximately 20% of operable landscape outside of community protection areas, next priority, consensus-based treatments including fire-only)
    e. Fire Use (rest of project area not prioritized for mechanical treatment, prescribed and resource benefit fire only with increased resources and dedicated fire implementation team)

This alternative would meet the purpose of Rim Country to increase ecosystem resiliency and sustainability, and would move the project area toward desired conditions. However, this alternative was not analyzed in detail as the major elements suggested have been considered and included in the existing action alternatives, the Modified Proposed Action and the focused restoration alternative. The Modified Proposed Action proposes fire across the project area and would incorporate the use of any naturally-occurring fire for resource benefits. The focused restoration alternative prioritizes and limits where mechanical treatments are proposed, based on spatial analysis of the values-at-risk to protect from undesirable fire effects, and where resources should be deployed to "yield the greatest restoration benefit." Although the three management areas recommended are not used, both action alternatives prioritize treatments around non-Forest Service land with structures and critical infrastructure. The focused restoration alternative also prioritizes areas with the highest probability of active crown fire. Both action alternatives propose "consensus-based treatments" as developed with stakeholders through the collaboration process.

Design Features, Best Management Practices, Conservation and Mitigation Measures

The Forest Service employs several measures in the planning and implementation of management activities to reduce or prevent negative effects on the environment. The application of these measures begins in the planning and design phase of a project. Forest Plan standards and guidelines and the direction contained in the Watershed Conservation Practices Handbook (FSH 2509.25) are protection measures applied to any project. Both of these sources are incorporated by reference and are not reiterated here.

Project design features, best management practices (BMPs), and conservation and mitigation measures that are designed to minimize or avoid effects from the proposed activities have been included in the analysis of this DEIS (see appendix C). All design features apply to both action alternatives.

Implementation Plan

The implementation plan (appendix D) is designed to be integral to the selected alternative and record of decision. It must be considered in conjunction with appendix C, which provides the design criteria, best management practices, and conservation and mitigation measures. The implementation plan provides direction to be used by Forest Service personnel to ensure that management activities are implemented to meet the purpose and need for Rim Country and to follow Forest Plan standards and guidelines. The implementation Plan includes the Large Tree Implementation Plan (LTIP) and Old Tree Implementation Plan (OTIP) as well as permits and other law, regulations and policy requirements the project would follow.

Monitoring

Appendix E includes the biophysical and socioeconomic monitoring plan. This plan is designed to be integral to the selected alternative and record of decision. The monitoring plan details the framework and process for monitoring selected activities. The 4FRI stakeholders and the Forest Service coordinated on the design of the monitoring plan.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 16. Comparison of Alternatives by Proposed Treatment

Proposed Activity	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Mechanical Treatments		
Intermediate thinning	152,270	114,280
10% to 25% interspace	30,210	24,260
25% to 40% interspace	60,000	40,290
40% to 55% interspace	62,060	49,730
Stand improvement	71,270	37,300
10% to 25% interspace	13,660	7,480
25% to 40% interspace	34,590	17,120
40% to 55% interspace	14,460	7,690
Single tree selection	12,510	5,630
Uneven-aged group selection	226,520	113,350
10% to 25% interspace	77,820	48,500
25% to 40% interspace	109,210	53,740
40% to 55% interspace	39,490	11,110
Aspen restoration	1,230	1,010
Facilitative operations	123,700	47,880
MSO recovery - replacement nest/roost	25,290	19,590
MSO PAC - mechanical	17,460	15,750
Savanna restoration	18,570	2,470
Severe disturbance area treatment	132,240	31,760
Wildland Urban Interface & Infrastructure Protection	63,930	46,260
Grassland restoration*	36,280	36,280
Wet meadow restoration*	6,400	6,400
Riparian restoration*	13,060	13,060
Total mechanical treatment (acres)	**889,340**	**483,160**
Prescribed Fire		
Prescribed fire along with mechanical treatment	889,340	483,160
Prescribed fire only	63,790	45,900
Total prescribed fire (acres)	**953,130**	**529,060**
Grassland Restoration	36,280	36,280
Mechanical and Prescribed Fire		

Proposed Activity	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Prescribed fire only	40	40
Total grassland restoration* (acres)	**36,320**	**36,320**
Wet Meadow Restoration Mechanical and Prescribed Fire	6,410	6,410
Prescribed fire only	310	310
Total wet meadow restoration* (acres)	**6,720**	**6,720**
Riparian restoration Mechanical and Prescribed Fire	13,060	13,060
Prescribed fire only	1,500	1,500
Total riparian restoration* (acres)	**14,560**	**14,560**
Springs restored (number)	**184**	**184**
Protective barriers around springs, aspen, native willows and bigtooth maples (miles)	**200**	**200**
Stream restoration (miles)	**777**	**777**
Existing road decommission (miles)	**490**	**490**
Unauthorized route decommission (miles)	**800**	**800**
Temporary road construction and decommission (miles)	**330**	**170**
Road relocation and reconstruction (miles)	**As needed**	**As needed**

*Overlap exists between the riparian, grassland and wet meadow restoration categories (approximately 3,120 acres)

Comparison of Alternatives by Issue

Table 17. Comparison of Alternatives by Issue

Issue Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Issue 1 – Treatment in MSO PAC Stand density as measured by SDI, TPA, QMD, Canopy Cover and Basal Area (BA). Metrics are calculated for Mixed Conifer (MC) and Pine-Oak (PO) Cover Types.	SDI MC: from 398 (existing condition) to 414 in 2029 and 425 in 2039 SDI PO: from 339 (existing condition) to 353 in 2029 and 362 in 2039 TPA MC: from 1,291 (existing condition) to 1,170 in 2029 and 1,057 in 2039 TPA PO: from 1,276 (existing condition) to 1,130 in 2029 and 990 in 2039 QMD MC: from 6 to 7" over 20 years QMD PO: from 6 to 7" over 20 years Canopy Cover MC: from 74% (existing condition) to 76% in 2029 and 78% in 2039 Canopy Cover PO: from 69% (existing condition) to 71% in 2029 and 73% in 2039 BA MC: from 173 inches in the existing condition to 185 in 2029 and 196 in 2039 BA PO: from 144 inches in the existing condition to 155 in 2029 and 163 in 2039	SDI MC: from 398 (existing condition) to 253 in 2029 and 218 in 2039 SDI PO: from 339 (existing condition) to 215in 2029 and 191 in 2039 TPA MC: from 1,291 (existing condition) to 392 in 2029 and 227 in 2039 TPA PO: from 1,276 (existing condition) to 369 in 2029 and 232 in 2039 QMD MC: from 6" (existing condition) to 9" in 2029 and 12" in 2039 QMD PO: from 6" (existing condition) to 9" in 2029 and 11" in 2039 Canopy Cover MC: from 74% (existing condition) to 67% in 2029 and 66% in 2039 Canopy Cover PO: from 69% (existing condition) to 62% in 2029 and 61% in 2039 BA MC: from 173 inches in the existing condition to 131 in 2029 and 127 in 2039 BA PO: from 144 inches in the existing condition to 110 in 2029 and 106 in 2039	SDI MC: from 398 (existing condition) to 262 in 2029 and 235in 2039 SDIPO: SDI PO: from 339 (existing condition) to 237 in 2029 and 223 in 2039 TPA MC: from 1,291 (existing condition) (existing condition) to 531 in 2029 and 379 in 2039 TPA PO: from 1,276 (existing condition) to 496 in 2029 and 368 in 2039 QMD MC: from 6" (existing condition) to 9" in 2029 and 12" in 2039 QMD PO: from 6" (existing condition) to 9" in 2029 and 10" in 2039 Canopy Cover MC: from 74% (existing condition) to 67% in 2029 and 67% in 2039 Canopy Cover PO: from 69% (existing condition) to 64% in 2029 and 64% in 2039 BA MC: from 173 inches in the existing condition to 131 in 2029 and 130in 2039 BA PO: from 144 inches in the existing condition to 117 in 2029 and 117 in 2039

Issue Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Fuel loading in Mixed Conifer (MC and Pine-Oak Cover Types, fire hazard index, and risk of crown fire	Fuel loading MC:29 tons per acre (existing condition) to 29 tons/acre in 2029 and 33 tons/acre in 2039 Fuel Loading PO: 20 tons/acre (existing condition to 23 tons/acre in 2029 and 25 tons/acre in 2039 Fire hazard index: from 49,889 acres (41 % of all PACs in the project area) in the existing condition to 57,191 (47 %) are at risk of high severity wildfire Active and Passive Crown fire assessment: from 58,253 acres (48% of all PACs in the project area) in the existing condition to 61,608 acres (50%) that are at risk of active fire	Fuel loading MC: 29 tons/acre (existing condition) to 28 tons/acre in 2029 and 27 tons/acre in 2039 Fuel Loading PO: 20 tons/acre (existing condition to 18 tons/acre in 2029 and 19 tons/acre in 2039 Fire hazard index: from 49,889 acres (41 % of all PACs in the project area) in the existing condition to 34,410 (28 %) are at risk of high severity wildfire Active and Passive Crown fire assessment: from 58,253 acres (48% of all PACs in the project area) in the existing condition to 34,068 acres (28%) that are at risk of active fire	Fuel loading MC: 29 tons/acre (existing condition) to 27 tons/acre 2029 and 27 tons/acre in 2039 Fuel Loading PO: 20 tons/acre (existing condition to 19 tons/acre in 2029 and 20 tons/acre in 2039 Fire hazard index: from 49,889 acres (41 % of all PACs in the project area) in the existing condition to 33,105 (30 %) are at risk of high severity wildfire Active and Passive Crown fire assessment: from 58,253 acres (48% of all PACs in the project area) in the existing condition to 33,044 acres (30%) that are at risk of active fire

Issue Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Prey habitat as measured by number of snags/acre ≥ 12 inches in diameter, CWD, and shrub and herbaceous cover. Metrics are calculated for Mixed Conifer (MC) and Pine-Oak (PO) Cover Types.	Snags/acre ≥ 12"MC: from 7/acre (existing condition) to 5/acre in 2029 and 2039 Snags/acre ≥ 12"PO: from 3/acre (existing condition) to 4/acre in 2029 and 2039 CWD MC: from 10 tons/acre (existing condition) to 12 tons/acre in 2029 and 14 tons/acre in 2039 CWD PO: from 8 tons/acre (existing condition) to 9 tons/acre in 2029 and 10 tons/acre in 2039 Shrub cover MC: from 0.4 tons/acre (existing condition) to 0.34 tons/acre in 2039. Shrub cover decreased Shrub cover PO: from 0.23 (existing) with no change through 2039 Herbaceous cover MC and PO: from 0.21 tons/acre (existing condition) with no change through 2039.	Snags/acre ≥ 12" MC: from 7/acre (existing condition) to 12/acre in 2029 and 8/acre in 2039 Snags/acre ≥ 12" PO: from 3/acre (existing condition) to 7/acre in 2029 and 2039 CWD MC: from 10 tons/acre (existing condition) to 12/tons/acre in 2029 and 13 tons/acre in 2039 CWD PO: from 8 tons/acre (existing condition) to 9 tons/acre in 2039 Shrub cover MC: from 0.4 tons/acre (existing condition) to 0.63 tons/acre in 2029 and 0.73 tons/acre in 2039 Shrub cover PO: from 0.23 (existing) to 0.24 in 2039 Herbaceous cover MC: from 0.21 tons/acre (existing condition) to 0.24 tons/acre in 2039 Herbaceous cover PO: from 0.21 tons per acre (existing condition) to 0.23 tons/acre in 2039	Snags/acre ≥ 12" MC: from 7/acre (existing condition) to 10/acre in 2029 and 8/acre in 2039 Snags/acre ≥ 12" PO: from 3/acre (existing condition) to 7/acre in 2029 and 6/acre in 2039 CWD MC: from 10tons/acre (existing condition) to 12 tons/acre in 2029 and 12 tons/acre in 2039 CWD PO: from 8 tons/acre (existing condition) to 9 tons/acre in 2039 Shrub cover MC: from 0.4 tons/acre (existing condition) to 0.55 tons/acre in 2029 and 0.65 tons/acre in 2039. Shrub cover PO: from 0.23 (existing) to 0.25 in 2039 Herbaceous cover MC: from 0.21 tons/acre (existing condition) to 0.24 tons/acre in 2039. Herbaceous cover PO: from 0.21 tons per acre (existing condition) to 0.22 tons/acre in 2039
Issue 2 – Treatments in Goshawk Habit Stand density as measured by SDI, TPA, QMD, reduction of average BA of large young trees Size Classes 3 (5-12") and 4 12-18"	SDI: from 312 (existing condition) to 326 in 2029 and 336 in 2039. TPA: 872 (existing condition) to 793 in 2029 and 721 in 2039. QMD: from 6 to 7" over 30 years. BA of Tree Size Classes: 3 (5-12") 47 trees/acre (existing condition) to 48 trees/acre in 2039 4 (12-18") 41 trees/acre (existing condition) to 47 trees/acre in 2039	SDI: from 312 (existing condition) to 129in 2029 and 118 in 2039. TPA: 872 (existing condition) to 136 in 2029 and 88 in 2039. QMD: from 6 to 14" over 30 years BA of Tree Size Classes: 3 (5-12") 47 trees/acre (existing condition) to 9 trees/acre in 2039 4 (12-18") 41 trees/acre (existing condition) to 20 trees/acre in 2039	SDI: from 312 (existing condition) to 168in 2029 and 165 in 2039 TPA: 872 (existing condition) to 271 in 2029 and 224 in 2039. QMD: from 6 to 12" over 30 years BA of Tree Size Classes: 3 (5-12") 47 trees/acre (existing condition) to 18 trees/acre in 2039 4 (12-18") 41 trees/acre (existing condition) to 25 trees/acre in 2039

Issue Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Fuel loading, fire hazard index, and risk of crown fire	Fuel loading: from 17 tons/acre (existing condition) to 22 tons/acre in 20439 Fire hazard index: from 16,211 acres (28 % of all PFAs in the project area) in the existing condition to 19,472 (33 %) are at risk of high severity wildfire Crown fire assessment: Risk of crown fire in PFAs goes from 23,270 acres (39% of all PFAs in the project area in the existing condition to 24,653 acres (41%) in 2039	Fuel loading: from 17 tons/acre (existing condition) to 12 tons/acre in 2039 Fire hazard index: from 16,211 acres (28 % of all PFAs in the project area) in the existing condition to 8,281 (14 %) are at risk of high severity wildfire Crown fire assessment: Risk of crown fire in PFAs goes from 23,270 acres (39% of all PFAs in the project area in the existing condition to 11,170 acres (19%) in 2039	Fuel loading: from 14 tons/acre (existing condition) to 13 tons/acre in 2039 Fire hazard index: from 16,211 acres (28 % of all PFAs in the project area) in the existing condition to 9,621 (17 %) are at risk of high severity wildfire Crown fire assessment: Risk of crown fire in PFAs goes from 23,270 acres (39% of all PFAs in the project area in the existing condition to 11,421 acres (20%) in 2039
Prey habitat as measured by number of snags/acre ≥ 12 inches in diameter, CWD, and shrub and herbaceous cover	Snags/acre ≥ 12 inches: from 4/acre (existing condition) to 3/acre in 2039. CWD: from 7 tons/acre (existing condition) to 9 tons/acre in 2039 Shrub cover: from 0.28 tons/ acre (existing condition) to 0.26 tons/acre in 2039 (no change). Herbaceous cover: from 0.20 tons/acre (existing condition) with no change through 2039	Snags/acre ≥ 12 inches: from 4/acre (existing condition) to 6/acre in 2039. CWD: from 7 tons/acre (existing condition) to 6 tons/acre in 2039 Shrub cover: from 0.28 tons/acre (existing condition) to 0.38 tons/acre in 2039 Herbaceous cover: from 0.20tons/acre (existing condition) to 0.24 tons/acre in 2039	Snags/acre ≥ 12 inches: from 4/acre (existing condition) to 5/acre in 2039. CWD: from 7 tons/acre (existing condition) to 7tons/acre in 2039 Shrub cover: from 0.28 tons/acre (existing condition) to 0.38 tons/acre in 2039 Herbaceous cover: from 0.20 tons/acre (existing condition) to 0.23 tons/acre in 2039
Issue 3 – Large Tree Retention Acres meeting SPLYT criteria (2019 / 2039)	36,270 / 80,140	36,270 / 64,770	36,270 / 72,420
Issue 4 – Dwarf Mistletoe (DM) Mitigation Acres of intermediate thinning proposed in severe DM stands	0	18,456	16,236

Issue Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
% of acres in DM severity rating classes	The proportion of acreage with a severe dwarf mistletoe rating would increase from 4 percent in 2019 to 6 percent in 2029, reaching 9 percent in 2039. The proportion of acreage that meets the desired condition decreases from 96 percent in 2019 to 91 percent in 2039.	The proportion of acreage with a severe dwarf mistletoe rating would decrease from 4 percent in 2019 to 2 percent in 2029, reaching 3 percent in 2039. The proportion of acreage that meets the desired condition would increase from 96 percent in 2019 to 97 percent in 2039.	The proportion of acreage with a severe dwarf mistletoe rating remains essentially unchanged from 4 percent in 2019 to 2 percent in 2029, returning to 4 percent in 2039. The proportion of acreage that meets the desired condition is also the same in 2019 and in 2039.
Issue 5 – Economics Volume of wood products available	Ongoing projects will continue to provide some amount with no contribution from the Rim Country Project	5.3 MMCCF	3.6 MMCCF
Economic efficiency (project benefits/value less costs)	No direct project benefits or costs; no economics of scale in forest restoration activities	Avoided costs from forest restoration and reduced risk of high intensity wildfire	Avoided costs from forest restoration and reduced risk of high intensity wildfire; more concentrated treatments (compared to alternative 2) would lower operating costs
Changes in employment (jobs created) and labor income	Three national forests would continue to support local employment and labor income associated with harvesting, grazing and recreation at levels similar to current conditions	1,890 jobs and 78 million dollars in labor income	1283 jobs and 53 million dollars in labor income
Issue 6 – Smoke/Air Quality Potential for Rx fire emissions	Smoke and associated emission impacts on air quality would come solely from wildfire events. These events would be unpredictable in both magnitude and timing, with the potential for large pulse impacts to air quality metrics. Wildfire related emissions would be expected infrequently (a few times a year). Overall, smoke impacts would be less predictable, less frequent, and more concentrated than impacts from the prescribed fires proposed for alternatives 2 and 3.	Smoke and associated impacts on air quality would come primarily from prescribed fire. Wildfire would continue to occur, but per acre emissions for wildfires occurring post treatment would be reduced up to 40% compared with existing conditions. Variability from year to year in total smoke related emissions would be high, but overall, smoke impacts would be more predictable, less concentrated, though potentially more frequent than wildfire related emissions associated with alternative 1. All prescribed fire treatments would comply with National Ambient Air Quality Standards.	In treated areas, smoke and associated impacts on air quality would come primarily from prescribed fire, while smoke from untreated areas would be generated from wildfires. On average, approximately 45% less acreage would be burned with prescribed fire in this alternative compared with alternative 2. Areas burned with prescribed fire would produce lower emissions per acre than untreated acers burned by wildfires. All prescribed fire treatments would comply with National Ambient Air Quality Standards.

Issue Indicator/Measure	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Level of modelled pollutants	Modeled wildfire emissions: PM2.5- 359 lbs/acre PM10- 304 lbs/acre Carbon monoxide- 3,384 lbs/acre Sulfur dioxide- 35 lbs/acre	Modeled wildfire emissions: PM2.5- 164-227 lbs/acre PM10- 139-193 lbs/acre Carbon monoxide- 1,790-2,447 lbs/acre Sulfur dioxide- 8-12 lbs/acre	Modeled wildfire emissions: PM2.5- 164-359 lbs/acre PM10- 139-304 lbs/acre Carbon monoxide- 1,790-3,384 lbs/acre Sulfur dioxide- 8-35 lbs/acre
Effects of smoke on quality of life and tourism	This alternative would not result in smoke emissions from prescribed fire in the project area. Smoke from wildfires, though unpredictable in frequency and duration, would be likely to adversely affect quality of life and tourism over both the short and long terms. Because this alternative would not reduce fuel loading, wildfires in the project area would likely produce more smoke and particulate matter compared with wildfires in treated areas or prescribed fires. Because wildfires are unplanned there is little potential to work with fire managers to reduce smoke impacts in areas when fires occur. High-severity fires in untreated areas are likely to result in substantial tree mortality and post-fire effects that have the potential to negatively affect quality of life and tourism for forest users.	Prescribed burns would have short-term and minimal negative effects to quality of life and tourism during implementation, and long-term benefits from reduced risk of severity of wildfire. Mechanical treatments would reduce fuel loading so that prescribed fires and wildfires in treated areas would be likely to emit less smoke and particulate matter. Wildfires in treated areas would be less likely to kill entire stands, thus protecting resources and forest characteristics that contribute to quality of life and tourism in the area.	Prescribed burns would have short-term and minimal negative effects to quality of life and tourism during implementation, and long-term benefits from reduced hazard and severity of wildfire. Mechanical treatments would reduce fuel loading so prescribed fires and wildfires in treated areas would emit less smoke and particulate matter. Compared to alternative 2, benefits of reduced fire hazard and potential negative, short-term effects would occur across a smaller area. Wildfires in treated areas would be less likely to kill entire stands, protecting resources and forest characteristics that contribute to quality of life and tourism in the area.
Issue 7 – Roads # of miles temporary roads needed	0 miles	330 miles	170 miles

Comparison of Alternatives by Effects

Table 18. Comparison of Alternatives by Effects

Resource Area	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Water Quality	Upland and riparian vegetation, soil productivity, and wetland function would not be restored to desired conditions. Degrading contributors to water quality would continue to persist.	Localized, short-term changes in water quality due to sediment concentrations are possible in water bodies adjacent to project activity areas. Risk to long-term surface water quality is expected to decrease more rapidly and over a larger extent when compared to alternative 3 by bringing upland and riparian vegetation, soil productivity, and wetland function to desired conditions.	Same as Alternative 2 with the exception of substantially fewer upland acres treated with mechanical vegetation and prescribed burning treatments in forested conditions 48% less) and grasslands and savannahs (28%) less and prescribed burning treatments. Prescribed burning only acres are 26% less. Therefore, potentially fewer short-term effects and long-term benefits to water quality.
Water Quantity	Water yield including persistence of flow and stability of hydrologic flow regimes would likely continue to decline as a result of continued departure from desired conditions.	Water yield may increase depending on vegetation type and climate variables. More stable hydrologic regimes are expected as a result of moving resources towards desired conditions.	Due to fewer acres being treated through mechanical vegetation treatments and prescribed burning overall water yield and stability may be lower than in Alternative 2 but greater than in Alternative 1.
Riparian Zones	Degradation of riparian systems would continue unabated, with reduced function and stability of riparian areas, wetlands, and springs.	Vegetation treatments, including mechanical thinning and prescribed burning along with other aquatic and watershed treatments, would increase water availability and stability to riparian areas, wetlands, and springs. Riparian vegetation and stream habitats would be restored and maintained.	Fewer acres would receive mechanical vegetation and prescribed burning treatments than Alternative 2, resulting in potentially less water availability for supporting riparian areas, wetlands, and springs and restoration of fewer areas of riparian vegetation and stream habitat.
Watershed Condition	There would be no discernable change in watershed condition. Current rates of watershed restoration are insufficient to fully restore watershed functionality at the landscape scale.	Watershed condition would be improved throughout the project area with implementation of the suite of proposed restoration actions.	Watershed condition would improve throughout the Rim Country analysis area, just not to the extent provided by Alternative 2.

Resource Area	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Soil Condition	With no activities resulting from the Rim Country Project, no additional soil disturbance or displacement would occur beyond existing projects for which NEPA analysis has been completed. By not decommissioning or relocating roads as part of the Rim Country Project, soil conditions on those roads will not be improved.	Greatest soil disturbance and displacement would occur with short-term negative effects throughout much of the Rim Country analysis area. As a result of proposed restoration treatments, Alternative 2 would achieve desired condition for soils and watershed over the long term by removing sufficient canopy cover to allow sunlight to penetrate to the forest floor, increasing growth response of grasses, forbs and shrubs. In the long term, increased fine roots and vegetative ground cover would protect soils from erosion by wind and water better than forest litter alone, providing the greatest long term soil condition improvement. Road decommissioning would improve soil condition on former road beds.	Less soil disturbance and displacement than Alternative 2, resulting in less short-term adverse effects to soils. Would not achieve desired conditions at the landscape scale for soils over the long-term since it would result in treatment of only the highest priority areas. Soil nutrient cycling would progress toward the desired condition in treated areas, which are substantially less than Alternative 2. Untreated areas would continue to have less understory vegetative cover. The litter layer, or duff would continue to provide soil nutrients and contribute to soil profile development, but not to the extent provided by grasses, forbs, and shrubs in Alternative 2. Road decommissioning would improve soil condition on former road beds.
Forest Structure - General	Stand structure would continue to not meet the desired conditions as smaller trees are overrepresented. This trend would be expected to continue, leading to increased density dependent mortality, while basal area and stand density index (SDI) would continue to increase. The number of trees per acre and basal area and SDI would move further away from the natural range of variation (NRV) and the desired conditions. This trend would be expected to continue. Insect hazard rating and severity of dwarf mistletoe infections would continue to increase.	Stand structure would move toward desired conditions as trees would be well distributed across size classes. The number of trees per acre, basal area, and SDI would decrease considerably, trending toward desired conditions within NRV as a result of thinning and prescribed fire activities. Insect hazard rating and dwarf mistletoe severity would be reduced in treated areas, thus moving toward the desired conditions.	In general, the effects would be similar to the effects of Alternative 2, with a muted effect due to the fewer number of acres treated, and would only be observed in the stands treated. The number of trees per acre, basal area, and SDI would decrease considerably, trending toward desired conditions within NRV as a result of thinning and prescribed fire activities. Insect hazard rating and dwarf mistletoe severity would be reduced in treated areas, thus moving toward the desired conditions.
Forest Structure - Pattern	Stands would continue to remain in a closed condition, lacking groups and clumps of trees or randomly spaced trees. Grasses forbs and shrubs would continue to be underrepresented. Forest structure would continue to be departed from historic conditions.	This alternative would generally meet the desired condition. The majority of stands would be in an open condition. Forest arrangement would be in individual trees, small clumps, and groups of trees or randomly spaced trees that are similar to historic patterns and are as a result of the proposed action Most forest stands in uneven-aged condition to meet forest resilience and sustainability goals while maintaining wildlife habitat.	This alternative would generally meet the desired condition on the acres that were treated, however the acres that were not treated would resemble the conditions described in the no action alternative. Forest arrangement would resemble historic forest structure in some places, while many other areas would not meet the desired condition for forest pattern and structure.

Resource Area	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Forest Structure – Trees per Acre	Total trees per acre continues to remain above the desired condition. The percentage of acreage in the project within desired condition moves up from 13 percent in 2019 to 15 percent in 2039 as a result of density-dependent mortality. Tree distribution does not approximate the idealized distribution with too many trees in the smaller size classes. By 2039 there would be 621, 121, 39, 12, and 4 trees in the 0-5", 5-12", 12-18", 18-24" and 24"+ size classes, respectively.	The percentage of acreage within desired condition for trees per acre increases dramatically from 13 percent in 2019 to 84 percent in 2049. The distribution of trees across size classes approximates the idealized distribution by 2039 better than any of the other alternatives. By 2039 there would be 48, 18, 14, 8, and 4 trees in the 0-5", 5-12", 12-18", 18-24" and 24"+ size classes, respectively.	Trees per acre: The percentage of acreage within desired condition for trees per acre increases from 13 percent in 2019 to 55 percent in 2039. Tree distribution does not approximate the idealized distribution with too many trees in the smaller size classes. By 2039 there would be 222, 50, 21, 9, and 4 trees in the 0-5", 5-12", 12-18", 18-24" and 24"+ size classes, respectively.
Forest Structure – Basal Area	Average basal area would continue to increase across the project area from 129 square feet per acre in 2019 to 150 square feet per acre in 2039. The percentage of acres that would meet desired condition decreases from 19 percent in 2019 to 12 percent by 2039.	Average basal area would decrease across the project area from 129 in 2019 to 65 in 2029 and 62 in 2039. The percentage of acres that meet desired condition would increase from 19 percent in 2019 to 58 percent in 2029 and then to 56 percent in 2039.	Average basal area would decrease across the project area from 129 in 2019 to 87 in 2029 and 89 in 2039. The percentage of acres that meet desired condition for basal area would increase from 19 percent in 2019 to 42 percent in 2029 and then to 40 percent in 2039.
Forest Structure – Stand Density Index	Average stand density index would continue to increase across the project area from 296 in 2019 to 324 in 2039. The percentage of acres that would meet desired condition decreases from 15 percent in 2019 to 11% in 2039.	Average stand density index would decrease across the project area from 296 in 2019 to 116 in 2029 and 103 in 2039. The percentage of acres that meet desired condition would increase from 15 percent in 2019 to 27 percent in 2029 and then 21 percent in 2039.	Average stand density index would decrease across the project area from 296 in 2019 to 172 in 2029 and 170 in 2039. The percentage of acres that meet desired condition would increase from 15 percent in 2019 to 27 percent in 2029 and then to 21 percent in 2039.
Forest Insects	The proportion of acreage that would meet the desired condition for bark beetle hazard decreases from 26 percent in 2019 to 19 percent in 2039 as a result of increased stocking and lack of disturbance over time.	The proportion of acreage that would meet the desired condition for bark beetle hazard would increase from 26 percent in 2019 to 92 percent in 2039.	The proportion of acreage that meet the desired condition for bark beetle hazard would increase from 26 percent in 2019 to 60 percent in 2039.
Forest Disease	The proportion of acreage with a severe dwarf mistletoe rating would increase from 4 percent in 2019 to 9 percent in 2039. The proportion of acreage that meets the desired condition decreases from 96 percent in 2019 to 91 percent in 2039.	The proportion of acreage with a severe dwarf mistletoe rating would decrease from 4 percent in 2019 to 3 percent in 2039. The proportion of acreage that meets the desired condition would increase from 96 percent in 2019 to 97 percent in 2039.	The proportion of acreage with a severe dwarf mistletoe rating remains essentially unchanged from 4 percent in 2019 to 4 percent in 2039. The proportion of acreage that meets the desired condition also remains unchanged from 96 percent in 2019 and 2039.

Resource Area	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Fire Ecology	Fire Type: Wildfires would continue to impact the project area, though no prescribed burning would occur. Existing conditions, which are currently prone to high severity crown fire would only worsen. Conditions across 80% of the project area would be capable of supporting active or passive crown fire under extreme fire weather conditions. This includes approximately 33% of the project area with potential for active crown fire. Fire Hazard Index: 40% of the project area would have moderate to extreme Fire Hazard Index ratings, representing difficult and dangerous conditions for fire suppression during wildfire events and elevated potential for adverse post fire effects to soils and surface water quality. Surface Fuel Loading: Total surface fuel loading would continue to accumulate. Approximately 123,000 acres of the Ponderosa Pine cover type and nearly 26,000 acres of the Dry Mixed Conifer cover type would exceed desired conditions for fuel loading after 20 years of additional accumulation.	Fire Type: Wildfires occurring within the project area would generally be less likely to burn with high severity. Existing susceptibility to crown fire would be reduced. Conditions across 69% of the project area would be capable of supporting active or passive crown fire under extreme fire weather conditions. This would include 12% of the project area with the potential for active crown fire under these extreme fire weather conditions. Prescribed fire would be predominantly surface fire. Fire Hazard Index: There would be an overall decrease in the Fire Hazard Index, with only 15% of the project area in moderate to high ratings. This would decrease the overall area where difficult and dangerous conditions for fire suppression during wildfire. Surface Fuel Loading: Total surface fuel loading would fluctuate during implementation, but overall would decrease in most portions of the project area with the exception of areas proposed for MSO treatments. Approximately 40,000 acres of the Ponderosa Pine cover type and 15,500 acres of the Dry Mixed Conifer cover type would exceed desired conditions for fuel loading.	Fire Type: In treated areas, wildfires would generally be less likely to burn with high severity, though untreated areas would continue to have elevated potential for high severity fire. Conditions across 74% of the project area would be capable of supporting active or passive crown fire under extreme fire weather conditions. This would include 18% of the project area with the potential for active crown fire under these extreme wildfire conditions. Fire Hazard Index: Treated areas would lead to an overall decrease in Fire Hazard Index ratings, though untreated areas would continue to contribute to elevated FHI ratings. 22% of the project area is expected to have moderate to high Fire Hazard Index ratings. Surface Fuel Loading: In treated areas, total surface fuel loading would fluctuate during implementation, and decrease overall, with the exception of areas proposed for MSO treatments. Untreated areas would see continued accumulations of surface fuels. Approximately 64,300 acres of the Ponderosa Pine cover type and 16,500 acres of the Dry Mixed Conifer vegetation type would exceed desired conditions for fuel loading.
Air Quality	Smoke and associated emission impacts on air quality would come solely from wildfire events. These events would be unpredictable in both magnitude and timing, with the potential for large pulse impacts to air quality metrics. Wildfire related emissions would be expected infrequently (a few times a year). Overall, smoke impacts would be less predictable, less frequent, and more concentrated than impacts from the prescribed fires proposed for alternatives 2 and 3.	Smoke and associated impacts on air quality would come primarily from prescribed fire. Wildfire would continue to occur, but per acre emissions for wildfires occurring post treatment would be reduced up to 40% compared with existing conditions. Variability from year to year in total smoke related emissions would be high, but overall, smoke impacts would be more predictable, less concentrated, though potentially more frequent than wildfire related emissions associated with alternative 1. All prescribed fire treatments would comply with National Ambient Air Quality Standards.	In treated areas, smoke and associated impacts on air quality would come primarily from prescribed fire, while smoke from untreated areas would be generated from wildfires. On average, approximately 45% less acreage would be burned with prescribed fire in this alternative compared with alternative 2. Areas burned with prescribed fire would produce lower emissions per acre than untreated acers burned by wildfires. All prescribed fire treatments would comply with National Ambient Air Quality Standards.

Wildlife	Under the no-action alternative, most wildlife habitat would move toward desired conditions more slowly than with the action alternatives, while some habitat may not move toward desired conditions at all. No acres are proposed for mechanical treatment or prescribed fire, so the project area would have less tree age class-diversity than with the action alternatives. Specifically, alternative 1 would result in the lowest proportion in grass-forb-shrubs, seedlings, and saplings; the highest proportion in mid-aged forest; and the lowest proportion in older tree age classes. Alternative 1 would result in the slowest progress of all alternatives toward desired conditions of higher proportions of older age classes within uneven-aged forest conditions.	Northern goshawk: Within post-fledging family habitat (PFA), in ponderosa pine habitat the average trees per acre (TPA) would decrease under alternative 2, from the existing 872 TPA to 136 TPA in 2029 and 88 TPA in 2039. Average basal area and canopy cover would also decrease, along with stand density index (SDI), which would decrease from 312 to 118 in 30 years. Lower competition for resources would increase the quadratic mean diameter (QMD), from 6 inches to nearly 14 inches after 20 years. Mid-aged forest in age class 3 (5-12" in diameter), and age class 4 (12-18") would be greatly reduced, meeting desired conditions for these age classes in 30 years. MSO: There could be increased disturbance to individual MSO from noise or smoke in the short term. Given restoration project objectives, the scale of the cumulative effects area, the distribution of MSO habitat across the project area, and the length of time over which treatments would be implemented alternative 2 is not expected to negatively affect MSO population in the long term. Treatments in MSO habitat should move forest conditions toward desired conditions and decrease the risk of habitat loss to large-scale high-severity fire. Snags of all size classes important to wildlife species would increase. Coarse woody debris and downed logs important to prey and wildlife species would increase over the 20 years modeled. Herbaceous and shrub layers, also important to prey and wildlife species, would increase or be maintained. Various other restoration activities (grassland and meadow restoration, spring restoration, riparian stream and stream channel restoration, stream habitat restoration, and aspen restoration) would occur under alternative 2 to benefit wildlife.	Alternative 3 treats goshawk habitat with slightly less restoration to bring about desired conditions. Northern goshawk: Within PFA habitat, in ponderosa pine habitat the average trees per acre would decrease under alternative 3, from the existing 872 to 271 in 2029 and 224 in 2039. The average of all basal area and canopy cover would also decrease, but the stand density index would be reduced from 312 to 165 after 20 years. Lower competition for resources in treated areas would increase the quadratic mean diameter, from 6 inches to nearly 12 inches after 20 years. Mid-aged forest (BA3, 5-12 inches, and BA4, 12-18 inches) would be greatly reduced under Alternative 3, bringing these age classes closer to desired conditions after 20 years. MSO: MSO habitat not assigned treatments using the decision matrix would include 218,670 fewer acres in Alternative 3 than in Alternative 2. In PACs, 14,640 fewer acres would be thinned and burned in alternative 3. In Recovery Nest/Roost habitat, 5,820 fewer acres would be treated in Alternative 3. Savannah treatments in Alternative 3 would be reduced by 15,190 acres, providing less restoration to benefit the MSO prey base. While short-term effects from disturbance would be reduced in Alternative 3, the long-term effects and risk of habitat degradation from stand-altering wildfire or insect infestations would be greater than under alternative 2. Snags of all size classes important to wildlife species would increase in the treated acres and in the untreated acres. Coarse woody debris and downed logs important to prey and wildlife species would increase over the 30 years modeled. Herbaceous and shrub layers, also important to prey and wildlife species, would increase or be maintained in the acres treated. The higher number of untreated acres, relative to alternative 2, leaves habitat at a greater risk of high severity wildfire that could result in more severe effects on ecosystem components than those which would occur as part of a natural fire regime.

Resource Area	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
			Fewer acres of habitat would be restored and conserved for wildlife in alternative 3 than in alternative 2. Other restoration activities beneficial to wildlife species are the same as in alternative 2.
Aquatic Species	By not moving vegetation toward desired conditions and a more natural fire regime, riparian and watershed condition would remain the same or degrade over time. The hazard of undesirable fire behavior and negative fire effects to aquatic resources would remain. Riparian condition and instream aquatic habitat would remain in the current state or degrade further over time. There would be no decrease in road density or improvement of riparian condition from decommissioning or relocating roads.	Vegetation treatments (fire and mechanical) will have short- to mid-term negative impacts to aquatic species and habitats, but will have the most long-term benefits by promoting or improving riparian and watershed condition by increasing forest resiliency and reducing road density. The risk of undesirable fire behavior and effects wildfire would be reduced across all treated acres. Long-term beneficial impacts of improved riparian condition and instream aquatic habitat from stream restoration would occur.	There would be fewer short- and mid-term impacts to aquatic species and habitats from fewer acres of vegetation treatments and temporary roads. Decreased acres of vegetation treatments would equate to less long-term improvement in riparian and watershed condition. The same amount of aquatic restoration and road decommissioning and associated long-term benefits would occur.
Southwestern Region Sensitive Plants	There would be no effects to sensitive plants from management activities because no activities would occur. There would be no restoration activities to address overly dense stands, allowing conditions to move further out of the natural range of variation (NRV) and away from the desired conditions identified for forested areas across the project area. There would be no opportunities to improve the habitat of understory plants including sensitive plants in the project area. There would be no reduction of the risk of uncharacteristic wildfires in the habitats of sensitive plants. Riparian vegetation and habitat would remain in the current state or degrade further over time. There would be no decrease in road density or improvement of riparian condition from decommissioning or relocating roads, precluding opportunities to improve habitat for species such as Bebb's willow or Arizona sneezeweed.	Would move treated areas in the project area closer to NRV and the desired conditions, providing more open stands in some areas which would improve habitat for understory plants including sensitive plants. Would reduce the risk of uncharacteristic wildfire and therefore the risk of habitat damage and potential loss of sensitive plants. Would improve riparian conditions and aquatic habitats and reduce road densities in certain areas of the project, thereby improving the habitat for species such as Bebb's willow and Arizona sneezeweed.	Would reduce the risk of uncharacteristic wildfire, the risk of damage to habitat, and the potential of loss of sensitive plants on fewer acres in the project area than under alternative 2. Would improve riparian conditions and aquatic habitats and reduce road densities in certain areas of the project, thereby improving the habitat for species such as Bebb's willow and Arizona sneezeweed.

Resource Area	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Noxious and Invasive Weeds	Weed infestations that would have been detected by surveys would not occur. Weed treatments would not occur except as part of other projects within the Rim Country project area, or if treated by a cooperating agency.	Vegetation and prescribed burning treatments would limit the establishment and spread of invasive species within and adjacent to the project area over the next several decades by decreasing risk of undesirable fire behavior and effects.	Vegetation and prescribed burning treatments would limit the establishment and spread of invasive species within and adjacent to treated areas over the next several decades by decreasing risk of undesirable fire behavior and effects. With fewer acres being treated, the benefits of limiting the establishment and spread of weeds would be diminished compared to alternative 2.
Heritage Resources	Fuels would continue to accumulate across the project area, including in and around archeological sites. This may result in more frequent and intense wildfires which could cause site and artifact damage such as spalling of rock art and cracking of artifacts. Fire suppression actions, particularly bulldozer operations, may damage or completely destroy surface and subsurface (pit houses/kivas) archaeological sites resulting in the loss of the pit houses and associated resources.	Mechanical thinning on up to 889,000 acres would result in improved protection to cultural resources from the effects of high intensity fires. Ground disturbing treatments have potential to adversely affect cultural resources. Effects could include rutting, erosion, dislocation or breakage of artifacts and features, and destruction of sites and site stratigraphy. Traditional uses of areas or resources by Native American tribes may be affected. These concerns can be addressed through on-going consultation. Rock pit use and expansion have the potential to affect cultural sites adjacent to the pits. These effects would be avoided through coordinated pit expansion design and avoidance measures. Possible unauthorized collection of artifacts may increase near pits but would be mitigated by requiring that sites identified near the pit operation areas are recorded in detail, and monitored. Use of in-woods processing and storage sites would have mitigations in place to limit impacts to cultural resources.	Mechanically thinning on up to 483,000 acres will result in improved protection to cultural resources from the effects of high intensity fires, but less so than in alternative 2. Ground disturbance treatments have potential to adversely affect cultural resources. Effects could include rutting, erosion, dislocation or breakage of artifacts and features and destruction of sites and site stratigraphy. Traditional uses of areas or resources by Native American tribes may be affected. These concerns can be addressed through on-going consultation. Rock Pit use and expansion have the potential to affect cultural sites adjacent to the Pits. These effects would be avoided through coordinated pit expansion design and avoidance measures. Possible unauthorized collection of artifacts may increase near pits but would be mitigated by requiring that sites identified near the pit operation areas are recorded in detail, and monitored. Use of in-woods processing and storage sites would have mitigations in place to limit impacts to cultural resources.

Resource Area	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Socioeconomics	Ongoing projects will continue to provide some amount of socioeconomic benefits with no contribution from the Rim Country Project. There would be no direct project benefits or costs and no economics of scale in forest restoration activities. The three national forests would continue to support local employment and labor income associated with thinning, grazing and recreation at	Up to 5.3 million cubic feet (MMCCF) of products would be produced. There would be avoided costs from reducing the risk of high intensity wildfire and post-fire effects such as flooding and sedimentation. Up to 1,890 jobs and $78 million in labor income would be expected.	Up to 3.6 MMCCF of products would be produced. There would be avoided costs from reducing the risk of high intensity wildfire and post-fire effects such as flooding and sedimentation. Compared to alternative 2, alternative 3 would treat fewer acres. Focusing treatments on a smaller area could lower the operating costs associated with treatments. Fixed costs associated with site preparation would be lower, site infrastructure needs (e.g., processing, roads) would be reduced, and costs associated with transporting forest products would be lower than under alternative 2. Up to 1,280 jobs and $53 million in labor income would be expected.
Recreation	Current management would continue. However, the risk of undesirable fire behavior and effects would not be reduced. This could have negative consequences for recreation values and experiences in affected areas. Developed recreation sites could be adversely affected. Fire-affected areas could be closed to camping. Trails could be closed until repaired. Long-term recreation user displacement and activity substitution behavior could result from negative effects on areas affected by severe wildfires.	Dispersed recreation would not be significantly affected, as there would be many places to camp and recreate. Treatments around the perimeters of campgrounds and other developed sites would protect these areas from the risk of undesirable fire behavior and effects. Trails may be temporarily closed during prescribed burning treatments. After mechanical treatments, trail crossings would be restored to pre-treatment conditions.	Effects would be similar to, but less than those from alternative 2, because fewer acres are proposed for treatment in alternative 3. The acres not treated would retain the same level of wildfire risk as in alternative 1. There would be less short-term recreation user displacement and activity substitution behavior compared to alternative 2 since fewer acres would be treated.

Resource Area	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Scenery	In the short term, scenic integrity would remain unchanged. In the long term, if dense stands foster insect outbreaks, increased dwarf mistletoe spread, or other forest health concerns, there is the potential for a reduction in scenic integrity. If stand-replacing wildfire occurs, this would also result in the loss of valued scenic character, as views of a fire-altered landscape may begin to dominate the project area.	In the short term, the scenic integrity would be reduced while project activities (e.g. temporary road construction and reconstruction, rock pits, landings and in-woods processing sites) take place. Scenic integrity should increase once the appearance of slash and ground disturbing activities diminish, roads are rehabilitated, and plant communities respond to the decreased resource competition. In the long term, this alternative would improve the stability of scenic resources by reducing fuel loads and move the project area toward the desired landscape character.	Would have similar effects as those described in alternative 2 except the short-term impacts are expected to be fewer than in alternative 2 due to fewer acres being treated. The acres not proposed for treatment in this alternative would retain the same degree of potential for long-term effects to scenic integrity if insect and mistletoe outbreak and undesirable fire behavior occurs as expected for alternative 1. Since high severity fire is a risk factor for most scenery attributes, the smaller area of proposed mechanical and prescribed fire treatments would result in fewer improvements to scenic quality in the long term compared to alternative 2.
Lands and Minerals	Fuel loading would continue to increase across the project area, increasing the risk of undesirable fire behavior and effects, and leaving the area less resilient to disturbance. Severe wildfire could affect lands special uses by threatening structures and infrastructure they authorize in both the short term (10 years) and long term (beyond 20 years). Infrastructure associated with active minerals sites would also be similarly threatened.	Implementation would result in lower risk of undesirable fire behavior across the treated area, which would reduce the threat to the infrastructure and structures whose use are authorized under lands special use, and mineral permits. Short-term impacts to lands special uses and mineral projects could occur as restoration activities are implemented. Potential negative effects would be minimized through notifications of and coordination with permit holders.	Implementation would result in lower risk of undesirable fire behavior across the treated area, which would reduce the threat to the infrastructure and structures whose use are authorized under lands special use, and mineral permits. Permitted uses and infrastructure outside of treated areas would continue to be at risk from severe wildfire. Short-term impacts to lands special uses and mineral projects could occur as restoration activities are implemented, although potential disruptions would occur across fewer acres relative to alternative 2. Potential negative effects would be minimized through notifications of and coordination with permit holder.

Resource Area	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Tribal Relations	The risk of undesirable fire behavior and effects would not be reduced. Severe wildfire in untreated areas could result in impacts to Traditional Cultural Properties (TCPs) including loss of traditionally important native plant species and continued loss of culturally important springs due to decreased ground water recharge and availability.	Within treated areas, ground disturbing activities that could impact traditional collecting, gathering and ceremonial uses areas and TCPs would increase in the short term. Protection measures such as the use of tribal monitors other mitigation measures will help minimize potential negative effects during treatment implementation. In the long term, thinning and burning treatments would lead to increases in understory vegetation, including traditionally important native plant species. Water yield from springs may increase depending on vegetation type and climate variables.	Within treated areas, ground disturbing activities that could impact traditional collecting, gathering and ceremonial uses areas and TCPs would increase in the short term. Potential effects would occur across fewer acres than in alternative 2. Protection measures such as the use of tribal monitors other mitigation measures will help minimize potential negative effects during treatment implementation. In the long term, thinning and burning treatments would lead to increases in understory vegetation, including traditionally important native plant species. Water yield from springs may increase depending on vegetation type and climate variables. Potential benefits would occur across fewer acres compared to alternative 2.
Range	With no additional treatments, high tree densities would continue to suppress understory vegetation. In the short-term, no changes to livestock management would be needed but, over time, as forage production continues to decline, reductions in grazing capacity would occur.	Proposed thinning and prescribed fire would reduce tree densities, allowing for the greatest amount of understory vegetation production of all the alternatives. Short-term adjustments to pasture rotations may be needed but, in the long term, this alternative would result in the greatest increase the forage production.	Proposed thinning and prescribed fire would reduce tree densities, allowing for understory vegetation production, but on fewer acres than in alternative 2. Short-term adjustments to pasture rotations may be needed, but fewer than in alternative 2. The long-term forage production and grazing capacity would increase, but there would be less improvement than in alternative 2.

Resource Area	Alternative 1 No Action	Alternative 2 Modified Proposed Action (Preferred Alternative)	Alternative 3 Focused Restoration
Transportation	No new restoration activities would take place and no additional use of existing roads would occur. Current rates of public and administrative use would continue. Maintenance to provide public and administrative access would continue, contingent upon funding. No increase in road maintenance to accommodate restoration activities would occur. No road decommissioning would occur within the project area unless it is analyzed under separate NEPA analysis. No new temporary roads would be constructed, unless under separate NEPA analysis. No effects from in-woods processing and storage sites.	Nearly all, if not all system roads within the project area could be utilized at some point in implementation Roads that would be used would likely see pre-haul maintenance if needed and continued maintenance during implementation. This maintenance would be in addition to regularly scheduled maintenance Up to 200 miles of system roads would be decommissioned on the Coconino National Forest and the A-S National Forest. Approximately 290 miles of system roads on the Tonto National Forest would be decommissioned, and approximately 800 miles of unauthorized roads on all three forests may be decommissioned. Up to 330 miles of temporary road would be constructed and decommissioned after use Construction of temporary roads would expand the existing transportation system within the project area to provide adequate access to all stands in need of mechanical treatment. Construction of temporary roads would allow nearly all stands to be harvested with a maximum skidding distances of 1,250' or less". Temporary roads can also be used for access for prescribe fire and other restoration activities. In-woods processing and storage sites could require a limited amount of temporary road. This mileage is included in the overall estimated temporary road mileage for the alternative.	Nearly all, if not all system roads within the project area could be utilized at some point in implementation Roads that would be used would likely see pre-haul maintenance if needed and continued maintenance during implementation. This maintenance would be in addition regularly scheduled maintenance Up to 200 miles of system roads would be decommissioned on the Coconino National Forest and the A-S National Forest. Approximately 290 miles of system roads on the Tonto National Forest would be decommissioned, and approximately 800 miles of unauthorized roads on all three forests may be decommissioned. Up to 170 miles of temporary road would be constructed and decommissioned after use. Construction of temporary roads would expand the existing transportation system within the project area to provide adequate access to all stands in need of mechanical treatment. Construction of temporary roads would allow nearly all stands to be harvested with a maximum skidding distances of 1,250' or less". Temporary roads can also be used for access for prescribe fire and other restoration activities. In-woods processing and storage sites could require a limited amount of temporary road. This mileage is included in the overall estimated temporary road mileage road mileage for the alternative.