

# Forest Service and Greater Flagstaff Forests Partnership Woody Ridge Forest Restoration Project Proposed Action

## I. Introduction

This document describes management actions proposed for the Woody Ridge Forest Restoration Project and we are requesting your feedback, specifically that you identify any issues or concerns that you may have with the following proposed action. The project is located southwest of the community of Flagstaff. Communities immediately adjacent to the project area include: Westwood Estates, Flagstaff Ranch Golf Club, Equestrian Estates, Soggy Bottom, and Black Springs. Several private, county, city, and federal facilities are within or adjacent to the Woody Ridge Project Area and include: The Arboretum at Flagstaff, Naval Observatory, Gore Facilities, Fort Tuthill fairgrounds, Frontier property, Monterola property, and Miller’s property near Rogers Lake/Woody Mountain. In total, there are approximately 31,000 acres within the project boundary. The ownership patterns are described as follow: This proposed action applies to National Forest lands only.

<b>Ownership</b>	<b>Acres</b>	<b>% Of Total</b>
Forest Service	13,000	41
Private	3,700	12
State <sup>1</sup>	14,100	45
County	400	1
City	10	0
Other Federal	300	1
Total	31,510	100

For many years, fire personnel and resource specialists have been concerned about a large “crown” wildfire burning in this area and the affect such an event could have on the Flagstaff community, wildlife habitat, and the forest as a whole. Therefore, funding as a result of the National Fire Plan and efforts ongoing in Flagstaff Urban Interface led to this plan. This proposed action is intended to change fire behavior and improve declining forest health in the Woody Ridge Project Area.

The Woody Ridge Forest Restoration project addresses numerous forest health problems that currently exist, including severe wildfire potential. Scientists, land managers, and resource specialists worked together over the past several months to describe the problems, discuss options, and ultimately propose management solutions. This document describes why there is a need for change, and outlines a proposed management solution or proposed action. The team that planned this project compared existing conditions to desired future conditions and identified

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<sup>1</sup> The largest landholder within the Woody Ridge Project Area is the Arizona State Land Department, which includes acres now managed in conjunction with Northern Arizona University. State Trust Lands managed jointly by the State Land Department and Northern Arizona University are called “Centennial Forest.”

several areas where management actions should create change on the landscape related to forest vegetation, recreation, and road management. The Proposed Action represents those changes that need to occur to better represent the desired future described in the Coconino National Forest Land Management Plan and subsequent amendments (*Forest Plan*).

## **II. Proposed Action – Purpose and Need**

### **Administrative and Strategic Direction**

The proposed action is consistent with the *Forest Plan*. This project is the application of management direction for Mexican spotted owl, northern goshawk, management indicator species (MIS), soil and water quality protection, and archeological site protection. Key strategic points are listed here and additional detail is located in section III of this document under Design Features Associated with the Proposed Action.

- Retain all mature (old) “yellow-barked” ponderosa pine trees.
- Following thinning and the burning of slash piles, and or removal of slash, all acres (excluding Fry Canyon and Dry Lakee) are proposed for prescribed burning every 3 to 10 years. We will attempt to broadcast burn 1,000 acres or greater each year.
- Prioritize project implementation by treating stands adjacent to communities first, and then progressing south and west thereafter.
- Involve individual property owners, fire protection districts, and communities in the proposed treatments. Currently, the Flagstaff Fire Department is actively working in the communities adjacent to the project area, conducting thinning projects, and increasing public awareness of fire prevention techniques.
- Protect historical and cultural resources through the creation of an Archaeological Clearance Report for the Woody Ridge Forest Restoration Project. This report will document the archaeological inventory, results of consultations with Native American Tribes, and compliance with the National Historic Preservation Act of 1966, as amended. The report will contain site-specific protection measures for implementation, including monitoring requirements.
- Protect and manage Threatened and Endangered species habitat as described in the Wildland Urban Interface Batch Programmatic Consultation as described by the US Fish and Wildlife Service and USDA Forest Service.
- Encourage research and monitoring.
- Conduct additional thinning along a main electrical transmission line as necessary to help protect the electrical supply to the community of Flagstaff.

**Forest Vegetation Management  
Proposed Action – Purpose and Need  
Changing Wildfire Behavior - Improving Forest Health  
Enhancing And Protecting Wildlife Habitat**

Active forest restoration management including, thinning, prescribed burning, seeding, slash piling, slash removal, chipping, and pile burning are proposed to achieve future desired conditions for the Woody Ridge Project Area. Various treatments are proposed within two main zones:

- 1) **The Urban Rural Influence Zone<sup>2</sup>** which is approximately a ½ to 1 mile wide area adjacent to the Flagstaff community;
- 2) **Forest Restoration Emphasis Zone** which includes most of the area within the project boundary;

These zones are shown on Map 1. Zone 1 includes the relatively flat lands that lie beneath, or to the east of Woody Ridge. Zone 2 includes the steep slopes of Woody Ridge, the area on top of the ridge and to the west.

**The Urban Rural Influence Zone (4,400 Acres)**

Within this area, the desired future condition is for wildfire hazard potential to be reduced to low and to be maintained in that condition over time for community protection. Proposed management actions are described to “keep fire on-the ground” or in a worst-case scenario transform a “running crown fire” back to a “ground fire” where suppression efforts can be more effective. The existing condition shows that 94% of the forested area is susceptible to destructive crown wildfire therefore; there is a need for changing fuel conditions, fire behavior, and creating low wildfire hazard potential<sup>3</sup>.

The Proposed Action is to thin and broadcast burn 3,500 acres and burn only 900 acres of ponderosa pine forest. Many areas will require labor intensive mechanical thinning that may be followed with piling, removing, burning, and chipping slash that will reduce forest fuels. The proposed treatments would reduce fire potential to low and maintain this condition for approximately 20 to 30 years. The thinning will result in forest conditions that have canopy closure of 40% or less, residual basal area of 40 to 80 square feet per acre, and restoration of grassy openings. Uneven tree spacing and clumping will be used to mimic the open park-like appearance of historical ponderosa pine forests. Exceptions to this treatment within this zone include about 100 acres within a wildlife movement corridor. In the wildlife movement corridor, small patches of cover will be left to accommodate wildlife movement, and this will be coordinated with Arizona Game and Fish Department personnel. Other exceptions are steep slopes where thinning is not feasible or economical.

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<sup>2</sup> The Urban Rural Influence as described in this document includes the Urban Rural Influence Zone and a portion of the Fire Management Analysis Zone described in the Flagstaff Lake Mary Forest Plan Amendment.

<sup>3</sup> Low wildfire hazard potential are forested stands that will “keep fire on-the ground” or in a worst-case scenario transform a “running crown fire” back to a “ground fire.” Low wildfire hazard potential will not mean fewer fires.

Following thinning and the burning of slash piles, and/or removal of slash, all acres within this zone are proposed for prescribed burning every 3 to 10 years. Burn blocks of approximately 1,000 acres or greater are proposed for burning each year.

The desired condition results in a significant reduction in the potential for a stand replacement fire. Vegetative manipulation will eliminate thickets and promote development of open and park-like stands with an understory of herbs and grasses. As ignitions occur, flame lengths will typically be less than four feet. The forest will be able to withstand and recover from periodic natural occurrence or human initiated unwanted wildland fires.

### **Forest Restoration Emphasis Zone (8400 acres)**

There are numerous wildlife habitat features in the Woody Ridge area.

- An important wildlife movement corridor along and on top of Woody Ridge
- Multiple Protected Activity Centers (PAC's) and restricted habitat for the Mexican spotted owl (MSO)
- Northern goshawk foraging habitat and a Post Fledging-family Area (PFA)
- Important bear and turkey habitat
- An antelope movement corridor<sup>4</sup>

The desired future condition is a healthy forest condition more resistant to drought and insect damage with reduced fire hazard and improved tree growth. Stand Density Index (SDI) which is a measure of stand health shows that nearly 78% of stands are outside the desirable condition with greater than 35% SDI, and are very susceptible to drought kill and insect infestations. The desired condition is an SDI range between 15 to 35%. Fire hazard potential mapping shows a similar pattern with approximately 85% of the area at extreme to moderate fire hazard potential. There are few old yellow-barked ponderosa pine within the area.

### **Forest Restoration Emphasis Area (6900 acres)**

In order to improve forest health and reduce fire hazard potential the proposed action is to thin and broadcast burn 3,750 acres and burn only 1850 acres of ponderosa pine forest.

Approximately 1,300 acres within Fry Canyon and Dry Lake caldera would not be thinned, nor would we conduct broadcast burning on these areas. Many areas will require mechanical thinning, followed with piling, removing, burning, and/or chipping of slash that will reduce current stand densities to improve forest health conditions, reduce fire hazard potential, and improve individual tree growth. In areas thinned the desired objective is 15 to 35% SDI and wildfire hazard potential of low to moderate. Future fires burning through this area would encounter a mosaic of forest stand conditions. Following thinning there would still be some areas that would support "running crown fire" like the steep slopes of Woody Ridge and Fry Canyon, patches of wildlife cover and higher canopy closure stands. However, most of the thinned area would "keep fire on-the-ground."

Across the Forest Restoration Emphasis Area, the proposed thinning and prescribed burning would create forest conditions as described for the Mexican spotted owl and northern goshawk in

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<sup>4</sup> Based on radio telemetry data collected by the Arizona Game and Fish Department.

the *Forest Plan*. **Unevenaged** management will be the primary management prescription for the area.

#### **Mexican Spotted Owl Habitat**

There are 1800 acres that fall within Protected Activity Centers (PACs) within the project area. Thinning from below will occur on a limited basis (approximately 100 acres) as most PAC acres are on steep slopes, and inaccessible for thinning. The 100 acres selected for treatment will thin ponderosa pine trees that are less than 9 inches diameter and will meet desired objectives of reducing fire hazard and improving stand health. However, thinning efforts will not likely achieve 25 to 35% SDI. Prescribed burning is proposed for 1,200 acres within MSO PAC's and protected steep slopes that will reduce ground fire intensity for 5 to 7 years; however will have no impact on reducing crown fire hazard. There are 3,400 acres of restricted habitat for MSO within the project area and approximately 2,500 acres will be thinned from below to reduce fire hazard. The specific treatments will create stands that are in the 25 to 35% SDI range, will have extended rotation ages to 200 years, retain all trees greater than 24 inches diameter, and emphasize protection of large oaks and promoting growth of new large oaks. MSO habitat is also key turkey habitat and in these areas we will retain 15% cover patches per direction from the *Forest Plan* as described in the Flagstaff/Lake Mary Forest Plan Amendment. Areas of restricted habitat that are not thinned will be broadcast burned, and again the results in the unthinned stands would reduce ground fire intensity for 5 to 7 years; however will have no impact on reducing crown fire hazard.

#### **Northern Goshawk Habitat/Key Turkey Habitat**

*Forest Plan* direction for northern goshawk nesting and foraging habitat further guides the need for management action. The proposed action for thinning will work towards *Forest Plan* guidelines for Vegetative Structural Stage (VSS)<sup>5</sup> distribution. There is a need to create grassy forest openings, provide for regeneration of ponderosa pine, improve age class/tree size distribution, enhance and protect Gambel oak, mature or yellow-barked ponderosa pine, snags, and logs. A buffer approximately 100 to 300 yards in width will left unthinned for turkey movement around the edge of Fry Canyon.

##### **➤ Grassy openings and regeneration**

Tree removal would restore grassy openings that are variable in size building from existing landscape features. The openings will be irregular in shape to create stringers of openings that will improve the understory and reduce fire potential. We will be creating approximately 20% VSS1 to maintain as grassy openings and or provide for regeneration (seedling establishment) areas. There will be a substantial increase in grasses, wildflowers, herbs, and forbs in the forest understory.

##### **➤ Improving age class/tree size distribution**

Thinning will result in clumps of trees that will vary in size with an upper limit of about 4 acres, vary by age class or tree size, and density to meet VSS objectives described in the *Forest Plan*. Dense patches and thickets of ponderosa pine that dominate the landscape today would be

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<sup>5</sup> VSS is an age class and density description method. 1 = Meadows; 2 = Seedlings/Saplings; 3 = Small trees 5 – 12"; 4 = Medium poles 12 – 17"; 5 = Mature trees 18-24+"; and 6 = Old Forest 24+". A = Open canopy 0-39%; B = Medium canopy 40-59%; and C = Closed canopy 60-100%.

reduced in size and distribution, with approximately 15 to 30% maintained to provide for hiding and thermal cover for wildlife and turkey habitat. Basal areas within treated clumps will vary between 40 and 80 square feet per acre and typically we will carry the higher basal areas within clumps or stands of larger blackjack ponderosa pine trees. Canopy closure will vary corresponding with the variation in basal areas. Canopy closure will range from the low 30's to mid 40's in treated areas following thinning. The larger blackjack clumps or stands of VSS 4 and 5 will require higher basal area to achieve canopy cover guidelines as stated in the *Forest Plan*.

In the existing condition 70% of the project is VSS3. We will reduce VSS 3 by 40% with a portion creating openings and most thinning designed to promote future VSS 4's and 5's. Our goal with the thinning is to increase VSS 4 and 5 as much as 40% to place stands on a trajectory of attaining 20% VSS 5 and 6 over the next 50 to 75 years. As described in the *Forest Plan*, the desired long-term objectives for VSS are 10% VSS1, 10% VSS2, 20% VSS3, 20% VSS4, 20% VSS5 and 20% VSS6.

A variety of treatment methods or prescriptions will be used and will vary dependent upon existing stand conditions. Treatment prescriptions will include: restoration, uneven aged, and even-aged methods.

➤ **“Old” - Gambel Oak and Yellow-barked Ponderosa Pine Trees**

Thinning will occur around the old trees to reduce competition for light, moisture, and nutrients to improve their longevity. No Gambel oak and or yellow-barked ponderosa pine trees will be cut. Only 6% of the project area has greater than 8 or more yellow-barked pine per acre. Thinning will enhance vigor and growth of these trees in the area. Removing the pine canopy surrounding the Gambel oak will reduce fire laddering potential.

➤ **Snags and Logs**

On average, there are 0.7 snags/acre and 2.3 logs/acre. There is need to increase the number of snags and yellow-barked ponderosa pine on approximately 50 to 70% of the project area. Log numbers need to remain constant and improve slightly. Logs may be created where needed to mitigate loss during prescribed fire. Thinning is planned to exclude faders or lightning struck trees in order to have those trees for future snags. Existing snags and logs will be protected during prescribed burning activities. Adaptive management strategies<sup>6</sup> will be emphasized to account for changes from potential beetle kill and the contribution of beetle kill trees to increase snag and log densities.

Antelope Habitat Emphasis Area (1,500 acres)

The desired future condition is a healthy forest condition more resistant to drought and insect damage with reduced fire hazard and improved tree growth. In addition, the desired future condition is antelope habitat in good condition and the development of a viable antelope

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<sup>6</sup> If a new patch of beetle-killed trees occurs, the patch will be evaluated, especially as it relates to the total number of snags and logs in the project area. If treatment actions are needed, they may be undertaken if they meet the desired conditions and environmental effects described for this analysis. If actions are necessary that are not within the parameters of this project, then new NEPA would be initiated.

movement corridor. The existing condition of the antelope movement area is poor with less than 10% of the area in open habitats important to the species. There is a need for creating additional open habitat and the proposed action is to thin from below and broadcast burn 1,500 acres. Thinning from below will create stand conditions that will be very open and park-like, similar to the treatment described for the Urban Rural Influence Zone. The primary difference will be that leave clumps will be fewer but larger within the antelope habitat emphasis area. The leave clumps will provide for more forest edge effect than the leave clumps in the Forest Restoration Emphasis Area.

#### Archeological Site Protection (150 Acres – Across all three zones)

The desired future condition is to reduce fire hazard within historic sites to low. There are 12 sites and 7 segments of railroad where fuels reduction is needed. Prescribed burning, hand thinning, mechanical thinning, and hand piling will be used to protect historic sites. The team archaeologist has made a site-specific recommendation for each site and will coordinate recommendations during project implementation. The proposed action will result in low to moderate wildfire hazard potential on 150 acres including archeological sites.

## **Road Management**

### **Proposed Action – Purpose and Need**

#### **Providing A Quality Recreation Experience – Reducing Fire Risk Enhancing And Protecting Wildlife Habitat And Watershed Conditions**

The desired future condition is a transportation system that provides a quality recreational experience, reduces fire risk, enhances, and protects forest resources. Proposed action elements described here are shown on Map 2. Proposed management actions are described to obliterate, close, provide administrative access, and reconstruct roads to create a transportation system in line with the agency's budget. The existing condition shows there are approximately 4 miles of road affecting meadows and riparian areas; 3 miles of redundant roads; 15 miles of road creating high fire risk; and 6 miles of road impacting Semi-Primitive Non Motorized (SPNM) areas. There is a need for change to reduce impacts to resources (riparian and meadow habitats); change road density in SPNM areas; reduce fire risk; and in total bring the number of roads and maintenance level in line with the agency's budget.

The Proposed Action is to obliterate approximately 6 miles of road following thinning activities. In addition, we would obliterate all non-system<sup>7</sup> roads in the area. Roads to be obliterated may be converted to trail if desirable to do so. Road obliteration will include ripping, seeding, re-contouring in some situations, placing rocks, boulders, and slash on the obliteration to achieve the desired condition of not having vehicles drive the roads in the future.

The Proposed Action also includes 12 miles of administrative road closures. An administrative road closure provides access for administrative purposes only; in this case, the roads are gated to provide access for wildland fire fighting. Currently, there are some administratively closed roads within the Woody Ridge area that have been in place since 1992. *Forest Plan* direction for area

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<sup>7</sup> Non-system roads are usually user-created or 'social' roads.

along Woody Ridge is SPNM. Additional gating is required in two locations to effectively manage this area as SPNM. The need for change in this area is based on meeting SPNM objectives and improving wildlife habitat.

Two new administrative road closures are proposed. First, the road to the Woody Mountain lookout tower would be gated at the junction of the lookout road and FR 231. Second, the area west of Westwood Estates accessed by the FR 82 would be gated. The two new areas proposed for administrative closure are to reduce fire risk.

Road reconstruction to improve meadow habitat is proposed on 2.4 miles of road and will include re-routing, use of turnpiking, and reconstruction to correct drainage.

Temporary road construction will be necessary for the proposed thinning. Approximately 8 to 12 miles of temporary roads will be required. Approximately 4.5 miles of temporary road construction will be needed for conducting thinning in the Urban Rural Influence Zone, and 7 miles in the Forest Restoration Zone.

The proposed action results in an open road density for the future of 1.7 miles of open road per section. There are approximately 12 miles of Level III roads generally surfaced and passable by passenger car, and 47 miles of Level II roads that are generally not surfaced and not generally suited to passenger cars. The proposed action reduces fire risk, corrects resource degradation of meadows and wetlands, and results in a road system in line with the agency's budget. The future road system is shown on Map 2.

**Recreation Management**  
**Proposed Action – Purpose and Need**  
**Providing A Quality Recreation Experience – Reducing Fire Risk**  
**Camping And Trails**

The desired future condition for camping and trail access is one that provides a quality recreational experience, reduces fire risk, enhances, and protects our forest resources. Recreation proposed action elements are shown on Map 3. Proposed management actions are described for providing areas of designated dispersed camping that will reduce fire risk and improve wildlife habitat. New trail access is based on opportunities described in the Open Space and Greenways Plan (OSGW) and Flagstaff Urban Trail System Plan (FUTS). Additionally we are proposing an access plan into the Dry Lake caldera, recently acquired by the Forest Service. In the existing condition, there are approximately 600 dispersed recreation sites throughout the project area and these are concentrated along the Highway 89A corridor and within close proximity to the Urban Interface. A portion of the area is closed to camping currently<sup>8</sup>. There are no Forest Service system trails within the project area. There is a need to change where and how camping occurs within the project area to reduce impacts to resources and reduce fire risk. Trail construction is

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<sup>8</sup> The Flagstaff/Lake Mary Ecosystem Analysis Forest Plan Amendment 17 has approved areas shown as no camping on Map 3. We will complete implementation of this previous decision as part of the Woody Project.

proposed to provide for a quality recreational experience, and alleviate additional social trail development.

The Proposed Action is to implement designated dispersed camping on approximately 1,500 acres. The areas proposed for designated dispersed camping are along the Highway 89A corridor. Camping would be limited to camping in designated campsites only. Selection of designated campsite locations will be determined from site-specific inventory. Camping in the designated sites will be allowed within a 50 to 100 foot radius of a marked post.

Approximately 10 miles of new trail construction is proposed, and this project provides us with an opportunity for completion of NEPA required to construct the trails that were planned during past community planning efforts, primarily Opens Spaces and Greenway Planning. These trails begin to link the communities on the West side with Kachina Village, Fort Tuthill, and access into NAU and communities along Lake Mary Road where the FUTS trail system is in place. OSGW and FUTS trails were planned as Multi-Use nonmotorized trails.

The construction of approximately 1-½ miles of interpretive trail in the Dry Lake caldera would provide public access and ecological information to a very unique area. The purpose and need for the trail proposed is to provide for protection of the wetland and wildlife habitat, while providing a quality hiking experience, interpretive education, and wildlife viewing opportunity. Currently, there are no access routes into the caldera, and social trails are developing. Further social trail development has the potential to impact sensitive wildlife habitat and the wetland. Trails in and thru the Dry Lake caldera will connect to portions of the FUTS and OSGW trails. In the short term, until FUTS and OSGW trails are constructed, trail construction will be phased. The Dry Lake caldera will provide for pedestrian hiking only.

The location of the trail within the Dry Lake caldera begins at a parking area located along Kiltie Lane where the Flagstaff Ranch Development deeded a small parcel to the County. From the parking area, Flagstaff Ranch developers are requesting an easement for a trail from the Arizona State Land Department that would provide access onto National Forest Lands within the caldera. At this point, the Forest Service trail would be constructed across the far north end of the large meadow and then climb the eastern slope of the caldera. At a large rock outcropping, once marked as the 15<sup>th</sup> green, the trail would climb quickly to the top of the ridge and then follow the spine of the ridge to the saddle just north of the cinder pit. At this point the trail would swithchback down the eastern slope adjacent to the boundary of Flagstaff Ranch Development and FS boundary<sup>9</sup>.

### **III. Design Features Associated with the Proposed Action**

As part of the proposed action, we would incorporate the following into the project design, including mitigation, and monitoring measures. These measures focus on items/tasks that are incorporated into the design of the proposed action, or will be incorporated into the implementation of an activity

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<sup>9</sup> Map 3 shows the general location of the Dry Lake caldera trail. Larger scale, more detailed maps will be available at the open house, and upon request.

(identified in a contract, burn plan, or silvicultural marking prescriptions). These measures address effects of project activities on soil and water, wildlife, vegetation, recreation, and visual quality.

#### **Soil and Watershed Protection**

- Best Management Practices (BMP's) will be incorporated into activities as a means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals. BMP's will be incorporated into all project activities.

#### **Mexican Spotted Owl (MSO)**

- No activities, including thinning, broadcast burning, or new trail construction will occur within PACs during the breeding season (March 1 to August 31).
- Any burning outside PACs during the MSO breeding season will be designed to minimize smoke impacts on the PAC's.
- Follow Mandatory Impact Minimization Measures to protect Mexican spotted owl (USDI Fish and Wildlife Service 2001)

#### **Protected Areas (MSO)**

- Continue to work with the US Fish and Wildlife Service and the recovery plan to develop a monitoring program that assesses the combined effects of thinning and fire on spotted owls and their habitat.
- Within MSO habitat treated to reduce fire risk, pre-and post-treatment assessments of habitat conditions and owl occupancy should be done. Specific habitat characteristics that should be monitored include fuel levels, canopy cover, snag basal area, volume of large logs (12 inch midpoint diameter), and live tree basal area.
- No aerial ignition within PACs

#### **Steep Slopes Outside of PACs**

- No seasonal restrictions apply. Prescribed natural fire<sup>10</sup> and the creation of firebreaks may be used as appropriate. On steep slopes treated to reduce fire risk, either by the use of prescribed fire alone or in conjunction with removal of stems and ground fuels, pre- and post-treatment monitoring of habitat conditions should be done. Specific habitat characteristics to be measured include fuel levels, snag basal area, volume of large logs (>12" midpoint diameter), and live tree basal area.

#### **Restricted Areas:**

##### **These measures should be followed whenever consistent with risk reduction objectives (MSO)**

- Manage mixed-conifer and pine-oak forest types to provide continuous replacement nest habitat over space and time (Table III.B.1 of spotted owl recovery plan).
- Incorporate natural variation, such as irregular tree spacing and various stand/patch sizes, into management prescriptions and attempt to mimic natural disturbance patterns.
- Maintain all species of native vegetation in the landscape, including early seral species. To allow for variation in existing stand structures and provide species diversity, both uneven-aged and even-aged systems may be used as appropriate.

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<sup>10</sup> No prescribed natural fire (letting a lightning fire burn within prescription) is proposed for this project.

- Allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure.
- Within pine-oak types, emphasis should be placed on management that retains existing large oaks and promotes the growth of additional large oaks.
- Retain all trees >24 in dbh.
- Retain hardwoods, large down logs, large trees, and snags.
- Emphasize a mix of size and age classes of trees. The mix should include large mature trees, vertical diversity, and other structural and floristic characteristics that typify natural riparian conditions.

### **Northern Goshawk**

- Thinning treatments will not occur within or near nesting areas during the breeding season (March 1 through September 30).

### **Other Raptors**

- No cut buffers for nest and roost sites will be implemented according to the Coconino National Forest Plan standards and guidelines.

### **Turkey Nesting**

- Thinning and broadcast burning will not occur from April 15 through June 30 within turkey nesting and brood sites. Duff and debris will be raked away from the base of roost trees prior to broadcast burning where litter depth layers are greater than 12 inches. Also within these stands, the wildlife biologist and burn boss will coordinate, in the field, whether or not to conduct spring burning in these sensitive areas.

### **Plants**

- To reduce the impacts on rare and sensitive plants, thinning slash and burn lines will not be placed within plant populations. Appropriate firing techniques will be used to minimize the effect of burning on known populations.
- Prescribed fire control lines and temporary roads will avoid known populations of sensitive plant species.
- Surveys for sensitive plant species will be conducted prior to trail and temporary road construction. If sensitive plant species are found, layout will avoid plants.

### **Noxious Weeds**

- Native perennial species or annual rye grass seeds will be used where re-seeding of grasses and herbaceous vegetation is needed after ground disturbing activities. Sterile non-native species or non-seeding methods, such as weed-free straw, may be necessary for sites where annual rye grass persists. Seed mixes containing seeds of non-native *Penstemon spp.* will be avoided.
- During thinning operations equipment will be cleaned prior to entering the project area to avoid introduction or transfer of noxious weeds. Within the project area, equipment will be cleaned prior to leaving areas infested with noxious weeds. Known populations of bull thistle will be marked for avoidance.

### **Yellow Pines and Other Mature Trees**

- Slash piles will not be placed near large yellow pines to avoid damage during burning. This would be especially important in bald eagle winter roost areas, turkey summer and winter ranges, and protected or restricted MSO habitat.
- Burn damage to large mature trees will be avoided. Burning techniques will protect mast-producing trees (i.e. large alligator juniper, large pine, and oak), and turkey roost trees throughout the project area. Burning techniques will minimize heat effects to the feeder roots and cambiums of mature trees.
- Old ‘yellow barked’ pine trees will have duff raked away from the bases where high litter depth layers (greater than 12 inches deep) may result in girdling and mortality.
- Large Gambel oak will be retained. Burn plans will mitigate oak loss through the removal of large material, raking duff from the base of oaks where litter depth exceeds 12 inches, and avoidance of slash piles near oaks.

### **Snags and Logs**

- Snags will be lined before broadcast burning. Slash piles will be placed away from snags.
- Loss of large logs will be minimized through ignition techniques and possibly fire-lining. The timing of prescribed burning (spring burning) may also reduce the loss of logs.

### **Recreation**

- No slash piling in dispersed camping sites.
- No log landings in dispersed camping sites.
- No thinning activities on heavily used holiday weekends, such as Memorial Day, Fourth of July, or Labor Day.

### **Visual Management**

- Adjust unit boundaries to avoid straight edges around units. Develop marking prescriptions, which “feather” the edges of units. Look for opportunities to define unit boundaries with natural features such as canyon edges or drainages and avoid using roads or fence lines as unit boundaries when those features are straight.

### **Archeology**

- Site-specific layout and coordination within sites treated to reduce wildfire hazard potential will be conducted by archaeology staff.
- Surveys for archaeological sites will be conducted prior to trail construction and temporary road construction and avoid archaeological sites.

### **Implementation Monitoring**

Implementation monitoring includes assistance in layout and design and assesses if the project was implemented as designed and if it complies with the *Forest Plan*. Planning for routine implementation monitoring began with the preliminary design of the Woody Ridge Forest Restoration project.

Routine implementation monitoring is a part of the administration of all project contracts. They monitor performance relative to contract requirements. Input by resource staff

specialists, such as wildlife biologists, soil scientists, hydrologists, and engineers, is regularly requested during this implementation monitoring process. These specialists provide technical advice when questions arise during project implementation.

Project activities may be incorporated into routine forest monitoring like the annual BMP implementation and effectiveness review. The results of this and other monitoring are summarized in a National Forest Annual Monitoring and Evaluation Report. This report provides information about how well the management direction of the forest is being carried out. It also measures the accomplishment of anticipated outputs, activities, and effects.

## **Implementation Coordination**

### **Thinning – Turkey Habitat**

Site-specific implementation, such as the layout of cover, marking, and thinning, will include assistance from the Arizona Game and Fish Department and the USFS Wildlife Biologists. The monitoring objective will be to assure the sites include cover patches. The district wildlife biologist along with timber staff and silviculturist will assume responsibility for the completion of the task.

### **Thinning – MSO PACs**

The key to implementation of site-specific thinning includes layout and assistance during thinning by U.S. Fish and Wildlife Service, USFS, and Arizona Game and Fish Department personnel. The objective of the monitoring is to reduce fire potential within MSO PACS, following recovery guidelines. Fuels specialist and the district wildlife biologist will be responsible for completing the task.

### **Thinning – Goshawk PFA**

The key to implementation of site-specific thinning includes layout and assistance during from the wildlife biologist and silviculturist. The objective of monitoring this thinning is to assure canopy closure guidelines are met.

### **Wildlife Movement Corridor**

The site-specific layout will include assistance from the Arizona Game and Fish Department and USFS Wildlife Biologists. The monitoring objective is to assure the site includes adequate cover within the movement corridor. The district wildlife biologist along with timber staff will assume responsibility for the completion of the task.

### **Trails and Signing in the Dry Lake Caldera**

The site-specific layout will include input from the Friends of Dry Lake. Objectives include protection of the wetland and wildlife habitat. Signs and trail design should discourage off-trail hiking.

### **Herbaceous Understory Recovery**

The Annual Operating Instructions for grazing allotments will be adjusted as needed to allow for recovery of naturally occurring herbaceous communities. Range conservationists will conduct monitoring following both thinning and burning treatments. Monitoring will be conducted via observations to determine readiness for livestock use. These observations will

include species maturity (seed heads) and abundance. Grass species, including Arizona fescue (*Festuca arizonica*), mountain muhly (*Muhlenbergia montana*), and squirrel tail (*Sitanion hystrix*) will be the key species used in these observations. Noxious weed monitoring will occur during these observations to detect changes in distribution and or abundance.

#### **Project-Specific Effectiveness Monitoring**

The purpose of effectiveness monitoring is to determine the efficacy and usefulness of specific design features or mitigation measures in protecting natural resources.

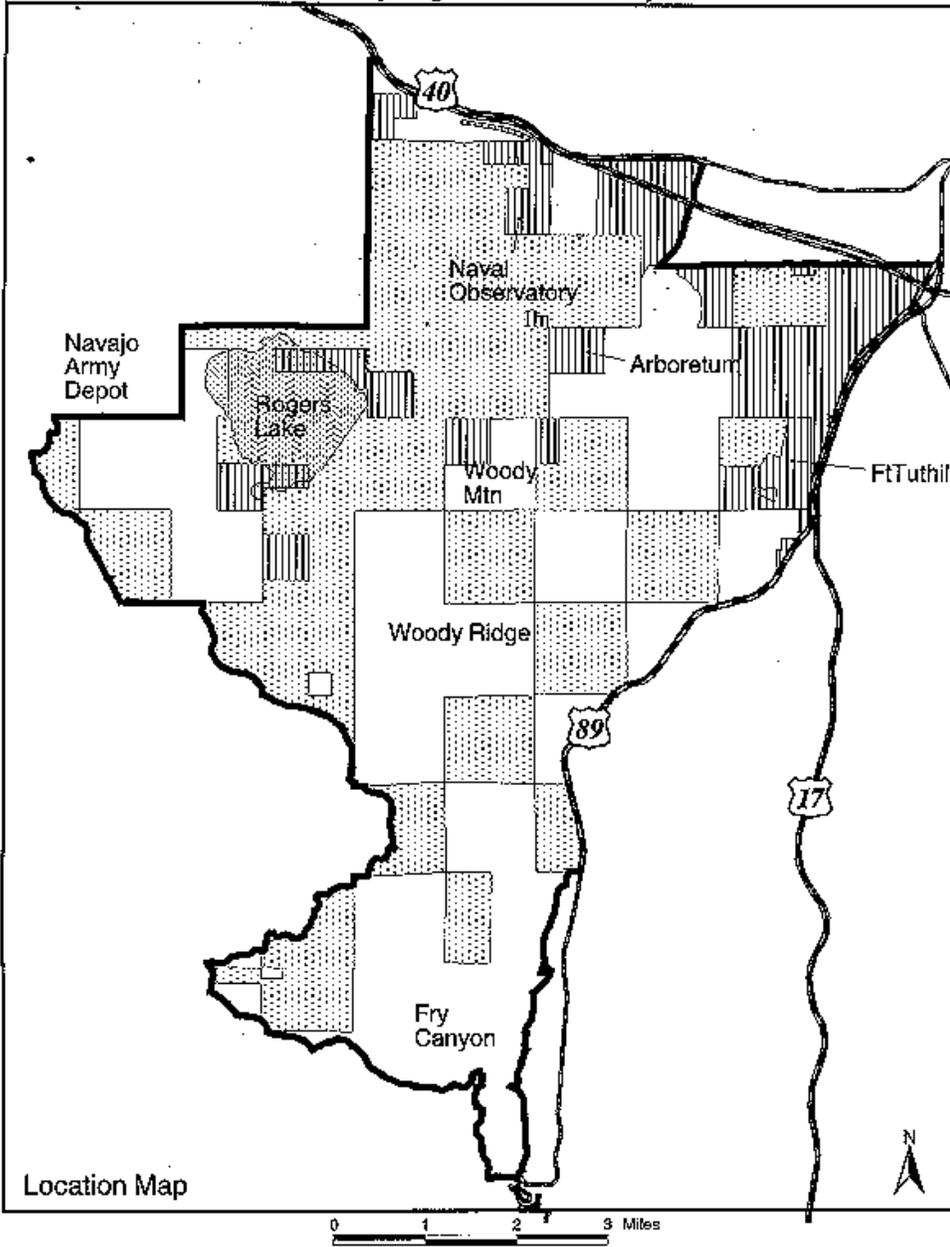
#### **Microhabitat Monitoring for Mexican Spotted Owls**

Microhabitat monitoring will be conducted according to standard protocol as identified by Forest Service Region 3 direction.

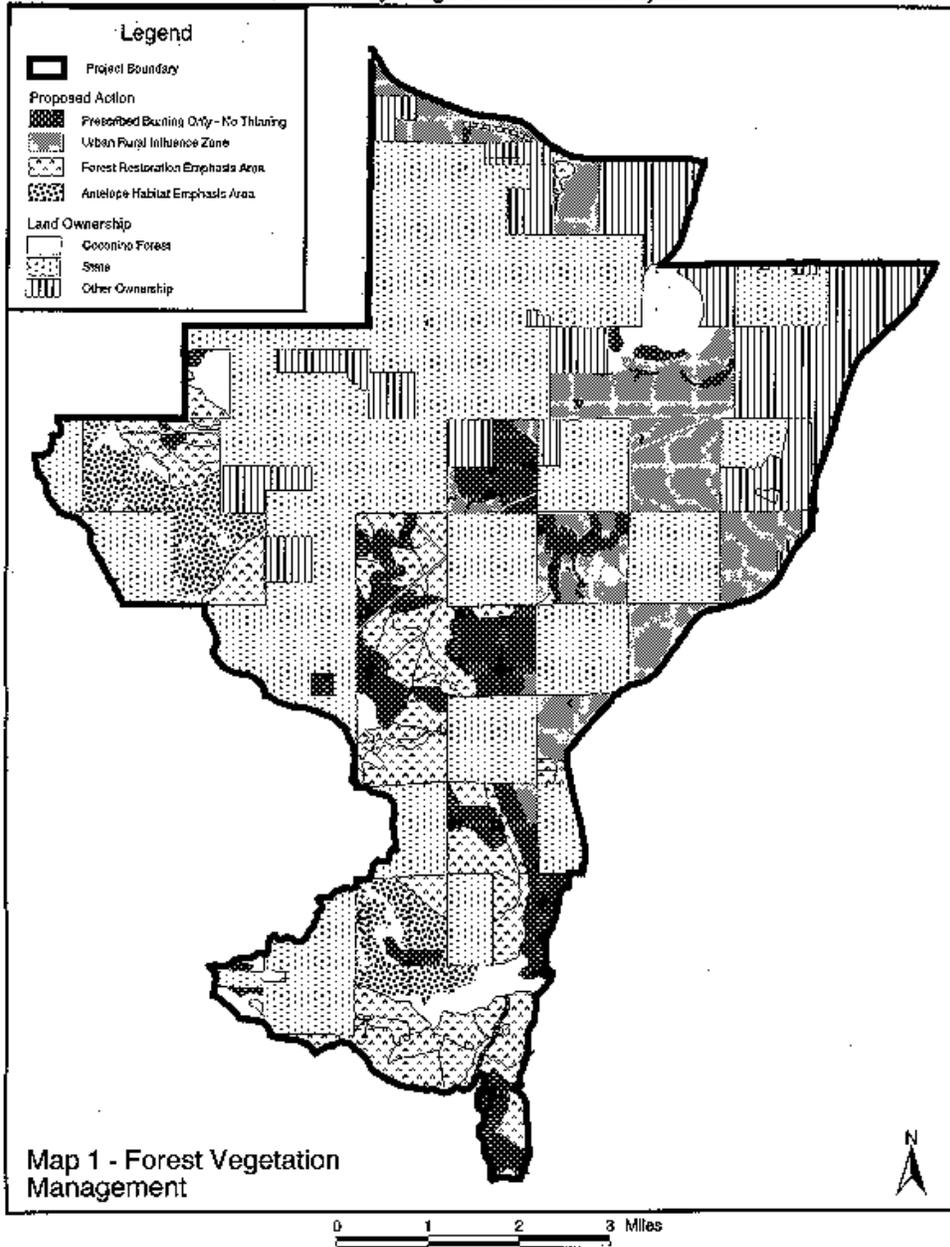
## **IV. Maps**

The following maps show the locations of the proposed actions. The first map is a location map that shows the location of the area in proximity to highways and land features. Map 1 shows the location of vegetation management actions, Map 2 shows road management actions, Map 3 shows recreation management actions.

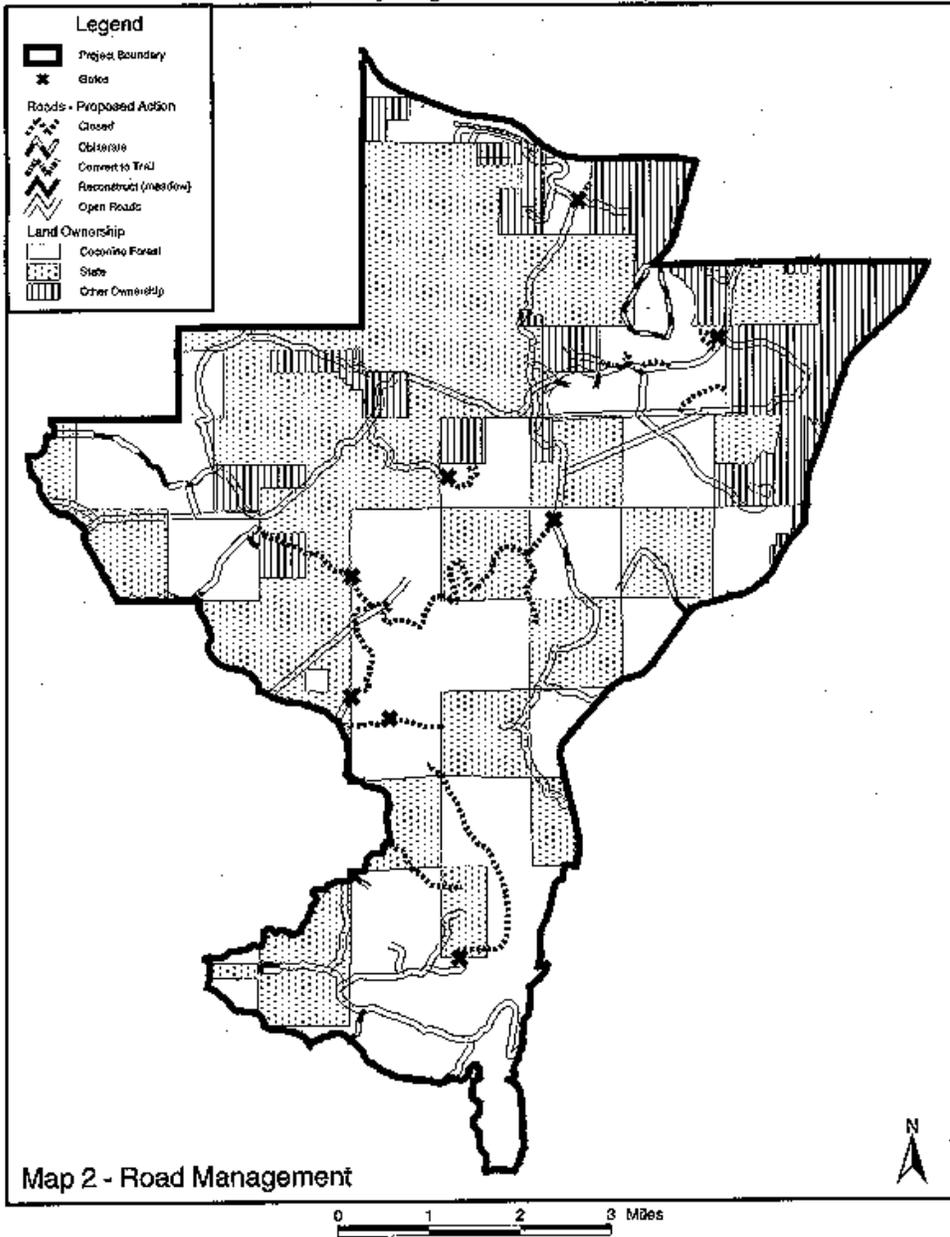
Woody Ridge Forest Health Project



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