Chapter 1. Purpose of and Need for Action

Document Structure

The Forest Service has prepared this draft environmental impact statement (DEIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This DEIS discloses the direct, indirect, and cumulative environmental effects that would result from implementation of the modified proposed action (the preferred alternative) and other alternatives presented. The document is organized into two volumes.

Volume 1

Chapter 1. Purpose of and Need for Action: The chapter includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for fulfilling that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

Chapter 2. Alternatives, including the Proposed Action: This chapter provides a more detailed description of the agency's proposed action as well as an alternative method for achieving the stated purpose. These alternatives were developed and modified based on significant issues raised by the public and other agencies. This discussion also includes mitigation measures. Finally, this section provides a summary table (Table 18) of the environmental consequences associated with each alternative.

Chapter 3. Affected Environment and Environmental Consequences: This chapter describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area.

Volume 2

Continued - Chapter 3. Affected Environment and Environmental Consequences: This chapter describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area.

Chapter 4. Preparers and Contributors: This chapter provides a list of those who prepared and contributed to this environmental impact statement.

Chapter 5. Distribution List: This chapter lists all tribes, agencies, organizations, and persons to whom the draft environmental impact statement (DEIS) was provided.

References: This section provides a list of scientific literature used to inform the analysis.

Appendices A through F**:** the appendices provide more detailed information to support the analysis. Appendices include a placeholder for a map packet in appendix A; proposed Forest Plan amendments in appendix B; project design features, best management practices (BMPs), and conservation/mitigation measures in appendix C; an Implementation Plan in appendix D; a Monitoring and Adaptive Management Plan in appendix E; and a glossary of terms in appendix F.

Additional documentation, including the more detailed analysis for each resource in the resource specialist reports, can be found in the project record located at the Coconino National Forest Supervisor's Office, 1824 South Thompson Street, Flagstaff, Arizona. All of the specialist reports are also available on the 4FRI Rim Country webpage at: www.fs.usda.gov/goto/4FRIRimCountry.

Background

The Four Forest Restoration Initiative (4FRI) is a planning effort designed to restore forest resilience and ecosystem function in ponderosa pine forests and associated ecosystems across four national forests in Arizona including the Coconino, Kaibab, Apache-Sitgreaves, and Tonto National Forests (Figure 1).

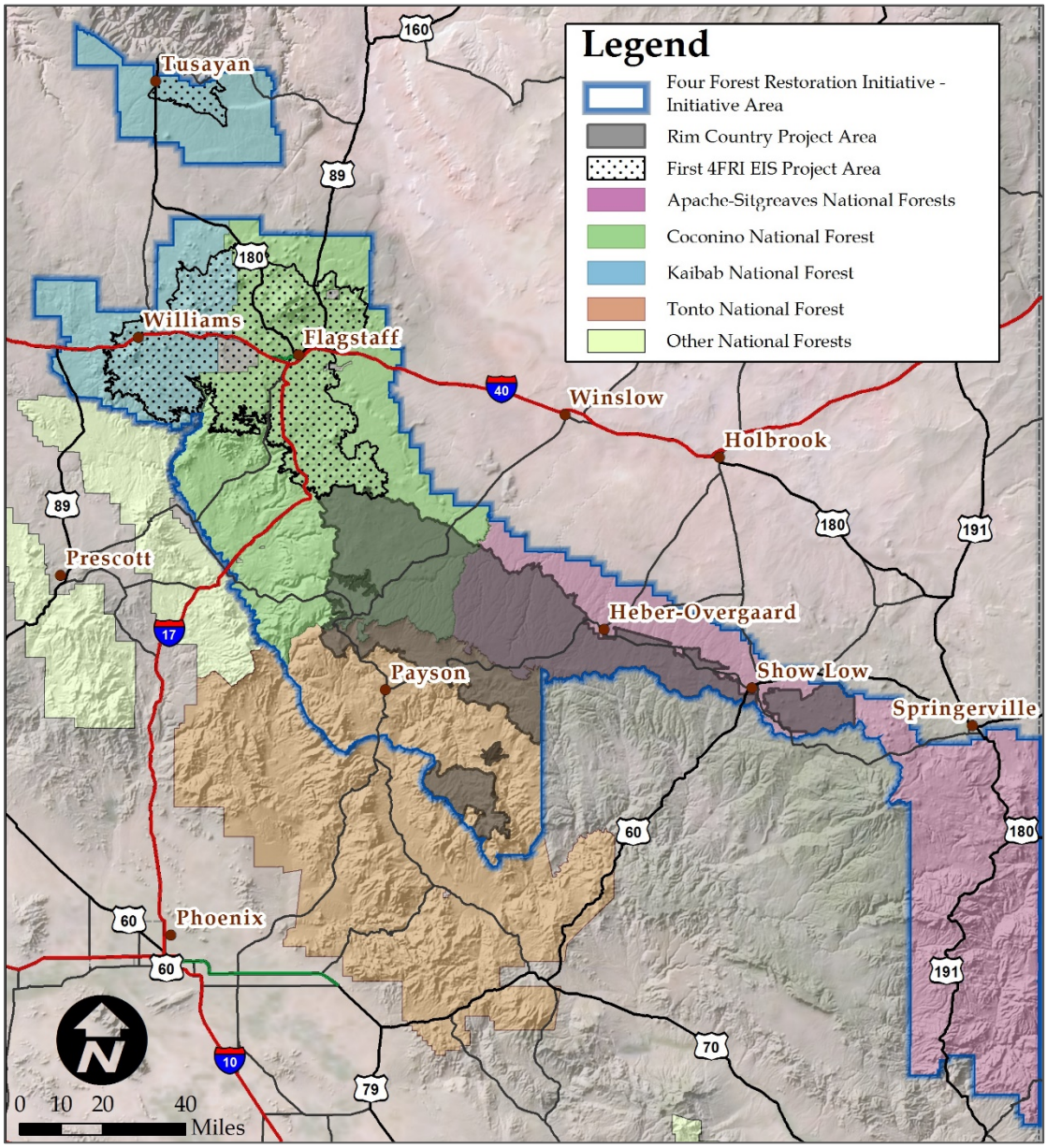

Figure 1. Four Forest Restoration Initiative

In February 2008, based on recommendations within the statewide strategy, the Analysis of Small Diameter Wood Supply in Northern Arizona report (Hampton et al. 2008) was completed. This process

demonstrated a level of "social agreement" on how much, where, and under what basic parameters mechanical treatment, as one restoration tool, could be used to accelerate restoration of the 2.4 million-acre initiative area.

To further advance collaborative efforts and secure the necessary assistance, the Forest Service created a task force to work with the Forest Health Council. The purpose of the task force was to identify alternative approaches to accelerating forest restoration in northern Arizona. To move into on-the-ground implementation as quickly as possible, stakeholders consisting of individuals, state and federal agencies, local governments, the four national forests in northern Arizona, and the Forest Service's Southwestern Regional Office moved forward with the Four Forest Restoration Initiative.

In 2009, Title IV of the Omnibus Public Land Management Act (P.L. 111-11) authorized the Collaborative Forest Landscape Restoration (CFLR) Program and Fund to support landscape-scale restoration on National Forest System lands. In 2010, the initiative received funding via the CFLR Program. The CFLR Program objectives include reducing uncharacteristic wildfire and the associated management costs, supporting local and collaborative partnerships, supporting monitoring of restoration efforts, and supporting efforts that utilize forest products that benefit communities and offset treatment costs. In 2015, the Record of Decision was signed for the first 4FRI EIS for the northern portion of the Coconino National Forest and the Kaibab National Forest. The Rim Country Project continues the ecosystem restoration effort on about 1,240,000 acres on the Mogollon Rim and Red Rock Ranger Districts of the Coconino National Forest, the Black Mesa and Lakeside Ranger Districts of the Apache-Sitgreaves National Forests, and the Payson and Pleasant Valley Ranger Districts of the Tonto National Forest (Figure 2). This analysis is independent of any preceding or subsequent environmental analysis that may occur in the national forests across northern Arizona.

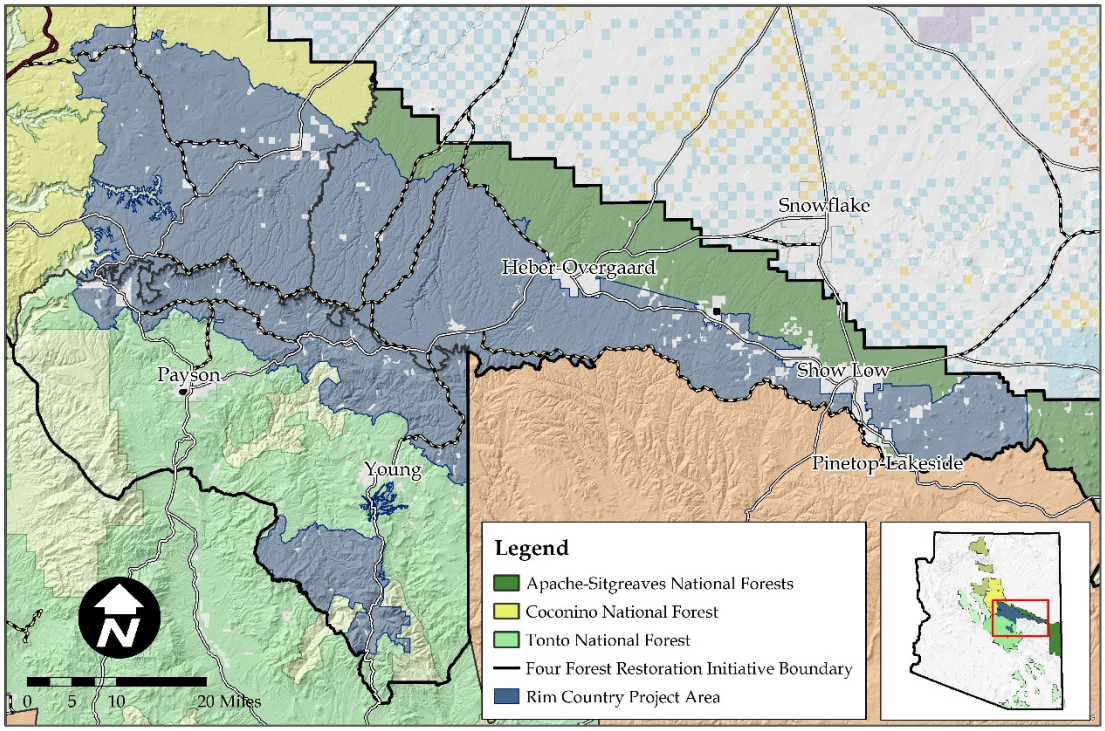

Figure 2. 4FRI Rim Country Project Area

Approximately 192,000 acres already covered by NEPA decisions will be included in the Rim Country analysis in order to incorporate additional restoration activities such as road decommissioning, spring and

stream channel restoration, and wildlife habitat restoration. And, of the total project area, about 98,000 acres (Figure 3) have been excluded from analysis because they are not National Forest System lands, or are included in other restoration NEPA projects that already have decisions.

- Approximately 37,000 acres have been excluded from being incorporated into treatment proposals because they are non-Forest Service lands. Past, present, and reasonably foreseeable actions on these lands are addressed under cumulative effects in chapter 3.
- Approximately 61,000 acres have been excluded because they are already covered by NEPA decisions, with treatments designed to meet restoration objectives. These past and ongoing projects will be addressed in cumulative effects.

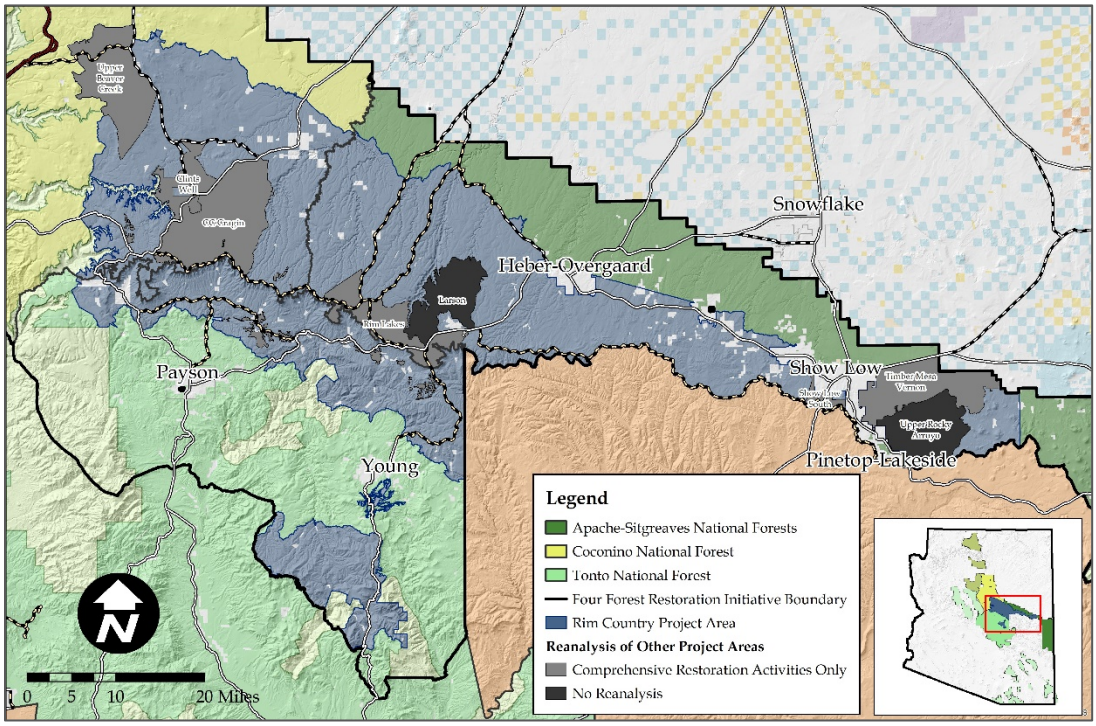

Figure 3. Other Projects within the 4FRI Rim Country Project Area

Current Management Direction

The Rim Country Project was reviewed for consistency with the direction in the Apache-Sitgreaves Revised Forest Plan (USDA Forest Service 2016), the Coconino Revised Forest Plan (USDA Forest Service 2018), and the current Tonto National Forest Plan, as amended (USDA Forest Service 2017). Consistency evaluations can be found in each specialist report. Appendix B provides details on the Forest Plan amendments for the Tonto National Forest Plan proposed in alternatives 2 and 3. The design features in appendix C and the implementation plan in appendix D document how treatment design meets Apache-Sitgreaves, Coconino, and Tonto National Forests Forest Plan direction.

Wild and Scenic Rivers

There are no designated wild and scenic rivers in the Rim Country project area. Unless otherwise specified, references to wild and scenic rivers in this document refer to either river segments that have been evaluated, have been found to be free-flowing, and, in combination with their adjacent land area, possess one or more outstandingly remarkable values ("eligible rivers"), or river segments that a Federal agency has studied and determined to be suitable for inclusion in the National Wild and Scenic Rivers

System but have not been statutorily designated by Congress ("suitable rivers"). A wild and scenic river corridor is the geographic area generally encompassed within one-quarter mile on either side of a river studied for eligibility or suitability that contains the river and its outstandingly remarkable values (FSH 1909.12, 80.5).

Previous eligibility studies identified 12 eligible wild and scenic rivers in the project area. Seven of these occur on the Coconino or Apache-Sitgreaves National Forests or on their shared border (USDA Forest Service 2009, 2013). Five eligible wild and scenic rivers occur on the Tonto National Forest and were identified in a 1993 eligibility report covering all the national forests in Arizona (USDA Forest Service 1993). As part of its ongoing Forest Plan revision process, the Tonto National Forest is completing an updated eligibility report for wild and scenic rivers to replace the existing eligibility report from 1993 (USDA Forest Service 2018). To ensure compliance with current Tonto National Forest Plan direction, the Rim Country DEIS includes both the eligible rivers listed in the 1993 report, as well as those listed in the current draft eligibility report for the Tonto (March 22, 2017). Design features have been included in appendix C specifically for the purpose of adjusting proposed treatments in the future as eligibility and suitability are determined. Any management activities proposed in eligible wild and scenic river corridors in the Rim Country project area would have the purposes of restoring natural geomorphic and ecological processes and protecting or enhancing the specific outstandingly remarkable values (ORVs) of the river (such as fish and wildlife habitat). In addition, classification of an eligible river must be maintained as inventoried in an eligibility study unless a suitability study is completed that recommends management at a less restrictive classification level, such as from wild to scenic, or scenic to recreational (FSH 1909.12, 84.2).

Apache-Sitgreaves National Forests

The revised Forest Plan for the Apache-Sitgreaves National Forests became effective in August 2015, with minor revision in 2016. With design features in appendix C, alternatives 2 and 3 are consistent with Forest Plan objectives, standards, and guidelines. Although movement toward desired conditions varies by alternative.

On the Apache-Sitgreaves National Forest, the Rim Country project area contains the following management or designated areas:

- General Forest (approximately 431,600 acres)
- Community-Forest Intermix (28,480 acres)
- Wildlife Quiet Area (22,400 acres)
- Wild Horse Territory (18,760 acres)
- Natural Landscape (13,230 acres)
- High Use Developed Recreation Area (7,490 acres)
- Energy Corridor (1,510 acres)
- 64 miles of the General Crook National Recreation Trail

Table 1 describes the Apache-Sitgreaves National Forests management areas located in the Rim Country project area and Figure 4 displays the general location of those management areas.

Coconino National Forest

The revised Forest Plan for the Coconino National Forest was signed in March 2018. With design features in appendix C, alternatives 2 and 3 are consistent with Forest Plan objectives, standards, and guidelines. Although movement toward desired conditions varies by alternative.

On the Coconino National Forest, the Rim Country project area contains the following management or designated areas:

- Long Valley (approximately 156,020 acres)
- Pine Belt (102,230 acres)
- East Clear Creek (54,960 acres)
- C.C. Cragin Watersheds (46,000 acres)
- Anderson Mesa (38,016)
- Verde Valley (1,640 acres)
- Long Valley Experimental Forest (1,260 acres)
- Rocky Gulch Research Natural Area (proposed) (930 acres)
- Mogollon Rim Botanical Area (339 acres)
- Scenic Resources, 40 miles of the Arizona National Scenic Trail
- 37 miles of the General Crook National Recreation Trail

Table 2 describes the Coconino National Forest management areas located in the Rim Country project area and Figure 4 displays the general location of those management areas.

Tonto National Forest

The Tonto National Forest is presently going through the process of revising the Forest Plan. The current plan was developed under the 1982 Planning Rule and went into effect in 1985. Activities proposed in alternatives 2 and 3 are based on the best available scientific information, which includes more than 25 years of advances in forest management science and learning since the current Forest Plan was developed.

To align current Forest Plan standards and guidelines with best available scientific information, thereby making alternatives 2 and 3 consistent with the Forest Plan, three project-specific Forest Plan amendments are proposed. Each amendment is a one-time variance in the current Tonto National Forest Plan direction specifically for the Rim Country Project. The amended direction would not apply to any other projects or areas outside of the Rim Country Project and it would cease to be in effect upon completion of the project. Analysis of the effects of the proposed amendments is integrated into the analysis of the alternatives presented in Chapter 3.

These amendments would be required under the current Tonto National Forest Plan if the Rim Country Record of Decision is signed prior to the revised Tonto National Forest Plan going into effect (anticipated in 2020). If this is the case, the Record of Decision will include two separate decisions: a decision on which alternative to implement and a decision on which, if any, Forest Plan amendments to approve. However, if the revised Tonto National Forest Plan goes into effect before the Rim Country Record of Decision is signed, one or more of the three proposed project-specific amendments may not be necessary depending on the content of the revised plan.

The purpose of amendment 1 is to bring the Forest Plan into alignment with the best available science (Reynolds et al. 2013) that provides desired conditions for restoring fire-adapted ponderosa pine in the Southwest. The purpose of amendment 2 is to bring the Forest Plan into alignment with the revised Mexican Spotted Owl Recovery Plan (USDI Fish and Wildlife Service 2012) and defer monitoring to the Fish and Wildlife Service biological opinion that is specific to this project. The purpose of amendment 3 is to update Forest Plan language to account for advances in mechanized thinning technology and capabilities. Amendment 3 would remove language restricting the use of mechanical equipment to slopes less than 40 percent and identifying slopes above 40 percent as inoperable. Proposed language would allow the use of mechanized ground-based equipment to thin on slopes greater than 40 percent where it is not otherwise restricted and where it would not result in adverse effects on soil and water resources. This would allow for restoration treatments to be implemented on steeper slopes to meet the purpose and need of the Rim Project, and to move toward desired conditions in these areas.

Although the current Tonto National Forest Plan was developed under a planning rule enacted in 1982, the 2012 Planning Rule (36 CFR 219) requires the Forest Service to use an updated Forest Plan amendment process for amending plans created under a prior rule (36 CFR 219.17). Section 219.15 (c) (4) of the 2012 Planning Rule provides the language authorizing the proposed project-specific amendments to the Tonto National Forest Plan. These amendments, along with the Rim Country Project, are subject to the predecisional administrative review (objection) process pursuant to 36 CFR 218.

The project-specific amendments included in this project may affect substantive requirements of the 2012 planning rule at 36 CFR 219.9, which requires Forest Plans to provide for maintaining the diversity of plant and animal communities and the persistence of native species in the plan area. Since this project includes two project-specific amendments to modify current Forest Plan direction related to the management of Mexican spotted owl and northern goshawk habitats, it is possible that the plan's inherent capability to meet these attributes would be affected.

The significance of each proposed amendment was evaluated in accordance with Forest Service Manual (FSM) 1926.51 and FSM 1926.52. Proposed amendments would neither significantly alter the long-term relationship between levels of multiple-use goods and services originally projected, nor have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period. The proposed project-specific amendments would result in minor changes in standards and guidelines that would apply only to activities carried out as part of the Rim Country Project.

With the proposed Forest Plan amendments (see appendix B) and design features in appendix C, alternatives 2 and 3 are consistent with the direction in the 1985 Tonto National Forest Plan as amended.

On the Tonto National Forest, the Rim Country project area contains the following management or designated areas:

- 4D: Mogollon Rim Area (approximately 133,010)
- 5D: Mogollon Rim-Sierra Ancha Area (121,580 acres)
- 5G:General Management Area (29,480 acres)
- 4F:General Management Area (15,570 acres)
- MSO PACs (29,110 acres)

Table 3, describes the Tonto National Forest management areas located in the Rim Country project area and Figure 4 displays the general location of those management areas.

Table 1. Apache-Sitgreaves Forest Plan Management Areas in the Rim Country Project Area

Forest Management/Designated Area	Description	Forest Plan Emphasis	Acres in Rim Country
Community-Forest Intermix	Lands within ½ mile of communities at risk	Complete initial treatments to reduce fire hazard, maintain with prescribed fire and mechanical treatments	28,480
Energy Corridor	Three existing high-voltage energy corridors	Managed to provide a reliable supply of energy	1,510
General Forest	Majority of the Apache-Sitgreaves National Forests, capable of providing a variety of forest products	Restore priority 6th level HUC watersheds, restore fire-adapted ecosystems, reduce the threat of uncharacteristic wildfire, and provide forest products	431,600
High Use Developed Recreation Area	Places with relatively high levels of visitor use	Recreation site plans to provide a wide variety of opportunities to a broad spectrum of visitors	7,490
Natural Landscape	Undeveloped areas that are natural appearing and provide primitive and semi primitive recreation opportunities	Retain natural appearing character	13,230
Wild Horse Territory	The Heber Wild Horse Territory established in 1973	Manage the territory in accordance with the Wild Horse and Burro Act	18,760
Wildlife Quiet Area	Relatively undisturbed habitat where big game and other wildlife aren't disturbed by motorized vehicle use	Manage for nonmotorized access, improve wildlife habitat, and maintain existing wildlife developments	22,400
General Crook National Recreation Trail	Non-motorized scenic trail	Preserve historic route, features, and associated values	64 miles

Table 2. Coconino Forest Plan Management Areas in the Rim Country Project Area

Forest Management/Designated Area	Description	Forest Plan Emphasis	Acres in Rim Country
Anderson Mesa	Grasslands, pinyon juniper, and wetlands on Anderson Mesa	Wildlife-viewing and hunting, supports sustainable population of pronghorn, functioning wetlands	38,020
C.C. Cragin Watersheds	Watersheds for C.C. Cragin Reservoir along the Mogollon Rim	Coordinate with partners to proactively improve the health and resilience of the watersheds, reduce the threat of uncharacteristic wildfires, flooding, and sedimentation, and maintain water quality and quantity	46,000
Long Valley	Ponderosa pine, grassland, riparian, pinyon juniper, mixed conifer, and wetlands in the Long Valley area	Functioning wetlands, low-disturbance wildlife habitat, a mix of dispersed and developed recreation opportunities	156,020
Pine Belt	Dominant ponderosa pine vegetation belt	Functioning wetlands, backcountry recreation, wildlife viewing and hunting	102,230
East Clear Creek	Remote area of East Clear Creek and its tributaries along the Mogollon Rim	Low disturbance wildlife habitat, primitive and semi primitive recreational opportunities	54,960
Verde Valley	The Verde Valley north and west of the Verde River	Reduced risk of uncharacteristic flooding and sedimentation, recreational opportunities, interconnected trail system	1,640
Mogollon Rim Botanical Area	Preserves unique white fir/bigtooth maple community	Interpretation and monitoring	340
Long Valley Experimental Forest		Managed by the Rocky Mountain Research Station	1,260
Rocky Gulch Research Natural Area (proposed)	Area of old-growth ponderosa pine used as a control for research in the Beaver Creek watershed	Prepare establishment report	930
Arizona National Scenic Trail	Non-motorized scenic trail	Minimize visual impacts, keep well maintained, signed, and passable	40 miles
General Crook National Recreation Trail	Non-motorized scenic trail	Preserve historic route, features, and associated values	37 miles

Table 3. Tonto Forest Plan Management Areas in the Rim Country Project Area

Forest Management/Designated Area	Description	Forest Plan Emphasis	Acres in Rim Country
MSO PACs	Mexican spotted owl protected activity centers	Survey all potential habitat, establish PACs,	29,110
4D: Mogollon Rim Area	Ponderosa pine forest below the Mogollon Rim, Payson Ranger District	Intensive sustained yield timber management, timber resource protection, wildlife habitat diversity, recreation opportunity	133,010
4F: General Management Area	General management area on the Payson Ranger District	Wildlife habitat improvement, livestock forage production, dispersed recreation	15,570
5D: Mogollon Rim-Sierra Anchas Area	Ponderosa pine forest below the Mogollon Rim and in the Sierra Anchas Mountains, Pleasant Valley Ranger District	Intensive sustained yield timber management, timber resource protection, wildlife habitat diversity, recreation opportunity	121,580
5G: General Management Area	General management area on the Pleasant Valley Ranger District	Wildlife habitat improvement, livestock forage production, dispersed recreation	29,480

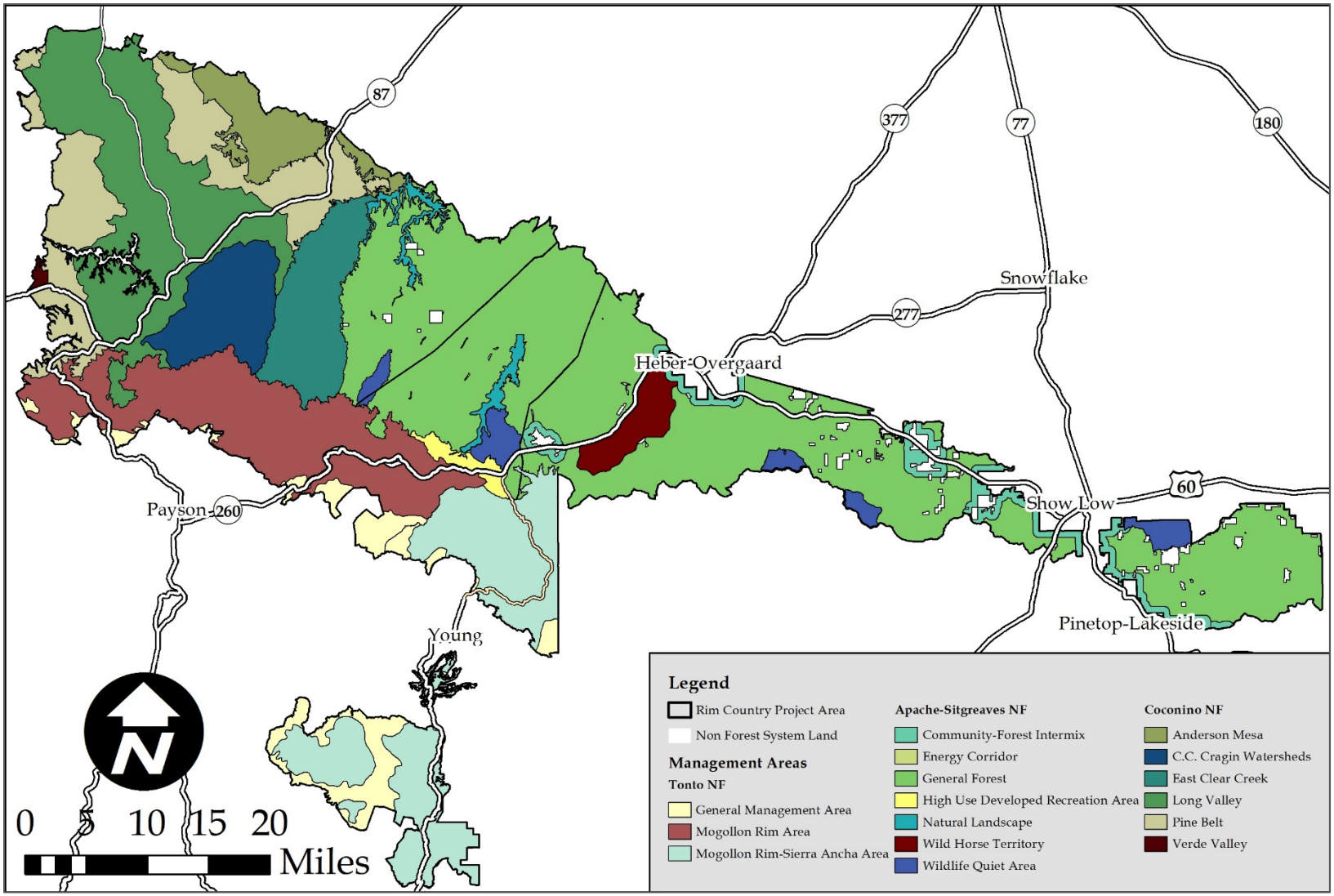

Figure 4. Forest Plan Management or Designated Areas in the Rim Country Project Area

Existing and Desired Conditions

The following description of existing and desired conditions is a summary of those conditions. Full descriptions of existing conditions in the Rim Country project area can be found in chapter 3 of this DEIS by resource area as well as the Rim Country specialist reports. Desired conditions for the Rim Country project area are incorporated by reference from the current Apache-Sitgreaves, Coconino, and Tonto National Forest Plans. Desired conditions pertinent to each resource area are described in each resource specialist report. Movement toward the desired conditions is analyzed in both individual specialist reports and this DEIS.

Existing Conditions

The forested landscapes in the Rim Country project area are highly departed from desired conditions, lacking desired species composition, spatial arrangement, and structure. Stands across the majority of the area where thinning treatments are proposed exhibit extremely high densities as measured by basal area (BA), trees per acre (TPA), stand density index (SDI). Some of these areas are at high risk for disturbance from uncharacteristic fire behavior, insects and disease, density-related mortality, and climate change.

Table 4 shows the cover types that occur on National Forest System land within the Rim Country project area (including areas that are parts of ongoing projects or other analyses) and Table 5 compares the existing conditions to the desired conditions for areas proposed for mechanical thinning.

Table 4. Acres of Cover Type on Forest Service-managed Land within the Project Area

Cover Type	Total Acres
Aspen	1,465
Grassland/Meadow*	20,378
Madrean Encinal Woodland	1,689
Madrean Pinyon-Oak	23,307
Mixed Conifer with Aspen*	19,855
Mixed Conifer/Frequent Fire*	59,860
Pinyon-Juniper Woodland	143,486
Ponderosa Pine*	764,689
Ponderosa Pine/Evergreen Oak*	149,446
Riparian	14,558
Other - Dam/Pit/Road/Water	2,994

*Target cover type: frequent-fire type targeted for restoration treatments

Table 5. Desired Conditions (DC) Compared to Existing Conditions (EC) in Areas Proposed for Mechanical Thinning. *These existing and desired conditions apply to the 953,130 acres analyzed for mechanical thinning and prescribed fire treatments

	Desired Condition	Existing Condition
Structure - Pattern	The majority of stands are in an open condition. Forest arrangement is in individual trees, small clumps, and groups of trees or randomly spaced trees interspersed within variably sized openings of grasses, forbs, and shrubs that are similar to historic patterns. Most forest stands in uneven-aged condition to meet forest resilience and sustainability goals while maintaining wildlife habitat.	The majority of stands are in a closed condition and lacking groups and clumps of trees or randomly spaced trees. Grasses, forbs and shrubs are underrepresented compared to historic patterns. This is departed from desired conditions consisting of a matrix of groups, clumps and individual randomly spaced trees with interspaces,
Structure - Trees per acre	Trees are distributed across size classes with total number of trees per acre between 10 and 250. An idealized tree distribution across size classes totaling 74 trees per acre and carrying 90 ft^2 of basal area would have 24, 18, 14, 10, and 8 trees in the 0-5", 5-12", 12-18", 18-24" and 24"+ size classes, respectively.	Total trees per acre is higher than the desired condition and are overrepresented in the smaller diameter classes and underrepresented in the larger classes. There are currently 813, 114, 35, 9, and 3 trees in the 0-5", 5-12", 12-18", 18-24" and 24"+ size classes, respectively.
Basal Area	Generally less than 90 square feet per acre to meet forest resilience goals while maintaining wildlife habitat desired conditions. For MSO protected and nest/roost replacement habitat 110 to 120 square feet per acre is the minimum.	The current average basal area within the project area is 129 square feet per acre. High densities in terms of basal area make trees more susceptible to mortality from insects, disease, and competition and increase crown fire risk.
Stand Density Index	Maintain forest density between 25% and 45% of SDImax to maintain forest health and tree growth. For ponderosa pine this SDI range is between 112.5 and 202.5. For MSO protected and Nest/Roost replacement habitat, desired forest density is between 45% and 60% of SDImax or between 202.5 and 270.	Currently the average stand density index across the project area is 66% of MaxSDI. 21 percent of stands meet the desired condition for SDI. High densities in terms of stand density index make trees more susceptible to mortality from insects, disease, and competition and increase crown fire risk.
Forest Insects	Stands in the project area are in the low or moderate hazard for bark beetles	Currently 74% of acreage have a high bark beetle hazard rating. The remaining 26% of stands meet the desired condition for insect hazard.
Forest Disease	Stands in the project area have low to moderate dwarf mistletoe infection severity (Less than 20% of trees infected)	Currently 75% of acreage has a low dwarf mistletoe infection rating, 22% of acres have a moderate rating, and 4% have a severe infection rating. 96% of the project area meets the desired condition for mistletoe infection severity.

Across the project area, fire regimes constitute a spatial and temporal mosaic of landscape patterns. There is a need to reintroduce or maintain fire in ponderosa pine, aspen, mixed conifer, and grasslands in the project area. Currently, across much of the project area, fuel loading in the immediate vicinity of many

large and/or old trees is such that mortality would be high in the event of a wildfire burning under undesirable conditions. With a delay of 10 to 20 years between fires or mechanical treatments, areas currently showing potential for passive crown fire are likely to transition to active crown fire, depending on geographic location and site conditions. Table 6 shows the existing crownfire potential in ponderosa pine cover types.

Table 6. Existing Crownfire Potential in Ponderosa Pine Cover Types

Vegetation Cover Type	Acres	All Crown Fire	Active Crown Fire
Ponderosa Pine	556,284	72%	21%
Ponderosa Pine/Evergreen Oak	147,989	82%	29%

Currently, modeling results show that, under conditions similar to those of the Rodeo/Chediski Fire, there is potential for about 75 percent of the dry mixed conifer in the Rim Country project area to burn with crown fire, of which 50 percent would be active crown fire, as shown in Table 7.

Table 7. Existing Crownfire Potential in Dry Mixed Conifer Cover Type

Vegetation Cover Type	Acres	All Crown Fire	Active Crown Fire
Dry Mixed Conifer	49,281	75%	50%

The exclusion of fire has resulted in high canopy cover and high tree density which limits the amount of sunlight and precipitation reaching the ground. Consequently, understory vegetation is less diverse, sparse, and it provides poorer quality food and cover for wildlife than under more open canopies.

The ponderosa pine and mixed conifer cover types support a wide range of wildlife species, including nesting MSO. The Rim Country project area includes about 68,630 acres of MSO PACs and over 128,800 acres of recovery habitat. Protected activity centers currently contain high fuel loadings due to management actions for the last few decades. There are also about 500,940 acres of goshawk post-fledging areas and foraging habitat. The increased tree densities, closed canopies, and loss of habitat heterogeneity have led to the loss of habitat for a wide range of species, including ground and shrub-nesting passerines and small mammals and birds that depend upon the herbaceous understory for food and/or cover. Current stand conditions exhibit declining to stagnant tree growth in areas where late-successional habitat is desired.

Aspen are dying or rapidly declining in the Rim Country project area due to the combined effects of conifer encroachment, browsing, grazing, insects, disease, severe weather events, and lack of fire disturbance.

There are approximately 132,240 acres (severe disturbance areas) where high severity effects from fires, such as the Dude and Rodeo-Chediski fires, insect and disease outbreaks, or harvesting operations have resulted in reduced forest cover and a departure from desired conditions.

Southwestern dwarf mistletoe is a natural component of the forests in the Rim Country project area. Dwarf mistletoe can create or increase forest openings at endemic levels (Conklin 2000), improving wildlife habitat (Parker 2001) by creating unique canopy structure and snags with longevity and conditions that stimulate understory growth (Conklin 2000). At epidemic levels, mistletoe can prevent stands from attaining mature and old-growth conditions (Conklin and Fairweather 2010), preventing trees from attaining nest and roost structure for species like the MSO and northern goshawk. Infections of high

severity can increase tree stress, the likelihood of bark beetle infestations during periods of drought, and tree death (Kenaley 2008).

While the overall incidence (distribution and percent of landscape affected) of dwarf mistletoe is thought to have increased only modestly compared to historic conditions, the overall abundance of mistletoe is thought to have increased considerably (Conklin and Fairweather 2010). Stands covering approximately 22 percent of the Rim Country project area exhibit infections at moderate severity levels (20 percent to 80 percent of susceptible trees infected) while stands making up four percent of the area have high severity infection ratings (more than 80 percent of susceptible trees infected) (Moore 2019).

Grasslands, savannas, and meadows provide valuable habitat for many wildlife species including pronghorn antelope (a focal species), raptors such as western burrowing owls, Swainson's hawks, and ferruginous hawks (sensitive species/migratory birds), an abundance of small mammals including Navajo Mogollon voles (sensitive species), and a range of important prey species for both MSOs and northern goshawks. Savannas and meadows are also used by game species such as elk and black bears. In the meadows and grasslands of the Rim Country project area, junipers and other conifers have encroached into these once open grassland habitats, decreasing the size and function of landscapes that were historically grasslands. As tree canopy increases, understory productivity decreases. The grasslands have impaired soil conditions due to inadequate protective ground cover, compacted soil surfaces, and encroaching pines and junipers. In many meadows, vegetative ground cover is low, hydrologic soil function is reduced from compaction, groundwater levels have dropped below root zones due to gully formation, and encroaching upland tree species are competing with desired species.

The Coconino National Forest established its Travel Management Rule (TMR) motor vehicle use designations in 2011; the Tonto National Forest will be publishing its draft Record of Decision for TMR designations this year; and the Apache-Sitgreaves National Forests are currently working on their proposed action for TMR designations.

Most watersheds in the Rim Country project area have been assigned a fair or poor rating for road and trail density, location, distribution, and maintenance. Roads in close proximity to streams have the greatest effects on water quality. High road density increases effective drainage density, which can increase the size of damaging peak flows.

There are approximately 411 known springs in the Rim Country project area. A limited number have been assessed, but these assessments indicate that springs in the project area have been adversely affected by human activities such as flow regulation through installation of spring boxes and piping of discharge to off-site locations, recreation, and urbanization and other construction activities, as well as grazing by wild and domestic herbivores. Approximately 184 springs in the Rim Country project area exhibit declining or degraded conditions where restoration treatments may be applied.

Many riparian streams in the Rim Country project area, particularly within the Rodeo-Chediski Fire area, are currently non-functioning[1] or functioning-at-risk[2], with accelerated erosion and increased peak flows. Table 8 shows the condition classes of riparian areas by national forest within the project area.

Table 8. Condition Classes of Riparian Areas in the Project Area by National Forest

[1] These riparian areas clearly are not providing adequate vegetation, landform, or woody material to dissipate stream energy associated with moderately high flows, and thus are not reducing erosion or improving water quality.

[2] These riparian areas are in limited functioning condition: however, existing hydrologic, vegetative, or geomorphic attributes make them susceptible to impairment.

Forest	Total (miles*)	Properly Functioning (miles*)	Functioning-at-Risk (miles*)	Non-Functioning (miles*)
Apache-Sitgreaves	240	60	113	67
Coconino	196	120	53	23
Tonto	440	77	309	54
Totals	876	257	475	144

*Miles are approximate

Within the Rim Country project area there are approximately 360 miles of streams that are occupied by, or are suitable for, aquatic species such as fish, garter snakes, mollusks, and invertebrates. These streams and associated 6th Hydrologic Unit Code (HUC) watersheds provide habitat for nine federally listed fish and garter snake species and 16 Forest Service Southwestern Region sensitive species, two of which are also federally listed (see Table 9). Fourteen Forest Service Southwestern Region sensitive species, including 12 invertebrates and 2 mollusks, are not shown in the table but were included in the analysis presented in chapter 3 and the aquatics specialist report.

Table 9. Status and Habitat for Federally Listed and Forest Service (FS) Sensitive Fish and Garter snake Species

Species	Status	Occupied/Suitable Habitat (approximate miles/acres)
Gila trout (Oncorhynchus gilae gilae)	Threatened	32.1 miles
Little Colorado spinedace (Lepidomeda vittata)	Threatened with Critical Habitat	186.9 miles
Gila chub (Gila intermedia)**	Endangered with Critical Habitat	21,600 acres
Gila topminnow (Poeciliopsis occidentalis occidentalis)**	Endangered	21,600 acres
Razorback sucker (Xyrauchen texanus)**	Endangered with Critical Habitat	12,300 acres
Loach minnow (Tiaroga cobitis)**	Endangered with Critical Habitat	12,300 acres
Spikedace (Meda fulgida)**	Endangered with Critical Habitat	12,300 acres
Narrow-headed gartersnake (Thamnophis rufipunctatus)*	Threatened with proposed Critical Habitat	3,880 acres
Northern Mexican gartersnake (Thamnophis eques megalops)*	Threatened with proposed Critical Habitat	1,470 acres
Desert sucker (Catostomus clarki)	FS Sensitive	106.1 miles
Sonoran sucker (Catostomus insignis)	FS Sensitive	13.1 miles
Little Colorado sucker (Catostomus sp. 3)	FS Sensitive	147.1 miles
Headwater chub (Gila nigra)	FS Sensitive	47.8 miles
Roundtail chub (Gila robusta)	FS Sensitive	34.4 miles

* USFWS considered all proposed critical habitat as occupied for these species in the Federal Register proposed ruling. These are also Forest Service Southwestern Region sensitive species.
** Species not known to occur within the project area, but known to occur in adjacent/nearby parts of 6th HUC watersheds that intersect the project area. Acres displayed represent the areas of those subwatersheds within the project area.

There are 23 known species of rare plants in the Rim Country project area, including Forest Service Southwestern Region sensitive species and Forest Planning or analysis species. Bebb's willows and bigtooth maples, tree species that provide habitat for songbirds and small mammals, as well as soil and stream bank stability, are declining in health, vigor, and number in the project area.

Desired Conditions

The proposed treatments in the Rim Country Project would restore or move the project area toward desired conditions as described in the Apache-Sitgreaves, Coconino, and Tonto National Forest Plans, and help to re-establish resilient and functioning ecosystems. The proposed mechanical treatments (thinning) are specifically designed to establish interspaces reflecting pre-fire suppression-spatial patterns and uneven-aged stand structure, mitigate adverse effects of dwarf mistletoe, and improve stand structure and health. Table 5 displays the desired conditions related to stand structure, pattern, density, and health. Desired conditions are for no more than 15 percent of the ponderosa pine (under conditions modeled) in the treatment area to be prone to crown fire or high-severity fire, with areas of potential high severity spatially distributed. For the dry mixed conifer cover type, Forest Plan direction is to allow fire to play its natural role, with high frequency (averaging about 12 years) and mostly low severity (less than 20 percent high severity under modeled conditions). Implementing fire and mechanical treatments would decrease

surface and canopy fuel loading, as well as ladder fuels in the immediate vicinity of old trees. This would decrease potential fire-caused mortality in large and/or old trees. Use of prescribed burning, particularly when combined with mechanical thinning, would reduce the potential for damage from wildfires, the costs associated with fire suppression and safety concerns for fire managers.

Desired conditions for MSO and northern goshawk habitat include large tree size-classes and higher tree densities for nest areas, activity centers, surrounding nest core areas, and habitat for general foraging and movements. There is a need to restore resilient late-successional forest and increase habitat diversity, particularly within MSO PACs. Improving stands of larger/older trees would improve nesting habitat. Moving towards a forest structure with all age and size classes represented would improve MSO recovery habitat and overall habitat for northern goshawks. Creating rooting zones and returning low-severity fire would maintain a mosaic of grass, forbs, and shrubs, benefiting key prey species for both owls and goshawks.

While many of the understocked forest areas may not be suitable for planting, actions are needed to move them toward their desired forested conditions. Planting, burning, and other management actions will be considered to encourage reforestation.

Grasslands were designated a priority habitat in the Arizona Partners In Flight Bird Conservation Plan, with the objective to permanently protect, enhance, and/or restore over 500,000 acres of grassland in northern Arizona. Grasslands and meadows should have satisfactory soil conditions, with vegetative cover adequate to prevent erosion above tolerance conditions, uncompacted soil surfaces that allow for satisfactory hydrologic function and desirable vegetation, and little to no tree encroachment.

As Travel Management Rule (TMR) plans are completed and implemented for each forest, unneeded and poorly located roads may be improved, removed, or relocated to reduce effects on water quality and natural resources. The Forest Service will reclaim any previously disturbed areas used as temporary access roads on National Forest System lands once activities specified in the decision for the 4FRI Rim Country Project are completed.

Springs exhibiting degraded or declining condition and function need to be improved to sustain these important ecological features. Spring restoration would include reducing tree encroachment and noxious weeds, returning fire to the system (through prescribed fire), placing protective barriers, restoring flow to historic areas of influence, restoring or repairing damaged infrastructure, and removing dilapidated or non-functioning infrastructure where appropriate.

Desired conditions for riparian zones along streams are that they are capable of filtering sediment, capturing and/or transporting bedload (aiding floodplain development, improving flood-water retention, improving or maintaining water quality), and providing ground water recharge within their natural potential. Their necessary physical and biological components provide habitat for a diverse community of plant and wildlife species including cover, forage, available water, microclimate, and nesting/breeding/transport habitat. Stream habitats and aquatic species depend upon perennial streams or reaches and their habitat is maintained by the watershed, soil, and riparian conditions within the ecosystem.

All proposed riparian treatments will also improve or maintain stream habitat by restoring watershed function or resilience. Upland treatments in watersheds may also improve water infiltration rates and increase subsurface flows higher in the stream system that provide cool perennial water to streams which helps to maintain stream temperatures.

Desired conditions for streams and aquatic habitats are to support native fish and other aquatic species, providing the quantity and quality of aquatic habitat within the natural range of variation. This includes increasing habitat complexity such as pools and large woody debris, reducing downcutting and sedimentation, improving riparian areas that provide channel stability and leaf litter, and stream shading to maintain water temperatures.

The habitat for rare plant species will remain suitable and capable to support them. Some habitat may improve as a result of management actions, especially in spring and channel restoration areas and in areas where litter and tree canopy are high. Any negative effects on these species from management actions will be mitigated and plant numbers will remain the same or increase. To stimulate growth, recruit younger age classes, and increase individual recruitment of aspen, protective barriers would be placed around sites to prevent browsing and other disturbance during regeneration. Protective barriers would also be placed around pockets of Bebb's willow and bigtooth maple to reduce browsing and other disturbances, recruit younger age classes, increase populations, and retain this diverse habitat until they are sustainable.

Purpose and Need for Action

The purpose and need for the Rim Country Project was determined by comparing the existing conditions in the project area to the desired conditions in the Forest Plans related to forest and ecosystem function and resilience. In addition, relevant research, the best available science and information, and the landscape restoration criteria found in the Omnibus Public Land Management Act of 2009 (P.L. 111-11, Title IV Forest Landscape Restoration) were used to develop the purpose and need. Among other things, these criteria require that landscape-scale restoration strategies maintain or contribute to the restoration of the structure and composition of old growth stands, maximize the retention of large trees to the extent that they promote fire-resilient stands, focus on small-diameter tree thinning, do not require the establishment of permanent roads, and commit to decommission all temporary roads built for treatment purposes. Below is some of the pertinent language from the Omnibus Public Land Management Act as it relates to the Rim Country project.

The Four Forest Restoration Initiative (4FRI) is a Collaborative Forest Landscape Restoration Project covering portions of four national forests in Arizona that meets the requirements of the Omnibus Public Lands Management Act of 2009. The first 4FRI Environmental Impact Statement (EIS) was completed and the Record of Decision was signed in 2015. Implementation of the treatments analyzed in the 1st EIS are currently being implemented. The 4FRI Rim Country analysis continues this collaboration effort. Below are specific portions of the Omnibus Public Lands Management Act of 2009 that speak to eligibility of projects under the Collaborative Forest Landscape Restoration Program and also project implementation:

> (b) Eligibility Criteria- To be eligible for nomination under subsection (c), a collaborative forest landscape restoration proposal shall--
>
> (1) be based on a landscape restoration strategy that--
>
> (A) is complete or substantially complete;
>
> (B) identifies and prioritizes ecological restoration treatments for a 10-year period within a landscape that is--
>
> (i) at least 50,000 acres;

(ii) comprised primarily of forested National Forest System land, but may also include land under the jurisdiction of the Bureau of Land Management, land under the jurisdiction of the Bureau of Indian Affairs, or other Federal, State, tribal, or private land;

(iii) in need of active ecosystem restoration; and

(iv) accessible by existing or proposed wood-processing infrastructure at an appropriate scale to use woody biomass and small-diameter wood removed in ecological restoration treatments;

(C) incorporates the best available science and scientific application tools in ecological restoration strategies;

(D) fully maintains, or contributes toward the restoration of, the structure and composition of old growth stands according to the pre-fire suppression old growth conditions characteristic of the forest type, taking into account the contribution of the stand to landscape fire adaptation and watershed health and retaining the large trees contributing to old growth structure;

(E) would carry out any forest restoration treatments that reduce hazardous fuels by--

(i) focusing on small diameter trees, thinning, strategic fuel breaks, and fire use to modify fire behavior, as measured by the projected reduction of uncharacteristically severe wildfire effects for the forest type (such as adverse soil impacts, tree mortality or other impacts); and

(ii) maximizing the retention of large trees, as appropriate for the forest type, to the extent that the trees promote fire-resilient stands; and

(F)(i) does not include the establishment of permanent roads; and

(ii) would commit funding to decommission all temporary roads constructed to carry out the strategy;

(2) be developed and implemented through a collaborative process that—

(A) includes multiple interested persons representing diverse interests; and

(B)(i) is transparent and nonexclusive; or

(ii) meets the requirements for a resource advisory committee under subsections (c) through (f) of section 205 of Public Law 106-393 (16 U.S.C. 500 note)

(g) Program Implementation and Monitoring-

(2) PROJECT IMPLEMENTATION- Amounts transferred to the Secretary from the Fund shall be used to carry out ecological restoration treatments that are—

(A) consistent with the proposal and strategy; and

(B) identified through the collaborative process described in subsection (b)(2).

The purpose of the 4FRI Rim Country Project is to restore and maintain the structure, pattern, health, function, 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 in the Forest Plans. One outcome of restored ecosystems is increased resilience. Resilience is the ability of an ecosystem to survive natural disturbances such as fire, insects and disease, and climate change without changing its inherent function (FSH 1909.12, 05; SER 2004). This project is needed to:

- Increase forest and grassland resilience and sustainability
- Reduce hazards associated with 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
- Support sustainable forest products industries
- Improve the motorized transportation system and provide for a more sustainable road system where poorly located roads are relocated or obliterated.

Forest Resilience and Sustainability. There is a need to restore the frequent low-severity fire regimes in which the forest in the Rim Country project area evolved. Resilience increases the ability of the ponderosa pine and mixed conifer-frequent fire forest types (target cover types) to survive natural disturbances and stressors such as fire, insect and disease outbreaks, and climate change (FSM 2020.5).

There is a need to move tree group pattern, interspaces, and stand density toward the natural range of variation. There is a need to manage forest density, structure, and composition to improve forest health and reduce adverse effects from bark beetles and dwarf mistletoe, while also providing a diversity of habitat types and features. In the oak woodland and shrubland cover types, there is a need to stimulate new growth, maintain vigor in large-diameter trees, encourage faster growth in young smaller oaks, and provide for a variety of shapes and sizes of trees across the forest cover types.

Where aspen is found in the frequent fire forest cover types, there is a need to stimulate growth, reduce conifer encroachment, and increase individual tree recruitment.

In grassland cover types, there is a need to reduce or remove trees and other woody species that have encroached, which has decreased the size and function of these systems that were historically grasslands and functionally connected montane meadows.

There is a need to improve the condition of native plant communities and the resilience of rare species. There is also a need to improve the abundance, diversity, distribution, and vigor of native understory vegetation to provide food and cover for wildlife where it is absent under dense forest stands where fire has been excluded.

Tonto Forest Plan Amendments - There is also a purpose and need to amend the 1985 Tonto Forest Plan in three different areas. They are discussed below.

Amendment #1, Ponderosa pine vegetation/forest cover types- The Tonto Forest Plan (1985) does not reflect a change in conditions since the 1980's including acknowledgement that vegetation conditions (structure, composition, and function) are divergent from reference conditions and forest conditions

indicate a substantial departure from the naturel fire regime. The revised forest plans of the Apache-Sitgreaves and the Coconino National Forest's use the best available science and information so therefore do acknowledge changing conditions. This amendment is needed to replace forest plan standards and guidelines for ponderosa pine/bunchgrass, ponderosa pine/Gambel oak, and ponderosa pine/evergreen oak, dry mixed conifer and old growth with desired conditions and guidelines, to add a desired condition for the percentage of interspaces within uneven-aged stands to facilitate restoration, add the desired interspaces distance between tree groups, add a definition to the Tonto FP glossary for the terms interspaces and openings.

Amendment #2, the Mexican Spotted Owl (MSO) component- The Tonto Forest Plan (1985) is inconsistent with the 2012 Mexican Spotted Owl Recovery Plan. This amendment is needed to update definitions, language and treatment opportunities within MSO habitat. The Apache-Sitgreaves and Coconino Forest Plans are more recent and are consistent with the MSO recovery plan.

Amendment #3, Mechanical treatments on steep slopes- The Tonto Forest Plan (1985) currently restricts the use of mechanical equipment to slopes less than 40 percent. Since the 1985 plan began being implemented the design of mechanized ground-based equipment has progressed to allow operations on steep slopes more effectively and without adverse effects on soil resources. It is necessary to allow for use of specialized mechanical equipment to cut and remove threes and also to mechanically treat other vegetation on steep slopes, in order to carry out restoration treatments in portions of the Rim Country project area on the Tonto National Forest and to meet the projects purpose and need.

Undesirable Fire Effects. There is a need to reduce the risk of undesirable fire behavior and effects, which currently pose a threat to ecosystem function and services, and human safety, lives, and values. Restoring fire regimes in forests and grasslands would decrease the risks of post-fire flooding and debris flows that cause loss of soil productivity, water quality, and watershed function. Reducing the potential for undesirable fire effects and reducing excessive fuel loadings would help protect terrestrial and aquatic species habitat as they increase resilience to fires, including areas within and adjacent to Mexican spotted owl habitat.

Terrestrial and Aquatic Species Habitat. There is a need to move the project area toward desired conditions for snags, coarse woody debris, forest structural stages, and stream habitat complexity. There is a need to retain as many old and large trees as possible, while moving toward restoration-based desired conditions and recognizing the ecological and socio-political importance of these trees. Where restoration activities occur in the ponderosa pine and dry mixed conifer cover types, there is a need to maintain and promote the development of old growth characteristics and components. There is a need to maintain or improve aquatic habitats to meet needs for fish, frogs, and garter snakes, recognizing the ecological and socio-political importance of these streams and associated riparian areas.

Streams and Springs. There is a need to improve the condition and function of riparian areas, wet meadows, streams, and springs in the Rim Country project area in order to sustain these features for terrestrial and aquatic habitat, as well as for human use.

Riparian Vegetation. There is a need to restore native riparian vegetation, including large conifers and willows in some cover types, to reduce sedimentation to stream habitat, provide stream shading, maintain cool-water conditions, and provide large wood recruitment to streams to improve habitat complexity.

Cultural Resources. There is a need to reduce threats to cultural resources caused by overly dense vegetation and soil erosion. Though most archaeological sites can tolerate low-severity fire, all are very vulnerable to the effects of high severity fire in unnaturally high fuel loads and to the soil loss that occurs

in post-fire flooding. In particular, there is a need to reduce fuels accumulation around cultural resources to reduce threats to these non-renewable resources.

Forest Products Industries. There is a need to support appropriately-scaled, sustainable, forest products industries that strengthen local economies, while conserving natural resources and aesthetic values. Appropriately-scaled businesses would play a key role in accelerated forest restoration, by harvesting, processing, and selling wood products, thereby reducing treatment costs and providing economic opportunities. Engaging industry would offer the opportunity to cover all, or nearly all, of the cost of removal of forest restoration byproducts by the value of the products removed.

Improved Motorized Transportation System. There is a need to have adequate access for project implementation, and decommission temporary roads after use to restore these areas once project activities are completed. In addition, there is a need to decommission unneeded routes identified during the forest Travel Management Rule planning processes as part of the restoration of the landscape in the project area.

Public Involvement

Collaboration

Collaboration has been integral to the 4FRI, and in 2010, stakeholders began refining their vision for ponderosa pine forest restoration across 2.4 million acres on four national forests in Arizona including the Apache-Sitgreaves, Coconino, Kaibab, and Tonto.

The 4FRI stakeholders developed a comprehensive restoration strategy for the first analysis area on the Coconino and Kaibab National Forests (4FRI Stakeholders 2010). The landscape strategy documented existing conditions, identified potential treatment areas, and desired post-treatment conditions. The Forest Service used the stakeholder's landscape strategy to inform the purpose and need and proposed action for both the 1st 4FRI EIS and this Rim Country Project DEIS.

Cooperating Agencies

On July 15, 2015, the Arizona Game and Fish Department (AZGD) became a cooperating agency. AZGD specialists attended interdisciplinary team meetings, held workshops to gather aquatics and terrestrial wildlife data, and provided existing condition and location information (tabular and spatial) for priority species. AZGD specialists served on the interdisciplinary team for the Rim Country Project, helped develop the proposed action and other action alternatives, provided existing conditions for species and their habitat, and reviewed, edited, and augmented species analysis.

Tribal Consultation

Each forest consulted with specific tribes to reduce redundancy of information sharing. Comments gathered by each forest liaison is continuously shared with the other forests. Tribes who received invitations to consult on the project include: the Hopi Tribe, Havasupai Tribe, Hualapai Tribe, Kaibab Band of Paiute Indians, San Juan Southern Paiute Tribe, Fort McDowell Yavapai Nation, Yavapai-Apache Nation, Yavapai-Prescott Indian Tribe, Mescalero Apache Tribe, San Carlos Apache Tribe, Tonto Apache Tribe, White Mountain Apache Tribe, Pueblo of Acoma, Pueblo of Zuni, Gila River Indian Community, Salt River Pima–Maricopa Indian Community, Navajo Nation, and Navajo chapters in proximity to the project area: the Alamo, Bodaway/Gap, Cameron, Coalmine Canyon, Dilkon, Lechee, Leupp, Ramah, Tolani Lake, and To'Nanees'Dizi Chapters.

On July 1, 2016 the Rim Country Project proposal was sent to each Tribe along with an invitation to formally consult with the Forest Service. This resulted in various phone calls, emails, and consultation meetings. One written scoping response was received from the Hopi Tribe in which the Tribe requested continued consultation on implementation and review of cultural resource surveys, Traditional Cultural Properties, and ethnographic studies. On April 6, 2017 the Archaeological Site Treatment strategy was distributed to tribes for comment.

The tribal relations section in chapter 3 of this DEIS and tribal relations specialist report provide more information and complete documentation of consultation.

Stakeholder and Public Involvement

The Rim Country Project has been published in the Coconino, Apache-Sitgreaves, and Tonto National Forests' Schedule of Proposed Actions (SOPA) since January of 2016. As the Rim Country project area was developed, the Forest Service worked with stakeholders to define the project boundary as well as the extent of the analysis in different portions of the project including multiple meetings, presentation, and field visits. The notice of intent to prepare an environmental impact statement was published in the Federal Register on June 27, 2016 (81 FR 41517). A scoping document was posted on the project website (www.fs.usda.gov/goto/4FRIRimCountry) and mailed to all known potentially interested parties, inviting public comment on the proposed action for the Rim Country Project. Letters and scoping documents were mailed to 676 individuals, local governments, state governments, federal and state agencies, and organizations that engage with all three national forests. Public workshops were held on July 14 in Show Low and on July 21 in Payson, to discuss the proposed action and accept comments.

Fifty (50) scoping responses (e-mails, letters, and public meeting comment forms) were received from this scoping effort.

Development of Action Alternatives

The preliminary alternatives being considered for Rim Country were first posted to the 4FRI website and shared with the SHG in March of 2017. The preliminary alternatives were then defined and shared at public workshops cohosted by the SHG in April 2017. The IDT reviewed feedback received at these workshops on the preliminary alternatives.

Additional presentations on the Rim Country alternatives were given to the SHG in July and November 2017, discussing the progression of the action alternatives that would be analyzed in the draft environmental impact statement (DEIS). The decision was made by the 4FRI Board of Supervisors to drop one of the preliminary alternatives from consideration in the Rim Country DEIS.

Collaboration on the Mechanical Treatments and Aquatics Flexible Toolbox Approaches with the SHG, Arizona Game and Fish Department and Trout Unlimited took place throughout 2017 with meetings, presentations and field visits.

Issues

Issues are statements of cause and effect, linking environmental effects to proposed activities. Comments from the public, the 4FRI Stakeholder Group, other agencies, tribes, and Forest Service personnel were used to formulate issues concerning the proposed action. All comments received were reviewed and analyzed by the interdisciplinary team to "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review…" (Council on Environmental Quality, Sec. 1506.3; 40 CFR 1501.7(a) (3)).Non-significant issues were identified as

those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. Significant issues were identified as those directly or indirectly caused by implementing the proposed action. Significant issues were grouped by issues that can be responded to through mitigation measures and those that were responded to in alternatives to the modified proposed action.

The public comments received during the scoping period from June 27 to August 11, 2016 presented seven issues that are within the scope of the proposed action, and relevant to the decision to be made for the project These key issues were used to modify the proposed action and formulate a new action alternative for the analysis.

Significant Issues Responded to through Mitigation Measures, Analysis, and Modifications to the Proposed Action

Issue 1 – Treatments in MSO PACs

The proposed action may have negative effects on Mexican spotted owl (MSO) by cutting trees up to 17.9 inches in diameter in MSO protected activity centers (PACs). The Forest Service should act conservatively to protect MSO habitat and consider all cautions identified in the revised Recovery Plan for MSO (USDI Fish and Wildlife Service 2012). There is a concern about how MSO will respond to the removal of trees up to 17.9 inches in diameter, given a lack of monitoring data.

How Issue 1 is addressed

This issue is addressed in the effects analysis for all alternatives using the best available science and with design features and conservation measures as outlined in the 2012 revised MSO Recovery Plan to apply to treatments in MSO PACs. The wildlife analysis will reference all available monitoring information from the 1st 4FRI EIS and from other sources across the region.

Indicators/Measures

Indicators will include changes in the amount and quality of MSO nest/roost habitat within PACs. Specific measures include:

- Stand density as measured by stand density index (SDI), trees per acre (TPA), quadratic mean diameter (QMD), Canopy Cover, Basal Area Average, reduction of average basal area (BA) of large young trees;
- Fuel loading, fire hazard index, and risk of crown fire;
- Prey habitat as measured by number of snags/acre ≥ 12 inches in diameter, coarse woody debris (CWD), and shrub and herbaceous cover.

Issue 2 – Treatments in Northern Goshawk Habitat

The proposed action may have negative effects on northern goshawk and canopy-dependent prey species by reducing late seral, dense understory, and old growth habitat. Specifically, there is a concern that treatments will reduce the mix of densities and cover types, including later seral stages.

How Issue 2 is addressed

This issue will be addressed in the effects analysis for all alternatives, and with design features and conservation measures as outlined in the most current management recommendations to apply to treatments in northern goshawk habitat.

Indicators/Measures

Indicators will include changes in the amount and quality of goshawk nesting and foraging habitat. Specific measures include:

- Stand density as measured by stand density index (SDI), trees per acre (TPA), quadratic mean diameter (QMD), Canopy Cover, Basal Area Average, reduction of average basal area (BA) of large young trees;
- Fuel loading, fire hazard index, and risk of crown fire;
- Prey habitat as measured by number of snags/acre ≥ 12 inches in diameter, downed logs, coarse woody debris (CWD), and shrub and herbaceous cover.

Issue 3 – Large Tree Retention

The proposed action may cause the loss of large trees which may significantly affect old growth recruitment. Proposed management actions in old growth, future old trees (large young trees), and high-canopy patches should be very explicit, and no old trees be cut.

How Issue 3 is addressed

This issue will be addressed in the effects analysis for all alternatives. Large tree retention will be addressed with treatment design and location, design features, mitigation measures, and BMPs to retain old growth and groups of large trees in all action alternatives. The Old Growth Protection and Large Tree Retention Strategy (OGP/LTRS) as developed by the 4FRI Stakeholder Group will be evaluated and considered as fully as possible in all action alternatives.

Indicators/Measures:

- Number of acres of stands meeting collaboratively established Stands with a Preponderance of Large Young Trees (SPLYT) criteria.

Issue 4 – Dwarf Mistletoe Mitigation

The proposed action includes dwarf mistletoe treatments that may remove the largest trees in some stands. The scale and intensity of mistletoe mitigation should be more clearly defined as far as scale, that where it occurs at natural levels it be allowed to remain to provide essential food and occupancy needs to wildlife, and that the mitigation treatments not focus on removing the largest trees.

How Issue 4 is addressed

This issue is addressed in the effects analysis for all alternatives. Dwarf mistletoe mitigation will be addressed with treatment design and location and collaboratively developed guidance in the implementation plan (appendix D). Some dwarf mistletoe will be retained as a natural component for wildlife, and limits will be placed on removal of large infected trees. The alternatives will propose a range of mitigation treatments depending on the severity and extent of infection.

Indicators/Measures

- Acres of intermediate thinning proposed in stands with severe dwarf mistletoe infection
- Anticipated percent change in dwarf mistletoe infection severity ratings on acres proposed for mechanical thinning treatments.

Issue 5 – Economics

The proposed action does not include measures to make it economically viable. A wide range of options should be considered in the action alternatives that would allow for biomass removal where economically feasible but would also allow other options to dispose of uneconomically feasible biomass.

How Issue 5 is addressed

To improve the economic viability, analysis of the development and use of 12 in-woods processing sites to increase the utilization of forest products and transportation efficiencies is included in both action alternatives. Alternative 2 provides for treating the most acres in the project area as identified by the Mechanical Treatments Flexible Toolbox Approach and determined during implementation. Alternative 3 focuses on those areas 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. This issue will be included in the analysis in this DEIS, the Implementation Plan (appendix D), and will also be addressed during implementation as opportunities for biomass removal are developed.

Indicators/Measures for the Analysis:

- Volume of wood products (ccfs and biomass dry tons) available for removal by restoration activities.
- Unit and overall project net treatment costs.
- Mill delivered value of wood products from restoration activities.
- Economic efficiency (project benefits/value less project costs).
- Changes in employment (annual jobs created) and labor income.

Significant Issues Responded to in Alternatives to the Proposed Action

Issue 6 – Smoke/Air Quality

The proposed prescribed burning may have negative effects on air quality and human health. Some commenters are concerned that the smoke from prescribed burns will degrade air quality and the health of northern Arizona residents.

How Issue 6 is addressed:

Alternative 3 was partially developed to respond to this issue. It includes fewer acres of prescribed burning than the other action alternatives. This issue will be also be addressed in a considered-but-eliminated-from-detailed-study alternative that proposes even less prescribed fire (see chapter 2). This issue will be addressed in the effects analysis for all alternatives. Design features and/or mitigation measures will be included to minimize effects on air quality from prescribed fires.

Indicators/Measures:

The potential for emissions from proposed prescribed fire to affected communities will be evaluated qualitatively. The pollutants to be modeled include the six listed in the Clean Air Act for which there are

National Ambient Air Quality Standards: carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter less than 10 microns in size (PM 10), particulate matter less than 2.5 microns in size (PM 2.5), ozone (O_2), and sulfur dioxide (SO_2). There will be a discussion on the ecological effects of smoke, and the socioeconomic analysis will evaluate the effects of smoke on the quality of life and tourism.

Issue 7 – Roads

The miles of temporary roads in the proposed action may negatively affect watershed and stream conditions, and wildlife habitat and connectivity. Commenters asked that the Forest Service limit road networks to those roads needed for access and management. Commenters requested an alternative that dramatically reduces temporary road mileage.

How Issue 7 is addressed:

Alternative 3 was partially developed to respond to this issue. It includes the least number of miles of temporary roads. Design features and/or mitigation measures will be developed to reduce effects on watersheds, streams, and wildlife habitat. This issue will be addressed in the effects analysis for all alternatives.

Indicators/Measures:

Indicators will include the range of temporary roads that may be needed in each of the alternatives, measured by the approximate number of miles of temporary roads proposed in each alternative.

Decision to be Made

The Apache-Sitgreaves, Coconino, and Tonto National Forest Supervisors are the Forest Service officials responsible for the decision about the Rim Country Project. Based on the purpose and need for action, the findings in the Environmental Impact Statement and supporting project record, and consideration of the best available science, the responsible officials' will decision will include:

- Selecting one of the alternatives analyzed, or selecting an alternative that combines activities proposed in the different alternatives analyzed. This "blending" of alternatives must be a mix of proposed activities for which the Rim Country analysis discloses the effects.
- Determining which, if any of the proposed Forest Plan amendments to approve and whether one or more amendments would affect the plan's inherent capability of meeting the substantive requirements in the 2012 Planning Rule.
- Determining the design features, best management practices, and conservation and mitigation measures to be used in implementation.
- Establishing the Implementation Plan, and the Monitoring and Adaptive Management Plan prepared with the Multi-party Monitoring Board.