4FRI Rim Country Project

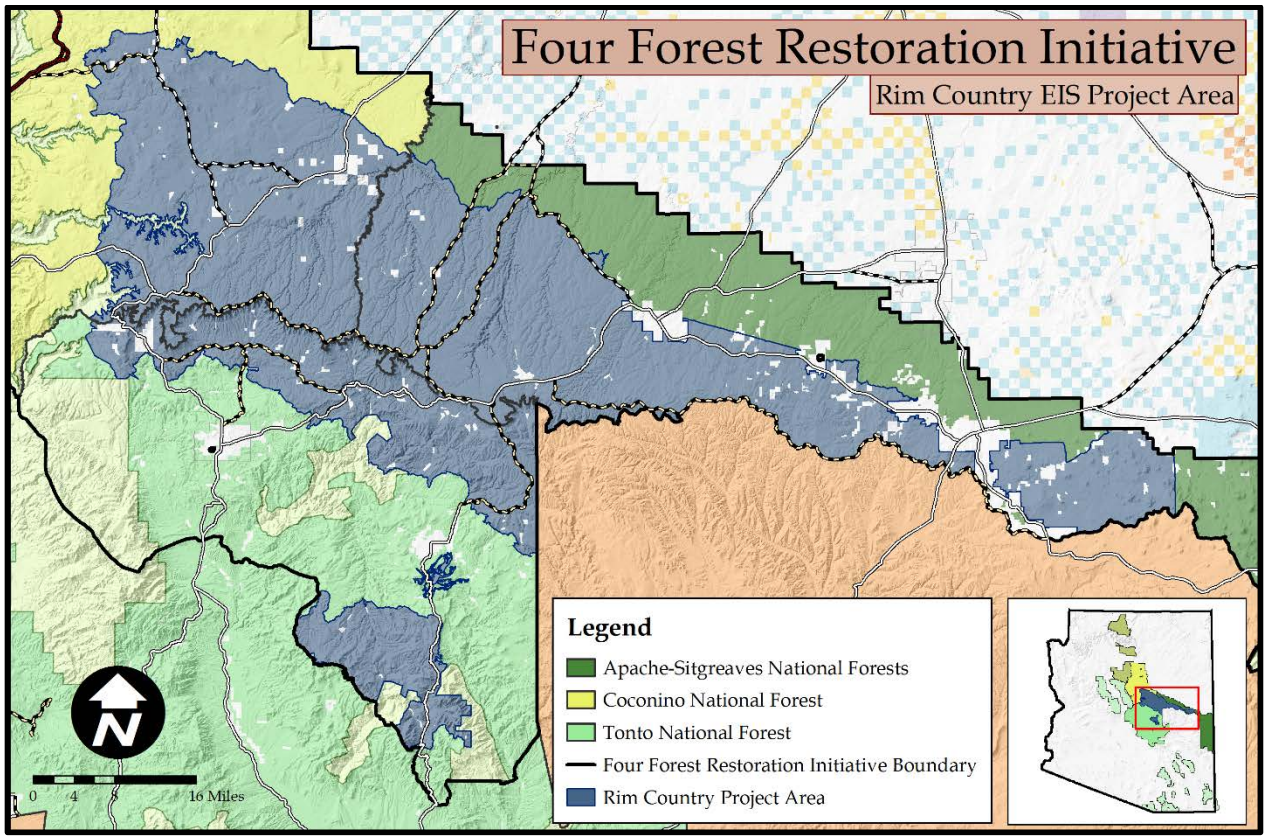
Proposed Action

June 2016

Introduction

The Four Forest Restoration Initiative (4FRI) is a planning effort designed to restore forest resiliency and ecosystem function in ponderosa pine forests across four national forests in Arizona including the Coconino, Kaibab, Apache-Sitgreaves, and Tonto National Forests (Figure 1). In 2015, the Record of Decision for the first 4FRI environmental impact statement (EIS) for the northern portion of the Coconino National Forest (NF) and the Kaibab NF was signed. The Rim Country EIS continues the ecosystem restoration effort on about 1,240,000 acres on the Mogollon Rim and Red Rock Ranger Districts of the Coconino NF, the Black Mesa and Lakeside Districts of the Apache-Sitgreaves NF, and the Payson and Pleasant Valley Districts of the Tonto NF.

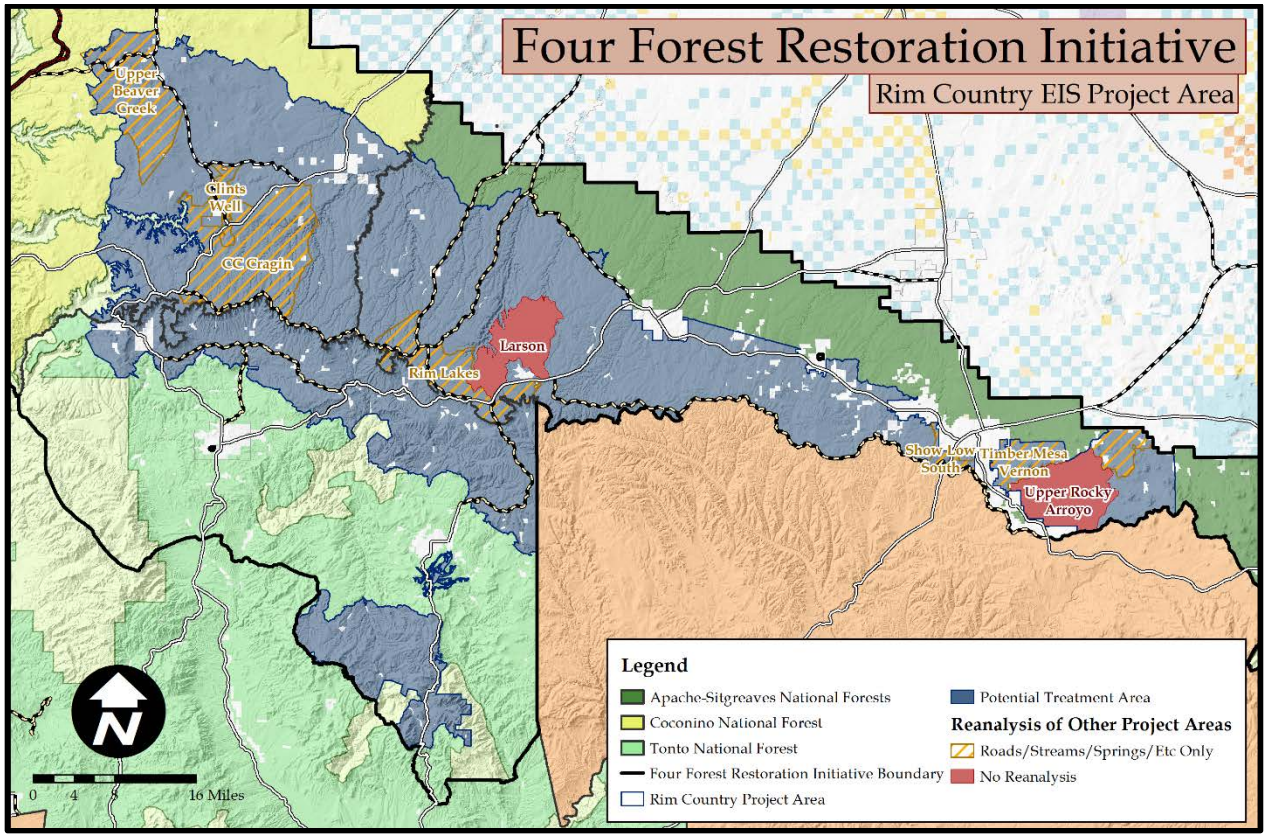
Figure 1. 4FRI Rim Country Project Area



The project area includes portions of Coconino, Yavapai, Gila, and Navajo Counties. Of the total project area, about 98,000 acres will be 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 will be addressed in cumulative effects.
- 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.
- 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.

Figure 2. Other Projects within the 4FRI Rim Country Project Area



Purpose and Need

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 land and resource management plans (forest plans) related to forest and ecosystem function and resiliency. 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. These criteria for landscape-scale restoration address community, wildlife habitat, and forest protection while retaining as many large trees as possible. National direction found in Forest Service Manuals 2020 and 4000 was used to evaluate the needs for the Long Valley Experimental Forest.

The purpose of the Rim Country 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. The outcome of improving structure and function is increased ecosystem resiliency. Resiliency increases the ability of an ecosystem to survive natural disturbances such as fire, insects and disease, and climate change (FSM 2020.5) without changing its inherent function (SER 2004). This project is needed to:

- Increase forest resiliency and sustainability
- Reduce 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
- Support sustainable forest products industries

Forest Resiliency and Sustainability. Resiliency 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 restore the frequent low-severity fire regimes in which the forest in the Rim Country project area evolved. The Rim Country Project is expected to move over 1,000,000 acres toward comprehensive, landscape-scale restoration.

There is a need to move tree group pattern, interspaces, and stand density toward the natural range of variation. This is a sum of reference conditions that provides a mix of open, moderately closed, and closed canopy conditions at the fine (group) to landscape (ponderosa pine ecosystems) scales as defined by the Forest Plans. There is a need to manage forest density, structure, and composition to increase forest health and reduce adverse effects from epidemic levels of 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 resiliency 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.

In the Long Valley Experimental Forest, there are needs to (1) learn more about restoration through experimentation; (2) restore the composition, structure, function, and structure of the forest overstory and understory; (3) increase resilience to disturbances and climate change; and (4) restore the natural fire regime.

The Rim Country Project includes extensive areas where the ponderosa pine and mixed conifer cover types interface with the pinyon-juniper and oak woodland types. Because of this close association, some facilitative operations may be needed in these other, non-target cover types (such as pinyon-juniper) to support, increase the safety and effectiveness of, and minimize surface disturbance of treatments to restore the frequent-fire forest structure in the target cover types (ponderosa pine types). Facilitative operations would support the safe and effective use of prescribed fire in the cover types targeted for restoration treatments. Where prescribed fire alone would not be safe or effective in a non-target cover type, limited mechanical operations may be needed to create conditions safe for personnel and to ensure prescribed fire meets objectives when entering the target cover types. The expectation is that the majority of the area available for facilitative operations would be for prescribed fire only, with mechanical treatments being the exception. The effects of facilitative operations on the non-target cover types is expected to be maintenance of current conditions or movement toward desired conditions per the applicable forest plan.

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 will 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 will protect terrestrial and aquatic species habitat as they increase resiliency to fires, including areas within and adjacent to Mexican spotted owl habitat. Protected activity centers (PACs) currently contain high fuel loadings because of past management and a century of wildfire suppression efforts.

Terrestrial and Aquatic Species Habitat. There is a need to move the Rim Country 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, 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. Reducing road density and improving road and stream crossings would maintain natural flow regimes, provide connectivity for aquatic species and habitats, and reduce sediment delivery to streams and other water bodies.

Woody Riparian Vegetation. Restoring native riparian vegetation, including large conifers and willows in some cover types, would reduce sedimentation to stream habitat, provide stream shading, maintain cool-water conditions, and provide large wood recruitment to streams to improve habitat complexity. This may include maintaining and promoting existing vegetation, reducing conifer tree encroachment and noxious weeds, planting desirable species such as willows where they have been extirpated, and returning fire to riparian areas. Re-establishment of woody riparian vegetation will also benefit aquatic and terrestrial fish and wildlife species.

Roads. There is a need to have adequate access for project implementation, but then 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 review processes as part of the restoration of the landscape in the project area.

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. As a primary tool to conduct accelerated forest restoration, 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 achieving the goals of 4FRI 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. Restoration that proceeds with enough predictability and social support would allow significant, long-term investment by industry partners.

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, and are very dense as measured by basal area, trees per acre, and stand density index. Some of these areas are at high risk for disturbance from undesirable fire behavior, insects and disease, and climate change.

Table 1 shows the cover types that occur in the Rim Country project area and Table 2 compares the existing conditions to the desired conditions for the target cover types.

Table 1. Acres of Cover Type

Cover Type	Total Acres
Juniper	28,340
Pinyon Juniper Woodland	83,330
Ponderosa Pine*	316,660
Ponderosa Pine-Gambel Oak*	170,710
Cottonwood Group	3,200
Aspen	1,450
Oak Shrubland	17,980
Ponderosa Pine-Evergreen Oak*	146,340
Mixed Conifer-Dry*	62,940
Mixed Conifer-Wet	2,650
Grassland	21,550
Reforestation Needs	69,360
Other	27,810

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

Table 2. Existing Conditions (EC) Compared to Desired Conditions (DC) by Target Cover Type*

Cover Type	Acres	Average Basal Area EC (DC)	Average Trees per Acre EC (DC)	% of Max Stand Density Index EC (DC)
Ponderosa Pine	316,660	125 (20-80)	684 (11-124)	60.2 (25)
Pine/Gambel Oak	170,710	126 (20-80)	1,139 (11-124)	66.6 (25)
Pine/Evergreen Oak	146,340	178 (20-80)	1,296 (11-124)	91.5 (25)
Dry Mixed Conifer	62,940	172 (40-124)	1,382 (20-100)	68.0 (25)

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

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 3 shows the existing crownfire potential in ponderosa pine cover types. When all ponderosa pine systems are combined, modeled fire behavior shows potential for crown fire in 65% of the ponderosa pine; 13% of which would be active crown fire.

Table 3. Existing Crownfire Potential in Ponderosa Pine Cover Types

Cover Type	Acres	No Fire	Crown Fire	
			Passive	Active
Ponderosa Pine	316,660	0%	52%	11%
Pine/Evergreen Oak	146,340	1%	51%	22%
Pine/Gambel Oak	170,710	1%	54%	9%
All Ponderosa Pine	**633,710**	**2%**	**52%**	**13%**

Currently, modeling results show that, under conditions similar to those of the Rodeo/Chediski Fire, there is potential for about 79% of the dry mixed conifer in the Rim Country project area to burn with crown fire, of which 33% would be active crown fire, as shown in Table 4.

Table 4. Existing Crownfire Potential in Dry Mixed Conifer Cover Type

Cover Type	Acres	No fire	Crown Fire	
			Passive	Active
Dry Mixed Conifer	62,940	1%	46%	33%

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

limited management. 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 69,360 acres of understocked national forest lands in the project area. These are areas where extreme fire behavior (e.g., 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. These acres were historically forested (ponderosa pine or mixed conifer cover types) and now have less than 10% canopy cover or less than 10 basal area of desired trees.

The incidence of dwarf mistletoe infections is higher than historical norms. Approximately 41 percent of the Rim Country project area is infected by dwarf mistletoe. About 22 percent has moderate (20% to 50% of the trees infected) to heavy (50-80% of the ponderosa pine infected) mistletoe infection rates. The average percent of trees infected ranges from five to 10 percent in none/low infection groups and is greater than 20 percent in the moderate/high infection groups. There are some stands with an extreme infection rating where 80% or more of the trees are infected. Large amounts of dwarf mistletoe can increase tree stress, the likelihood of bark beetle infestations during periods of drought, and tree death.

Grasslands, savannas, and meadows provide valuable habitat for many wildlife species including pronghorn antelope (a management indicator species (MIS)), 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, conifers and junipers 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) 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 downward trends or static-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 5 shows the condition classes of riparian areas by national forest.

Table 5: Condition Classes of Riparian Areas by National Forest

Forest	Total Miles*	Properly Functioning	Functioning-at-Risk	Non-Functioning
Apache-Sitgreaves	608	169	334	105
Coconino	195	120	52	23
Tonto	440	77	309	54
Totals	**1,243**	**366**	**685**	**182**

*Miles are approximate

There are approximately 360 miles of fish-bearing streams in the Rim Country project area. These streams provide habitat for 11 native fish and two gartersnakes, including five federally-listed species, two proposed species, and four Regional Forester Sensitive species (see Table 6).

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

Table 6. Status and Habitat for Native Fish and Gartersnake Species

Species	Status	Occupied/Recovery Habitat (approximate miles/acres)
Apache trout (*Oncorhynchus gilae apache*)	Threatened	9.6 miles
Gila trout (*Oncorhynchus gilae gilae*)	Threatened	32.0 miles
Little Colorado spinedace *(Lepidomeda vittata)*	Threatened with Critical Habitat	78.6 miles
Narrow-headed gartersnake *(Thamnophis rufipunctatus)**	Threatened with proposed Critical Habitat	2,810 acres
Northern Mexican gartersnake (*Thamnophis eques*)*	Threatened with proposed Critical Habitat	1,480 acres
Roundtail chub *(Gila robusta)*	Proposed	34.4 miles
Headwater chub (*Gila nigra)*	Proposed	47.8 miles
Bluehead sucker *(Pantosteus discobilis)*	Sensitive	163.4 miles
Desert sucker *(Pantosteus clarki)*	Sensitive	100.7 miles
Sonoran sucker *(Catostomus insignus)*	Sensitive	13.1 miles
Little Colorado sucker *(Catostomus sp. 3)*	Sensitive	147.2 miles
Speckled dace *(Rhinichthys osculus)*	Sensitive	223.4 miles
Longfin dace *(Agosia chrysogaster)*	N/A	31.3 miles

* USFWS considered all proposed critical habitat for these species as occupied in the Federal Register proposed ruling.

There are 26 known species of rare plants in the Rim Country project area, including Region 3 sensitive species and forest planning or analysis species. Bebb's willows and big-tooth 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 will bring the project area back to, or move it toward desired conditions as described in the Apache-Sitgreaves, Coconino, and Tonto Forest Plans, and help to establish sustainable, resilient, and functioning ecosystems. The proposed mechanical treatments (thinning) are designed to establish interspace and uneven-aged stand structure, mitigate adverse effects of dwarf mistletoe, and improve stand structure and health. Table 7 displays the desired conditions by target cover type.

Table 7. Desired Conditions by Target Cover Type

Cover Type	Acres	Average Basal Area	Average Trees per Acre	% of Max Stand Density Index
Ponderosa Pine	316,660	20-80	11-124	25
Pine/Gambel Oak	170,710	20-80	11-124	25
Pine/Evergreen Oak	146,340	20-80	11-124	25
Dry Mixed Conifer	62,940	30-100	20-100	25

Desired conditions are for no more than 15% 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% 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, as well as the costs associated with fire suppression.

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. Canopy gaps and openings would provide adequate space for the development of interspaces, increasing tree group resilience. 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 are not suitable for planting, there needs to be an effort to move them toward their desired forested conditions. Planting, burning, and other management actions will be considered to encourage reforestation.

Dwarf mistletoe is a natural component of the forest but also an historical disease-causing agent in the Rim Country cover types. Mistletoe can create or increase forest openings at endemic levels, improving wildlife habitat by creating unique canopy structure and snags with longevity and conditions that

stimulate understory growth. At epidemic levels, mistletoe can prevent stands from attaining mature and old-growth conditions, preventing trees from attaining nest and roost structure for species like the MSO and northern goshawk. Mitigations for dwarf mistletoe should be considered where more than 20% of the ponderosa pine trees or an aggregate of mixed conifer host species are infected.

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 for each forest, unneeded and poorly located roads may be improved, removed, or relocated to reduce effects on water quality and natural resources. For any proposed use of previously disturbed areas to be used as temporary access roads on National Forest System lands, once activities specified in the decision for the 4FRI Rim Country EIS are complete, the Forest Service will reclaim roads consistent with Travel Management Planning objectives.

The condition and function of springs exhibiting downward trends or static-degraded conditions need to be improved to sustain these features. Spring restoration would include reducing tree encroachment and noxious weeds, returning fire to the system (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 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 resiliency. 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 big-tooth maple to reduce browsing and other disturbances, recruit younger age classes, increase populations, and retain this diverse habitat.

Proposed Action

To meet the purpose and need for the Rim Country Project and move the project area toward desired conditions, the Apache-Sitgreaves, Coconino, and Tonto National Forests propose mechanical thinning, prescribed fire, and other restoration activities throughout the project area that would make the forest more resilient to natural disturbances such as fire, insect and disease, and climate change. Restoration activities are needed to maintain or restore forest structure and pattern, desired fire regimes, and watershed and ecosystem health and function in ponderosa pine, ponderosa pine-Gambel oak, ponderosa pine-evergreen oak, frequent fire mixed conifer (dry mixed conifer), aspen, and grassland cover types, moving them toward conditions within the natural range of variation. Facilitative operations may be needed in other cover types (such as pinyon juniper) to enable or complete treatments in target cover types, by reducing uncharacteristic fire risk, reducing ground disturbance from fireline construction, or improving operability. Table 8 displays project area acreage by cover type and Figure 3 displays the general location of the forest cover types.

Table 8. Acres of Cover Type

Cover Type	Total Acres
Juniper	28,340
Pinyon Juniper Woodland	83,330
Ponderosa Pine*	316,660
Ponderosa Pine-Gambel Oak*	170,710
Cottonwood Group	3,200
Aspen	1,450
Oak Shrubland	17,980
Ponderosa Pine-Evergreen Oak*	146,340
Mixed Conifer-Dry*	62,940
Mixed Conifer-Wet	2,650
Grassland	21,550
Reforestation Needs	69,360
Other	27,810

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

The proposed action is designed to achieve the purpose and need over a period of 10 years or until objectives are met. Restoration activities proposed for the Rim Country project area include:

- Mechanically thin trees and/or implement prescribed fire on approximately 952,330 acres.
    - Mechanically thin trees and implement prescribed fire on approximately 1,260 acres in the Long Valley Experimental Forest (in coordination with the Rocky Mountain Research Station).
    - Implement prescribed fire alone on approximately 45,290 acres.
    - Mechanically thin and/or implement prescribed fire on approximately 68,360 acres of Mexican spotted owl (MSO) protected activity centers (PACs), approximately 128,800 acres of MSO recovery habitat, and approximately 500,940 acres of northern goshawk habitat.
    - Mechanically thin trees and/or implement prescribed fire to restore approximately 40,760 acres of grasslands and meadows (includes 21,550 acres of grassland cover type).
    - Conduct facilitative operations (thin and/or burn) on up to 157,270 acres of non-target cover types to support treatments in target cover types.
    - Planting, burning, and other activities to encourage reforestation on approximately 69,360 acres of understocked areas that were previously forested.
- Decommission approximately 230 miles of existing system and unauthorized roads on the Coconino and Apache-Sitgreaves NFs.
- Decommission approximately 20 miles of unauthorized roads on the Tonto NF.
- Improve approximately 150 miles of existing non-system roads and construct approximately 350 miles of temporary roads for haul access; decommission when treatments are completed.
- Relocate and reconstruct existing open roads adversely affecting water quality and natural resources, or of concern to human safety.
- Restore hydrologic function and vegetation on approximately 9,570 acres of meadows.
- Restore approximately 184 springs.
- Restore function in up to 470 miles of riparian streams and intermittent and ephemeral stream channels (non-riparian[3]).
- Restore up to 360 miles of stream habitat[4] for threatened, endangered, and sensitive aquatic species.
- Construct up to 200 miles of protective barriers around springs, aspen, Bebb's willows, and big-tooth maples, as needed for restoration.

[3] Ephemeral and intermittent drainages that do not have perennial surface and ground water or riparian vegetation throughout the year.

[4] Non-riparian stream channels include ephemeral and intermittent streams that do not have either the duration of streamflow or sufficient water tables to create hydric (wet) soils that support hydrophilic (water-loving) plants.

Table 9 displays acres to be thinned and burned by forest cover type. Figure 4 displays general locations for the proposed vegetation thinning and prescribed fire. Figure 5 displays general locations for the proposed grassland and meadow restoration treatments. Figure 6 displays general locations for the proposed riparian area and stream channel restoration treatments.

Table 9. Acres of Proposed Mechanical Treatments and Prescribed Fire by Cover Type

Cover Type	Mechanical Treatment and/or Prescribed Fire	Prescribed Fire Only
Ponderosa Pine	316,500	160
Ponderosa Pine-Gambel	156,040	14,670
Ponderosa Pine-Evergreen	116,750	29,590
Dry Mixed Conifer	62,070	870
Aspen	1,450	0
Grassland	21,550	0
Totals	**674,360**	**45,290**

Figure 3. General Locations of Forest Cover Types

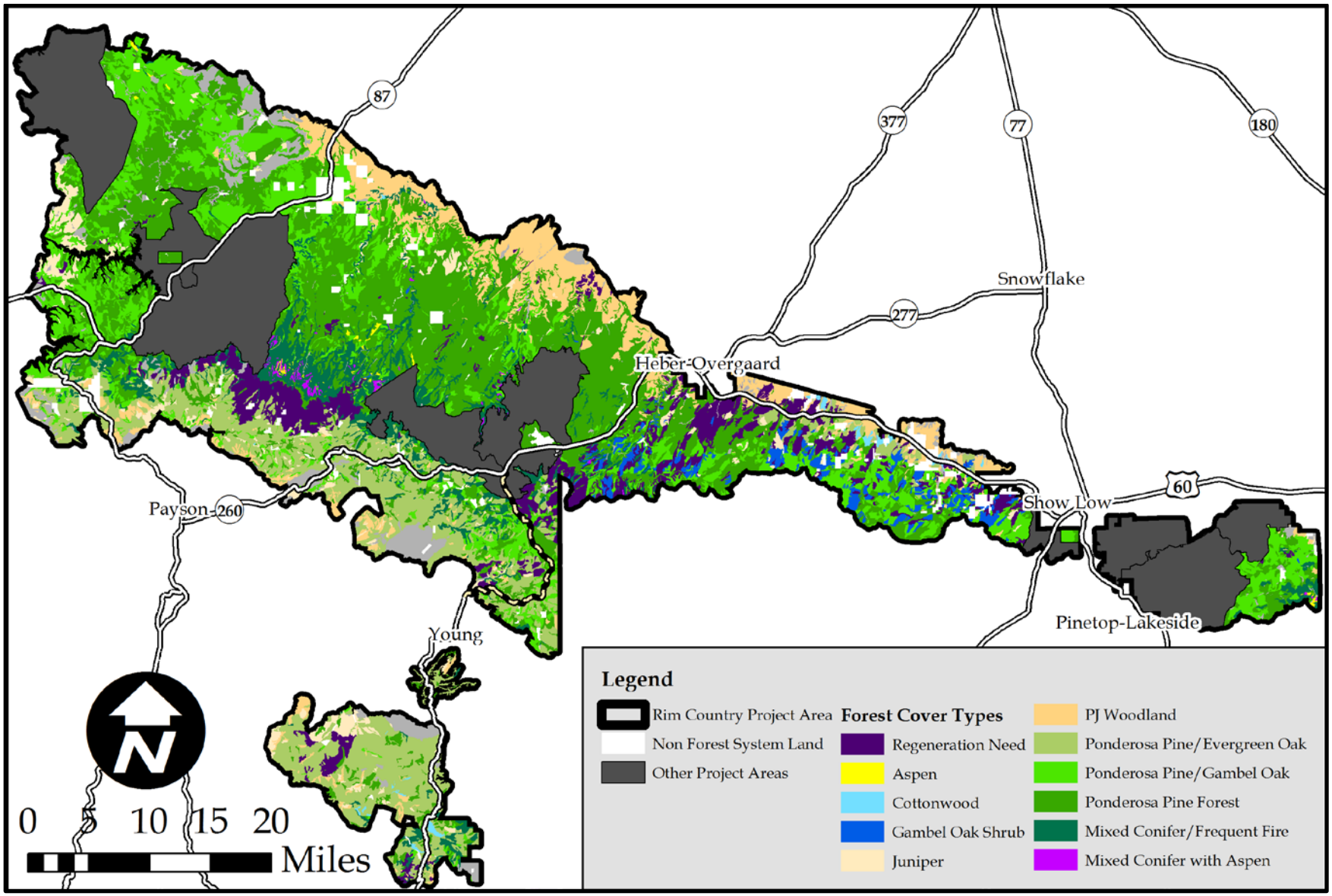


Figure 4. General Locations of Proposed Thinning and Prescribed Fire Treatments

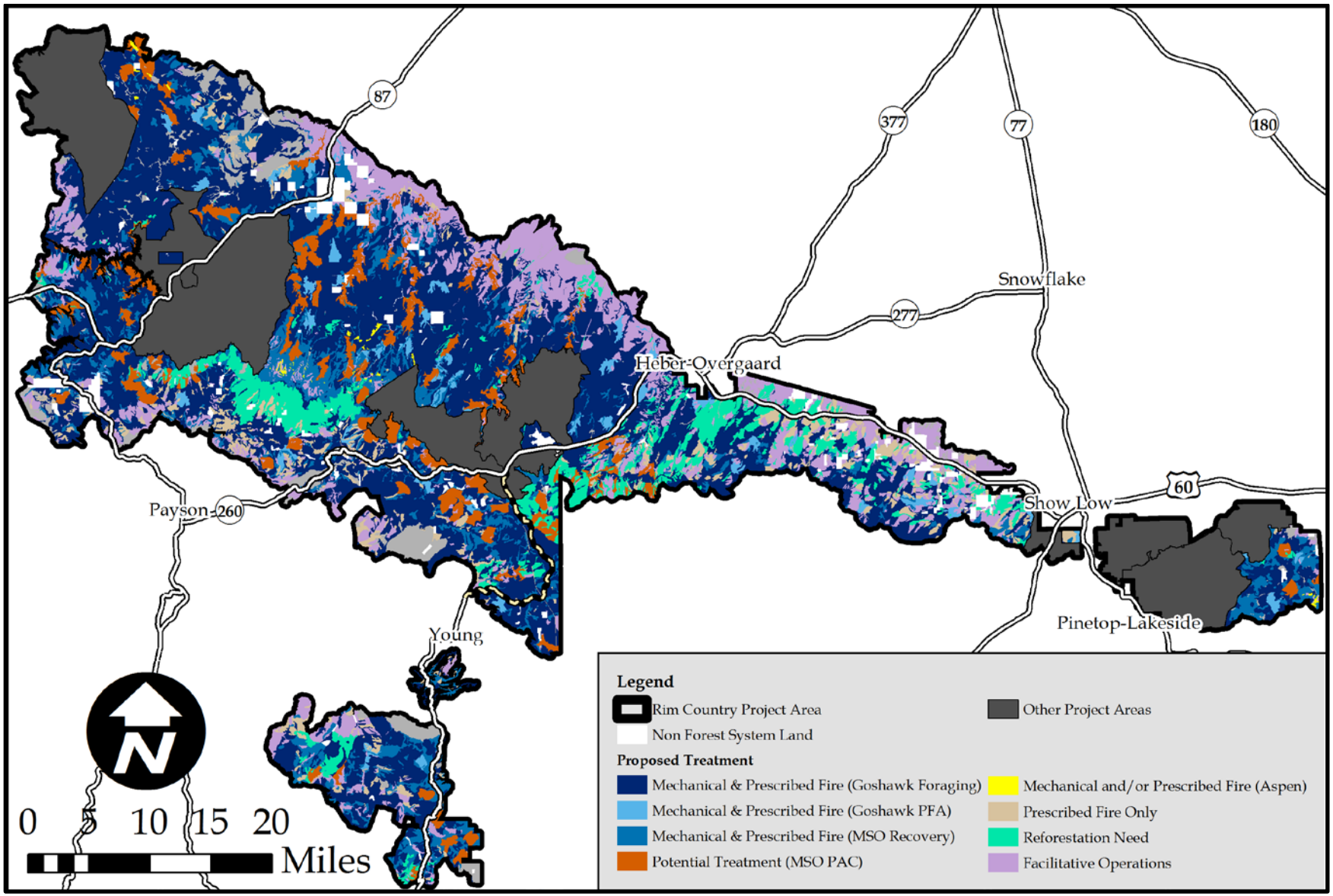


Figure 5. Locations of Proposed Grassland and Meadow Restoration Treatments

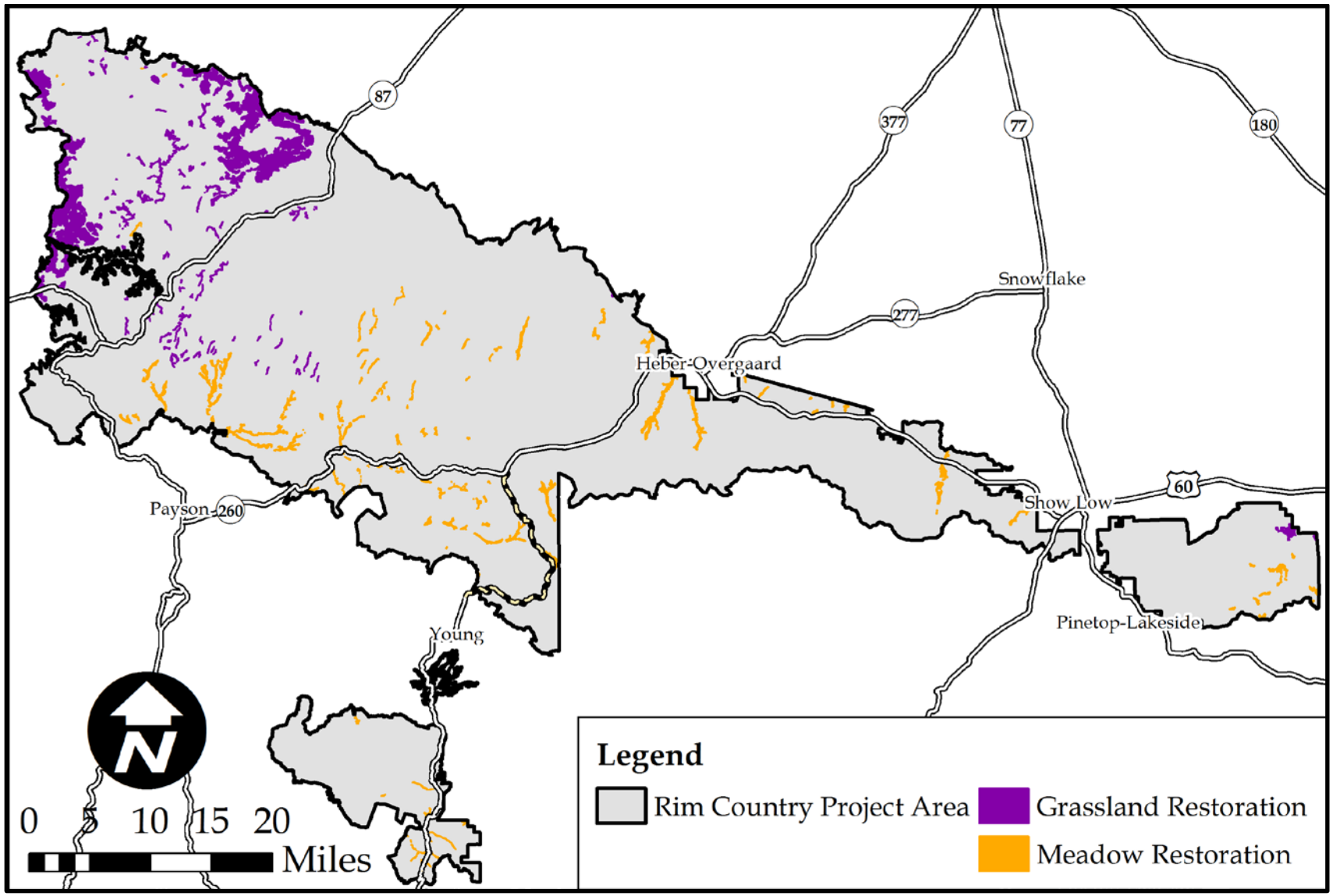
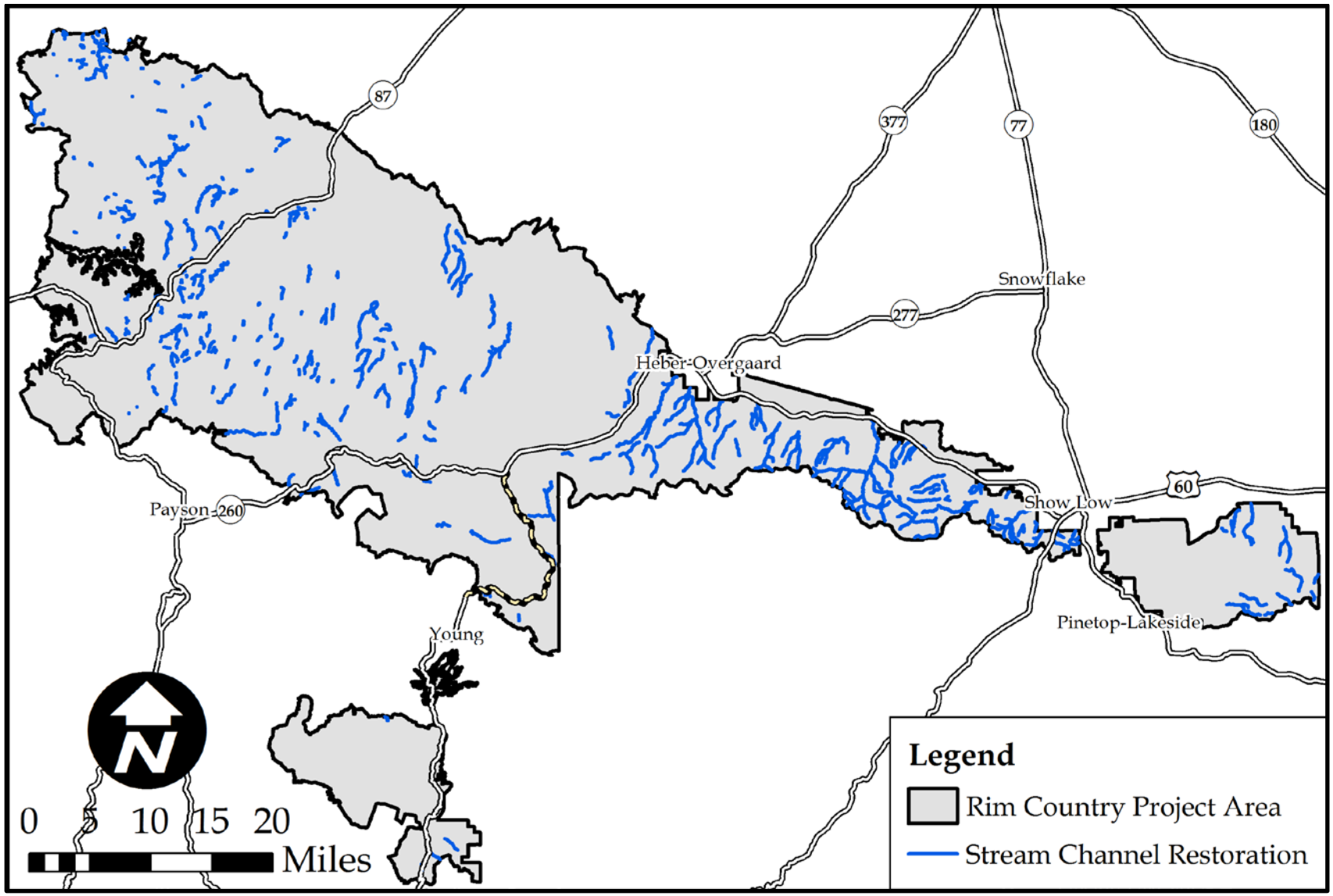


Figure 6. Locations of Proposed Stream Channel Restoration Treatments



Mechanical treatments are proposed within frequent low-severity fire ponderosa pine and mixed conifer ecosystems. Acres of ponderosa pine-Gambel oak, ponderosa pine-evergreen oak, and frequent-fire mixed conifer habitats that meet the definition of MSO habitat will be treated according to the direction provided in the revised MSO Recovery Plan (USDI FWS 2012). However, there are additional acres of these cover types that do not have the defined structure or that do not occur in the areas that meet the definitions of MSO habitat (USDI FWS 2012). This occurs in situations where, for example: Gambel oak lacks the size and/or total basal area to classify as MSO habitat, pine-evergreen oak is outside the Basin and Range West Ecological Management Unit where it is not considered MSO habitat, or frequent-fire mixed conifer with a largely ponderosa pine overstory and other conifer species are primarily regenerating as a result of fire exclusion. Table 10 displays the treatments proposed in MSO and northern goshawk habitat. The intent in these areas is to treat non-MSO habitat (i.e., areas outside of protected and recovery habitats) according to forest plan guidelines. Northern goshawk habitat in non-MSO habitat will be treated following forest plan direction by increasing the basal area by 10-20% in Post Fledgling Areas (PFAs) and ensuring denser canopy conditions in nest areas.

Table 10. Summary of Mechanical and/or Prescribed Fire Treatments Proposed in MSO and Goshawk Habitat

Treatment/Habitat/Forest Cover Type		**Acres**
MSO PAC Treatments*		**68,360**
Protected Activity Centers	Ponderosa Pine	20,870
	Ponderosa Pine-Gambel Oak	16,610
	Ponderosa Pine-Evergreen Oak	10,010
	Dry Mixed Conifer	20,630
	Aspen	240
MSO Recovery Treatments		**128,800**
Recovery	Ponderosa Pine-Gambel Oak	60,960
	Ponderosa Pine-Evergreen Oak	18,170
	Dry Mixed Conifer	30,660
Recovery Nest/Roost	Ponderosa Pine-Gambel Oak	6,770
	Ponderosa Pine-Evergreen Oak	2,020

	Dry Mixed Conifer	10,220
Goshawk PFA Treatments		**25,030**
Post-Fledging Family Areas	Ponderosa Pine	18,510
	Ponderosa Pine-Gambel Oak (non-MSO habitat)	2,960
	Ponderosa Pine-Evergreen Oak (non-MSO habitat)	3,540
	Dry Mixed Conifer (non-MSO habitat)	<10
Goshawk Foraging Treatments		**475,910**
Goshawk Foraging	Ponderosa Pine	277,280
	Ponderosa Pine-Gambel Oak (non-MSO habitat)	83,420
	Ponderosa Pine-Evergreen Oak (non-MSO habitat)	112,590
	Dry Mixed Conifer (non-MSO habitat)	1,420
	Aspen	1,200
Grand Total		**698,100**

*PAC treatment acres are estimates only, and will be determined after field visits with USFWS.

Proposed Treatments

This is a large landscape-level restoration project analyzing over 1,000,000 acres of National Forest System Lands for potential restoration treatments. We do not have complete information on the conditions found on every acre, but we do have enough data to make an informed decision about what types of treatments that would work best in certain conditions. For many of the treatments proposed, we will be guided by landscape features identified as we begin implementation, including cover and habitat type, topography, site condition, and scenic sensitivity levels. These site-specific landscape features will help us select the specific treatments or tools to implement proposed restoration activities. This approach provides flexibility and is

known as the "toolbox" approach. It accounts for imperfect information and adapts to changes in environmental conditions, encouraging application of the appropriate tool to achieve the desired result. The types of treatments we are proposing include:

Mechanical Treatments

Treatment Type	Treatment Description/Objective
All Treatment Types in MSO and Northern Goshawk (NOGO) Habitats	In Ponderosa Pine, Ponderosa Pine-Gambel Oak, Ponderosa Pine-Evergreen Oak, and Dry Mixed Conifer cover types (NOTE: all MSO and NOGO treatments apply to these cover types): Follow forest plan direction, including implementing guidelines from revised MSO Recovery Plan (USDI FWS 2012). Cover types may have all or some of the direction for MSO and NOGO habitats, depending on location and stand structure. In MSO PACs: Potentially thin and burn to improve structure, maintain and develop large trees, and reduce risk of high-severity fire in PACs. No mechanical treatments, but fire may be implemented, in 100-acre core areas. Outside core areas, trees may be thinned and/or prescribed fire implemented where feasible to improve forest structure and minimize undesirable fire effects. Have a diameter limit for trees removed in stands within treated PACs. Promote irregular tree spacing to create canopy gaps more conducive to treatment with prescribed fire, retain old growth attributes, protect large oaks, and ensure snags and coarse woody debris post-fire. Develop treatments in consultation with FWS. In MSO Recovery Habitat: Follow Table C3 in revised MSO Recovery Plan for potential future nest/roost habitat and provide for owl daily movements, dispersal, and foraging habitat. In MSO Recovery Habitat outside of potential future Nest/Roost: follow forest plan guidance. Intent is to continue to develop replacement Nest/Roost where possible, otherwise treat to develop a diverse mix of heterogeneous stand structures and densities to provide for owl dispersal and foraging. In NOGO post-fledging family areas (PFAs): Keep basal area 10-20% higher than surrounding forest/stand. In NOGO Nest stands: Same as PFAs, and assure interlocking crowns. Stands are multi-aged and dominated by large trees with relatively denser canopies than other ponderosa pine stands.

Treatment Type	Treatment Description/Objective
	NOGO foraging habitat: Same as general direction above.
Uneven-aged Group Selection	In Ponderosa Pine, Ponderosa Pine-Gambel Oak, and Ponderosa Pine-Evergreen Oak cover types: In stands not identified as MSO habitat, thin stands to 20-80 square feet of basal area and establish interspaces over 10-90% of the stand, according to site potential. Locate interspaces in currently non-stocked areas and lacking pre-settlement evidence. Create regeneration openings to recruit new age classes where needed. In Dry Mixed Conifer cover type: Thin tree groups to 30-100 square feet of basal area and establish interspaces adjacent to groups, according to site potential and current stand conditions. Favor early-seral, fire-resistant, shade-intolerant species. Locate interspaces in currently non-stocked areas and lacking pre-settlement evidence. Create regeneration openings to recruit new age classes where needed.
Single-tree Selection	In Ponderosa Pine, Ponderosa Pine-Gambel Oak, and Ponderosa Pine-Evergreen Oak cover types: Create small openings less than or equal to ¼ acre in size where seedlings and saplings are underrepresented and brush cover is greater than 40%. Increase/maintain age class diversity. Maintain higher basal area where brush competition is expected to be strong to suppress woody understory response.
Intermediate Thin	In Ponderosa Pine, Ponderosa Pine-Gambel Oak, and Ponderosa Pine-Evergreen Oak cover types: Thin tree groups to 70-90 square feet of basal area. Thin areas with low to moderate infections of dwarf mistletoe to improve growth and vigor. Retain the best dominant and co-dominant trees with the least amount of mistletoe in the lower crown. Locate interspaces in currently non-stocked areas and lacking pre-settlement evidence. Intent is to mitigate negative effects of dwarf mistletoe. In Dry Mixed Conifer cover type: Thin tree groups to 40-100 square feet of basal area. Thin areas with low to moderate infections of dwarf mistletoe to improve growth and vigor. Retain the best dominant and co-dominant trees with the least amount of mistletoe in the lower crown. Locate interspaces in currently non-stocked areas and lacking pre-settlement evidence. Intent is to mitigate negative effects of dwarf mistletoe.
Stand Improvement	In Ponderosa Pine, Ponderosa Pine-Gambel Oak, and Ponderosa Pine-Evergreen Oak cover types: Thin young, even-aged stands dominated by trees less than 8.5 " in diameter to improve growth and vigor. Establish interspaces between residual tree groups, in currently non-stocked areas and lacking pre-settlement evidence, according to site potential.

Treatment Type	Treatment Description/Objective
	In Dry Mixed Conifer cover type: thin young even- and uneven-aged stands to improve growth and vigor. Establish interspaces between residual tree groups, in currently non-stocked areas and lacking pre-settlement evidence, according to site potential.
Weed and Release	In Ponderosa Pine, Ponderosa Pine-Gambel Oak, and Ponderosa Pine-Evergreen Oak cover types: Thin brush, juniper, and evergreen oak species where these components are greater than 40% of the cover. Thin around ponderosa pine to reduce competition and minimize undesirable fire effects. Leave trees and brush arranged in groups, with interspaces. In Dry Mixed Conifer cover type: Thin brush, juniper, and evergreen oak species where these components are greater than 40% of the cover. Thin to reduce competition and minimize undesirable fire effects. Leave trees and brush arranged in groups, with interspaces.
Even-aged Shelterwood	In Ponderosa Pine, Ponderosa Pine-Gambel Oak, and Ponderosa Pine-Evergreen Oak cover types: Consider where more than 20% of the stand or more than 20% of the host species are infected by dwarf mistletoe. Use Large and Old Tree Implementation Plans where overstory is infected. Intent is to mitigate dwarf mistletoe as a tree stressor and protect future regeneration, not eradicate it.
Grasslands	Remove trees established since interruption of the historic fire regime. Retain all pre-settlement trees and the largest post-settlement trees as replacement trees adjacent to pre-settlement tree evidence (stumps, dead and down). Areas may be treated with prescribed fire where and when feasible.
Facilitative Operations	Facilitative operations may be needed in non-target cover types (such as pinyon juniper) to support treatments in target cover types (ponderosa pine types). The objective of facilitative operations would be to support the safe and effective use of prescribed fire in the cover types targeted for restoration treatments. Specific restoration treatments would not be developed for these non-target cover types. Facilitative operations would occur in those non-target cover types that lie between target cover types and natural or man-made features appropriate to use as prescribed fire unit boundaries. Including these areas in burn units should decrease the amount of ground disturbance from firelines that would otherwise need to be created (by dozer, ATV drag, hand). Areas where facilitative operations are indicated would not have to be treated to meet Rim Country objectives, but would be available as needed for implementation. The condition of some non-target cover types, such as chaparral, is such that prescribed fire alone may not be

Treatment Type	Treatment Description/Objective
	safe. In these cases, limited mechanical operations may be needed to create conditions safe for personnel and to ensure prescribed fire can meet objectives when entering the target cover types. The expectation is that the majority of the area available for facilitative operations would be for prescribed fire only, with mechanical treatments being the exception. The effects of facilitative operations on the non-target cover types is expected to be maintenance of current conditions or movement toward desired conditions per the applicable forest plan.

Grassland and Meadow Restoration

Meadow and grassland restoration would include reducing or eliminating tree encroachment (pines and junipers), and applying prescribed fire. Trees established since interruption of the historic fire regime would be removed, promoting and re-establishing the historic meadow edge. All pre-settlement trees would be retained and replacement trees left where evidence of historical large trees exist. Grasslands and meadows would be treated with prescribed fire where and when feasible.

Road Decommissioning

Stabilizing and restoring of unneeded roads to a more natural state would be accomplished with a variety of methods, including: ripping compacted road surfaces and seeding, re-establishing former drainage patterns, removing culverts, scattering slash and/or large rocks on the road surface, blocking the entrance to the roadway, completely eliminating the roadway by returning it to natural contours, constructing water bars to prevent erosion, or pulling berms back into the roadway.

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. 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.

Spring Restoration

Specific treatments to restore springs would be identified prior to mechanical and fire treatments in the vicinity. 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.

Riparian Stream and Stream Channel Restoration

Restoration is needed to restore the functionality of these streams. Specific treatments to restore riparian streams and stream channels would be identified prior to mechanical and fire treatments in the vicinity. 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.

Stream Habitat Restoration

Proposed stream habitat treatments may be needed within all or some portion of the fish-bearing streams. 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).

Aspen Restoration

Remove post-settlement conifers within 66 feet (one chain) of the aspen clone. Within the clone, remove aspen, disturb the ground, and/or apply fire as needed to stimulate suckering. Evaluate the need for barriers to reduce ungulate browsing.

Design Features

The proposed action is designed to comply with Forest Plan standards and guidelines, as amended. Design features would be incorporated into the project to protect forest resources of soil, water, scenery values, terrestrial and aquatic habitat, and rare plants. Mitigation measures and best management practices would be implemented during the project to reduce impacts to terrestrial and aquatic species, to protect heritage resources, to prevent the introduction and spread of invasive plants, and to protect public health and safety.

Forest Plan Amendments

To meet the project's purpose and need, the existing Coconino and Tonto Forest Plans would need to be amended to provide for areas of grass, forbs, and shrubs interspersed with tree groups and allow for treatments to move tree group patterns, interspaces, and stand density toward the

natural range of variation. Amending these forest plans would allow for treatments that improve MSO nesting and roosting habitat as defined in the Mexican spotted owl recovery plan. The desired conditions related in the project's purpose and need are consistent with the revised Apache-Sitgreaves Forest Plan. Amendments to the Coconino and Tonto Forest Plans would provide consistency in meeting desired conditions for ponderosa pine and mixed conifer forests across the Rim Country project area.

These amendments would be site-specific amendments and would be administratively reviewed as part of the project objection process. It is possible that the Coconino Forest Plan, currently being revised, will be finalized before completion of the 4FRI Rim Country EIS, in which case amendments to that forest plan would not be necessary.

For more information on the proposed amendments, please see Appendix A.

Possible Alternatives

In addition to the Proposed Action, a No Action Alternative will be analyzed, considering the effects of not completing the proposed restoration activities in the Rim Country project area. Based on the issues identified during scoping, other alternatives may be developed. The full development and analysis of alternatives will be completed following public response to this scoping effort and will be addressed in the Draft Environmental Impact Statement (DEIS), anticipated for release in 2017.

Your Involvement

This project is subject to the objection process pursuant to 36 CFR part 218, Subparts A and B (March 27, 2013). Therefore, those who provide specific written comments during the formal scoping and/or comment periods in accordance with §218.5 will be eligible to participate in the objection process. Issues raised in objections must be based on previously submitted timely, specific written comments regarding the proposed project unless new information arises after designated opportunities (36 CFR 218.7).

The formal scoping period will end 45 days from publication of the Notice of Intent (NOI) in the Federal Register; this publication date is the exclusive means for calculating the time to submit a comment. Individuals or organizations wishing to submit comments should not rely upon dates or timeframe information provided by any other source. It is important that reviewers provide their comments at such times and in such manner that they are useful to the agency's preparation of the environmental impact statement. Therefore, comments should be provided prior to the close of the scoping period and should clearly articulate the reviewer's concerns and contentions.

Comments received in response to this solicitation, including names and addresses of those who comment, will be part of the public record for this proposed action. Comments submitted anonymously will be accepted and considered, but will not be eligible for objection per §218.5.

The intent of this comment period is to provide those interested in or affected by this proposed action with an opportunity to make their concerns known. Written, facsimile, hand-delivered, and electronic comments concerning this proposed project will be accepted. We invite you to provide any substantive comments you might have regarding the proposed action for the 4FRI Rim Country Project. Substantive comments are those that are within the scope of the project and the decision to be made, are specific to the proposed activities and the project area, and have a direct relationship to the project. Please provide supporting reasons for us to consider. If you cite or include references with your comments, you need to state specifically how those references relate to the proposed action. Please include hard copies or internet links to any references to which you refer. It is important that reviewers provide their comments at such times and in such manner that they are useful to the agency's preparation of the environmental impact statement. Therefore, comments should be provided prior to the close of the comment period and should clearly articulate any concerns, issues, and opportunities.

Please send written comments regarding this proposed action to Annette Fredette, 4FRI Planning Coordinator; Coconino National Forest; 1824 S. Thompson St.; Flagstaff AZ 86001. Comments may also be sent via e-mail to 4FRI_comments@fs.fed.us, or via facsimile to 928-527-3620, or hand-delivered to the Coconino National Forest office at the above address, between 8:00 a.m. and 4:30 p.m., Monday through Friday except holidays.

Multiple public meetings will be held throughout the planning process for the 4FRI Rim Country Project, including scoping meetings scheduled for July 14, 2016 in Show Low, AZ, and July 21 in Payson, AZ. For times and locations and other meetings scheduled, please visit the 4FRI website: http://www.fs.usda.gov/goto/4FRIRimCountry.

Appendix A

Proposed Forest Plan Amendments

Coconino National Forest

Amendment 1. Mexican Spotted Owl (MSO) Habitat Management

Amendment 1 allows mechanical treatments up to 17.9 inches d.b.h. to improve habitat structure (nesting and roosting habitat) in MSO PACs. It allows low-severity prescribed fire within MSO PAC core areas. The amendment removes language referencing monitoring (pre- and post-treatment, population, and habitat). Replacement language is specific to this project. It defers final project design and monitoring to the U.S. Fish and Wildlife Service's biological opinion and appendix E to the FEIS. This amendment to the monitoring language allows the 4FRI to apply the most current science and design methods to the development of a treatment-specific monitoring plan that fits the regional effort underway in collaboration with the U.S. Fish and Wildlife Service. Definitions of recovery and potential future nesting/roosting habitat have been added since the current forest plan desired conditions were developed (see Coconino NF forest plan, page 65-3). Treatments will instead be in align with the revised MSO recovery plan (USDI FWS 2012) and developed in cooperation with the U.S. Fish and Wildlife Service.

Amendment 2. Management of Canopy Cover and Ponderosa Pine with an Open Reference Condition within Goshawk Habitat

In the "Vegetation Management – Goshawk Foraging Habitat" and "Vegetation Management –Within Post-fledging Family Areas" section of the forest plan, a site-specific, nonsignificant plan amendment will: (1) add the desired percentage of interspace within uneven-aged stands to facilitate restoration, (2) add the interspace distance between tree groups, (3) add language clarifying where canopy cover is and is not measured, (4) allow acres to be managed for an open reference condition which affects canopy cover guidelines for VSS 4 through VSS 6 groups and reserve trees, and (5) add a definition to the forest plan glossary for the terms interspaces, open reference condition, and stands.

The forest plan directs projects to manage for uneven-aged stand conditions within goshawk habitat. Forested groups consist of an interspersion of six vegetation structural stages (VSS 1 to VSS 6). For the purposes of this amendment, the following definitions apply:

> **Stands** are defined as a contiguous area of trees sufficiently uniform in forest type, composition, structure, and age class distribution, growing on a site of sufficiently uniform conditions to be a distinguishable unit. Four classification characteristics are generally used to distinguish forest stands: biophysical site (soils, aspect, elevation, plant community association, climate, etc.), species composition, structure (density, and age (1-aged, 2-aged, uneven-aged)), and management emphasis (administrative requirements

and local management emphasis that will shape structure over time). Based upon Agency guidelines, the minimum stand mapping size is 10 acres.

Interspaces as defined by RMRS-GTR-310 are areas within a stand that are not currently under the vertical projection of the outermost perimeter of tree canopies (drip-line). They are generally composed of grass-forb-shrub cover but could also be areas with scattered rock or exposed mineral soil. As spaces between trees, tree groups and tree clumps, interspaces contribute to the "open canopy" character of frequent-fire forests. They often connect with other interspaces and thus are variably shaped and sized. Also see "openings". Interspaces and tree group locations are dynamic and shift over time.

Open reference condition is defined as forested ponderosa pine areas with mollic-integrade soils to be managed as a relatively open forest with trees typically aggregated in small groups within a grass/forb/shrub matrix.

Tonto National Forest

Amendment 1. Cultural Resources

The Tonto National Forest Plan has a standard that directs management to achieve a "no effect" determination for cultural resources. The forest plan has ample direction that protects cultural resources including standard #1 that says: The Forest Service will comply with the National Historic Preservation Act (as amended) and the Programmatic Agreement. An amendment specific to the 4FRI Rim Country EIS would remove the following "no effect" language; Sites listed in, nominated to, eligible for, or potentially eligible for the National Register will be managed during the conduct of undertakings to achieve a "No Effect" finding, in consultation with the State Historic Preservation Officer.

Amendment 2. Ponderosa pine-bunch grass, Ponderosa pine-Gambel oak, Ponderosa Pine-evergreen oak, Dry Mixed Conifer, and Old Growth in Wildlife Habitat

There is a need for the 4FRI Rim Country analysis to be in alignment with the Apache-Sitgreaves National Forests revised forest plan management direction. The revised forest plans reflect a change in conditions since the 1980s including acknowledgement that vegetation conditions (structure, composition, and function) are divergent from reference conditions and forest conditions indicate a substantial departure from the natural fire regimes.

Revised plans use the latest best available science and information. Because a final Tonto National Forest (hereafter referred to as Tonto NF) revised forest plan is not expected until 2019, a project-specific plan amendment is needed to:

- Replace forest plan standards and guidelines for ponderosa pine - bunch grass, ponderosa pine - Gambel oak, ponderosa pine - evergreen oak, dry mixed conifer and old growth with desired conditions and guidelines.
- 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 forest plan glossary for the terms interspaces and openings.

For the purposes of this draft amendment, the following definitions apply:

Interspaces as defined by RMRS-GTR-310 are areas within a stand that are not currently under the vertical projection of the outermost perimeter of tree canopies (drip-line). They are generally composed of grass-forb-shrub cover but could also be areas with scattered rock or exposed mineral soil. As spaces between trees, tree groups and tree clumps, interspaces contribute to the "open canopy" character of frequent-fire forests. They often connect with other interspaces and thus are variably shaped and sized. Also see "openings". Interspaces and tree group locations are dynamic and shift over time.

Openings are defined as generally persistent treeless areas having a fairly distinct shape or size, occurring naturally due to differences in soil types as compared to sites that support forests or woodlands. Openings include meadows, grasslands, rock outcroppings, and wetlands. In contrast, created openings result from disturbances like severe fire or windthrow, or management activities to intentionally create space for new tree regeneration. Natural and created openings are not the same as interspaces found in the frequent-fire forests or woodlands. See "interspaces."

Uneven-aged forests are forests that comprise three or more distinct age classes of trees, either inter-mixed or in small groups.

Uneven-aged management is the application of combined actions needed to simultaneously maintain continuous forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection. An uneven-aged, regulated forest is one which has a balanced progression of three or more age/size classes, such that each younger/smaller class is advancing to replace the class

above it on approximately the same acreage, until it is mature for harvest or other resource objectives. A regulated forest reaches sustained yield when the volume cut periodically equals the amount of net volume growth for that same period.

Amendment 3. Mexican Spotted Owl Component

In 2012, the Mexican Spotted Owl Recovery Plan, First Revision, was published. There is a need for the 4FRI Rim Country analysis to be in alignment with the management direction provided in the revised Recovery Plan and the other forest plans that are part of this project. A project-specific plan amendment is needed because the 1985 Tonto Forest Plan, as amended, includes direction from the former 1995 recovery plan and would:

- Update definitions and direction for protected activity centers (PACs), recovery habitat, and other forest and woodland types to be in alignment with the current recovery plan.
- Update language and direction related to prescribed cutting and fire treatments in PACs to be consistent with the current recovery plan.
- Add forest structure guidelines for recovery habitat.
- Update survey information and remove population and habitat monitoring direction. The MSO monitoring plan from the 1st 4FRI EIS (Coconino and Kaibab NFs) would serve as a starting point for continuing monitoring across MSO habitat on Tonto NF, in consultation with the USFWS.
- Remove the direction for treating habitat in incremental percentages. The MSO monitoring plan for the Coconino and Kaibab NF 4FRI decision would serve as a starting point for continuing monitoring across MSO habitat on Tonto NF, in consultation with the USFWS. The monitoring plan includes a phased implementation and monitoring strategy.