Appendix B – Forest Plan Amendments

Table 91 summarizes the proposed forest plan amendments by alternative and theme. For electronic copy viewers, hyperlinks to each amendment are provided.

Table 91. Summary of forest plan amendments by alternative and theme

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

Alt.	Mechanical Treatments in PACs – Coconino NF Only	Treatments in PAC Core Areas – Coconino NF Only	Restricted Habitat Management	Basal Area (BA) in Restricted Target and Threshold Habitat – Coconino and Kaibab NFs	Population and Habitat Monitoring – Coconino and Kaibab NFs	Habitat Treatment in Incremental Percentages
D	Coconino NF Amendment 1 Allows mechanical treatment up to 16 inch d.b.h. in 18 PACs	NA	Coconino NF Amendment 1 Kaibab NF Amendment 2 Adds definitions for target and threshold habitat, allows managing for less than 10% target or threshold habitat on the Coconino NF and Kaibab NF	NA—basal area in restricted target and threshold habitat remains 150 on both forests	Coconino NF Amendment 1 Kaibab NF Amendment 1 Defers monitoring to the project's USFWS biological opinion	Coconino NF Amendment 1 Kaibab NF Amendment 2 Defers treatment design to the project's USFWS biological opinion

Alt.	Description
Forest Plan Amendment Theme: Management of Canopy Cover and Ponderosa Pine with an Open Reference Condition within Goshawk Habitat	
A	NA
B–D	Coconino NF Amendment 2, Kaibab NF Amendment 1: For both the Coconino NF and Kaibab NF the amendment: (1) adds the desired percentage of interspaces within uneven-aged stands to facilitate restoration, (2) adds the interspaces distance between tree groups, (3) adds language clarifying where canopy cover is and is not measured, (4) allows 29,017 acres on Coconino NF (alts. B–D) and 27,637 acres on Kaibab NF (alts. B, D) or 27, 675 acres (alt. C only) to be managed for an open reference condition (up to 90 percent open with less than 3 to 5 reserve trees), and (5) adds a definition to the forest plan glossary for the terms: interspaces, open reference condition, and stands.
Forest Plan Amendment Theme: Management of the Proposed Garland Prairie RNA	
A	NA
B	NA
C	Kaibab NF Amendment 2: The amendment would add language to allow prescribed fire and mechanical treatments in order to maintain and/or restore the ecological qualities of the proposed RNA.
D	NA

Alt.	Mechanical Treatments in PACs – Coconino NF Only	Treatments in PAC Core Areas – Coconino NF Only	Restricted Habitat Management	Basal Area (BA) in Restricted Target and Threshold Habitat – Coconino and Kaibab NFs	Population and Habitat Monitoring – Coconino and Kaibab NFs	Habitat Treatment in Incremental Percentages
Forest Plan Amendment Theme: Effect Determination for Cultural Resources						
A	NA					
B–D	Coconino NF Amendment 3: The amendment deletes the standard that would require achieving a "no effect" determination and adds the words "or no adverse effect" to the remaining standard. In effect, management strives to achieve a "no effect" or "no adverse effect" determination.					

Alternative B – Coconino National Forest Site-Specific Nonsignificant Forest Plan Amendments

Three nonsignificant, site-specific forest plan amendments are proposed for alternative B. Table 92 provides the current forest plan direction and the proposed amendment language for comparison purposes.

Related Planning Efforts

A revised MSO recovery plan, issued by the U.S. Fish and Wildlife Service (hereafter referred to as FWS) was finalized in December of 2012 (USDI 2012). The current forest plan is consistent with the previous MSO recovery plan (USDI 1995). At some point in time, the Coconino NF may amend its forest plan to be consistent with the revised MSO recovery plan. For this analysis, a forest plan amendment would be needed to utilize the revised recovery plan direction if it is different than what is currently included in the Coconino NF forest plan.

Currently, the Coconino NF is revising its forest plan. An analysis was conducted to determine how the proposed amendments align with the draft plan (as currently written) (USDA 2011). A revised forest plan may affect the need for amendment 1 through 3 in the following ways:

Amendment 1: The amendment would be in alignment with the draft forest plan (as currently written) in that it defers management of MSOs to direction in the MSO recovery plan. The revised (2012) MSO recovery plan does not limit tree removal from within PACs to a specific d.b.h., nor does it require a specific method for habitat monitoring. Although restricted habitat is referred to as "recovery habitat" and "nest/roost habitats" in the 2012 revised plan (USDI 2012, pp. 3, 4), the project's desired conditions for nesting and roosting habitat is consistent with the revised recovery plan. The revised plan still recommends that a percentage (10 to 25 percent) of recovery habitat be managed as nesting/roosting (USDI 2012, page VIII). Designating habitat in the project with the best potential would move toward desired percentages in recovery habitat. Amendment 1 would provide additional site-specific requirements at the project scale that would not be precluded by the revised forest plan or the revised (2012) recovery plan (USDI 2012).

Amendment 2: Canopy cover requirements in VSS 4 to VSS 6 and direction for managing goshawk habitat for a balance of VSS is presented differently in the current draft forest plan (USDA 2011, pages 51 to 54). Amendment 2 would be in alignment with the draft forest plan (as currently written) as it: (1) provides for managing crowns of trees within the mid-aged to old groups as interlocking or nearly interlocking (USDA 2011, page 53); (2) manages forest conditions in goshawk PFAs with 10 to 20 percent higher basal area in mid-aged to old tree groups than in goshawk foraging areas and general forest (USDA 2011, Page 51); (3) manages for goshawk nest areas (known and replacement) (USDA 2011, page 53); and (4) generally maintains 3 to 5 reserve trees in management created openings greater than 1 acre in ponderosa pine goshawk foraging areas and PFAs (USDA 2011, page 54), with the exception of acres managed for an open reference condition.

The draft forest plans (as currently written) allow for project-specific plan amendments. The portion of the amendment that allows: (1) deviation from maintaining 3 to 5 reserve trees per acre and (2) having openings up to 90 percent (on lands managed for an open reference condition) would be consistent with what is allowed at the project level.

At the landscape scale, the project would be consistent with forest plan draft desired conditions for ponderosa pine which states, "Forest appearance is variable but generally uneven-aged and open; occasional areas of even-aged structure are present. The forest arrangement is in individual trees, small clumps, and groups of trees interspersed within variably sized openings of grass/forb/shrub vegetation associations similar to historic patterns. Size, shape, number of trees per group, and number of groups per area are variable across the landscape" (USDA 2011, page 51). The terms "interspaces" and "open reference condition" do not appear in the draft forest plans (as written). The amendment would need to continue providing this definition. The definition of "stand" could be removed from the amendment (USDA 2011, page 225). The amendment would provide additional site-specific direction and definitions that apply to landscape restoration that are not precluded by the draft forest plan.

Amendment 3 would not be required. As currently written, the draft forest plan desired condition is to generally manage for no adverse effects and minimize adverse impacts or impacts through consultation (USDA 2012, "Coconino National Forest Draft Land and Resource Management Plan," November. FW-Hrtg-DC, DC-1, p. 92).

Amendment 1. MSO Habitat Management (Coconino NF)

Amendment 1 is a specific, one-time variance for the Coconino NF restoration project. Once the project is complete, current forest plan direction would apply to the project area. The language proposed does not apply to any other forest project. The amendment would be authorized per direction in the National Forest Management Act of 1976 (NFMA) and its implementing regulations found in 36 CFR 219 (1982).

Amendment Description

The amendment would add language to allow mechanical treatments up to 16-inch d.b.h. to improve habitat structure (nesting and roosting habitat) in 18 MSO PACs.

The amendment, which is specific to restricted habitat in pine-oak, would allow for designating less than 10 percent of restricted habitat on the Coconino NF as target or threshold (i.e., future nesting and roosting habitat) based on the quality of the habitat. Definitions of target and threshold habitat would be added since the current forest plan refers to "threshold" in terms of values and desired conditions (see Coconino NF forest plan, page 65-3.) within restricted habitat and there is no reference to "target" conditions.

The amendment would remove language that limits PAC treatments in the recovery unit to 10 percent increments and language that requires the selection of an equal number of untreated PACs as controls. The amendment would remove language referencing monitoring (pre- and post-treatment, population, and habitat monitoring). Replacement language would defer final project design and monitoring to the FWS biological opinion specific to MSO for the project.

Background

In 2011, biologists from the Coconino and Kaibab NFs, the 4FRI team, and the FWS worked together to review individual MSO PACs within the project area. The evaluation process including site visits and modeling silvicultural treatments and prescribed fire to move existing

owl habitat toward the desired conditions described in the 1995 MSO recovery plan (USDI 1995) and forest plan.

There are 99 PACs within the 4FRI project area and 72 PACs within the treatment area. Of the 72, 18 were identified as having habitat that could be improved with vegetation treatments. No PACs proposed for treatment are located in designated wilderness. Each stand within the 18 PACs was modeled to identify treatments that would yield the best existing and future MSO habitat conditions. See the wildlife specialist report "Methodology" section for complete details on the habitat evaluation process.

Mechanical Treatment Up to 16-inch d.b.h. in Select PACs (7,353 acres)

MSO PAC field reviews, data evaluation, and vegetation simulation modeling indicated 18 MSO PACs (approximately 3,388 acres or 10 percent of all PACs acres within the treatment area) would move toward MSO recovery plan desired conditions from mechanically cutting trees up to 9-inch d.b.h. Treatments up to 9-inch d.b.h. are consistent with the forest plan.

An additional 7,353 acres within 18 PACs would have nesting and roosting habitat benefits from cutting trees up to 16-inch d.b.h. Mechanical treatments above 9-inch d.b.h. would facilitate the removal of ladder and canopy fuels which would reduce the fire risk in the 18 PACs. Increasing the range of the mechanical treatment thresholds up to 16-inch d.b.h. within 18 MSO PACs would provide for a higher degree of stand structure improvements to nesting and roosting habitat. The proposal addresses comments from the FWS and is in alignment with the revised MSO recovery plan (USDI 2012). Figure 50 displays the general location of mechanical treatment up to 16-inch d.b.h., prescribed fire, and areas where no treatment is proposed within MSO PACs.

Incremental Treatments and Monitoring Responses to Spotted Owl Treatments

Monitoring assesses the effectiveness of management actions and provides the adaptive framework for more successful management guidelines. Monitoring habitat allows for modeling future forest conditions to determine if there will be adequate habitat to support MSO populations. Monitoring and final project design (addressing incremental treatments) for all proposed activities in all MSO habitat would be developed in consultation with the FWS in a manner specific to this project.

Manage Up to 10 Percent of Restricted Habitat as Target or Threshold

In 2011, biologists from the Coconino and Kaibab NFs, the 4FRI team, and the FWS worked together to develop a geographic layer for restricted habitat across the 4FRI treatment area. Data from the Kaibab and Coconino NFs (based on polygons) was merged with pine-oak data from the Lab of Landscape Ecology and Conservation Biology (raster data; Dr. Steve Sesnie and Jill Rundall, Northern Arizona University). This landscape-scale approach better meets the goal of providing continuous replacement nesting and roosting habitat over space and time, as described in the previous (1995) recovery plan and the 1996 "Record of Decision for the Amendment of Eleven Forest Plans." A new restricted layer was created within the 4FRI treatment area, including designation of target and threshold habitat as described in the MSO recovery plan.

The Kaibab NF consists of three disjunct ranger districts. The North Kaibab Ranger District is north of the Grand Canyon and in a different recovery unit. No resident MSOs have been identified on the North Kaibab and the district is outside the 4FRI planning boundary. The Tusayan and Williams districts are both south of the Grand Canyon and both districts are in the 4FRI planning boundary. The Tusayan district does not include MSO habitat and there are no records of MSOs occurring on the district. The Williams district has limited pine-oak habitat. In achieving a landscape-scale assessment for the 4FRI, MSO pine-oak habitat was assessed across the Williams district and much of the Coconino NF.

The MSO recovery plan describes past planning as operating at "limited spatial scale(s)" which precludes a more meaningful review of MSO habitat at ecological scales (USDI 1995). The scale of the 4FRI, and the fact it transcends administrative boundaries, allows managers to conduct a true landscape-scale analysis. Overall, about 11.5 percent (8,713 acres) of the 4FRI restricted habitat would be managed as current or future target or threshold habitat. On the Coconino NF portion of the project, where the most owls and the most MSO habitat occurs, 13 percent (6,465 acres) of the restricted layer would be designated as target or threshold habitat. The Kaibab NF portion of the 4FRI treatment area would have 8 percent (2,247 acres) of the restricted layer designated as target or threshold habitat. By creating more future nesting and roosting habitat on the Coconino NF, future MSO habitat would be more contiguous for dispersing MSOs, and occur in areas supporting higher densities of MSOs than if 10 percent of the restricted layer was designated by individual administrative boundaries (see figure 60 and figure 62).

Edited or added/new text is **bolded** in table 92.

Table 92. Alternative B Amendment 1 Current and Proposed MSO Forest Plan Language (Coconino NF)

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
MSO Standards	
No corresponding direction currently exists	**The project will comply with biological opinion that has been developed in consultation with FWS.**
Provide three levels of habitat management – protected, restricted, and other forest and woodland types to achieve a diversity of habitat conditions across the landscape (Coconino NF forest plan, p. 65)**.**	No Change
Protected areas include delineated protected activity centers; mixed conifer and pine-oak forests with slopes greater than 40% where timber harvest has not occurred in the last 20 years; and reserved lands which include wilderness, research natural areas, wild and scenic rivers, and congressionally recognized wilderness study areas (Coconino NF forest plan, p. 65)**.**	No Change
Restricted areas include all mixed-conifer, pine-oak, and riparian forests outside of protected areas (Coconino NF forest plan, p. 65).	No Change

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Other forest and woodland types include all ponderosa pine, spruce-fir, woodland, and aspen forests outside protected and restricted areas (Coconino NF forest plan, p. 65).	No Change
Survey all potential spotted owl areas including protected, restricted, and other forest and woodland types within an analysis area plus the area 1/2 mile beyond the perimeter of the proposed treatment area (Coconino NF forest plan, p. 65).	No Change
Establish a protected activity center at all Mexican spotted owl sites located during surveys and all management territories established since 1989 (Coconino NF forest plan, p. 65).	No Change
Allow no timber harvest except for firewood and fire risk abatement in established protected activity centers. For protected activity centers destroyed by fire, windstorm, or other natural disaster, salvage timber harvest or declassification may be allowed after evaluation on a case-by-case basis in consultation with U.S. Fish and Wildlife Service (Coconino NF forest plan, p. 65).	Allow no timber harvest except for firewood, fire risk abatement, in established protected activity centers **except as follows: Allow firewood, fire risk abatement, and habitat structure improvement in the following established protected activity centers: Lake No. 1/Seruchos, Archies, Red Hill, Crawdad, Holdup, Bonita Tank, Red Raspberry, Bear Seep, Mayflower Tank, Knob, T6 Tank, Iris Tank, Frank, Rock Top, Lee Butte, Foxhole, Bar M, and Sawmill Spring.** For protected activity centers destroyed by fire, windstorm, or other natural disaster, salvage timber harvest or declassification may be allowed after evaluation on a case-by-case basis in consultation with U.S. Fish and Wildlife Service.
Allow no timber harvest except for fire risk abatement in mixed conifer and pine-oak forests on slopes greater than 40% where timber harvest has not occurred in the last 20 years (Coconino NF forest plan, p. 65).	No Change
Limit human activity in protected activity centers during the breeding season (Coconino NF forest plan, p. 65).	No Change
In protected and restricted areas, when activities conducted in conformance with these standards and guidelines may adversely affect other threatened, endangered, or sensitive species or may conflict with other established recovery plans or conservation agreements; consult with US Fish and Wildlife Service to resolve the conflict (Coconino NF forest plan, p. 65-1).	No Change
Monitor changes in owl populations and habitat needed for delisting (Coconino National Forest plan, page 65-1).	**See "Standards" for monitoring direction**

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Guidelines – General – No Change	
Guidelines – Protected Areas, Protected Activity Centers	
Delineate an area of not less than 600 acres around the activity center using boundaries of known habitat polygons and/or topographic features. Written justification for boundary delineation should be provided (Coconino National Forest plan, page 65-1).	No Change
The protected activity center boundary should enclose the best possible owl habitat configured in as compact a unit as possible, with the nest or activity center located near the center (Coconino National Forest plan, page 65-1).	No Change
The activity center is defined as the nest site. In the absence of a known nest, the activity center should be defined as a roost grove commonly used during breeding. In the absence of a known nest or roost, the activity center should be defined as the best nest/roost habitat (Coconino NF forest plan, p. 65-1).	No Change
Protected activity center boundaries should not overlap (Coconino NF forest plan, p. 65-1).	No Change
Submit protected activity center maps and descriptions to the recovery unit working group for comment as soon as possible after completion of surveys (Coconino NF forest plan, p. 65-1).	No Change
Road or trail building in protected activity centers should be avoided but maybe permitted on a case-by-case basis for pressing management reasons (Coconino NF forest plan, p. 65-1).	No Change
Generally allow continuation of the level of recreation activities that was occurring prior to listing (Coconino NF forest plan, p. 65-1).	No Change
Require bird guides to apply for and obtain a special use permit. A condition of the permit shall be that they obtain a subpermit under the U.S. Fish and Wildlife Service Master Endangered Species permit. The permit should stipulate the sites, dates, number of visits, and maximum group size permissible (Coconino NF forest plan, p. 65-1).	No Change
Harvest firewood when it can be done in such a way that effects on the owl are minimized. Manage within the following limitations to minimize effects on the owl (Coconino NF forest plan, p. 65-2). Retain key forest species such as oak. Retain key habitat components such as snags and large downed logs. Harvest conifers less than 9 inches in diameter only	Harvest firewood when it can be done in such a way that effects on the owl are minimized. Manage within the following limitations to minimize effects on the owl. Retain key forest species such as oak. Retain key habitat components such as snags and large downed logs. Harvest conifers less than 9 inches in diameter only

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
within those protected activity centers treated to abate fire risk as described below, except for the Clark PAC where trees less than 16 inches diameter will be harvested.	within those protected activity centers treated to abate fire risk as described below, except for the Clark PAC where trees less than 16 inches diameter will be harvested area except as follows: **Harvest conifers up to 16-inch diameter within the Lake No. 1/Seruchos, Archies, Red Hill, Crawdad, Holdup, Bonita Tank, Red Raspberry, Bear Seep, Mayflower Tank, Knob, T6 Tank, Iris Tank, Frank, Rock Top, Lee Butte, Foxhole, Bar M, and Sawmill Spring PACs to abate fire risk and improve habitat structure.**
Treat fuel accumulations to abate fire risk. –Select for treatment 10% of the protected activity centers where nest sites are known in each recovery unit having high fire risk conditions. Also select another 10% of the protected activity centers where nest sites are known as a paired sample to serve as control areas (Coconino National Forest plan, page 65-2). –Designate a 100-acre "no treatment" area around the known nest site of each selected protected activity center. Habitat in the no treatment area should be as similar as possible in structure and composition as that found in the activity center. –Use combinations of thinning trees less than 9 inches in diameter (or less than 16 inches in the Clark PAC), mechanical fuel treatment and prescribed fire to abate fire risk in the remainder of the selected protected activity center outside the 100-acre "no treatment" area.	Treat fuel accumulations to abate fire risk. –Designate a 100-acre "no treatment" area around the known nest site of each selected protected activity center. Habitat in the no treatment area should be as similar as possible in structure and composition as that found in the activity center. – Use combinations of thinning trees less than 9 inches in diameter (or less than 16 inches in the Clark PAC), mechanical treatment and prescribed fire to abate fire risk in the remainder of the selected protected activity center outside the 100-acre "no treatment" area **except as follows:** **Use combinations of thinning trees up to 16-inch d.b.h. within the Lake No. 1/Seruchos, Archies, Red Hill, Holdup, Rock Top, Foxhole, Bar M, PACs, Crawdad, Bonita Tank, Red Raspberry, Bear Seep, Mayflower Tank, Knob, T6 Tank, Iris Tank, Frank, Lee Butte, and Sawmill Springs PACs**, mechanical fuel treatment and prescribed fire to abate fire risk **and improve habitat structure** in the remainder of the selected protected activity center outside the 100-acre "no treatment" area.
Treat fuel accumulations to abate fire risk. Pre- and post-treatment monitoring should be conducted in all protected activity centers treated for fire risk abatement. (See monitoring guidelines) (Coconino National Forest plan, page 65-2).	**–See "Standards" for Monitoring Direction**
Steep Slopes (Mixed conifer and pine-oak forests outside protected activity centers with slopes greater than 40% that have not been logged within the past 20 years): No seasonal restrictions apply.	
Treat fuel accumulations to abate fire risk. –Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel removal, and prescribed fire. –Retain woody debris larger than 12 inches in diameter, snags, clumps of broadleafed woody vegetation, and hardwood tress larger than 10 inches in diameter at the root collar.	Treat fuel accumulations to abate fire risk. –Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel removal, and prescribed fire. –Retain woody debris larger than 12 inches in diameter, snags, clumps of broadleafed woody vegetation, and hardwood tress larger than 10 inches in diameter at the

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
– Pre and post treatment monitoring should occur within all steep slopes treated for fire risk abatement. (See monitoring guidelines).	root collar. **–See "Standards" for Monitoring Direction**
Reserved Lands (Wilderness, Research Natural Areas, Wild and Scenic Rivers, and Congressionally Recognized Wilderness Study Areas): Allow prescribed fire where appropriate – No change.	
Restricted Areas (Mixed conifer, pine-oak, and riparian forests)	
No corresponding direction	**Target habitat is a category of restricted habitat intended to provide future nesting and roosting habitat (see glossary definition for restricted habitat). The minimum values identified for the forest attributes represent the threshold for meeting nesting and roosting conditions (see the definition for threshold habitat). They can also be targets to be achieved with time and management. If less than 10 percent of the restricted habitat in ponderosa pine-Gambel oak qualifies as threshold habitat, the areas that can eventually achieve all threshold conditions simultaneously should be identified as target habitat and managed to achieve threshold conditions as rapidly as possible. Because no known nests or roosts occur in restricted habitat, target habitat is considered future nesting and roosting habitat.**
No corresponding direction	**Threshold habitat is a category of restricted habitat intended to provide for future nesting and roosting habitat (see definition for restricted habitat). A variety of forest structural attributes is used to define when nesting and roosting habitat is achieved (summarized in table III.B.1 of the 1995 recovery plan and table C-2 of the 2012 recovery plan). Threshold habitat meets or exceeds these values. When the minimum values identified for the forest attributes are met simultaneously, they represent the threshold of nesting and roosting conditions. Up to 10 percent of restricted habitat in ponderosa pine-Gambel oak should be designated as threshold habitat. Management in threshold habitat cannot lower any of the forest attribute values below the nesting and roosting threshold unless a landscape analysis demonstrates an abundance of this habitat. Because no known nests or roosts occur in restricted habitat, target habitat is managed as future nesting and roosting habitat.**
Mixed Conifer and Pine-oak Forests (see glossary definition): Manage to ensure a sustained level of owl nest/roost habitat well distributed across the landscape. Create replacement owl nest/roost habitat where appropriate while providing a diversity of stand conditions across the landscape to ensure habitat for a diversity of prey species. The following table displays	Mixed Conifer and Pine-oak Forests (See glossary definition): Manage to ensure a sustained level of owl nest/roost habitat well distributed across the landscape. Create replacement owl nest/roost habitat where appropriate while providing a diversity of stand conditions across the landscape to ensure habitat for a diversity of prey species. The following table displays

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
the minimum percentage of restricted area which should be managed to have nest/roost characteristics. The minimum mixed conifer restricted area includes 10% at 170 basal area and an additional amount of area at 150 basal area. The additional area of 150 basal area is +10% in BR-E and +15% in all other recovery units. The variables are for stand averages and are minimum threshold values and must be met simultaneously. In project design, no stands simultaneously meeting or exceeding the minimum threshold values should be reduced below the threshold values unless a districtwide or larger landscape analysis of restricted areas shows that there is a surplus of restricted area acres simultaneously meeting the threshold values. Management should be designed to create minimum threshold conditions on project areas where there is a deficit of stands simultaneously meeting minimum threshold conditions unless the districtwide or larger landscape analysis shows there is a surplus. This table has been modified to contain only information pertinent to the Coconino NF. (Coconino NF forest plan, pp. 65-3 to 65-5).	the minimum percentage of restricted area which should be managed to have nest/roost characteristics. The minimum mixed conifer restricted area includes up to 10 percent at 170 basal area and an additional amount of area at 150 basal area. The additional area of 150 basal area is +10 percent in BR-E and +15 percent in all other recovery units. **In pine-oak, the minimum restricted area includes up to 10 percent at 150 basal area.** The variables are for stand averages, are minimum **target and** threshold **habita**t values, and must be met simultaneously. In project design, no stands simultaneously meeting or exceeding the minimum **target and** threshold **habita**t values should be reduced below **target and** threshold values unless a districtwide or larger landscape analysis of restricted areas shows that there is a surplus of restricted area acres simultaneously meeting **target and** threshold values. Management should be designed to create minimum **target and** threshold **habitat** conditions on project areas where there is a deficit of stands simultaneously meeting minimum **target and** threshold **habitat** conditions unless the districtwide or larger landscape analysis shows there is a surplus. This table has been modified to contain only information pertinent to the Coconino NF.

Variable	Mixed Conifer All RU	Mixed Conifer Other RU*	Pine-Oak Target and Threshold Habitat**
Restricted Area %	10%	+15%	**Up to** 10%
Stand Averages for:			
Basal Area	170	150	150
18 inch+ trees/acre	20	20	20
Oak Basal Area	NA	NA	20
Percent total existing:			
12–18”	10	10	15
18–24”	10	10	15
24+”	10	10	15

Attempt to mimic natural disturbance patterns by incorporating natural variation, such as irregular tree spacing and various patch sizes, into management prescriptions (Coconino National Forest plan, page 65-4).	No Change
Maintain all species of native trees in the landscape including early seral species (Coconino National Forest plan, page 65-4).	No Change

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure (Coconino National Forest plan, page 65-4).	No Change
Emphasize uneven-aged management systems. However, both even-aged and unevenaged systems may be used where appropriate to provide variation in existing stand structure and species diversity. Existing stand conditions will determine which system is appropriate (Coconino National Forest plan, page 65-4).	No Change
Extend rotation ages for even-aged stands to greater than 200 years. Silvicultural prescriptions should explicitly state when vegetative manipulation will cease until rotation age is reached (Coconino National Forest plan, page 65-4).	No Change
Save all trees greater than 24 inches d.b.h. In pine-oak forests, retain existing large oaks and promote growth of additional large oaks (Coconino National Forest plan, page 65-4).	No Change
In pine-oak forests, retain existing large oaks and promote growth of additional large oaks (Coconino National Forest plan, page 65-4).	No Change
Encourage prescribed and prescribed natural fire to reduce hazardous fuel accumulation. Thinning from below may be desirable or necessary before burning to reduce ladder fuels and the risk of crown fire (Coconino National Forest plan, page 65-4).	No Change
Retain substantive amounts of key habitat components: • Snags 18 inches in diameter and larger • Down logs over 12 inches midpoint diameter • Hardwoods for retention, recruitment, and replacement of large hardwoods	No Change
Riparian Areas – No Change	
Domestic Livestock Grazing – No Change	
Old-Growth – No Change	
Other Forest and Woodland Types – No Change	
Guidelines for Specific Recovery Units – No Change	

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Monitoring Guidelines	
Monitoring and evaluation should be collaboratively planned and coordinated with involvement from each national forest, USFWS Ecological Services Field Office, USFWS Regional Office, USFS Regional Office, Rocky Mountain Research Station, recovery team, and recovery unit working groups.	**See "Standards" for Monitoring Direction**
Population monitoring should be a collaborative effort with participation of all appropriate resource agencies. (Coconino National Forest plan, page 65-6).	
Habitat monitoring of gross habitat changes should be a collaborative effort of all appropriate resource agencies. (Coconino National Forest plan, page 65-6).	
Habitat monitoring of treatment effects (pre- and post-treatment) should be done by the agency conducting the treatment. (Coconino National Forest plan, page 65-6).	
Prepare an annual monitoring and evaluation report covering all levels of monitoring done in the previous year. The annual report should be forwarded to the regional forester with copies provided to the recovery unit working groups, USFWS Ecological Services field offices, and the USFWS Regional Office (Coconino National Forest plan, page 65-6).	
Rangewide: Track gross changes in acres of owl habitat resulting from natural and human-caused disturbances. Acreage changes in vegetation composition, structure, and density should be tracked, evaluated, and reported. Remote sensing techniques should provide an adequate level of accuracy. (Coconino National Forest plan, page 65-6) In protected and restricted areas where silvicultural or fire abatement treatments are planned, monitor treated stands pre- and post-treatment to determine changes and trajectories in fuel levels; snag basal areas; live tree basal areas; volume of down logs over 12 inches in diameter; and basal area of hardwood trees over 10 inches in diameter at the root crown (Coconino National Forest plan, page 65-6).	

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Upper Gila Mountain, Basin and Range East, and Basin and Range West Recovery Units: Assist the recovery team and recovery unit working groups to establish sampling units consisting of 19 to 39 square mile quadrats randomly allocated to habitat strata. Quadrats should be defined based on ecological boundaries such as ridge lines and watersheds. Quadrat boundaries should not traverse owl territories. Twenty percent of the quadrats will be replaced each year at random. Using the sample quadrats, monitor the number of territorial individuals and pairs per quadrat; reproduction; apparent survival; recruitment; and age structure. Track population density both per quadrat and habitat stratum.	**See "Standards" for Monitoring Direction**

* Edited text is **bolded.**

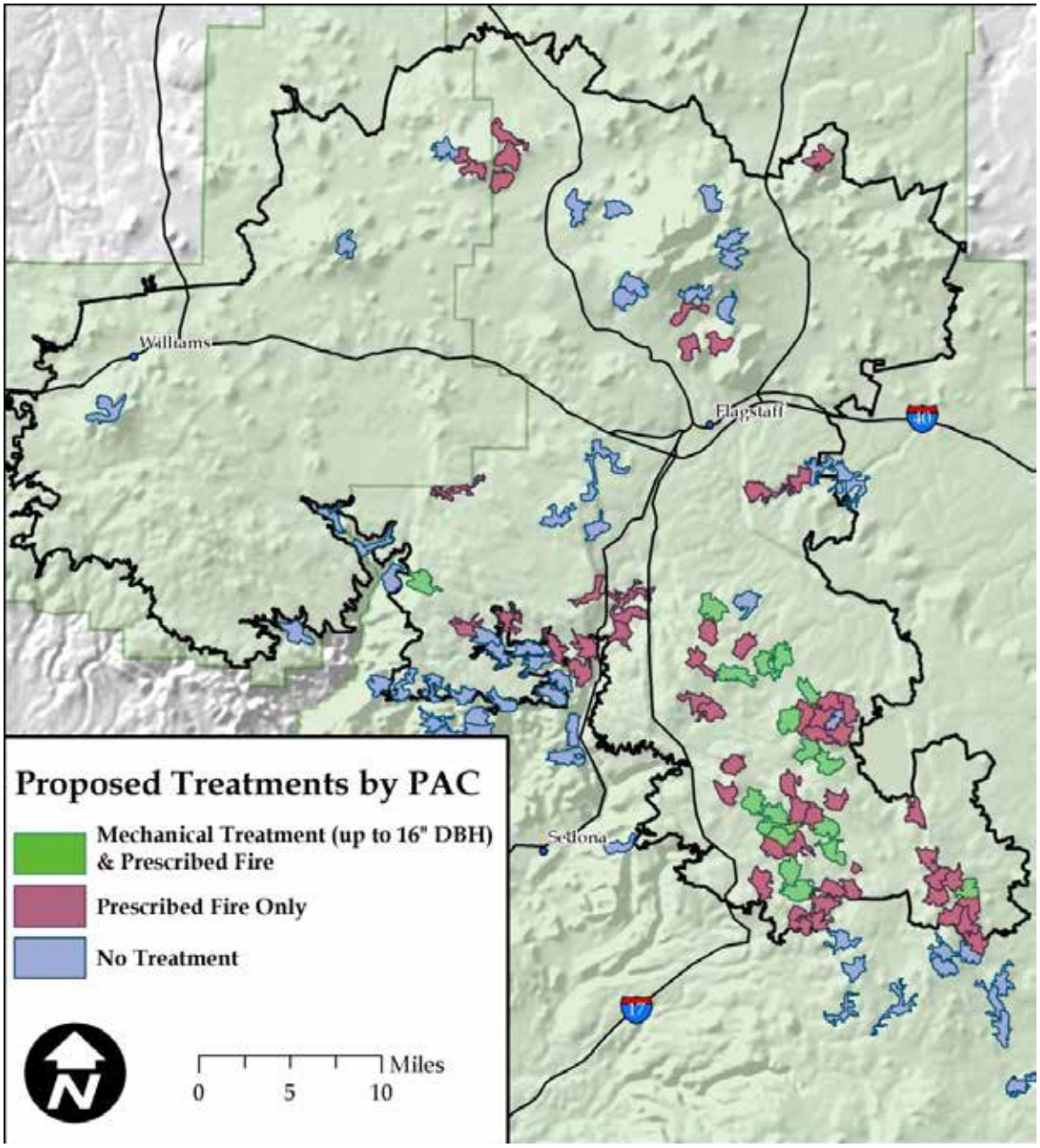

Figure 50. Alternative B amendment 1 MSO PAC treatments

Consistency with the MSO Recovery Plan

The 1995 recovery plan (USDI 1995), which was incorporated into the current forest plans states "Two primary reasons were cited for the listing: historical alteration of its habitat as the result of timber management practices, specifically the use of even-aged silviculture…" and "The danger of catastrophic wildfire…" While the recovery plan is clear that the primary existing threat is high-severity wildland fire, the recovery plan also states that "[r]etaining large trees is desirable because they are impossible to replace quickly and because they are common features of nesting and roosting habitats for the owl." The recovery plan recognizes that "ecosystems are temporally

dynamic [and] provisions are needed to ensure owl habitat in the long term." The primary objective to be achieved by the recovery plan guidelines is protection of the best available habitat for the MSO, while maintaining sufficient flexibility for land managers to abate high fire risks and to improve habitat conditions for the owl and its prey (page 89). The potential for using silviculture as a tool for meeting objectives such as maintaining and developing MSO habitat and enhancing various ecological factors is specifically identified in the recovery plan.

The 1995 recovery plan recommends that recovery efforts concentrate on the recovery units with the highest owl populations and where significant threats exist. The project is located within the Upper Gila Mountain Recovery Unit (UGM RU). The UGM RU contains the largest known number of MSOs with approximately 55 percent of known spotted owl territories. The major land use within this recovery unit has been timber harvest.

The 1995 recovery plan describes a change in the size class distribution of trees that occurred on commercial forest lands in Arizona and New Mexico between the 1960s and 1980s. The density of large trees (greater than 19-inch d.b.h.) decreased by 20 percent and sapling-sized trees (1- to 4.9-inch d.b.h.) decreased in both absolute density and in relative contribution to the size class distribution. Trees 5- to 12.9-inch d.b.h. increased in density by 40 percent and in relative proportion of the size class distribution and trees 13- to 19-inch d.b.h. increased in density but not in the relative proportion of the tree distribution. The decrease in large trees was described as "an alarming negative trend with respect to a very critical component of spotted owl habitat" (page 68) given that "the basis to maintain owl populations is to ensure that adequate habitat quality and quantity will be sustained through time." In order to achieve this, the 1995 recovery plan advocates using coarse and fine filters for ecosystem management.

Coarse filters should be used "to maintain the natural array of conditions that exist with the biotic and physical limits of the landscape" while fine filters may be used "to provide specialized habitats or habitat elements within that overall landscape." They recommend "innovative applications of uneven-aged management" for developing and maintaining important but difficult to replace spotted owl habitat elements, including large pine and oak trees and key habitat components, such as trees greater than 24-inch d.b.h. and prey habitat. The amendment allows for using silvicultural treatments in 18 PACs at risk of losing key MSO habitat elements through declining forest health. Treatment objectives in the 18 PACs are to develop and maintain adequate MSO habitat quality and quantity through time.

The need to evolve from managing solely for firewood collection and fire risk abatement is reflected in the revised 2012 recovery plan. In the revised plan, the FWS states, "Management recommendations are most conservative within PACs, but by no means advocate a "hands-off" approach. The recovery team recognizes situations exist where management is needed to sustain or enhance desired conditions for the owl, including fire-risk reduction, as well as monitoring owl response. Mechanical treatments in some PACs may be needed to achieve these objectives; determining which PACs may benefit from mechanical treatments requires a landscape analysis to determine where the needs of fire risk reduction and habitat enhancement are greatest. " (USDA 2012, page VIII) which is the process we are currently undergoing.

The plan amendment would require monitoring to occur as outlined in the project's biological opinion from the FWS. Following the current forest plan direction would have resulted in few PACs being treated during the life of the project. Current plan direction suspends treatments until monitoring of the initial sample shows there are no negative impacts, or negative impacts are

mitigated by modifying treatments. Following this direction could delay implementation for years, potentially decades' if changes in populations had to be documented before additional treatments were implemented. Following the current forest plan direction would have resulted in few PACs being treated with the objective of fire-risk reduction or improving condition for the owl during the life of the project.

The deviation from selecting PACs and monitoring in 10 percent increments is consistent with the new MSO recovery plan. The plan amendment would require monitoring to occur as outlined in the project's biological opinion from the FWS.

Significance Evaluation

Per FSM 1926.51, changes to the land management plan that are not significant can result from:

1. Actions that do not significantly alter the multiple-use goals and objectives for long-term land and resource management.
2. Adjustments of management area boundaries or management prescriptions resulting from further onsite analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long-term land and resource management.
3. Minor changes in standards and guidelines.
4. Opportunities for additional projects or activities that will contribute to achievement of the management prescription.

Per FSM 1926.52, circumstances that may cause a significant change to a land management plan include:

1. Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected (see section 219.10(e) of the planning regulations in effect before November 9, 2000 (see 36 CFR parts 200 to 299, revised as of July 1, 2000)), and
2. Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

Analysis demonstrated that the proposed amendment is nonsignificant (FSM 1926.51) because the actions would not measurably alter the multiple-use goals and objectives for long term land and resource management. How actions could potentially affect timing, location, and size, relationship to forest goals, objectives, outputs, and management prescriptions was evaluated.

Timing: In terms of timing, the forest plan has been in place and amended several times since 1987, and revision efforts are underway. The forest plan incorporated direction (via an amendment) from the Forest Service Southwestern Region's 1996 "Amendment of Forest Plans Record of Decision" (USDA 1996). The actions allowed via the amendment are consistent with existing forest plan direction in that it improves nesting and rooting habitat, reduces the risk of loss from fire, and will comply with the site-specific treatment and monitoring requirements in the FWS biological opinion. Forest plan direction may be amended to incorporate the revised MSO recovery plan (USDI 2012) which recognizes that habitat restoration, in addition to the reduction of fire risk, is key to improving habitat quality.

Location and Size: There are 168 MSO PACs occurring entirely on the Coconino NF. The amendment would affect 18 (11 percent) of all Coconino NF PACs. There is approximately 117,636 acres of MSO PACs on the Coconino NF. Approximately 35,566 acres of PAC habitat occurs within the project area. The amendment would affect 7,353 acres or 21 percent of the PAC habitat in the project area and approximately 6 percent of the total PAC habitat on the forest. Work would be accomplished incrementally over a 10-year period. On average, less than 1,000 acres of PAC habitat would be treated per year. This is expected to balance the need to reduce the risk of crown fire while allowing for monitoring and feedback loops that would allow management to be adaptive. On the Coconino NF portion of the project—where the most owls and the most MSO habitat occurs—13 percent (6,465 acres) of the restricted layer would be designated as target or threshold habitat.

Relationship to Forest Goals and Objectives: The amendment is consistent with forest plan goals for wildlife and fish of managing habitat to maintain viable populations of wildlife and fish species and improve habitat for selected species (Coconino National Forest plan, replacement page 22-1) and to improve habitat for listed threatened, endangered, or sensitive species of plants and animals and other species as they become threatened or endangered (Coconino National Forest plan, replacement page 23). The amendment is consistent with goals and objectives by protecting conditions and structures used by spotted owls where they exist and to set other stands on a trajectory to grow into replacement nest habitat or to provide conditions for foraging and dispersal (USDI 2012).

The amendment removes language that addresses pre- and post-treatment, population, and habitat monitoring and replaces it with language that focuses on implementing the requirements in the FWS biological opinion for this project. Delaying treatment in PACs would leave occupied MSO habitat at risk of loss from high-severity fire. Arizona's two largest fires account for nearly a million and half acres of forested land burned since 2002. Both fires included high-severity fire in PAC habitat. Other fires in the Upper Gila Recovery Unit have charred additional acres of MSO protected habitat. Most climate models suggest that the Southwest will experience higher temperatures and increased variability in precipitation, which will significantly affect fire regimes and forest health (Aumack et al. 2007).

The FWS urges a deliberate and cautious approach to management activities within PACs (USDI 2012). Silvicultural modeling of the proposed treatments indicates limited change to forest structure after implementation. However, the treatments are expected to include increased tree growth rates to reduce the time needed for developing large trees (defined as 18-inch d.b.h. and greater in the current recovery plan for the MSO), maintaining existing large trees, and decreasing surface fuels and increasing crown base height. Combined, this should develop and maintain MSO nesting and roosting habitat, a key aspect of the MSO recovery plan, while decreasing risk of crown fire.

Forest restoration and fuel reduction treatments would be evaluated over time. Through formal consultation with FWS, we expect that monitoring would be designed and implemented to evaluate the effects of prescribed fire and hazardous fuel reduction treatments on spotted owl habitat, and to retain or move toward MSO desired future conditions, as described in the recovery plan. The details on accomplishing the monitoring goals will be developed specifically through coordination with the FWS under formal consultation, as described in the ESA. In this way, work to protect and improve PAC habitat can be accomplished in a timely manner while emphasizing monitoring and feedback loops to allow management to be adaptive. For these reasons, the

amendment as it relates to pre- and post-treatment, population, and habitat monitoring is consistent with forest plan goals and objectives.

Designating target or threshold habitat in the project with the best potential would move toward desired percentages in restricted (recovery) habitat, consistent with forest plan goals and objectives.

Relationship to Management Prescriptions: Table 93 displays the forestwide management area acres that would be affected. The amendment would affect about 5,359 acres (1 percent) of MA 3 and about 1,773 acres (3 percent) of MA 35. Acres within other MAs (MA 4, MA 10, MA 5, MA 9, MA 12, and MA 6) are minor, totaling 221 acres.

The amendment intent is consistent with the management emphasis in MA 3 and MA 35 which stresses improving and maintaining the quality of the habitat (MA 3) and moving ponderosa pine toward the desired forest structure, including northern goshawk and MSO habitats (MA 35). The amendment would not impose requirements on future management of MSO PACs as the amendment is site specific to this analysis and only addresses current conditions within protected habitat.

Table 93. Alternative B amendment 1 management area acres (Coconino NF)

MA	MA Description	Forestwide Acres	Proposed Amendment Acres	Forestwide Acres Affected (Percent)
MA 3	Ponderosa Pine Below 40 Percent Slopes	511,015	5,359	1
MA 35	Lake Mary Watershed	62,536	1,773	3
MA 4, 10, 5, 9, 12, and 6	See chapter 1, table 14	307,011	221	<1

Relationship to Outputs: Outputs identified in the forest plan are associated with million board feet (MMBF) of sawtimber sales and products (meet demand for timber while reducing conflict with other resources), MMBF of firewood sold and free use (provide access to firewood), grazing capacity (MAUM), and permitted livestock use (MAUM). Due to the minimal acres affected, the amendment would not alter outputs on a forestwide basis or change the long-term relationship between levels of goods (timber, firewood) and services.

In comparison to the forest's total suitable timber lands (626,326 acres), the amendment affects about 1 percent of those lands. For this reason, treatments within PACs do not measurably increase or decrease timber outputs or firewood availability. Treatment within PACs would not affect decisions that have been made through separate analyses on grazing capacity or permitted livestock use. There would be no measurable effect to outputs on a forestwide basis or the long-term relationship between levels of goods (timber, firewood) and services from managing restricted habitat up to 10 percent or deferring the final design of treatments and monitoring to the project's biological opinion.

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

Amendment 2 is a specific, one-time variance for the Coconino NF portion of the restoration project. Once the project is complete, current forest plan direction would apply to the project area. The language proposed does not apply to any other forest project. The amendment would be authorized per direction in the National Forest Management Act of 1976 (NFMA) and its implementing regulations found in 36 CFR 219 (1982).

Amendment Description

In the "Vegetation Management – Landscapes Outside Goshawk Post-fledgling Family Areas" and "Vegetation Management –Within Post-fledgling Family Areas" section of the forest plan, a site-specific, nonsignificant plan amendment would: (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 29,017 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. Edited or added/new text is **bolded** in the "Proposed New Guideline Language" column in table 94.

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** are defined as the open space between tree groups intended to be managed for grass/forb/shrub vegetation during the long term. Interspaces may include scattered single trees.
- **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.

Background

Canopy cover is defined as "the percentage of a fixed area covered by the crowns of plants delimited by a vertical projection of the outermost perimeter of the spread of foliage" (Reynolds et al. 1992). Obtaining consistent results has been difficult; even the definition of the term is dependent on the method of measurement. To resolve this issue, the Forest Service used the Forest Vegetation Simulation (FVS) crown width model as the basis for developing stocking densities that would achieve desired canopy cover levels.

The forest plan directs projects to measure "vertical crown projection on average across the landscape" (see Coconino National Forest plan, page 65-9). Whereas the forest plan clearly provides direction for meeting minimum canopy cover percentages in VSS 4 to 6, the plans lack explicit language for measuring canopy cover. Although the forest plan provides direction and desired conditions for the vegetation structural stages, the forest plan does not describe the relationship between nonforested areas (interspace) and natural openings across the landscape. Figure 51 displays general locations of goshawk habitat that is subject to canopy cover requirements in VSS 4 through VSS 6 on the forests.

Nonforested areas (interspaces) occur between individual trees, tree clumps, and tree groups. These nonforested areas (interspaces) are not equivalent to VSS 1. Whereas VSS 1 may provide openings in the short term, this structural stage is expected to regenerate tree cover in the long term. Refer to the silviculture report and the mplementation plan (appendix D) which provides minimum stocking guidelines that have been developed to assure canopy cover requirements are met.

Approximately 198,136 acres (61 percent) of the forested areas (within the project area) have an open reference condition that corresponds to mollic-integrade soils. The desired condition is to have a portion of these acres (29,017 acres) managed as a relatively open forest with trees typically aggregated in small groups within a grass/forb/shrub matrix (Woolsey 1911, Cooper 1960, White 1985, Pearson 1950, Covington et a1.1997, Abella and Denton 2009). See the soils specialist report for detailed information. Figure 52 displays the location of acres that would be managed for an open reference condition.

Table 94. Alternative B Amendment 2 Management of Canopy Cover and Ponderosa Pine with an Open Reference Condition in Goshawk Habitat (Coconino NF)

Current Coconino NF Forest Plan Direction	Proposed New Guideline Language*
Landscapes Outside Goshawk Post-fledgling Family Areas	
No similar direction in forest plan	**General: Within ponderosa pine stands, manage over time for uneven-aged stand conditions composed of heterogeneous mosaics of tree groups and single trees, with interspaces between tree groups. The size of tree groups, as well as sizes and shapes of interspaces, should be variable. Over time, the spatial location of the tree groups and interspaces may shift within the uneven-aged stand.**
General: The distribution of vegetation structural stages for ponderosa pine, mixed conifer and spruce-fir forests is 10% grass/forb/shrub (VSS 1), 10% seedling-sapling (VSS 2), 20% young forest (VSS 3), 20% mid-aged forest (VSS 4), 20% mature forest (VSS 5), 20% old forest (VSS 6). NOTE: The specified percentages are a guide and actual percentages are expected to vary + or – up to 3% (Coconino NF forest plan, p. 65-9).	General: **For the areas managed for tree crown development**, the distribution of vegetation structural stages for ponderosa pine, mixed conifer, and spruce-fir forests is 10 percent grass/forb/shrub (VSS 1), 10 percent seedling-sapling (VSS 2), 20 percent young forest (VSS 3), 20 percent mid-aged forest (VSS 4), 20 percent mature forest (VSS 5), and 20 percent old forest (VSS 6). Note: the specified percentages are a guide and actual percentages are expected to vary plus or minus up to 3 percent.
The distribution of VSS, tree density, and tree age are a product of site quality in the ecosystem management area. Use site quality to guide in the	No change

Current Coconino NF Forest Plan Direction	Proposed New Guideline Language*
distribution of VSS, tree density and tree ages. Use site quality to identify and manage dispersal PFA and nest habitat at 2–2.5 mile spacing across the landscape (Coconino NF forest plan, p. 65-9).	
Snags are 18" or larger d.b.h. and 30 feet or larger in height, downed logs are 12 inches in diameter and at least 8 feet long, woody debris is 3 inches or larger on the forest floor, canopy cover is measured with vertical crown projection on average across the landscape (Coconino NF forest plan, p. 65-9).	Snags are 18" or larger d.b.h. and 30 feet or larger in height, downed logs are 12 inches in diameter and at least 8 feet long, woody debris is 3 inches or larger on the forest floor, **canopy cover as defined by vertical crown projection is evaluated within mid-aged to old forest vegetation structural stage groups (VSS 4, 5, and 6).**
No corresponding forest plan direction	**Develop and maintain a highly diverse vegetation mosaic: 30 to 90 percent of the uneven-aged stand should be under ponderosa pine and deciduous tree crowns. Within areas managed for an open reference condition, 10 to 30 percent of the uneven-aged stand should be under ponderosa pine and deciduous tree crowns.**
No corresponding forest plan direction	**Tree group spatial distribution may be highly variable based on local site and current conditions; the interspaces between groups may range from 20 to 200 feet, but generally between 25 and 100 feet apart from drip line to adjacent drip line. This spacing of groups is not affected by single trees in the interspace.**
No corresponding forest plan direction	**Each tree group is generally dominated by one vegetation structure stage. The spatial arrangement of trees, high dispersion of VSS structural stage diversity, and interspaces comprise each uneven-aged forest stand. Collectively these stands aggregate to uneven-aged forest landscapes, similar to natural conditions.**
The order of preferred treatment for woody debris is: (1) prescribed burning, (2) lopping and scattering, (3) hand piling or machine grapple piling, (4) dozer piling (Coconino NF forest plan, p. 65-9).	No Change
Canopy Cover: Canopy cover guidelines apply only to mid-aged to old forest structural stages (VSS 4, VSS 5, and VSS 6) and not to grass/forb/shrub to young forest structural stages (VSS 1, VSS 2, and VSS 3) (Coconino NF forest plan, p. 65-9).	Canopy Cover: Canopy cover guidelines apply only to mid-aged to old forest structural stage **groups** (VSS 4, VSS 5, and VSS 6) and not to grass/forb/shrub to young forest structural stage **groups** (VSS 1, VSS 2, and VSS 3) **or in interspaces, natural meadows, grasslands, or other areas not managed for forest cover.**
Spruce-Fir: Canopy cover for mid-aged forest (VSS 4) should average 1/3 60% and 2/3 40%, mature forest (VSS 5) should average 60+%, and old forest (VSS 6) should average 60+%. Maximum opening size is 1 acre with a maximum width of 125 feet. Provide 2 groups of reserve trees per acre with 6 trees per group when opening size exceeds 0.5. Leave at least 3 snags, 5 downed logs, and 10–15 tons of woody debris per acre (Coconino NF forest plan, p. 65-9).	No Change

Current Coconino NF Forest Plan Direction	Proposed New Guideline Language*
Mixed Conifer: Canopy cover for mid-aged forest (VSS 4) should average 1/3 60+% and 2/3 40+%, mature forest (VSS 5) should average 50+%, and old forest (VSS 6) should average 60+%. Maximum opening size is up to 4 acres with a maximum width of up to 200 feet. Retain 1 group of reserve trees per acre of 3–5 trees per group for openings greater than 1 acre in size. Leave at least 3 snags, 5 downed logs, and 10–15 tons of woody debris per acre (Coconino NF forest plan, p. 65-10).	No Change
Ponderosa Pine: Canopy Cover for mid-aged forest (VSS 4) should average 40+%, mature forest (VSS 5) should average 40+%, and old forest (VSS 6) should average 40+%. Opening size is up to 4 acres with a maximum width of up to 200 feet. One group of reserve trees, 3–5 trees per group, will be left if the opening is greater than an acre in size. Leave at least 2 snags per acre, 3 downed logs per acre, and 5–7 tons of woody debris per acre (Coconino NF forest plan, p. 65-10).	Ponderosa Pine: Canopy cover for mid-aged forest (VSS 4) should average 40+ percent, mature forest (VSS 5) should average 40+ percent, and old forest (VSS 6) should average 40+ percent. Opening size is up to 4 acres with a maximum width of up to 200 feet. One group of reserve trees, three to five trees per group, will be left if the **created regeneration** opening is greater than an acre in size. Leave at least two snags per acre, three downed logs per acre, and 5 to 7 tons of woody debris per acre. **In acres managed for an open reference condition, canopy cover guidelines for VSS 4 through VSS 6 groups do not apply. One group of reserve trees, with a minimum of one to two trees per group will be left if the interspace size is greater than an acre in size. Interspace size is up to 4 acres.** Leave at least two snags per acre, three downed logs per acre, and 5 to 7 tons of woody debris per acre
Woodland: manage for uneven-age conditions to sustain a mosaic of vegetation densities (overstory and understory), age classes, and species composition well distributed across the landscape. Provide for reserve trees, snags, and down woody debris (Coconino NF forest plan, p. 65-10).	No Change
Vegetation Management – Within Post-fledgling Family Areas	
General: Provide for a healthy sustainable forest environment for the post-fledging family needs of goshawks. The principle difference between within the post-fledging family area and outside the post-fledging family area is the higher canopy cover within the post-fledging family area and smaller opening size within the post-fledging family area. Vegetative structural stage distribution and structural conditions are the same within and outside the post-fledgling family area (Coconino NF forest plan, p. 65-10).	No Change

Current Coconino NF Forest Plan Direction	Proposed New Guideline Language*
No similar direction in forest plan	**Canopy cover is evaluated at the group level within mid-aged to old forest structural stages groups (VSS 4, VSS 5, and VSS 6) and not within grass/forb/shrub to young forest structural stage groups (VSS 1, VSS 2, and VSS 3) or in interspaces, natural meadows and grasslands, or other areas not managed for forest conditions.**
Spruce-fir: Canopy Cover for mid-aged forest (VSS 4) should average 60+% and for mature (VSS 5) and old forest (VSS 6) should average 70+% (Coconino NF forest plan, p. 65-10).	No Change
Mixed Conifer: Canopy Cover for mid-aged (VSS 4) to old forest (VSS 6) should average 60+%.	No Change
Ponderosa Pine: Canopy Cover for mid-aged forest (VSS 4) should average 1/3 60+% and 2/3 50+%. Mature (VSS 5) and old forest (VSS 6) should average 50+% (Coconino NF forest plan, p. 65-10).	No Change
No corresponding forest plan direction	**Develop and maintain a highly diverse vegetation mosaic: 30 to 90 percent of the uneven-aged stand should be under ponderosa pine and deciduous tree crowns.**
No corresponding forest plan direction	**Tree group spatial distribution may be highly variable based on local site and current conditions; the interspaces between groups may range from 20 to 200 feet, but generally between 25 and 100 feet apart from drip line to adjacent drip line. This spacing of groups is not affected by single trees in the interspace.**
No corresponding forest plan direction	**Each tree group is generally dominated by one vegetation structure stage. The spatial arrangement of trees, high dispersion of vegetation structural stage diversity, and interspaces comprise each uneven-aged forest stand. Collectively these stands aggregate to uneven-aged forest landscapes, similar to natural conditions.**
Glossary	
No corresponding forest plan language	**Interspaces: The open space between tree groups intended to be managed for grass/forb/shrub vegetation during the long term. Interspaces may include scattered single trees.**
No corresponding forest plan language	**Open reference condition: 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.**
No corresponding forest plan language	**Stands: 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.**

* Edited and new/added text is **bolded.**

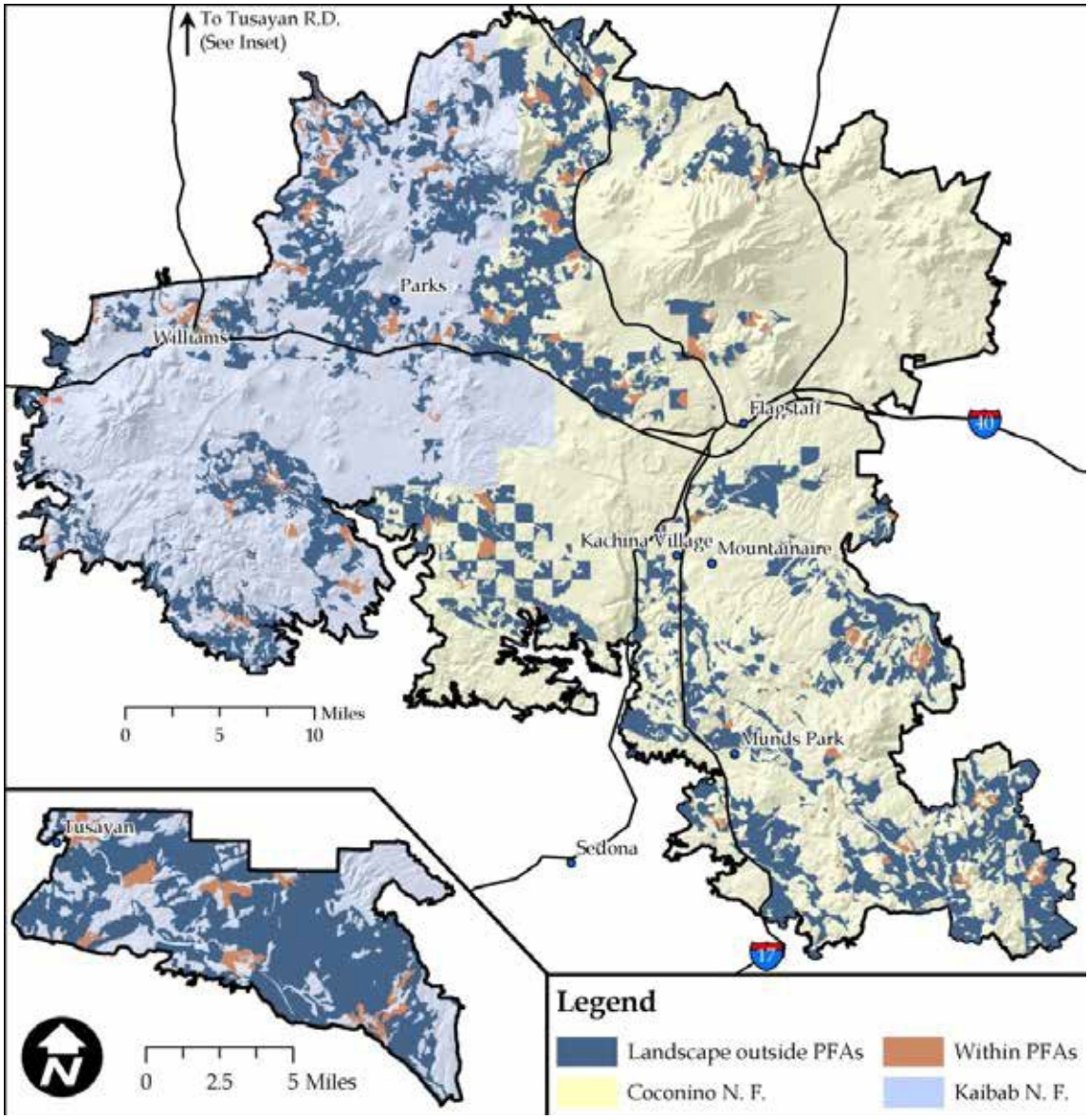

Figure 51. Alternative B goshawk habitat subject to canopy cover requirements in VSS 4 and VSS 6 (Coconino and Kaibab NF)

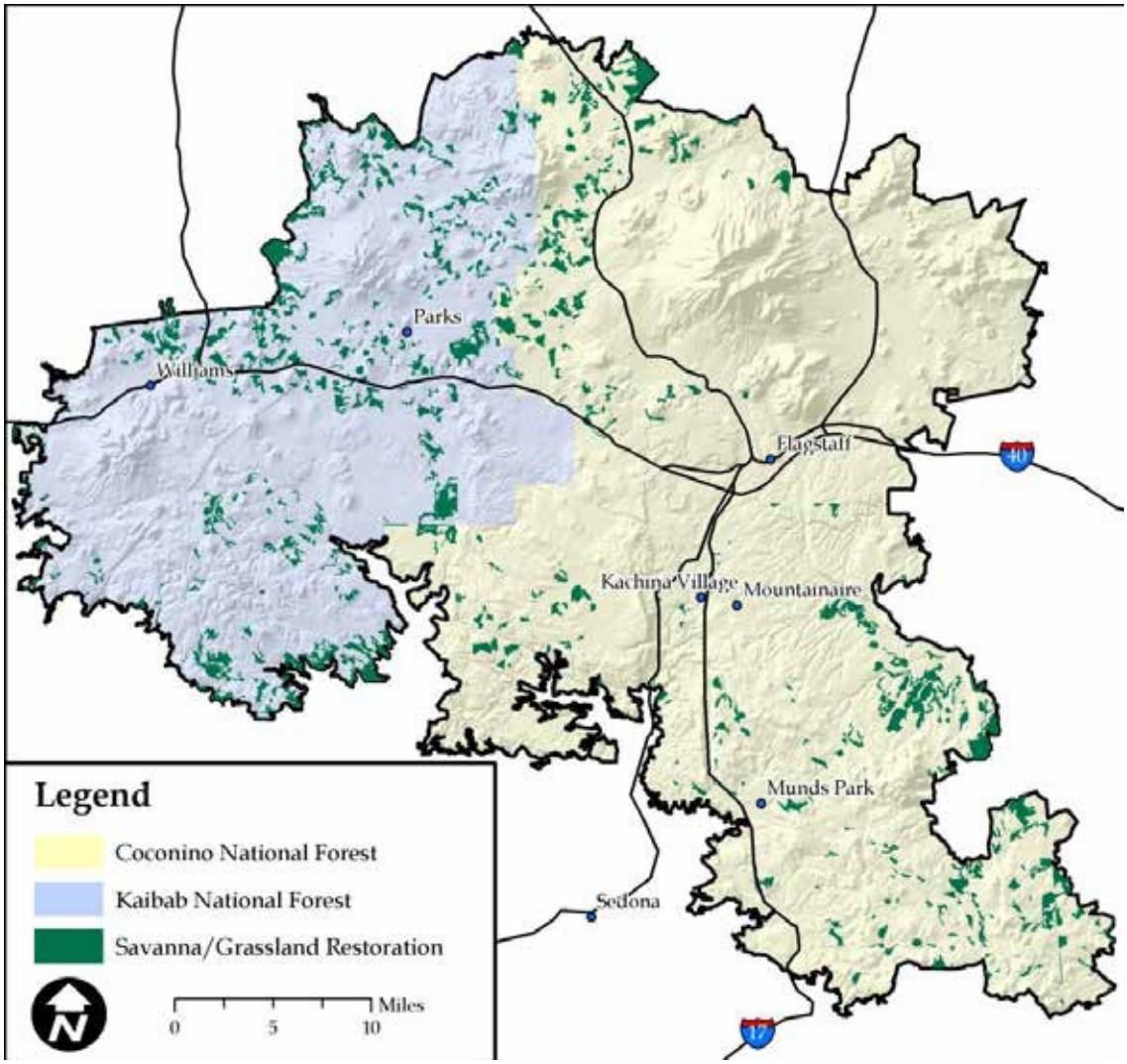

Figure 52. Alternative B general locations of savanna and grassland restoration treatments (Coconino NF and Kaibab NF)

Significance Evaluation

Per FSM 1926.51, changes to the land management plan that are not significant can result from:

1. Actions that do not significantly alter the multiple-use goals and objectives for long term land and resource management.
2. Adjustments of management area boundaries or management prescriptions resulting from further onsite analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long term land and resource management.
3. Minor changes in standards and guidelines.
4. Opportunities for additional projects or activities that will contribute to achievement of the management prescription.

Per FSM 1926.52, circumstances that may cause a significant change to a land management plan include:

1. Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected (see section 219.10(e) of the planning regulations in effect before November 9, 2000 (see 36 CFR parts 200 to 299, revised as of July 1, 2000)), and
2. Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

Analysis demonstrated that the proposed amendment is nonsignificant (FSM 1926.51) because the actions would not measurably alter the multiple-use goals and objectives for long term land and resource management and the actions. How actions could potentially affect timing, location and size, relationship to forest goals, objectives, outputs, and management prescriptions was evaluated.

Timing: In terms of timing, the forest plan has been in place (and amended) since 1987 and plan revision efforts are underway.

Location and Size: Suitable goshawk habitat on the Coconino NF encompasses about 791,897 acres (Green 2011, draft unpublished data). Approximately 399,633 acres of goshawk habitat is within the 4FRI project area.

- The canopy cover portion of the amendment would affect 139,308 acres (18 percent) of all goshawk habitat on the Coconino NF and about 35 percent of goshawk habitat within the project area. For this reason, location (confined to the ponderosa pine cover type) and size was determined to be nonsignificant.
- Managing 29,017 acres of ponderosa pine for an open reference condition would affect approximately 4 percent of all suitable goshawk habitats on the forest and about 8 percent of goshawk habitat within the project area.

For these reasons, location and size was determined to be nonsignificant. The amendment would facilitate moving over 139,000 acres toward the desired forest structure (tree groups and herbaceous openings) that maximizes prey base species habitat and allows for reintroduction of fire into the ecosystem; and moves over 29,000 acres toward historic reference conditions.

Relationship to Forest Goals and Objectives: Alternative B would meet goshawk forest plan canopy cover requirements in VSS 4 to 6 in all acres except the 29,017 acres managed for an open reference condition. In all acres but the open reference condition acres, actions would move toward forest plan desired VSS size class distribution.

The amendment is consistent with forest goals for wildlife and fish of managing habitat to maintain viable populations of wildlife and fish species and improve habitat for selected species (Coconino National Forest Plan, replacement page 22-1) and to improve habitat for listed threatened, endangered, or sensitive species of plants and animals and other species as they become threatened or endangered (Coconino National Forest Plan, replacement page 23).

Relationship to Management Prescriptions: Table 95 displays the acres associated with Coconino NF management areas (MAs).

Canopy Cover: The acres of forestwide MAs affected by the canopy cover portion of the amendment (139,308 acres total) would range from 3 percent (MA 4) to 35 percent (MA 38). The amendment is specific to this project and would not impose definition and clarification requirements on the future management of canopy cover within goshawk habitat.

Open Reference Condition: The acres of forestwide MAs affected by the open reference condition portion of the amendment (29,017 acres total) would range from 1 percent (MA 10) to 9 percent (MA 35). The amendment is consistent with the management emphasis of providing for multiple uses that includes wildlife habitat (MA 3) and moving ponderosa pine toward desired forest structure, including northern goshawk habitats (MA 35). The amendment is specific to this project and would not impose requirements on the future management of the 29,017 acres of goshawk non-PFA; however, forest plan revision decisions may change future management.

Table 95. Alternative B amendment 2 management area acres (Coconino NF)

MA	MA Description	Forestwide Acres	Proposed Amendment Acres	Forestwide Acres Affected (Percent)
Canopy Cover				
MA 3	Ponderosa pine below 40% slopes	511,015	92,301	18
MA 35	Lake Mary watershed	62,536	14,337	23
MA 38	West	36,298	12,844	35
MA 6	Unproductive Timber Lands	67,146	4,929	7
MA 37	Walnut Canyon	20,566	4,536	22
MA 20	Highway 180 corridor	7,608	2,087	27
MA 4	Ponderosa pine and mixed conifer >40%	46,382	1,612	3
MA 36	Schultz	21,289	1,815	9
*MA 9, 28, 5, 4, 10, 36, 34, 7, 12, 18, 15, and 14	See chapter 1, table 14	549,579	4,847	<1
Open Reference Condition				
MA 3	Ponderosa pine below 40% slopes	511,015	19,010	4
MA 35	Lake Mary watershed	62,536	5,840	9
MA 10	Transition grassland	160,494	1,288	1
MA 38	West	36,298	1,073	3
**MA 10, 9, 7, 12, 34, 28, and 5	See chapter 1, table 14	474,169	1,806	<1

*Acres of MAs range from 7 to 1,215 and were aggregated into one category.
**Acres of MAs range from 3 to 655 and were aggregated into one category.

Relationship to Outputs: Outputs identified in the current forest plan are associated with MMBF of sawtimber sales and products (meet demand for timber while reducing conflict with other

resources), MMBF of firewood sold and free use (provide access to firewood), grazing capacity (MAUM), and permitted livestock use (MAUM).

The canopy cover portion of the amendment provides clarification and disclosure of methods for meeting forest plan requirements. It has no relationship to outputs or to the relationship between the level of goods (timber, firewood) and services and would not result in a change land productivity or timber suitability classification.

Managing a portion of the landscape for an open reference condition affects about 29,017 acres of an estimated 626,326 acres of suitable timber lands (USDA 1987). The management strategy on these acres would result in an extended rotation period between treatments beyond what was considered in developing the long-term sustained yield output in the forest plan. In the short term (10-year period), the amendment affects about 5 percent of the suitable land base. However, due to the minimal acres affected, the amendment would not measurably alter outputs in the foreseeable future on a forestwide basis or change the long-term relationship between levels of goods (timber, firewood) and services. There would be no change in land productivity; therefore, it would not affect timber suitability classification.

Whether the 29,017 acres would continue to be managed as suitable timber in the long term will be evaluated during the forest plan revision process. No portion of the amendment would affect decisions that have been made through separate analyses on grazing capacity or permitted livestock use.

Amendment 3. Effect Determination for Cultural Resources (Coconino NF)

Amendment 3 is a specific, one-time variance for the Coconino NF restoration project. Once the project is complete, current forest plan direction would apply to the project area. The language proposed does not apply to any other forest project. The amendment would be authorized per direction in the National Forest Management Act of 1976 (NFMA) and its implementing regulations found in 36 CFR 219 (1982).

Amendment Description

The amendment deletes the standard that addresses achieving a “no effect” determination and adds the words “or no adverse effect” to the remaining standard. Management strives to achieve a “no effect” or “no adverse effect” determination.

Background

The Coconino NF forest plan as written has some conflicting direction regarding managing significant or potentially significant sites. One standard (which would be amended for this project) directs management to **strive** to achieve a “no effect” determination. A second standard (which would be deleted for this project) directs management to achieve a “no effect” determination in consultation with SHPO and ACHP (36 CFR 800). An amendment is proposed to recognize that there could be effects that are not adverse, and that there could be adverse effects that may or may not be fully mitigated. Table 96 displays current and proposed forest plan language. New or edited text is displayed in **bold** type.

Table 96. Alternative B amendment 3 effect determination for cultural resources (Coconino NF)

Current Coconino NF Forest Plan Direction	Proposed New Standards and Guidelines Language*
Cultural Resources	
Consult with Native Americans when projects and activities are planned in sites or areas of known religious or cultural importance (Coconino NF forest plan, page 52).	No Change
Make boughs and herbaceous plant parts used for Native American religious and ceremonial purposes available under conditions and procedures that minimize restrictions, consistent with laws, regulations, and agreements with tribes. The written authorization to the Hopi Tribe for gathering without specific individual permits is an example. This authorization does not include such items as firewood removed from the forest or Kiva logs, which do require a permit (Coconino NF forest plan, page 52).	No Change
The forest complies with the National Historic Preservation Act (NHPA) in decisions involving interactions between cultural and other resources. Cultural resources are managed in coordination with the State Historic Preservation Plan (SHPO). Until evaluated, the minimal level of management for all sites is avoidance and protection (Coconino NF forest plan, page 52).	No Change
Specific standards and guidelines derived from the settlement agreement for the Save the Jemez lawsuit are subject to adjustment, should that agreement be modified. In that event an amendment to the forest plan will be issued (Coconino NF forest plan, page 52).	No Change
Project undertakings are inventoried for cultural resources and areas of Native American religious use. Inventory intensity complies with regional policy, and the settlement agreement for the Save The Jemez Lawsuit, and is determined in consultation with the State Historic Preservation Officer (SHPO). Generally, inventory standards are: One hundred percent survey of all projects causing complete surface disturbance; when less than 100 percent survey is deemed appropriate, the specific sample fraction surveyed is determined in consultation with the State Historic Preservation Officer and is generally greater than 10 percent. Factors determining when sampling is appropriate include projects with dispersed or minimal impacts, low expected archaeological site density, ground cover, and types of archaeological sites present in the area; consultation with appropriate Native American groups; consultation with the SHPO, and if necessary, the Advisory Council on Historic Preservation (ACHP), before project implementation (Coconino NF forest plan, page 52-1).	No Change
Significant, or potentially significant, inventoried sites are managed to achieve a "No Effect" determination, in consultation with the SHPO and ACHP (36 CFR 800) (Coconino National Forest plan, page 53).	**Deleted**
Monitoring during and after project implementation is done to document site protection and condition (Coconino National Forest plan, page 53).	No Change
Management strives to achieve a "No Effect" determination (Coconino National Forest plan, page 53).	**Management strives to achieve a "no effect" or "no adverse effect" determination**
When sample surveys, rather than 100 percent survey coverage, are done for project clearances, survey locations and sample intensity are based on areas	No Change

Current Coconino NF Forest Plan Direction	Proposed New Standards and Guidelines Language*
of greatest project impact, likely locations for cultural resource sites based on archaeological experience, land management planning, dispersion of sample coverage, certain topographic features specified in the Save the Jemez lawsuit settlement agreement, and likely areas based on the forest site density predictions (Coconino National Forest plan, page 53).	
Identified sites are evaluated for their National Register eligibility when they are severely damaged, when they will be impacted by an undertaking, or information about the uniqueness, commonness, and characteristics of their site class are sufficiently known to make an informed decision. Sites for which determinations of eligibility have not been made are managed as if they are eligible, unless consultation with the SHPO indicates otherwise (Coconino National Forest plan, page 53).	No Change
For each full-time professional cultural resource specialist employed by the forest, at least two site nominations, one archaeological district nomination, or one thematic or multiple resource nomination will be made each year to the National Register of Historic Places. Or, alternatively, the forest will coordinate with other forests to prepare a joint district, thematic, or multiple resource nomination (Coconino National Forest plan, page 53).	No Change
Inventoried sites allocated to management categories, and/or eligible or potentially eligible for the NRHP or potentially eligible for the NRHP are systematically revisited by regularly scheduled patrols, and by cultural resources specialists to assess natural deterioration, vandalism, or pilfering. Inspections are made at least biannually of properties that have been listed in or nominated to the National Register. Sites most susceptible to natural deterioration and/or human disturbance are monitored frequently. Rapid natural deterioration, or susceptibility to such, requires stabilization, restoration, and/or data recovery. Vandalism or pilfering requires protective measures such as signing, remote sensing, increased patrolling, investigations, stabilization, restoration, and/or data recovery. Specific sites or areas may be closed to off-road driving and withdrawn from mineral entry. Law enforcement is planned and implemented to minimize resource damage and user conflicts. Signing is appropriate to inform and educate the public and minimize direct law enforcement activity. Aggressively pursue violations (Coconino National Forest plan, page 53).	No Change
Continue to interpret cultural resources through lectures, tours, papers, reports, publications, brochures, displays, films, trails, signs, and other opportunities (Coconino National Forest plan, page 54).	No Change
Develop a program to complete 100 percent coverage of the forest's cultural resource inventory by 2000 (Coconino National Forest plan, page 54).	No Change
The first priorities for cultural resources protection, enhancement, and interpretation are those sites that are easily accessible, have major interpretive potential, or are in major need of repair. Priority sites for signing are the C. Hart Merriam Base Camp, Honanki Cliff Dwellings, Elden Pueblo, Sacred Mountain, Palatki Cliff Dwellings, and Clear Creek Ruins. Priority sites for repair and stabilization are Honanki Cliff Dwellings, Palatki Cliff Dwellings, Sacred Mountain, Clear Creek Cliff Dwelling, and General Springs Cabin. Priority sites for developing interpretive brochures are Elden Pueblo, Sacred Mountain, Red Tank Draw Petroglyphs, Honanki Cliff Dwellings, Palatki Cliff Dwellings, and Clear Creek Ruins. Priorities are to:	No Change

Current Coconino NF Forest Plan Direction	Proposed New Standards and Guidelines Language*
Survey to clear projects. Survey to fill in gaps in existing inventory coverage. Survey areas of known high site densities. Survey areas that would do the most to answer current archaeological questions (Coconino National Forest plan, page 54).	
Computerize cultural resource site information by 1990 (Coconino National Forest plan, page 54).	No Change
Maintain a form for tracking compliance of each undertaking with the requirements of the National Historic Preservation Act (Coconino National Forest plan, page 54).	No Change
Stabilize or repair damaged National Register sites or other sites funded by regional priority (Coconino National Forest plan, page 54).	No Change
Continue to develop the Elden Pueblo Interpretive Site and the cooperative education program with the Museum of Northern Arizona (Coconino National Forest plan, page 54).	No Change
Encourage universities to conduct summer field schools to assist in cultural resource survey and excavation work and to provide the forest with scientific knowledge (Coconino National Forest plan, page 54).	No Change
Periodically focus media attention on Elden Pueblo and/or other sites to educate the public and further volunteer interest in resource management. Work with community organizations, businesses, and other agencies to promote Arizona Archaeology Week. Feature significant finds and significant damage in the media to increase public awareness of benefits and problems (Coconino National Forest plan, page 54).	No Change

* Edited and new/added text is **bolded.**

Significance Evaluation

Per FSM 1926.51, changes to the land management plan that are not significant can result from:

1. Actions that do not significantly alter the multiple-use goals and objectives for long term land and resource management.
2. Adjustments of management area boundaries or management prescriptions resulting from further onsite analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long term land and resource management.
3. Minor changes in standards and guidelines.
4. Opportunities for additional projects or activities that will contribute to achievement of the management prescription.

Per FSM 1926.52, circumstances that may cause a significant change to a land management plan include:

1. Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected (see section 219.10(e) of the

planning regulations in effect before November 9, 2000 (see 36 CFR parts 200 to 299, revised as of July 1, 2000)), and

2. Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

The proposed amendment is nonsignificant (FSM 1926.51) because multiple-use goals and objectives for long term land and resource management and its actions would not be altered. How the amendment could potentially affect timing, location and size, relationship to forest goals, objectives, outputs, and management prescriptions was evaluated:

Timing: In terms of timing, the forest plan has been in place (and amended) since 1987 and plan revision efforts are underway.

Location and Size: The amendment is specific to the 593,211 acres of proposed treatments in this project. This affects about 33 percent of the Coconino NF (which totals 1,821,495 acres). This would not have an important effect on the entire land management plan or a large portion of the planning area. For this reason, location and size was determined to be nonsignificant.

Relationship to Forest Goals and Objectives: The amendment would not affect attainment of forest goals and objectives for cultural resources. Cultural resource sites would be located and protected from project activities according to direction in FSM 2360 and 2430 (Coconino NF Forest Plan, page 50) and the requirements of 36 CFR 800 including 36 CFR 800.5, which provides direction for assessing adverse effects and proposing a finding of no adverse effect. Consultation with AZ SHPO would occur as required, and regulation 36 CFR 800 would be followed and met.

Relationship to Management Prescriptions: The amendment would apply to all 23 management areas (MA) as described in the Coconino National Forest plan (pages 46 to 206-113) and in chapter 1 of the DEIS. The amendment would not affect management of the MAs. All cultural resources are currently managed to minimize impacts and to achieve a “no effect” or “no adverse effect” determination whenever possible, in consultation with AZ SHPO, the council, and other consulting parties.

Relationship to Outputs: Outputs identified in the forest plan are associated with MMBF of sawtimber sales and products (meet demand for timber while reducing conflict with other resources), MMBF of firewood sold and free use (provide access to firewood), grazing capacity (MAUM), and permitted livestock use (MAUM).The amendment would not affect outputs or change the long-term relationship between levels of goods (timber, firewood) and services. All cultural resources are managed to minimize impacts and to achieve a “no effect” or “no adverse effect” determination whenever possible, in consultation with AZ SHPO, the council, and other consulting parties regardless of forest plan desired outputs.

Alternative B – Kaibab National Forest Site-Specific Nonsignificant Forest Plan Amendments

Two site-specific, nonsignificant forest plan amendments are proposed for alternative B.

Two Related Planning Efforts

A revised MSO recovery plan, issued by the U.S. Fish and Wildlife Service (hereafter referred to as FWS) was finalized in December of 2012 (USDI 2012). The current forest plan is consistent with the previous recovery plan (USDI 1995). At some point in time, the Kaibab NF may amend its forest plan to be consistent with the revised recovery plan. For this analysis, a forest plan amendment would be needed to utilize the revised recovery plan direction if it is different than what is currently included in the Kaibab NF land management plan.

Currently, the Kaibab NF is revising its forest plan. An analysis was conducted to determine how the proposed amendments align with the draft plan (as currently written) (USDA 2012). A revised forest plan may affect the need for amendments in the following ways:

Amendment 1: The current Kaibab NF forest plan has canopy cover requirements in VSS 4 to VSS 6, has requirements for managing goshawk habitat for a balance of VSS, and requirements for managing for three to five reserve trees in management created openings (greater than 1 acre in ponderosa pine in goshawk foraging areas and PFAs). Management direction for goshawk habitat is presented differently in the current draft forest plan (USDA 2012, page 14 to page 18). Amendment 1 would be in alignment with the draft forest plan (as currently written) as it: (1) provides for managing crowns of trees within the mid-aged to old groups as interlocking or nearly interlocking (USDA 2012 page 15); (2) manages forest conditions in some areas (e.g., goshawk PFAs, MSO protected areas, drainages, and steep north-facing slopes) with 10 to 20 percent higher basal area in mid-aged to old tree groups (USDA 2012, page 16); and(3) manages for known and replacement nest areas (USDA 2012, page 45).

The draft forest plans allow for project specific plan amendments. The portion of the amendment that allows deviation from maintaining three to five reserve trees for acres and having openings up to 90 percent for lands managed for an open reference condition would be consistent with what is allowed at the project level. The desired condition in ponderosa pine at the landscape scale is a ponderosa pine forest vegetation community with a mosaic of forest conditions composed of structural stages ranging from young to old trees. The forest is generally uneven-aged and open. Groups of old trees are mixed with groups of younger trees. Occasional areas of even-aged structure are present. Denser tree conditions exist in some locations such as north-facing slopes, canyons, and drainage bottoms (USDA 2012, page 16).

The amendment would still be required. The terms “interspaces,” “open reference condition,” and “stands” do not appear in the draft forest plan (as currently written). The amendment would need to continue providing this definition. The amendment would provide additional site-specific direction and definitions that apply to landscape restoration that are not precluded by the draft forest plan.

Amendment 2: The amendment would be in alignment with the draft forest plan (as currently written) in that it defers management of MSO to direction in the MSO recovery plan. The revised (2012) MSO recovery plan does not limit tree removal from within PACs to a specific d.b.h., nor does it require a specific method for habitat monitoring. Although restricted habitat is referred to as “recovery habitat” and “nest/roost habitats” in the 2012 revised plan (USDI 2012, pp. 3, 4), the project’s desired conditions for nesting and roosting habitat is consistent with the revised recovery plan. The revised plan still recommends that a percentage (10 to 25 percent) of recovery habitat be managed as nesting/roosting (USDI

2012, page VIII). Designating habitat in the project with the best potential would move toward desired percentages in recovery habitat. Amendment 2 would provide additional site-specific requirements at the project scale that would not be precluded by the revised forest plan or the revised recovery plan (USDI 2012).

Amendment 1. Management of Canopy Cover and Ponderosa Pine with an Open Reference Condition within Goshawk Habitat (Kaibab NF)

Amendment 1 is a specific, one-time variance for the Kaibab NF restoration project. Once the project is complete, current forest plan direction would apply to the project area. The language proposed does not apply to any other forest project. The amendments would be authorized per direction in the National Forest Management Act of 1976 (NFMA) and its implementing regulations found in 36 CFR 219 (1982).

Amendment Description

In the "Vegetation Management – Landscapes Outside Goshawk Post-fledgling Family Areas" and "Vegetation Management –Within Post-fledgling Family Areas" section of the forest plan, a nonsignificant plan amendment would: (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) allows 27,637 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. Edited or added/new text is **bolded** in the "Proposed New Guideline Language" column in table 97. Figure 53 and figure 54 display general locations affected by canopy cover and savanna and grassland restoration treatments.

The Kaibab National Forest plan (hereafter referred as "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** are defined as the open space between tree groups intended to be managed for grass/forb/shrub vegetation during the long term. Interspaces may include scattered single trees.
- **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.

Background

Canopy cover is defined as “the percentage of a fixed area covered by the crowns of plants delimited by a vertical projection of the outermost perimeter of the spread of foliage” (Reynolds et al. 1992). Obtaining consistent results has been difficult; even the definition of the term is dependent on the method of measurement. To resolve this issue, the Forest Service used the Forest Vegetation Simulation (FVS) crown width model as the basis for developing stocking densities that would achieve desired canopy cover levels.

The forest plan directs projects to measure “vertical crown projection on average across the landscape” (see Kaibab NF land management plan, page 29). Whereas the forest plan clearly provides direction for meeting minimum canopy cover percentages in VSS 4 to 6, the plans lack explicit language for measuring canopy cover. Although the forest plan provides direction and desired conditions for the vegetation structural stages, the forest plan does not describe the relationship between nonforested areas (interspace) and natural openings across the landscape.

Nonforested areas (interspaces) occur between individual trees, tree clumps, and tree groups. These nonforested areas (interspaces) are not equivalent to VSS 1. Whereas VSS 1 may provide openings in the short term, this structural stage is expected to regenerate tree cover in the long term. Refer to the silviculture report and the implementation plan (appendix D) which provides minimum stocking guidelines that have been developed to assure canopy cover requirements are met.

Approximately 198,136 acres (61 percent) of the forested areas (within the project area) have an open reference condition that corresponds to mollic-integrade soils. The desired condition is to have a portion of these acres (27, 637 acres) managed as a relatively open forest with trees typically aggregated in small groups within a grass/forb/shrub matrix (Woolsey 1911, Cooper 1960, White 1985, Pearson 1950, Covington et a1.1997, Abella and Denton 2009). See the soils specialist report for detailed information.

Table 97. Alternative B amendment 1 – management of canopy cover and ponderosa pine with an open reference condition in goshawk habitat (Kaibab NF)

Current Kaibab NF Forest Plan Direction	Proposed New Guideline Language*
Landscapes Outside Goshawk PFAs	
No corresponding forest plan direction (see Kaibab NF forest plan, p. 29).	**General: Within ponderosa pine stands, manage over time for uneven-aged stand conditions composed of heterogeneous mosaics of tree groups and single trees, with interspaces between tree groups. The size of tree groups, as well as sizes and shapes of interspaces, should be variable. Over time, the spatial location of the tree groups and interspaces may shift within the uneven-aged stand.**
General: The distribution of vegetation structural stages for ponderosa pine, mixed conifer and spruce-fir forests is 10% grass/forb/shrub (VSS 1), 10% seedling-sapling (VSS 2), 20% young forest (VSS 3), 20% mid-aged forest (VSS 4), 20% mature forest (VSS 5), 20% old forest (VSS 6). NOTE: The specified percentages are a guide and actual percentages are expected to vary + or – up to 3% (Kaibab NF Forest Plan, p. 29).	General: **For the areas managed for tree crown development**, the distribution of vegetation structural stages for ponderosa pine, mixed conifer and spruce-fir forests is 10 percent grass/forb/shrub (VSS 1), 10 percent seedling-sapling (VSS 2), 20 percent young forest (VSS 3), 20 percent mid-aged forest (VSS 4), 20 percent mature forest (VSS 5), and 20 percent old forest (VSS 6). Note: the specified percentages are a guide and actual percentages are expected to vary plus or minus up to 3 percent.
The distribution of VSS, tree density, and tree age are a product of site quality in the ecosystem management area. Use site quality to guide in the distribution of VSS, tree density and tree ages. Use site quality to identify and manage dispersal PFA and nest habitat at 2 to 2.5 mile spacing across the landscape (Kaibab NF forest plan, p.29).	No Change
Snags are 18" or larger d.b.h. and 30 feet or larger in height, downed logs are 12 inches in diameter and at least 8 feet long, woody debris is 3 inches or larger on the forest floor, canopy cover is measured with vertical crown projection on average across the landscape (Kaibab NF forest plan, p. 29).	Snags are 18" or larger d.b.h. and 30 feet or larger in height, downed logs are 12 inches in diameter and at least 8 feet long, woody debris is 3 inches or larger on the forest floor, **canopy cover as defined by vertical crown projection is evaluated within mid-aged to old forest vegetation structural stage groups (VSS 4, 5, and 6).**
No corresponding forest plan direction	**Develop and maintain a highly diverse vegetation mosaic: 30 to 90 percent of the uneven-aged stand should be under ponderosa pine and deciduous tree crowns. Within areas managed for an open reference condition, 10 to 30 percent of the uneven-aged stand should be under ponderosa pine and deciduous tree crowns.**
No corresponding forest plan direction	**Tree group spatial distribution may be highly variable based on local site and current conditions; the interspaces between groups may range from 20 to 200 feet, but generally between 25 and 100 feet apart from drip line to adjacent drip line. This spacing of groups is not affected by single trees in the interspace.**

Current Kaibab NF Forest Plan Direction	Proposed New Guideline Language*
No corresponding forest plan direction	**Each tree group is generally dominated by one vegetation structure stage. The spatial arrangement of trees, high dispersion of vegetation structural stage diversity, and interspaces comprise each uneven-aged forest stand. Collectively these stands aggregate to uneven-aged forest landscapes, similar to natural conditions.**
The order of preferred treatment for woody debris is: (1) prescribed burning, (2) lopping and scattering, (3) hand piling or machine grapple piling, (4) dozer piling (Kaibab NF forest plan, p. 29).	No Change
Canopy Cover: Canopy cover guidelines apply only to mid-aged to old forest structural stages (VSS 4, VSS 5, and VSS 6) and not to grass/forb/shrub to young forest structural stages (VSS 1, VSS 2, and VSS 3) (Kaibab NF forest plan, p. 29).	Canopy Cover: Canopy cover guidelines apply only to mid-aged to old forest structural stage **groups** (VSS 4, VSS 5, and VSS 6) and not to grass/forb/shrub to young forest structural stage **groups** (VSS 1, VSS 2, and VSS 3) **or in interspaces, natural meadows, grasslands, or other areas not managed for forest cover.**
Spruce-Fir: Canopy cover for mid-aged forest (VSS 4) should average 1/3 60% and 2/3 40%, mature forest (VSS 5) should average 60+%, and old forest (VSS 6) should average 60+%. Maximum opening size is 1 acre with a maximum width of 125 feet. Provide 2 groups of reserve trees per acre with 6 trees per group when opening size exceeds 0.5. Leave at least 3 snags, 5 downed logs, and 10–15 tons of woody debris per acre (Kaibab NF forest plan, p. 29).	No Change
Mixed Conifer: Canopy cover for mid-aged forest (VSS 4) should average 1/3 60+% and 2/3 40+%, mature forest (VSS 5) should average 50+%, and old forest (VSS 6) should average 60+%. Maximum opening size is up to 4 acres with a maximum width of up to 200 feet. Retain 1 group of reserve trees per acre of 3–5 trees per group for openings greater than 1 acre in size. Leave at least 3 snags, 5 downed logs, and 10–15 tons of woody debris per acre (Kaibab NF forest plan, pp. 29–30).	No Change
Ponderosa Pine: Canopy Cover for mid-aged forest (VSS 4) should average 40+%, mature forest (VSS 5) should average 40+%, and old forest (VSS 6) should average 40+%. Opening size is up to 4 acres with a maximum width of up to 200 feet. One group of reserve trees, 3–5 trees per group, will be left if the opening is greater than an acre in size. Leave at least 2 snags per acre, 3 downed logs per acre, and 5–7 tons of woody debris per acre (Kaibab NF forest plan, p.30).	Ponderosa Pine: Canopy cover for mid-aged forest (VSS 4) should average 40+ percent, mature forest (VSS 5) should average 40+ percent, and old forest (VSS 6) should average 40+ percent. Opening size is up to 4 acres with a maximum width of up to 200 feet. One group of reserve trees, three to five trees per group, will be left if the **created regeneration** opening is greater than an acre in size. Leave at least two snags per acre, three downed logs per acre, and 5 to 7 tons of woody debris per acre. **In acres managed for an open reference condition, canopy cover guidelines for VSS 4 through VSS 6 groups would not apply. One group of reserve trees, with a minimum of one to two trees per group will be left if the interspace size is greater than an acre in size.**

Current Kaibab NF Forest Plan Direction	Proposed New Guideline Language*
	Interspace size is up to 4 acres. Leave at least two snags per acre, three downed logs per acre, and 5 to7 tons of woody debris per acre.
Woodland: manage for uneven age conditions to sustain a mosaic of vegetation densities (overstory and understory), age classes, and species composition well distributed across the landscape. Provide for reserve trees, snags, and down woody debris (Kaibab NF forest plan, p. 30).	No Change
Vegetation Management – Within PFAs	
General: Provide for a healthy sustainable forest environment for the post-fledgling family needs of goshawks. The principle difference between within the post-fledgling family area and outside the post-fledgling family area is the higher canopy cover within the post-fledgling family area and smaller opening size within the post-fledgling family area. Vegetative structural stage distribution and structural conditions are the same within and outside the post-fledgling family area (Kaibab NF forest plan, p. 30).	No Change
No corresponding forest plan direction	**Canopy cover is evaluated at the group level within mid-aged to old forest structural stages groups (VSS 4, VSS 5, and VSS 6) and not within grass/forb/shrub to young forest structural stage groups (VSS 1, VSS 2, and VSS 3) or in interspaces, natural meadows and grasslands, or other areas not managed for forest conditions.**
Spruce-fir: Canopy Cover for mid-aged forest (VSS 4) should average 60+% and for mature (VSS 5) and old forest (VSS 6) should average 70+% (Kaibab NF forest plan, p. 30).	No Change
Mixed Conifer: Canopy Cover for mid-aged (VSS 4) to old forest (VSS 6) should average 60+% (Kaibab NF plan, p. 30).	No Change
Ponderosa Pine: Canopy Cover for mid-aged forest (VSS 4) should average 1/3 60+% and 2/3 50+%. Mature (VSS 5) and old forest (VSS 6) should average 50+% (Kaibab NF forest plan, p. 30).	No Change
Woodland: Maintain existing canopy cover levels (Kaibab NF plan, p. 30)	No Change
No corresponding forest plan direction	**Develop and maintain a highly diverse vegetation mosaic: 30 to 90 percent of the uneven-aged stand should be under ponderosa pine and deciduous tree crowns.**
No corresponding forest plan direction	**Tree group spatial distribution may be highly variable based on local site and current conditions; the interspaces between groups may range from 20 to 200 feet, but generally between 25 and 100 feet apart from**

Current Kaibab NF Forest Plan Direction	Proposed New Guideline Language*
	drip line to adjacent drip line. This spacing of groups is not affected by single trees in the interspace.
No corresponding forest plan direction	**Each tree group is generally dominated by one vegetation structure stage. The spatial arrangement of trees, high dispersion of VSS structural stage diversity, and interspaces comprise each uneven-aged forest stand. Collectively these stands aggregate to uneven-aged forest landscapes, similar to natural conditions.**
Glossary	
No corresponding forest plan direction	**Interspaces: The open space between tree groups intended to be managed for grass/forb/shrub vegetation during the long term. Interspaces may include scattered single trees.**
No corresponding forest plan direction	**Stands: 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.**
No corresponding forest plan direction	**Open reference condition: 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.**

* Edited and new/added text is **bolded.**

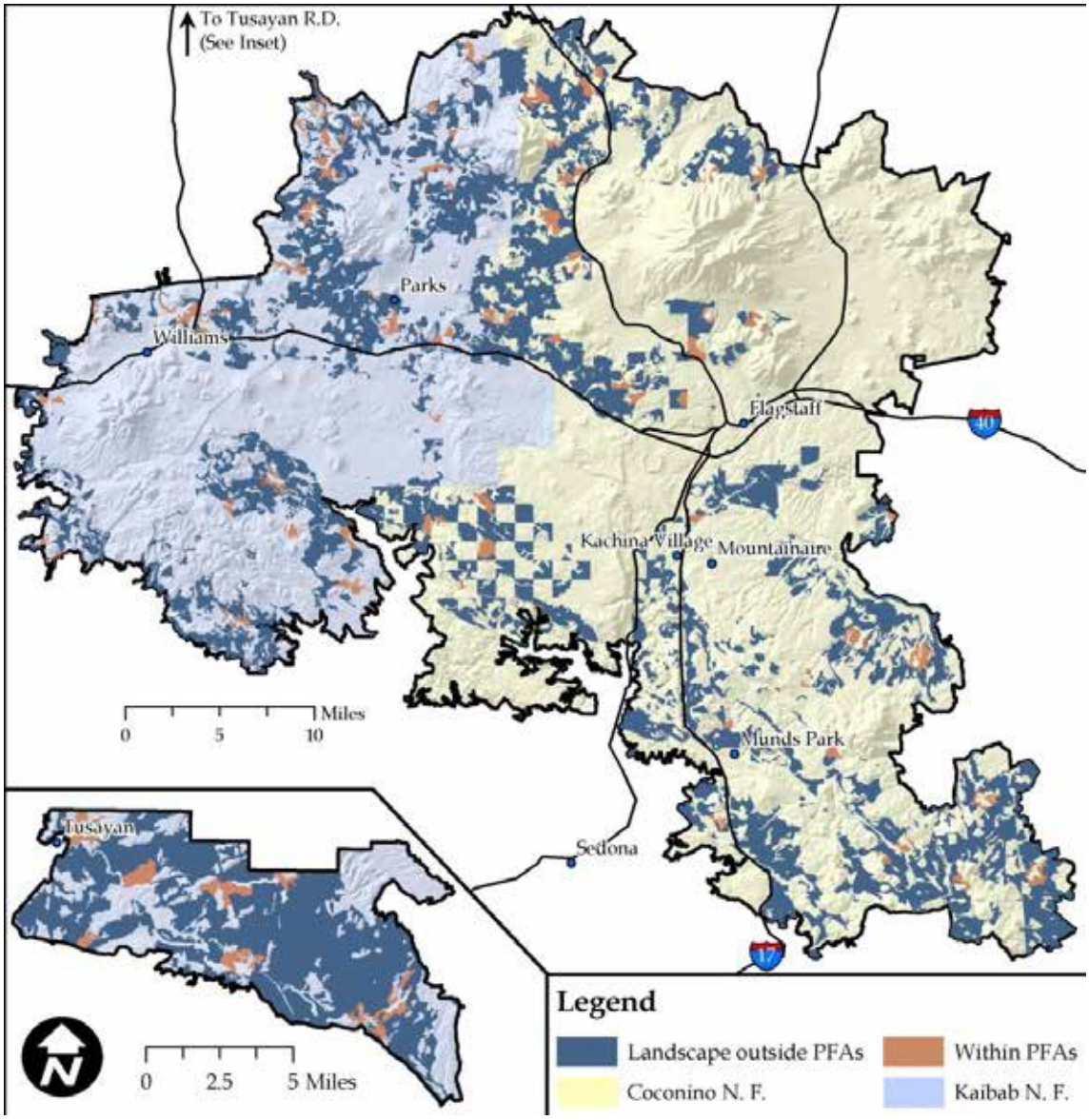

Figure 53. Alternative B general location of goshawk habitat subject to canopy cover requirements in VSS 4 to VSS 6 (Coconino NF and Kaibab NF)

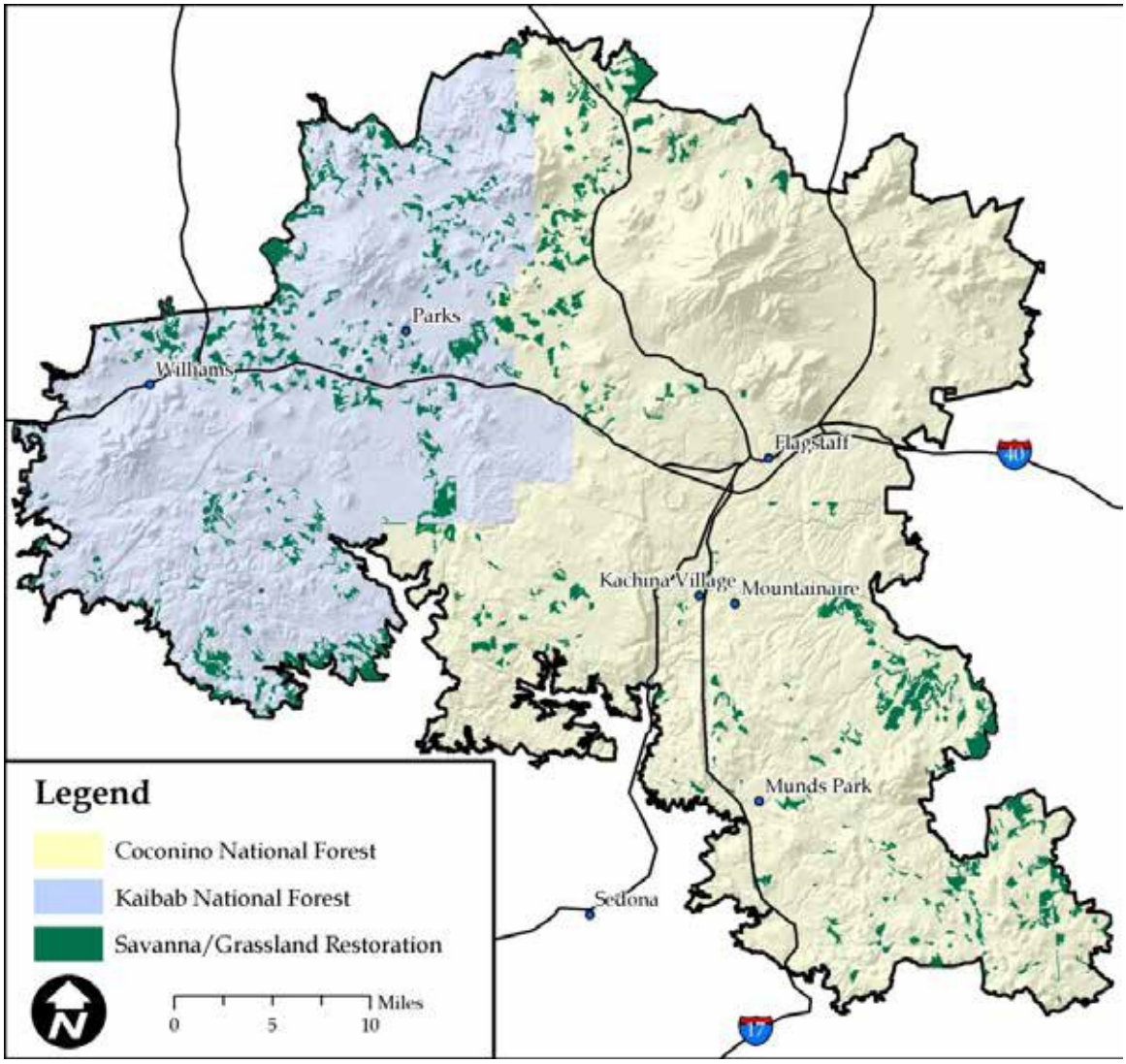

Figure 54. Alternative B general locations of savanna and grassland restoration treatments (Coconino NF and Kaibab NF)

Significance Evaluation

Per FSM 1926.51, changes to the land management plan that are not significant can result from:

1. Actions that do not significantly alter the multiple-use goals and objectives for long term land and resource management.
2. Adjustments of management area boundaries or management prescriptions resulting from further onsite analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long term land and resource management.
3. Minor changes in standards and guidelines.
4. Opportunities for additional projects or activities that will contribute to achievement of the management prescription.

Per FSM 1926.52, circumstances that may cause a significant change to a land management plan include:

1. Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected (see section 219.10(e) of the planning regulations in effect before November 9, 2000 (see 36 CFR parts 200 to 299, revised as of July 1, 2000)), and
2. Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

Analysis demonstrated that the proposed amendment is nonsignificant (FSM 1926.51) because the actions would not measurably alter the multiple-use goals and objectives for long term land and resource management and the actions. How actions could potentially affect timing, location and size, relationship to forest goals, objectives, outputs, and management prescriptions was evaluated.

Timing: The "Kaibab National Forest Land and Resources Management Plan" has been in place (and amended) since 1988 and plan revision efforts are underway. While the amendment does provide clarification that has been lacking since the forest plan was implemented, it is specific to this project.

Location and Size: Suitable goshawk habitat on the Kaibab NF encompasses approximately 541,000 acres (Keckler 2011, unpublished data) and the project area is comprised of about 399,633 acres of goshawk habitat. The amendment would affect approximately 20 percent of all suitable goshawk habitats on the forest and about 27 percent of goshawk habitat within the project area. For this reason, location and size was determined to be nonsignificant.

Relationship to Forest Goals and Objectives: Alternative B would meet goshawk forest plan canopy cover requirements in VSS 4 to 6 in all acres except the 27,637 acres managed for an open reference condition. In all acres but the open reference condition acres, actions would move toward the desired VSS size class distribution.

For this reason, the amendment is consistent with forest goals for wildlife and fish that promotes improving habitats through the development of habitat quality, diversity, and the identification and protection of key habitats. The amendment is consistent with the goal of improving habitats for listed threatened, endangered, or sensitive species of plants and animals and other species as they become threatened or endangered (Kaibab NF plan, page18).

Relationship to Management Prescriptions: Table 98 displays the acres associated with Kaibab NF geographic areas (GAs) and land use zones (LUZ).

Canopy Cover: The acres of forestwide GAs and LUZ affected by the canopy cover portion of the amendment (106,585 acres total) would range from less than 1 percent (LUZ 21) to 33 percent (GA 10). The amendment is specific to this project and would not impose requirements on the future management of canopy cover within these acres of goshawk habitat.

Open Reference Condition: The acres of forestwide GAs affected by the open reference condition portion of the amendment (27,637 acres total) would range from less than 1 percent

(GA 1) to 9 percent (GA 2).The amendment is consistent with the management emphasis of providing for multiple uses that includes wildlife habitat and moving ponderosa pine toward desired forest structure, including northern goshawk habitats. The amendment is specific to this project and would not impose requirements on the future management of the 27,637 acres of goshawk non-PFA; however, forest plan revision decisions may.

Table 98. Alternative B amendment 2 geographic area acres

GA	GA Description	Forestwide Acres	Proposed Amendment Acres	Forestwide Acres Affected (Percent)
Canopy Cover				
GA 2	Williams Forestland	308,394	73,352	24
GA 10	Tusayan Forestland	86,250	28,247	33
GA 3	North Williams Woodland	65,533	1,287	2
GA 1	Western Williams Woodland	169,041	1,970	1
GA 8	Tusayan Woodland	195,118	1,025	1
LUZ 21	Developed recreation sites	1,556	702	<1
Mapping Error	Camp Navajo	NA – Not in land management plan area	2	NA
Open Reference Condition				
GA 2	Williams Forestland	308,394	26,831	9
GA 3	North Williams Woodland	65,533	500	1
GA 1	Western Williams Woodland	169,041	302	<1
Mapping Error	Camp Navajo	NA – Not in land management plan area	4	NA

Relationship to Outputs: Outputs identified in the forest plan are associated with sawtimber and other product harvest levels (meet demand for timber while reducing conflict with other resources), commercial and personal use firewood programs (MBF), grazing capacity (AUM), watershed (acres in unsatisfactory condition and water yield), developed recreation (management of public sites at the standard service level), developed and dispersed recreation outputs (RVD), transportation (acres closed to off-road vehicle use), habitat diversity (change in habitat diversity index), old growth habitat (acres), and average annual wildlife and fish use (WFUD).

The canopy cover portion of the amendment provides clarification and disclosure of methods for meeting forest plan requirements. It has no relationship to outputs or to the relationship between

the level of goods (timber, firewood) and services and would not result in a change to land productivity or timber suitability classification.

Managing a portion of the landscape for an open reference condition affects about 27,637 acres of an estimated 490,368 acres of suitable timber lands. The management strategy on these acres would result in an extended rotation period between treatments beyond what was considered in developing the long-term sustained yield output in the forest plan. In the short term (10-year period), the amendment affects about 6 percent of the suitable land base. Due to the minimal acres affected, the amendment would not measurably alter outputs in the foreseeable future on a forestwide basis or change the long-term relationship between levels of goods (timber, firewood) and services. There would be no change in land productivity; therefore, it would not affect timber suitability classification.

Whether the 27,637 acres would continue to be managed as suitable timber in the long term will be evaluated during the forest plan revision process. No portion of the amendment would affect decisions that have been made through separate analyses on grazing capacity or permitted livestock use.

Amendment 2. MSO Habitat Management (Kaibab NF)

Amendment 2 is a specific, one-time variance for the Kaibab NF portion of the restoration project. Once the project is complete, current forest plan direction would apply to the project area. The language proposed does not apply to any other forest project. The amendment would be authorized per direction in the National Forest Management Act of 1976 (NFMA) and its implementing regulations found in 36 CFR 219 (1982).

Amendment Description

The amendment, which is specific to restricted habitat in pine-oak, would allow for designating less than 10 percent of restricted habitat on the Kaibab NF as target or threshold (i.e., future nesting and roosting habitat) based on the quality of the habitat. Definitions of target and threshold habitat would be added since the current forest plan refers to “threshold” in terms of values and desired conditions (see Kaibab NF forest plan, page 25) within restricted habitat and there is no reference to “target” conditions.

The amendment would remove language that limits PAC treatments in the recovery unit to 10 percent increments and language that requires the selection of an equal number of untreated PACs as controls. The amendment would remove language referencing monitoring (pre- and post-treatment, population, and habitat monitoring). Replacement language would defer final project design and monitoring to the FWS’ biological opinion specific to MSO for the project.

Background

MSO Monitoring

Monitoring assesses the effectiveness of management actions and provides the adaptive framework needed to develop successful management. Monitoring habitat facilitates modeling future forest conditions to determine if there will be adequate habitat to support MSO populations. For this project, the final design of the treatments and monitoring the results of the proposed activities in all MSO habitat would be developed in consultation with the FWS.

Manage Up to 10 Percent of Restricted Habitat as Target or Threshold

In 2011, biologists from the Coconino and Kaibab NFs, the 4FRI team, and the FWS worked together to develop a geographic layer for restricted habitat across the 4FRI treatment area. Data from the Kaibab and Coconino NFs (based on polygons) was merged with pine-oak data from the Lab of Landscape Ecology and Conservation Biology (raster data; Dr. Steve Sesnie and Jill Rundall, Northern Arizona University). This landscape-scale approach better meets the goal of providing continuous replacement nesting and roosting habitat over space and time, as described in the previous (1995) recovery plan and the 1996 "Record of Decision for the Amendment of Eleven Forest Plans." A new restricted layer was created within the 4FRI treatment area, including designation of target and threshold habitat as described in the 1995 recovery plan.

The Kaibab NF consists of three disjunct ranger districts. The North Kaibab Ranger District is north of the Grand Canyon and in a different recovery unit. No resident MSOs have been identified on the North Kaibab and the district is outside the 4FRI planning boundary. The Tusayan and Williams districts are both south of the Grand Canyon and in the 4FRI planning boundary. The Tusayan district does not include spotted owl habitat, and there are no records of spotted owls occurring on the district. The Williams district has limited pine-oak habitat. In achieving a landscape-scale assessment for the 4FRI, MSO pine-oak habitat was assessed across the Williams district and much of the Coconino NF.

The MSO recovery plan describes past planning as operating at "limited spatial scale[s]" which precludes a more meaningful review of MSO habitat at ecological scales (USDI 1995). The scale of the 4FRI and the fact it transcends administrative boundaries allows managers to conduct a true landscape-scale analysis. Overall, about 11.5 percent (8,713 acres) of the 4FRI restricted habitat would be managed as current or future target or threshold habitat. On the Coconino NF portion of the project, where the most owls and the most MSO habitat occurs, 13 percent (6,465 acres) of the restricted layer would be designated as target or threshold habitat. The Kaibab NF portion of the 4FRI treatment area would have 8 percent (2,247 acres) of the restricted layer designated as target or threshold habitat. By creating more future nesting and roosting habitat on the Coconino NF, future MSO habitat would be more contiguous for dispersing MSOs, and occur in areas supporting higher densities of MSOs than if 10 percent of the restricted layer was designated by individual administrative boundaries.

Edited or added/new forest plan text is **bolded** in table 99.

Table 99. Alternative B amendment 2 MSO proposed forest plan standard and guideline language (Kaibab NF)

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
MSO Standards	
No corresponding direction currently exists	**The project will comply with the biological opinion that has been developed in consultation with FWS.**
Provide three levels of habitat management -protected, restricted, and other forest and woodland types to achieve a diversity of habitat conditions across the landscape (Kaibab NF forest plan, page 22).	No Change

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Protected areas include delineated protected activity centers; mixed conifer and pine-oak forests with slopes greater than 40% where timber harvest has not occurred in the last 20 years; and reserved lands which include wilderness, research natural areas, wild and scenic rivers, and congressionally recognized wilderness study areas (Kaibab NF forest plan, page 22).	No Change
Restricted areas include all mixed-conifer, pine-oak, and riparian forests outside of protected areas (Kaibab NF forest plan, page 22).	No Change
Other forest and woodland types include all ponderosa pine, spruce-fir, woodland, and aspen forests outside protected and restricted areas (Kaibab NF forest plan, page 22).	No Change
Survey all potential spotted owl areas including protected, restricted, and other forest and woodland types within an analysis area plus the area 1/2 mile beyond the perimeter of the proposed treatment area (Kaibab NF forest plan, page 23).	No Change
Establish a protected activity center at all Mexican spotted owl sites located during surveys and all management territories established since 1989 (Kaibab NF forest plan, page 23).	No Change
Allow no timber harvest except for firewood and fire risk abatement in established protected activity centers. For protected activity centers destroyed by fire, windstorm, or other natural disaster, salvage timber harvest or declassification may be allowed after evaluation on a case-by-case basis in consultation with U.S. Fish and Wildlife Service (Kaibab NF forest plan, page 23).	No Change
Allow no timber harvest except for fire risk abatement in mixed conifer and pine-oak forests on slopes greater than 40% where timber harvest has not occurred in the last 20 years (Kaibab NF forest plan, page 23).	No Change
Limit human activity in protected activity centers during the breeding season (Kaibab NF forest plan, page 23).	No Change
In protected and restricted areas, when activities conducted in conformance with these standards and guidelines may adversely affect other threatened, endangered, or sensitive species or may conflict with other established recovery plans or conservation agreements; consult with U.S. Fish and Wildlife Service to resolve the conflict (Kaibab NF forest plan, page 23).	No Change
Monitor changes in owl populations and habitat needed for de-listing (Kaibab NF forest plan, page 23).	**Deleted**
Guidelines – A. General – No Change	
Guidelines – B. Protected Areas, Protected Activity Centers	
Delineate an area of not less than 600 acres around the activity center using boundaries of known habitat polygons and/or topographic features. Written justification for boundary delineation should be	No Change

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
provided (Kaibab NF forest plan, page 23).	
The protected activity center boundary should enclose the best possible owl habitat configured in as compact a unit as possible, with the nest or activity center located near the center (Kaibab NF forest plan, page 23).	No Change
The activity center is defined as the nest site. In the absence of a known nest, the activity center should be defined as a roost grove commonly used during breeding. In the absence of a known nest or roost, the activity center should be defined as the best nest/roost habitat (Kaibab NF forest plan, page 23).	No Change
Protected activity center boundaries should not overlap (Kaibab NF forest plan, page 23).	No Change
Submit protected activity center maps and descriptions to the recovery unit working group for comment as soon as possible after completion of surveys (Kaibab NF forest plan, page 23).	No Change
Road or trail building in protected activity centers should be avoided but maybe permitted on a case-by-case basis for pressing management reasons (Kaibab NF forest plan, page 23).	No Change
Generally allow continuation of the level of recreation activities that was occurring prior to listing (Kaibab NF forest plan, page 23).	No Change
Require bird guides to apply for and obtain a special use permit. A condition of the permit shall be that they obtain a sub-permit under the U.S. Fish and Wildlife Service Master endangered species permit. The permit should stipulate the sites, dates, number of visits and maximum group size permissible (Kaibab NF forest plan, pages 23 to 24).	No Change
Harvest firewood when it can be done in such a way that effects on the owl are minimized. Manage within the following limitations to minimize effects on the owl (Kaibab NF forest plan, page 24).	No Change
Retain key forest species such as oak (Kaibab NF forest plan, page 24).	No Change
Retain key habitat components such as snags and large downed logs (Kaibab NF forest plan, page 24).	No Change
Harvest conifers less than 9 inches in diameter only within those protected activity centers treated to abate fire risk as described below (Kaibab NF forest plan, page 24).	No Change
Treat fuel accumulations to abate fire risk (Kaibab NF forest plan, page 24).	No Change

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Select for treatment 10% of the protected activity centers where nest sites are known in each recovery unit having high fire risk conditions. Also select another 10% of the protected activity centers where nest sites are known as a paired sample to serve as control areas (Kaibab NF forest plan, page 24).	**Deleted**
Designate a 100 acre "no treatment" area around the known nest site of each selected protected activity center. Habitat in the no treatment area should be as similar as possible in structure and composition as that found in the activity center (Kaibab NF forest plan, page 24).	No Change
Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leafed woody vegetation, and hardwood trees larger than 10 inches in diameter at the root collar (Kaibab NF forest plan, page 24).	No Change
Select and treat additional protected activity centers in 10% increments if monitoring of the initial sample shows there were no negative impacts or there were negative impacts which can be mitigated by modifying treatment methods (Kaibab NF forest plan, page 24).	**Deleted**
Treat fuel accumulations to abate fire risk: Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel treatment, and prescribed fire to abate fire risk in the remainder of the selected protected activity center outside the 100-acre "no treatment" area (Kaibab NF forest plan, p. 24).	No Change
Treat fuel accumulations to abate fire risk. Select for treatment 10% of the protected activity centers where nest sites are known in each recovery unit having high fire risk conditions. Also select another 10% of the protected activity centers where nest sites are known as a paired sample to serve as control areas (Kaibab NF forest plan, page 24).	Treat fuel accumulations to abate fire risk.
Use light prescribed fire in non-selected protected activity centers on a case-by-case basis. Burning should avoid a 100-acre "no treatment" area around the activity center. Large woody debris, snags, clumps of broad-leafed woody vegetation should be retained and hardwood trees larger than 10 inches diameter at the root collar (Kaibab NF forest plan, page 24).	No Change
Pre- and post-treatment monitoring should be conducted in all protected activity centers treated for fire risk abatement (see monitoring guidelines). (Kaibab NF forest plan, page 24).	**Deleted**

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Steep Slopes (Mixed conifer and pine-oak forests outside protected activity centers with slopes greater than 40% that have not been logged within the past 20 years)	
No seasonal restrictions apply. Treat fuel accumulations to abate fire risk (Kaibab NF forest plan, page 24).	No Change
Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel removal, and prescribed fire (Kaibab NF forest plan, page 24).	No Change
Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leafed woody vegetation, and hardwood tress larger than 10 inches in diameter at the root collar (Kaibab NF forest plan, page 24).	No Change
Pre and post treatment monitoring should occur within all steep slopes treated for fire risk abatement. (See monitoring guidelines) (Kaibab NF forest plan, page 24).	**Deleted**
Reserved Lands (Wilderness, Research Natural Areas, Wild and Scenic Rivers, and Congressionally Recognized Wilderness Study Areas	
Allow fire use where appropriate.	No Change
C. Restricted Areas (Mixed Conifer, Pine-Oak, and Riparian Forests)	
Mixed Conifer and Pine-oak Forests (See glossary definition)	
No corresponding direction	**Target habitat is a category of restricted habitat intended to provide future nesting and roosting habitat (see glossary definition for restricted habitat). The minimum values identified for the forest attributes represent the threshold for meeting nesting and roosting conditions (see the definition for threshold habitat). They can also be targets to be achieved with time and management. If less than 10 percent of the restricted habitat in ponderosa pine-Gambel oak qualifies as threshold habitat, the areas that can eventually achieve all threshold conditions simultaneously should be identified as target habitat and managed to achieve threshold conditions as rapidly as possible. Because no known nests or roosts occur in restricted habitat, target habitat is considered future nesting and roosting habitat.**
No corresponding direction	**Threshold habitat is a category of restricted habitat intended to provide for future nesting and roosting habitat (see definition for restricted habitat). A variety of forest structural attributes are used to define when nesting and roosting habitat is achieved (summarized in table III.B.1 of**

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
	the 1995 recovery plan and table C-2 of the 2012 recovery plan). Threshold habitat meets or exceeds these values. When the minimum values identified for the forest attributes are met simultaneously, they represent the threshold of nesting and roosting conditions. Up to 10 percent of restricted habitat in ponderosa pine-Gambel oak should be designated as threshold habitat. Management in threshold habitat cannot lower any of the forest attribute values below the nesting and roosting threshold unless a landscape analysis demonstrates an abundance of this habitat. Because no known nests or roosts occur in restricted habitat, target habitat is managed as future nesting and roosting habitat.
Manage to ensure a sustained level of owl nest/roost habitat well distributed across the landscape. Create replacement owl nest/roost habitat where appropriate while providing a diversity of stand conditions across the landscape to ensure habitat for a diversity of prey species (Kaibab NF forest plan, page 25).	No Change
The following table displays the minimum percentage of restricted area which should be managed to have nest/roost characteristics. The minimum mixed conifer restricted area includes 10% at 170 basal area and an additional 15% of area at 150 basal area. The variables are for stand averages, are minimum threshold values and must be met simultaneously. In project design, no stands simultaneously meeting or exceeding the minimum threshold values should be reduced below the threshold values unless a districtwide or larger landscape analysis of restricted areas shows that there is a surplus of restricted area acres simultaneously meeting the threshold values. Management should be designed to create minimum threshold conditions on project areas where there is a deficit of stands simultaneously meeting minimum threshold conditions unless the districtwide or larger landscape analysis shows there is a surplus (Kaibab NF forest plan, page 25).	**Table 13** displays the minimum percentage of restricted area which should be managed to have nest/roost characteristics. The minimum mixed conifer restricted area includes 10 percent at 170 basal area and an additional 15 percent of area at 150 basal area. **In pine-oak, the restricted area includes up to 10 percent at 170 BA and 15 percent of area at 150 basal area.** The variables are for stand averages, are minimum threshold values and must be met simultaneously. In project design, no stands simultaneously meeting or exceeding the minimum threshold values should be reduced below the threshold values unless a districtwide or larger landscape analysis of restricted areas shows that there is a surplus of restricted area acres simultaneously meeting the threshold values. Management should be designed to create minimum **target and** threshold **habitat** conditions on project areas where there is a deficit of stands simultaneously meeting minimum threshold **habitat** conditions unless the districtwide or larger landscape analysis shows there is a surplus.

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*

Minimum Percentage of Restricted Areas Managed for Nest/Roost Characteristics

Variable	Mixed Conifer All RU	Mixed Conifer Other RU*	Pine-Oak Target and Threshold Habitat**
Restricted Area Percent	10%	+15%	**Up to** 10%
Stand Averages for:			
Basal Area	170	150	150
18 inch+ trees/ac	20	20	20
Oak Basal Area	NA	NA	20
Percent total existing:			
12–18 inches	10	10	15
18–24 inches	10	10	15
24+ inches	10	10	15

*Mixed Conifer Other RU applies to the Kaibab NF.

**Pine-Oak Target and Threshold Habitat applies to the Williams RD, Kaibab NF.

Attempt to mimic natural disturbance patterns by incorporating natural variation, such as irregular tree spacing and various patch sizes, into management prescriptions (Kaibab NF forest plan, page 25).	No Change
Maintain all species of native trees in the landscape including early seral species (Kaibab NF forest plan, page 25).	No Change
Allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure (Kaibab NF forest plan, page 25).	No Change
Extend rotation ages for even-aged stands to greater than 200 years. Silvicultural prescriptions should explicitly state when vegetative manipulation will cease until rotation age is reached (Kaibab NF forest plan, page 25).	No Change
Save all trees greater than 24 inches d.b.h. In pine-oak forests, retain existing large oaks and promote growth of additional large oaks (Kaibab NF forest plan, page 25).	No Change
Encourage prescribed and wildland fire use to reduce hazardous fuel accumulation. Thinning from below may be desirable or necessary before burning to reduce ladder fuels and the risk of crown fire (Kaibab NF forest plan, page 25).	No Change
Retain substantive amounts of key habitat components: Snags 18 inches in diameter and larger down logs over 12 inches midpoint diameter hardwoods for retention, recruitment, and replacement of large hardwoods (Kaibab NF forest plan, page 25).	No Change

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Riparian Areas – No Change	
Domestic Livestock Grazing – No Change	
Old Growth – No Change	
D. Other Forest and Woodland Types – No Change	
E. Specific Recovery Units on the Kaibab NF – No Change	
F. Monitoring Guidelines	
Monitoring and evaluation should be collaboratively planned and coordinated with involvement from each national forest, USFWS Ecological Services Field Office, USFWS Regional Office, USFS Regional Office, Rocky Mountain Research Station, recovery team, and recovery unit working groups (Kaibab NF forest plan, page 26).	**See "Standards" for monitoring direction**
Population monitoring should be a collaborative effort with participation of all appropriate resource agencies (Kaibab NF forest plan, page 26).	**Deleted**
Habitat monitoring of gross habitat changes should be a collaborative effort of all appropriate resource agencies (Kaibab NF forest plan, page 26).	**Deleted**
Habitat monitoring of treatment effects (pre- and post-treatment) should be done by the agency conducting the treatment (Kaibab NF forest plan, page 27).	**Deleted**
Rangewide: Track gross changes in acres of owl habitat resulting from natural and human caused disturbances. Acreage changes in vegetation composition, structure, and density should be tracked, evaluated, and reported. Remote sensing techniques should provide an adequate level of accuracy (Kaibab NF forest plan, page 27).	**Deleted**
In protected and restricted areas where silvicultural or fire abatement treatments are planned, monitor treated stands pre- and post-treatment to determine changes and trajectories in fuel levels; snag basal areas; live tree basal areas; volume of down logs over 12 inches in diameter; and basal area of hardwood trees over 10 inches in diameter at the root crown (Kaibab NF forest plan, page 27).	**Deleted**
Upper Gila Mountain, Basin and Range East, and Basin and Range West Recovery Units: Assist the recovery team and recovery unit working groups to establish sampling units consisting of 19 to 39 square mile quadrats randomly allocated to habitat strata. Quadrats should be defined based on ecological boundaries such as ridge lines and watersheds. Quadrat boundaries should not traverse owl territories (Kaibab NF forest plan, page 27).	**Deleted**

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Twenty percent of the quadrats will be replaced each year at random. Using the sample quadrats, monitor the number of territorial individuals and pairs per quadrat; reproduction; apparent survival; recruitment; and age structure. Track population density both per quadrat and habitat stratum (Kaibab NF Land Management Plan, page 27).	**Deleted**

* Edited and new/added text is **bolded.**

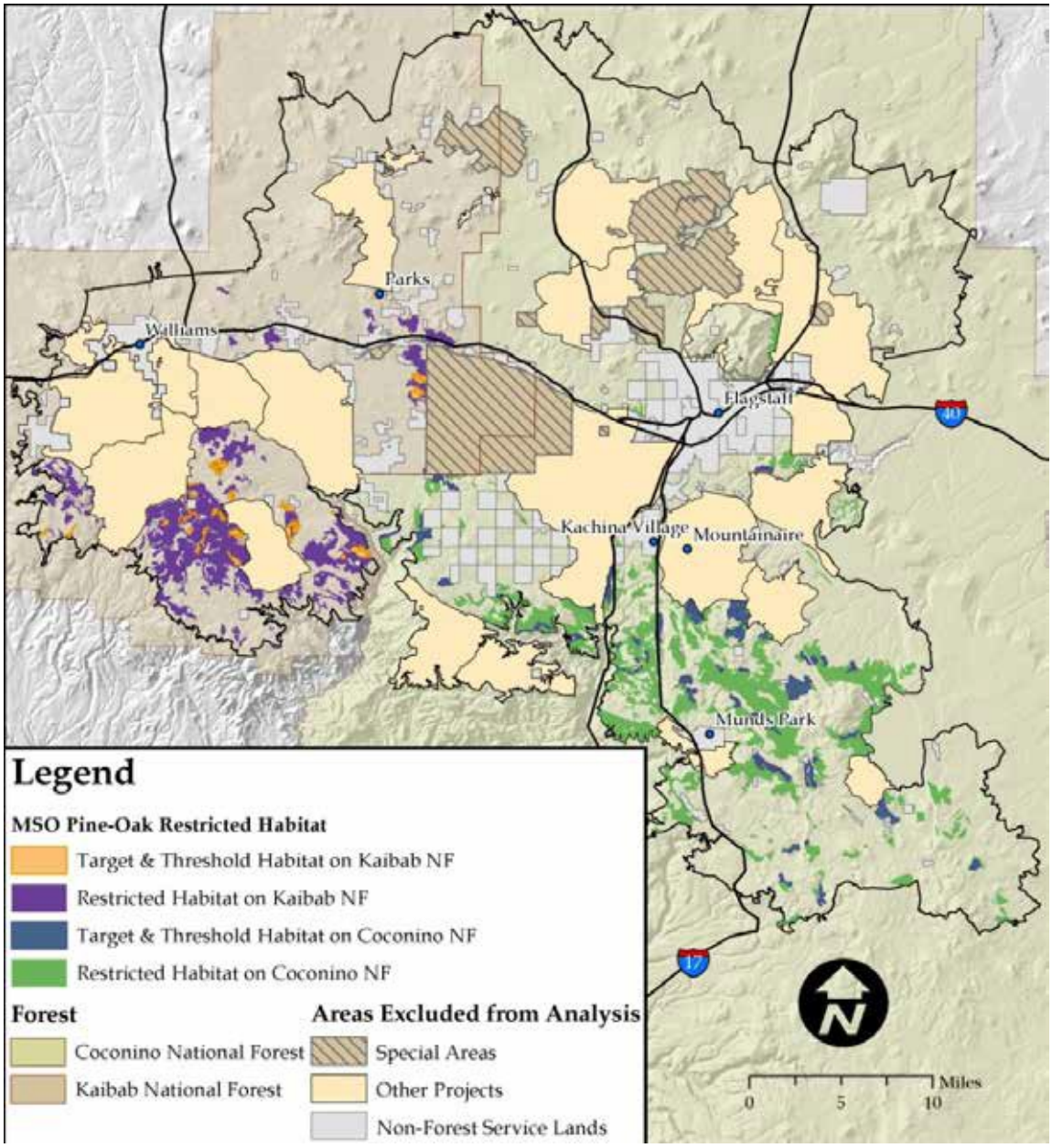

Figure 55. Alternative B amendment 2 landscape target and threshold analysis

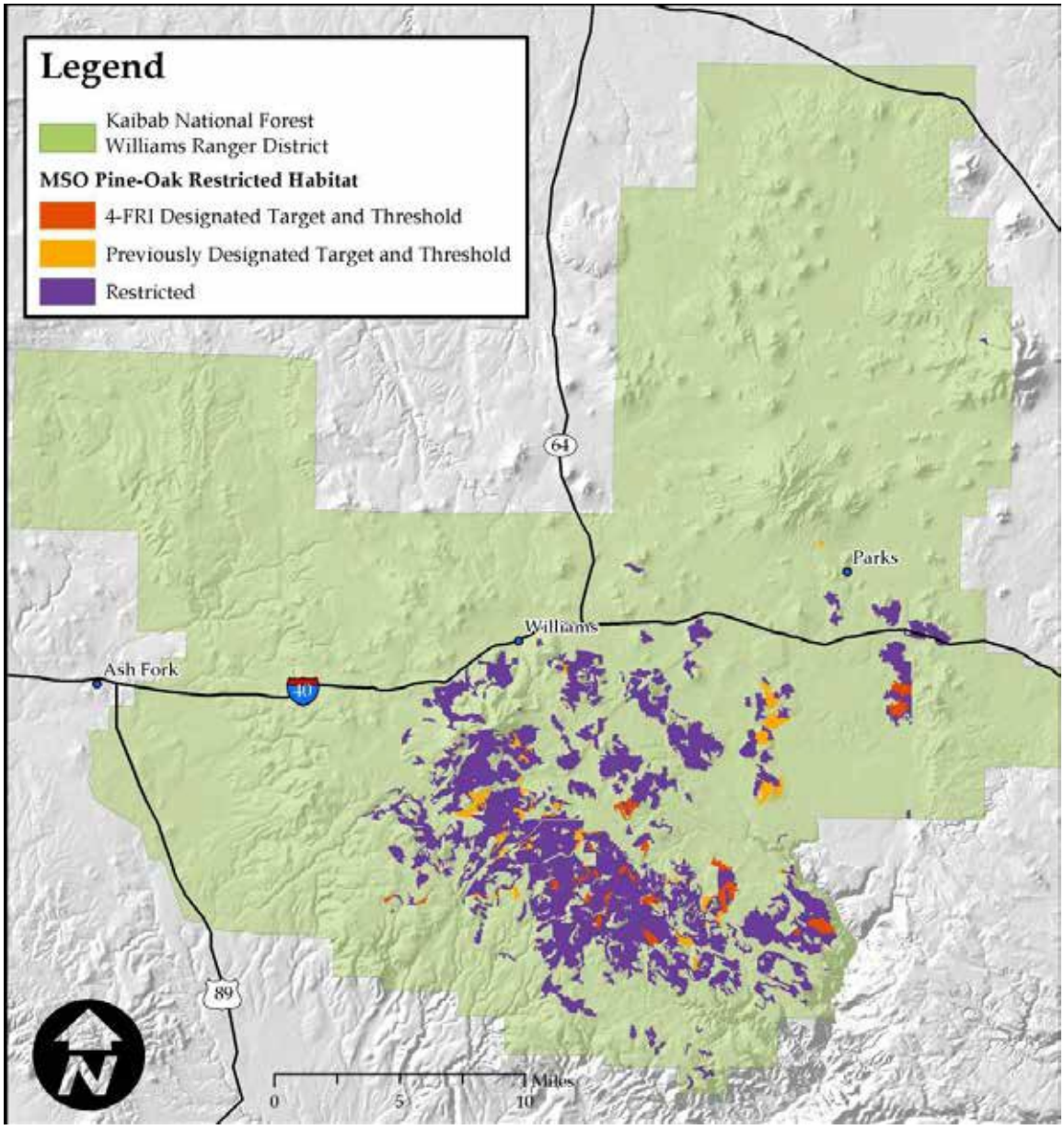

Figure 56. Alternative B–D MSO target and threshold habitat on the Kaibab NF

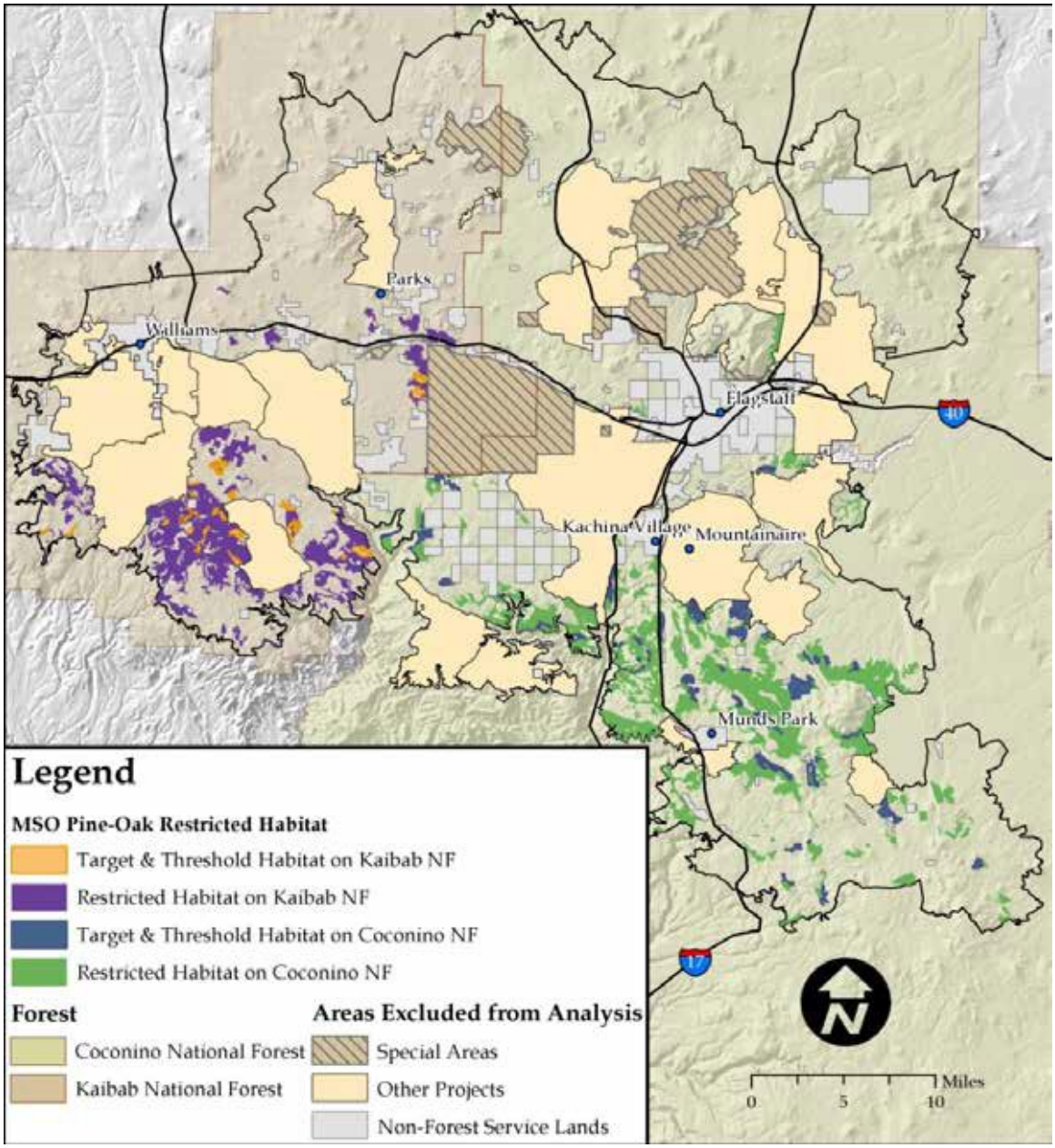

Figure 57. Project-scale designated MSO target and threshold habitat

Consistency with the MSO Recovery Plan

This amendment would allow for managing less than 10 percent of the designated restricted habitat as nest and roost habitat. MSO habitat is generally more abundant, more contiguous, and of higher quality on the Coconino NF than the Kaibab NF. This conclusion is based on forest data queries, years of on-the-ground experience of participants in the development of the restricted layer, and on presumed choices made by the owls themselves. MSOs are abundant and concentrated in pine-oak habitat on the Coconino NF. In contrast, there is only a single MSO detection dating from 1994 in pine-oak habitat on the Kaibab NF.

The recovery plan describes past planning as operating at "limited spatial scale[s]" which precludes a more meaningful review of MSO habitat at ecological scales (USDI 1995). The scale of the 4FRI and the fact it transcends administrative boundaries allows managers to conduct a true landscape-scale analysis. Overall, about 11.5 percent (8,713 acres) of the 4FRI restricted habitat would be managed as current or future target or threshold habitat. On the Coconino NF portion of the project, where the most owls and the most MSO habitat occurs, 13 percent (6,465 acres) of the restricted layer would be designated as target or threshold habitat.

The Kaibab NF portion of the 4FRI treatment area would have 8 percent (2,247 acres) of the restricted layer designated as target or threshold habitat. By creating more future nesting and roosting habitat on the Coconino NF, future MSO habitat would be more contiguous, better connected for dispersing MSOs, and occur in areas supporting higher densities of MSOs than if 10 percent of the restricted layer was designated by individual administrative boundaries.

This amendment meets the intent of the 1995 and revised (2012) recovery plan by reducing the potential for creating excessively fragmented habitat and managing stands based on their capability to attain desired stand conditions. This amendment does affect habitat designated in previous projects or in mixed-conifer habitat.

Adding a definition of target and threshold (restricted) habitat would be consistent with the desired conditions in the recovery plan (1995 and 2012 version). Although restricted habitat is referred to as "recovery habitat" and nest/roost habitat in the 2012 revised plan (USDI 2012, pp. 3, 4), the project's desired conditions for nesting and roosting habitat is consistent with the revised recovery plan. The revised plan still recommends that a percentage (10 to 25 percent) of recovery habitat be managed as nesting/roosting (USDI 2012, page VIII). Using habitat with the best potential, the project would move toward desired percentages in recovery habitat. Amendment 2 would provide additional site-specific requirements at the project scale that would not be precluded by the revised forest plan or the new recovery plan (USDI 2012). Specific treatments have been designed to move toward improving the quality and quantity of target and threshold habitat that occurs within restricted habitat.

Deferring monitoring and incremental treatments to the FWS biological opinion would be consistent with the revised recovery plan (2012). The new recovery plan defers monitoring requirements to the management agency and treatment in incremental amounts is not recommended in the plan.

Significance Evaluation

Timing: In terms of timing, the forest plan has been in place and amended several times since 1988, and revision efforts are underway. The forest plan incorporated direction (via an amendment) from the Forest Service Southwestern Region's 1996 "Amendment of Forest Plans Record of Decision" (USDA 1996). The actions allowed via the amendment are consistent with existing forest plan direction in that it improves nesting and rooting habitat, reduces the risk of loss from fire, and will comply with the site-specific treatment and monitoring requirements in the FWS biological opinion. Forest plan direction may be amended to incorporate the revised MSO recovery plan (USDI 2012) which recognizes that habitat restoration, in addition to the reduction of fire risk, is key to improving habitat quality.

Location and Size: There are 26,818 acres of MSO restricted habitat occurring entirely on the Kaibab NF. The amendment would affect the percentage of restricted acres designated as threshold habitat (8 percent), resulting in 2,247 acres on the Kaibab NF. About 11.5 percent of the designated restricted habitat would be managed for future nesting/roosting habitat across the 4FRI treatment area. Monitoring in all MSO habitat would be in compliance with the FWS biological opinion for the project.

Relationship to Forest Goals and Objectives: The amendment is consistent with forest plan goals for wildlife and fish of managing habitat to improve habitat quality and diversity in both the short and long term, to improve diversity and provide quality old-growth habitats (Kaibab National Forest plan, page 12), and to improve habitat for listed threatened, endangered, or sensitive species of plants and animals and work toward recovery and delisting of species (Kaibab National Forest plan, page 18).

Changing the minimal target/threshold acres in restricted habitat (2,247 acres) would not change the overall direction to manage for future nesting/roosting habitat on 10 percent of restricted acres across the planning area landscape as described in the forest plan. About 8,713 acres (about 11½ percent) are classified as target and threshold habitat in the 4FRI treatment area on both the Kaibab and Coconino National Forests.

The amendment removes language that addresses pre- and post-treatment, population and habitat monitoring and replaces it with language that focuses on implementing the requirements in the FWS biological opinion. Delaying treatment in and adjacent to the Kendrick PAC would leave occupied MSO habitat at risk of loss from high-severity fire. Arizona's two largest fires account for nearly a million and half acres of forested land burned since 2002. Both fires included high-severity fire in PAC habitat. Other fires burning in the Upper Gila Recovery Unit have charred additional acres of MSO protected habitat. Most climate models suggest that the Southwest will experience higher temperatures and increased variability in precipitation, which will significantly affect fire regimes and forest health (Aumack et al. 2007).

The FWS urges a deliberate and cautious approach to management activities within PACs (USDI 2012). Silvicultural modeling of the proposed treatments indicates limited change to forest structure after implementation. However, the treatments are expected to include increased tree growth rates to reduce the time needed to for developing large trees (defined as 18-inch d.b.h. and greater in the current recovery plan for the MSO), maintaining existing large trees, and decreasing surface fuels and increasing crown base height. Combined, this is should develop and maintain MSO nesting and roosting habitat, a key aspect of the recovery plans, while decreasing risk of crown fire.

Forest restoration and fuels reduction treatments would be evaluated over time. Monitoring would be designed and implemented to evaluate the effects of prescribed fire and hazardous fuel reduction treatments on spotted owl habitat, and to retain or move toward MSO desired future conditions as described in the recovery plan. The details on accomplishing the monitoring goals will be developed specifically for this approach through coordination with the FWS under formal consultation, as described in the ESA. In this way, work to protect and improve owl habitat can be accomplished in a timely manner while emphasizing monitoring and feedback loops to allow management to be adaptive. For these reasons, the amendment as it relates to pre- and post-treatment, population and habitat monitoring is consistent with forest plan goals and objectives.

Designating target or threshold habitat in the project with the best potential would move toward desired percentages in restricted (recovery) habitat, consistent with forest plan goals and objectives.

Relationship to Management Prescriptions: The intent of managing 2,247 acres of restricted habitat to current or future threshold conditions is consistent with the management emphasis of providing for multiple uses that includes wildlife habitat and meeting MSO standards and guidelines which emphasize improving and maintaining the quality of the habitat and moving ponderosa pine toward desired forest structure, including MSO habitats (table 100). The amendment would affect about 8 percent of all MSO restricted habitat on the Kaibab NF and less than 1 percent of GA 2.

Table 100. Alternative B Kaibab NF amendment 2 GA acres

GA	GA Description	Forestwide Acres	Proposed Amendment Acres	Forestwide Acres Affected (Percent)
Restricted Habitat				
GA-2	Williams Forestland	308,394	2,247	< 0.01

Relationship to Outputs: In comparison to the forest's total suitable timber lands (479,132 acres), the amendment would affect less than 0.01 percent of those lands. For this reason, mechanical treatment within current MSO threshold or future threshold (i.e., target) habitat would not measurably increase or decrease timber outputs or firewood availability. There would be no measurable effect to outputs managing from deferring the final design of treatments and monitoring to the project's biological opinion. The amendment would not affect decisions that have been made through separate analyses on grazing capacity or permitted livestock use.

Alternative C – Coconino National Forest Site-Specific Nonsignificant Forest Plan Amendments

Three site-specific, nonsignificant forest plan amendments are proposed for alternative C.

Related Planning Efforts

A revised MSO recovery plan, issued by the U.S. Fish and Wildlife Service (hereafter referred to as FWS) was finalized in December of 2012 (USDI 2012). The current forest plan is consistent with the previous recovery plan (USDI 1995). At some point in time, the Coconino NF may amend its forest plan to be consistent with the revised recovery plan. For this analysis, a forest plan amendment would be needed to utilize the revised recovery plan direction if it is different than what is currently included in the Coconino NF forest plan.

Currently, the Coconino NF is revising its forest plan. An analysis was conducted to determine how the proposed amendments align with the draft plan (as currently written) (USDA 2011). A revised forest plan may affect the need for amendments 1 through 3 in the following ways:

> **Amendment 1** would be in alignment with the draft forest plan (as currently written) in that it defers management of MSOs to direction in the MSO recovery plan. The revised (2012) MSO recovery plan does not limit tree removal from within PACs to a specific d.b.h., does

not require a specific method for habitat monitoring, the proposed basal area in nest/roost habitat is referenced in the 2012 revised plan, and the plan allows for the use of prescribed fire within PAC core areas outside the breeding season.

In the recovery plan, project monitoring is deferred to the management agency. For this project, monitoring would be determined in consultation with the FWS. Amendment 1 could be retained as it would provide additional site-specific direction for implementation at the project scale that would not be precluded by the forest plan or recovery plans.

Although restricted habitat is referred to as "recovery habitat" and "nest/roost habitats" in the 2012 revised plan (USDI 2012, pp. 3, 4), the project's desired conditions for nesting and roosting habitat is consistent with the revised recovery plan. The revised plan still recommends that a percentage (10 to 25 percent) of recovery habitat be managed as nesting/roosting (USDI 2012, page VIII). Designating habitat in the project with the best potential would move toward desired percentages in recovery habitat. Amendment 1 would provide additional site-specific requirements at the project scale that would not be precluded by the revised forest plan or the revised recovery plan (USDI 2012).

Amendment 2: Canopy cover requirements in VSS 4 to VSS 6 and managing goshawk habitat for a balance of VSS is presented differently in the current draft forest plan (USDA 2011, pages 51 to 54). Amendment 2 would be in alignment with the draft forest plan (as currently written) as it: (1) provides for managing crowns of trees within the mid-aged to old groups as interlocking or nearly interlocking (USDA 2011 page 53); (2) manages forest conditions in goshawk PFAs with 10 to 20 percent higher basal area in mid-aged to old tree groups than in goshawk foraging areas and general forest (USDA 2011, Page 51); (3) manages for goshawk nest areas (known and replacement) (USDA 2011, page 53); and (4) generally maintains three to five reserve trees in management created openings greater than 1 acre in ponderosa pine in goshawk foraging areas and PFAs (USDA 2011 page 54), with the exception of acres managed for an open reference condition.

The draft forest plan (as currently written) allow for project specific plan amendments. The portion of the amendment that allows deviation from maintaining three to five reserve trees and having openings up to 90 percent for lands managed for an open reference condition would be consistent with what is allowed at the project level. At the landscape scale, the project would be consistent with the draft desired conditions for ponderosa pine which states, "Forest appearance is variable but generally uneven-aged and open; occasional areas of even-aged structure are present. The forest arrangement is in individual trees, small clumps, and groups of trees interspersed within variably sized openings of grass/forb/shrub vegetation associations similar to historic patterns. Size, shape, number of trees per group, and number of groups per area are variable across the landscape" (USDA 2011, page 51). The terms "interspaces" and "open reference condition" do not appear in the draft forest plans (as written). The amendment would need to continue providing this definition. The definition of "stand" could be removed from the amendment (USDA 2011, page 225). The amendment would provide additional site-specific direction and definitions that apply to landscape restoration that are not precluded by the draft forest plan.

Amendment 3 would not be required. As currently written, the draft forest plan desired condition is to generally manage for no adverse effects and minimize adverse impacts or impacts through consultation (USDA 2012).

Amendment 1. MSO Habitat Management (Coconino NF)

Amendment 1 is a specific, one-time variance for managing MSO habitat on the Coconino NF in the 4FRI restoration project. Once the project is complete, current forest plan direction would apply to the project area. The language proposed does not apply to any other forest project. The amendments would be authorized per direction in the National Forest Management Act of 1976 (NFMA) and its implementing regulations found in 36 CFR 219 (1982).

Amendment Description

Amendment 1 would allow mechanical treatments up to 18-inch d.b.h. to improve habitat structure (nesting and roosting habitat) in 18 MSO PACs. It would allow low intensity prescribed fire within 56 MSO PAC core areas. The amendment would remove language that limits PAC treatments in the recovery unit to 10 percent increments and language that requires the selection of an equal number of untreated PACs as controls. The amendment would remove language referencing monitoring (pre- and post-treatment, population, and habitat). Replacement language would defer final project design and monitoring to the FWS' biological opinion specific to MSO for the project.

The amendment, which is specific to restricted habitat in pine-oak, would allow for designating less than 10 percent of restricted habitat on the Coconino NF as target or threshold (i.e., future nesting and roosting habitat) based on the quality of the habitat. Definitions of target and threshold habitat would be added since the current forest plan refers to "threshold" in terms of values and desired conditions (see Coconino NF forest plan, page 65-3.) within restricted habitat, and there is no reference to "target" conditions. In restricted pine-oak habitat, it would allow 6,321 acres of restricted target or threshold habitat to be managed for a minimum range of 110 to 150 basal area.

Background

In 2011, biologists from the Coconino and Kaibab NFs, the 4FRI team, and the FWS worked together to review individual MSO PACs within the project area. The evaluation process includes site visits and modeling silvicultural treatments and prescribed fire to move existing owl habitat toward the desired conditions described in the 1995 MSO recovery plan (USDI 1995) and forest plan.

There are 99 PACs within the 4FRI project area and 72 PACs within the treatment area. Of the 72 PACs, 18 were identified as having habitat that could be improved with vegetation treatments. No PACs proposed for treatment are located in designated wilderness. Each stand within the 18 PACs was modeled to identify treatments that would yield the best existing and future MSO habitat conditions. See the wildlife specialist report "Methodology" section for complete details on the habitat evaluation process.

Mechanical Treatment Up to 18-inch d.b.h. in Select PACs (7,353 acres)

MSO PAC field reviews, data evaluation, and vegetation simulation modeling indicated 18 MSO PACs (approximately 3,388 acres or 10 percent of all PACs acres within the treatment area) would move toward recovery plan desired conditions from mechanically cutting trees up to 9-inch d.b.h. Treatments up to 9-inch d.b.h. are consistent with the forest plan. See the wildlife specialist report "Methodology" section for complete details on the habitat evaluation process.

An additional 7,353 acres within 18 PACs would have nesting and roosting habitat benefits from cutting trees up to 18-inch d.b.h. Mechanical treatments above 9-inch d.b.h. would facilitate the removal of ladder and canopy fuels which would reduce the fire risk in the 18 PACs. Increasing the range of the mechanical treatment thresholds up to 18-inch d.b.h. within 18 MSO PACs would provide for a higher degree of stand structure improvements to nesting and roosting habitat. The proposal addresses comments from the FWS and is in alignment with the revised MSO recovery plan (USDI 2012). Figure 58 displays the general location of mechanical treatment up to 18-inch d.b.h., prescribed fire, and areas where no treatment is proposed within MSO PACs.

Prescribed Fire Within 56 PAC Core Areas (About 5,600 acres)

In order to improve habitat conditions outside of the 100-acre core area within 56 PACs, there is a need to use prescribed fire within select PAC core areas. Without the use of low-intensity prescribed fire within the core, each core area would need to have fire line constructed around it to prevent fire from entering the nest site during treatment in the surrounding PAC habitat. Depending on site and weather conditions, this could be anything from a 3-foot-wide hand line to a dozer line. The number of acres potentially affected from fire line activities within PACs would likely range from 0.80 (hand line) acre to 3.2 (dozer) acres. Most fire line would require post-treatment habitat rehabilitation.

Burning in MSO PACs is difficult as there is a need to address the high fuel loadings while maintaining many of the habitat elements that contribute to fuel loading. Burning has to be conducted in a very short timeframe to avoid the breeding season (i.e., the nonbreeding season – September 1 to February 28). Lining 56 core areas greater than or equal to 100 acres would be expensive in terms of time, money, and other resource commitments. In many projects, PAC treatments have been eliminated for these reasons. Applying low intensity prescribed burning within the 100-acre core areas would eliminate the need for fire line construction and would potentially minimize impacts on at least 179 acres of protected habitat. Figure 59 displays the general location of MSO PACs proposed for prescribed burning including where burning would occur within core areas.

Manage Up to 10 Percent of Restricted Habitat as Target or Threshold

In 2011, biologists from the Coconino and Kaibab NFs, the 4FRI team, and the FWS worked together to develop a geographic layer for restricted habitat across the 4FRI treatment area. Data from the Kaibab and Coconino NFs (based on polygons) was merged with pine-oak data from the Lab of Landscape Ecology and Conservation Biology (raster data; Dr. Steve Sesnie and Jill Rundall, Northern Arizona University). This landscape-scale approach better meets the goal of providing continuous replacement nesting and roosting habitat over space and time, as described in the previous (1995) recovery plan and the 1996 “Record of Decision for the Amendment of Eleven Forest Plans.” A new restricted layer was created within the 4FRI treatment area, including designation of target and threshold habitat as described in the recovery plan.

The Kaibab NF consists of three disjunct ranger districts. The North Kaibab Ranger District is north of the Grand Canyon and in a different recovery unit. No resident MSOs have been identified on the North Kaibab and the district is outside the 4FRI planning boundary. The Tusayan and Williams districts are both south of the Grand Canyon and in the 4FRI planning boundary. The Tusayan district does not include spotted owl habitat and there are no records of spotted owls occurring on the district. The Williams district has limited pine-oak habitat. In

achieving a landscape-scale assessment for the 4FRI, MSO pine-oak habitat was assessed across the Williams district and much of the Coconino NF.

The MSO recovery plan describes past planning as operating at "limited spatial scale[s]" which precludes a more meaningful review of MSO habitat at ecological scales (USDI 1995). The scale of the 4FRI and the fact it transcends administrative boundaries allows managers to conduct a true landscape-scale analysis. Overall, about 11.5 percent (8,713 acres) of the 4FRI restricted habitat would be managed as current or future target or threshold habitat. On the Coconino NF portion of the project, where the most owls and the most MSO habitat occurs, 13 percent (6,465 acres) of the restricted layer would be designated as target or threshold habitat. The Kaibab NF portion of the 4FRI treatment area would have 8 percent (2,247 acres) of the restricted layer designated as target or threshold habitat. By creating more future nesting and roosting habitat on the Coconino NF, future MSO habitat would be more contiguous for dispersing MSOs, and occur in areas supporting higher densities of MSOs than if 10 percent of the restricted layer was designated by individual administrative boundaries (see figure 60 and figure 62).

Manage 6,321 Acres of MSO Restricted Target and Threshold Habitat for a Minimum of 110 to 150 Basal Area

The development of 6,321 acres of restricted target and threshold habitats would be managed toward meeting a 110 to 150 basal area for MSO nest and roost habitat as recommended in the revised MSO recovery plan (USDI 2012). It would allow more of the uncharacteristic in-growth of mid-aged and mid-sized trees that currently dominate the 4FRI landscape to be removed while retaining nesting and roosting habitat components. Thinning more of these trees would improve forest health, increasing the ability to retain large trees and increase large tree growth rates as described in the revised recovery plan (USDI 2012). This would increase forest spatial heterogeneity, improve tree age diversity, and benefit prey habitat. Increasing the basal area range would provide opportunities to mimic canopy gap processes which produce horizontal variation in stand structure. These changes would both increase and retain nesting and roosting structure and increase understory cover. Research suggests that small mammal biomass (including voles and mice) drives spotted owl reproductive output, and thinning smaller trees would improve subcanopy flight zone, thereby increasing MSO foraging effectiveness. Figure 60 displays the extent of the landscape analysis conducted to designate MSO restricted habitat for the project. Figure 61 displays the project's designated MSO restricted habitat.

Monitoring Responses to MSO Treatments

Monitoring assesses the effectiveness of management actions and provides the adaptive framework needed to develop successful management. Monitoring habitat facilitates modeling future forest conditions to determine if there will be adequate habitat to support MSO populations. For this project, the final design of the treatments and monitoring the results of the proposed activities in all MSO habitat would be developed in consultation with the FWS. Edited or added/new text is **bolded** in table 101.

Table 101. Alternative C amendment 1 MSO current and proposed forest plan language (Coconino NF)

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
MSO Standards	
No corresponding direction currently exists	**The project will comply with the biological opinion that has been developed in consultation with the FWS.**
Provide three levels of habitat management - protected, restricted, and other forest and woodland types to achieve a diversity of habitat conditions across the landscape (Coconino NF forest plan, p. 65)**.**	No Change
Protected areas include delineated protected activity centers; mixed conifer and pine-oak forests with slopes greater than 40% where timber harvest has not occurred in the last 20 years; and reserved lands which include wilderness, research natural areas, wild and scenic rivers, and congressionally recognized wilderness study areas (Coconino NF forest plan, p. 65)**.**	No Change
Restricted areas include all mixed-conifer, pine-oak, and riparian forests outside of protected areas (Coconino NF forest plan, p. 65).	No Change
Other forest and woodland types include all ponderosa pine, spruce-fir, woodland, and aspen forests outside protected and restricted areas (Coconino NF forest plan, p. 65).	No Change
Survey all potential spotted owl areas including protected, restricted, and other forest and woodland types within an analysis area plus the area 1/2 mile beyond the perimeter of the proposed treatment area (Coconino NF forest plan, p. 65).	No Change
Establish a protected activity center at all Mexican spotted owl sites located during surveys and all management territories established since 1989 (Coconino NF forest plan, p. 65).	No Change
Allow no timber harvest except for firewood and fire risk abatement in established protected activity centers. For protected activity centers destroyed by fire, windstorm, or other natural disaster, salvage timber harvest or declassification may be allowed after evaluation on a case-by-case basis in consultation with US Fish and Wildlife Service (Coconino NF forest plan, p. 65).	Allow no timber harvest except for firewood and fire risk abatement in established protected activity centers **except as follows: Allow firewood, fire risk abatement, and habitat structure improvement in the following established protected activity centers: Lake No. 1/Seruchos, Archies, Red Hill, Crawdad, Holdup, Bonita Tank, Red Raspberry, Bear Seep, Mayflower Tank, Knob, T6 Tank, Iris Tank, Frank, Rock Top, Lee Butte, Foxhole, Bar M, and Sawmill Spring.** For protected activity centers destroyed by fire, windstorm, or other natural disaster, salvage timber harvest or declassification may be allowed after evaluation on a case-by-case basis in consultation with the U.S. Fish and Wildlife Service.

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Allow no timber harvest except for fire risk abatement in mixed conifer and pine-oak forests on slopes greater than 40% where timber harvest has not occurred in the last 20 years (Coconino NF forest plan, p. 65).	No Change
Limit human activity in protected activity centers during the breeding season (Coconino NF forest plan, p. 65).	No Change
In protected and restricted areas, when activities conducted in conformance with these standards and guidelines may adversely affect other threatened, endangered, or sensitive species or may conflict with other established recovery plans or conservation agreements; consult with U.S. Fish and Wildlife Service to resolve the conflict (Coconino NF forest plan, p. 65-1).	No Change
Monitor changes in owl populations and habitat needed for delisting (Coconino NF forest plan, page 65-1).	**See "Standards" for monitoring direction**
Guidelines – General – No Change	
Guidelines – Protected Areas, Protected Activity Centers	
Delineate an area of not less than 600 acres around the activity center using boundaries of known habitat polygons and/or topographic features. Written justification for boundary delineation should be provided (Coconino NF forest plan, page 65-1).	No Change
The protected activity center boundary should enclose the best possible owl habitat configured in as compact a unit as possible, with the nest or activity center located near the center (Coconino NF forest plan, page 65-1).	No Change
The activity center is defined as the nest site. In the absence of a known nest, the activity center should be defined as a roost grove commonly used during breeding. In the absence of a known nest or roost, the activity center should be defined as the best nest/roost habitat (Coconino NF forest plan, p. 65-1).	No Change
Protected activity center boundaries should not overlap (Coconino NF forest plan, p. 65-1).	No Change
Submit protected activity center maps and descriptions to the recovery unit working group for comment as soon as possible after completion of surveys (Coconino NF forest plan, p. 65-1).	No Change

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Road or trail building in protected activity centers should be avoided but maybe permitted on a case-by-case basis for pressing management reasons (Coconino NF forest plan, p. 65-1).	No Change
Generally allow continuation of the level of recreation activities that was occurring prior to listing (Coconino NF forest plan, p. 65-1).	No Change
Require bird guides to apply for and obtain a special use permit. A condition of the permit shall be that they obtain a subpermit under the U.S. Fish and Wildlife Service Master Endangered Species permit. The permit should stipulate the sites, dates, number of visits, and maximum group size permissible (Coconino NF forest plan, p. 65-1).	No Change
Harvest firewood when it can be done in such a way that effects on the owl are minimized. Manage within the following limitations to minimize effects on the owl (Coconino NF forest plan, p. 65-2). Retain key forest species such as oak. Retain key habitat components such as snags and large downed logs. Harvest conifers less than 9 inches in diameter only within those protected activity centers treated to abate fire risk as described below, **except for the Clark PAC where trees less than 16 inches diameter will be harvested**.	Harvest firewood when it can be done in such a way that effects on the owl are minimized. Manage within the following limitations to minimize effects on the owl. Retain key forest species such as oak. Retain key habitat components such as snags and large downed logs. Harvest conifers less than 9 inches in diameter only within those protected activity centers treated to abate fire risk as described below, except for the Clark PAC where trees less than 16 inches diameter will be harvested area except as follows: **Harvest conifers up to 18-inch diameter within the Lake No. 1/Seruchos, Archies, Red Hill, Crawdad, Holdup, Bonita Tank, Red Raspberry, Bear Seep, Mayflower Tank, Knob, T6 Tank, Iris Tank, Frank, Rock Top, Lee Butte, Foxhole, Bar M, and Sawmill Spring PACs to abate fire risk and improve habitat structure.**
Treat fuel accumulations to abate fire risk. –Select for treatment 10% of the protected activity centers where nest sites are known in each recovery unit having high fire risk conditions. Also select another 10% of the protected activity centers where nest sites are known as a paired sample to serve as control areas (Coconino NF forest plan, page 65-2). –Designate a 100-acre "no treatment" area around the known nest site of each selected protected activity center. Habitat in the no treatment area should be as similar as possible in structure and composition as that found in the activity center. –Use combinations of thinning trees less than 9 inches in diameter (or less than 16 inches in the Clark PAC), mechanical fuel treatment and prescribed fire to abate fire risk in the remainder of	Treat fuel accumulations to abate fire risk. –Designate a 100-acre "no treatment" area around the known nest site of each selected protected activity center. Habitat in the no treatment area should be as similar as possible in structure and composition as that found in the activity center. – Use combinations of thinning trees less than 9 inches in diameter (or less than 16 inches in the Clark PAC), mechanical treatment and prescribed fire to abate fire risk in the remainder of the selected protected activity center outside the 100-acre "no treatment" area **except as follows:** **Use combinations of thinning trees up to 18-inch d.b.h. within the Lake No. 1/Seruchos, Archies, Red Hill, Holdup, Rock Top, Foxhole, Bar M, PACs, Crawdad, Bonita Tank, Red Raspberry, Bear Seep, Mayflower Tank, Knob, T6 Tank, Iris Tank, Frank, Lee Butte, and**

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
the selected protected activity center outside the 100-acre "no treatment" area.	**Sawmill Springs PACs**, mechanical fuel treatment and prescribed fire to abate fire risk **and improve habitat structure in the remainder of the selected protected activity center outside the 100-acre "no treatment" area. Use low intensity prescribed fire within 56 select 100-acre core areas to eliminate the need for fire line construction.**
Treat fuel accumulations to abate fire risk. Pre and post treatment monitoring should be conducted in all protected activity centers treated for fire risk abatement. (See monitoring guidelines) (Coconino NF forest plan, page 65-2)	**–** Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leafed woody vegetation, and hardwood trees larger than 10 inches in diameter at the root collar. –Use light prescribed burns in nonselected protected activity centers on a case-by-case basis. Burning should avoid a 100-acre "no treatment" area around the activity center except as follows: **Use low intensity prescribed fire within 56 select 100-acre core areas to eliminate the need for fire line construction.** Large woody debris, snags, clumps of broad-leafed woody vegetation should be retained and hardwood trees larger than 10 inches diameter at the root collar. **–See "Standards" for Monitoring Direction**
Steep Slopes (Mixed conifer and pine-oak forests outside protected activity centers with slopes greater than 40% that have not been logged within the past 20 years): No seasonal restrictions apply.	
Treat fuel accumulations to abate fire risk. –Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel removal, and prescribed fire. –Retain woody debris larger than 12 inches in diameter, snags, clumps of broadleafed woody vegetation, and hardwood trees larger than 10 inches in diameter at the root collar. – Pre and post treatment monitoring should occur within all steep slopes treated for fire risk abatement. (See monitoring guidelines)	Treat fuel accumulations to abate fire risk. –Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel removal, and prescribed fire. –Retain woody debris larger than 12 inches in diameter, snags, clumps of broadleafed woody vegetation, and hardwood trees larger than 10 inches in diameter at the root collar. **–See "Standards" for Monitoring Direction**
Reserved Lands (Wilderness, Research Natural Areas, Wild and Scenic Rivers, and Congressionally Recognized Wilderness Study Areas): Allow prescribed fire where appropriate – No Change	
Restricted Areas (Mixed conifer, pine-oak, and riparian forests)	
No corresponding direction	**Target habitat is a category of restricted habitat intended to provide future nesting and roosting habitat (see glossary definition for restricted habitat). The minimum values identified for the forest attributes represent the threshold for meeting nesting and roosting conditions (see the definition for threshold habitat). They can also be targets to be achieved with time and management. If less than 10 percent of the restricted habitat in ponderosa pine-Gambel oak**

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
	qualifies as threshold habitat, the areas that can eventually achieve all threshold conditions simultaneously should be identified as target habitat and managed to achieve threshold conditions as rapidly as possible. Because no known nests or roosts occur in restricted habitat, target habitat is considered future nesting and roosting habitat.
No corresponding direction	**Threshold habitat is a category of restricted habitat intended to provide for future nesting and roosting habitat (see definition for restricted habitat). A variety of forest structural attributes are used to define when nesting and roosting habitat is achieved (summarized in table III.B.1 of the 1995 recovery plan and table C-2 of the 2012 recovery plan). Threshold habitat meets or exceeds these values. When the minimum values identified for the forest attributes are met simultaneously, they represent the threshold of nesting and roosting conditions. Up to 10 percent of restricted habitat in ponderosa pine-Gambel oak should be designated as threshold habitat. Management in threshold habitat cannot lower any of the forest attribute values below the nesting and roosting threshold unless a landscape analysis demonstrates an abundance of this habitat. Because no known nests or roosts occur in restricted habitat, target habitat is managed as future nesting and roosting habitat.**
Mixed Conifer and Pine-oak Forests (See glossary definition): Manage to ensure a sustained level of owl nest/roost habitat well distributed across the landscape. Create replacement owl nest/roost habitat where appropriate while providing a diversity of stand conditions across the landscape to ensure habitat for a diversity of prey species. The following table displays the minimum percentage of restricted area which should be managed to have nest/roost characteristics. The minimum mixed conifer restricted area includes 10% at 170 basal area and an additional amount of area at 150 basal area. The additional area of 150 basal area is +10% in BR-E and +15% in all other recovery units. The variables are for stand averages and are minimum threshold values and must be met simultaneously. In project design, no stands simultaneously meeting or exceeding the minimum threshold values should be reduced below the threshold values unless a district-wide or larger landscape analysis of restricted areas shows that there is a surplus of restricted area acres simultaneously meeting the threshold values. Management should be designed to create minimum threshold conditions on project areas where there is a deficit of stands simultaneously meeting minimum threshold conditions unless the district-wide or	Mixed Conifer and Pine-oak Forests (See glossary definition): Manage to ensure a sustained level of owl nest/roost habitat well distributed across the landscape. Create replacement owl nest/roost habitat where appropriate while providing a diversity of stand conditions across the landscape to ensure habitat for a diversity of prey species. The following table displays the minimum percentage of restricted area which should be managed to have nest/roost characteristics. The minimum mixed conifer restricted area includes up to 10 percent at 170 basal area and an additional amount of area at 150 basal area. The additional area of 150 basal area is +10 percent in BR-E and +15 percent in all other recovery units. **In pine-oak, the minimum restricted area includes up to 10 percent at 110 to 150 basal area.** The variables are for stand averages and are minimum **target and** threshold **habitat** values and must be met simultaneously. In project design, no stands simultaneously meeting or exceeding the minimum **target and** threshold **habitat** values should be reduced below **target and** threshold values unless a districtwide or larger landscape analysis of restricted areas shows that there is a surplus of restricted area acres simultaneously meeting **target and** threshold values. Management should be designed to create minimum **target and** threshold **habitat** conditions on project areas where there is a deficit of stands simultaneously meeting

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
larger landscape analysis shows there is a surplus. This table has been modified to contain only information pertinent to the Coconino NF. (Coconino NF forest plan, pp. 65-3 to 65-5).	minimum **target and** threshold **habitat** conditions unless the districtwide or larger landscape analysis shows there is a surplus. This table has been modified to contain only information pertinent to the Coconino NF.

Variable	Mixed Conifer All RU	Mixed Conifer Other RU*	Pine-Oak Target and Threshold Habitat**
Restricted Area Percent	10%	+15%	**Up to** 10%
Stand Averages for:			
Basal Area	170	150	**110–150**
18 inch+ trees/acre	20	20	20
Oak Basal Area	NA	NA	20
Percent total existing:			
12–18 inches	10	10	15
18–24 inches	10	10	15
24+ inches	10	10	15

Attempt to mimic natural disturbance patterns by incorporating natural variation, such as irregular tree spacing and various patch sizes, into management prescriptions (Coconino NF forest plan, page 65-4).	No Change
Maintain all species of native trees in the landscape including early seral species (Coconino NF forest plan, page 65-4).	No Change
Allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure (Coconino NF forest plan, page 65-4).	No Change
Emphasize uneven-aged management systems. However, both even-aged and uneven-aged systems may be used where appropriate to provide variation in existing stand structure and species diversity. Existing stand conditions will determine which system is appropriate (Coconino NF forest plan, page 65-4).	No Change
Extend rotation ages for even-aged stands to greater than 200 years. Silvicultural prescriptions should explicitly state when vegetative manipulation will cease until rotation age is reached (Coconino NF forest plan, page 65-4).	No Change
Save all trees greater than 24 inches d.b.h. In pine-oak forests, retain existing large oaks and promote growth of additional large oaks (Coconino NF forest plan, page 65-4).	No Change

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
In pine-oak forests, retain existing large oaks and promote growth of additional large oaks (Coconino NF forest plan, page 65-4).	No Change
Encourage prescribed and prescribed natural fire to reduce hazardous fuel accumulation. Thinning from below may be desirable or necessary before burning to reduce ladder fuels and the risk of crown fire (Coconino NF forest plan, page 65-4).	No Change
Retain substantive amounts of key habitat components: • Snags 18 inches in diameter and larger • Down logs over 12 inches midpoint diameter • Hardwoods for retention, recruitment, and replacement of large hardwoods	No Change
Riparian Areas – No Change	
Domestic Livestock Grazing – No Change	
Old-Growth – No Change	
Other Forest and Woodland Types – No Change	
Guidelines for Specific Recovery Units – No Change	
Monitoring Guidelines	
Monitoring and evaluation should be collaboratively planned and coordinated with involvement from each national forest, USFWS Ecological Services Field Office, USFWS Regional Office, USFS Regional Office, Rocky Mountain Research Station, recovery team, and recovery unit working groups.	**See "Standards" for Monitoring Direction**
Population monitoring should be a collaborative effort with participation of all appropriate resource agencies. (Coconino NF forest plan, page 65-6)	
Habitat monitoring of gross habitat changes should be a collaborative effort of all appropriate resource agencies. (Coconino NF forest plan, page 65-6)	
Habitat monitoring of treatment effects (pre- and post-treatment) should be done by the agency conducting the treatment. (Coconino NF forest plan, page 65-6)	
Prepare an annual monitoring and evaluation report covering all levels of monitoring done in the previous year. The annual report should be forwarded to the Regional Forester with copies provided to the recovery unit working groups, USFWS Ecological Services field offices, and the USFWS Regional Office (Coconino NF forest plan,	

Current Coconino NF Forest Plan Direction	Proposed New Standard or Guideline Language*
page 65-6).	
Rangewide: Track gross changes in acres of owl habitat resulting from natural and human caused disturbances. Acreage changes in vegetation composition, structure, and density should be tracked, evaluated, and reported. Remote sensing techniques should provide an adequate level of accuracy (Coconino NF forest plan, page 65-6). In protected and restricted areas where silvicultural or fire abatement treatments are planned, monitor treated stands pre- and post-treatment to determine changes and trajectories in fuel levels; snag basal areas; live tree basal areas; volume of down logs over 12 inches in diameter; and basal area of hardwood trees over 10 inches in diameter at the root crown (Coconino NF forest plan, page 65-6).	
Upper Gila Mountain, Basin and Range East, and Basin and Range West Recovery Units: Assist the recovery team and recovery unit working groups to establish sampling units consisting of 19 to 39 square mile quadrats randomly allocated to habitat strata. Quadrats should be defined based on ecological boundaries such as ridge lines and watersheds. Quadrat boundaries should not traverse owl territories. Twenty percent of the quadrats will be replaced each year at random. Using the sample quadrats, monitor the number of territorial individuals and pairs per quadrat; reproduction; apparent survival; recruitment; and age structure. Track population density both per quadrat and habitat stratum.	**See "Standards" for Monitoring Direction**

* Edited and new/added text is **bolded.**

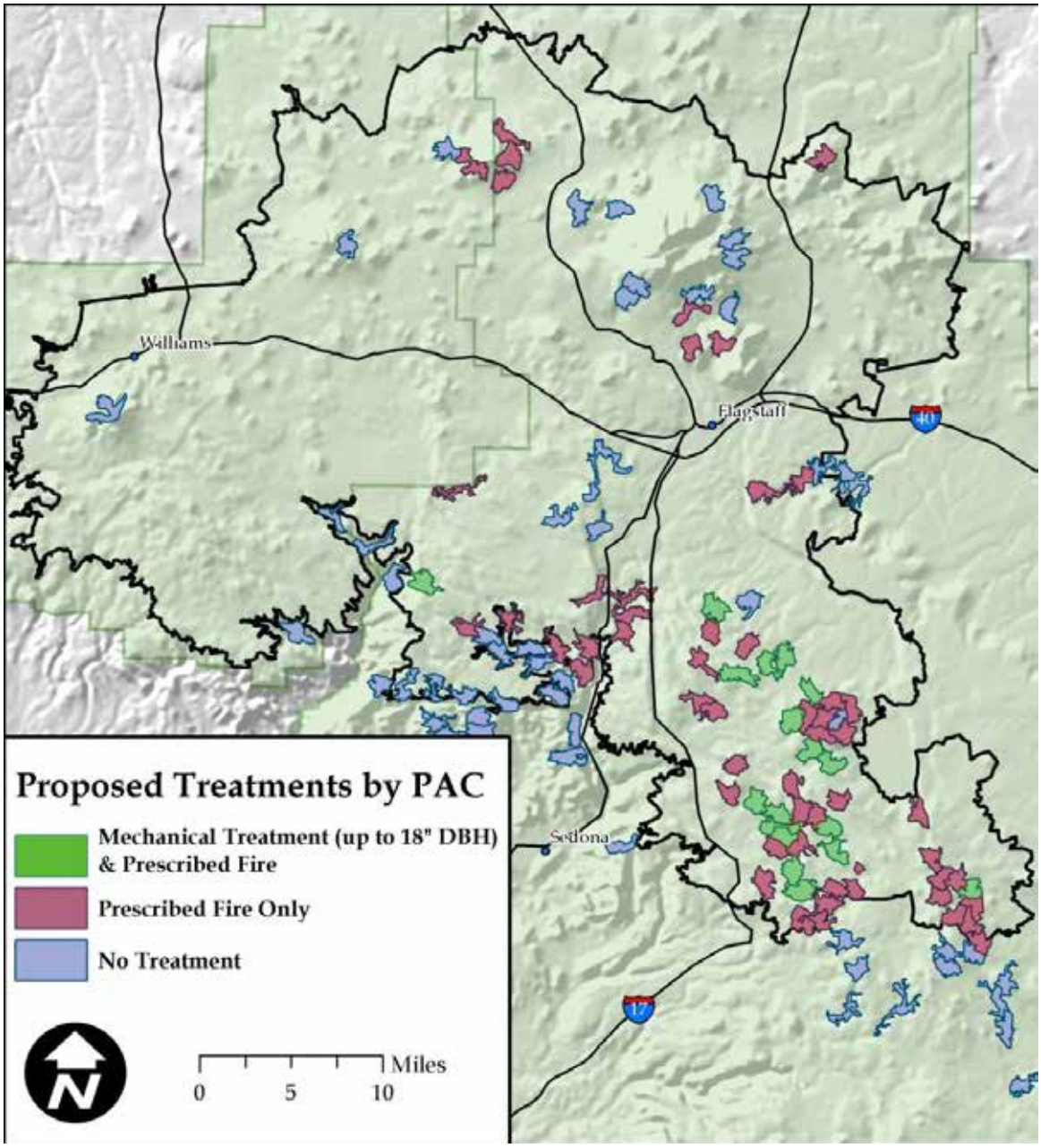

Figure 58. Alternative C amendment 1 proposed activities in MSO PACs in relation to no treatment areas (Coconino NF)

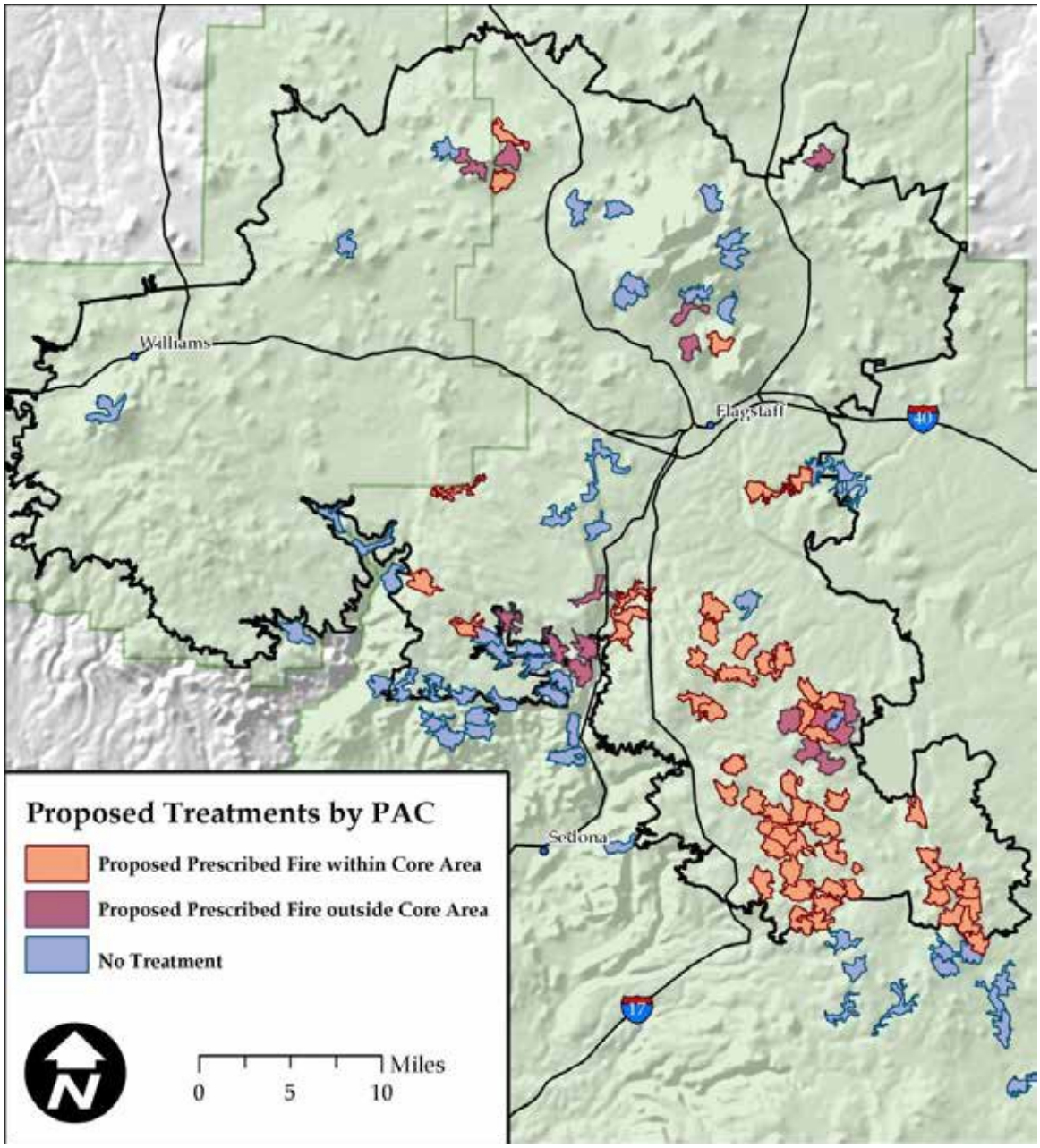

Figure 59. Alternative C amendment 1 prescribed fire within and outside of MSO core areas

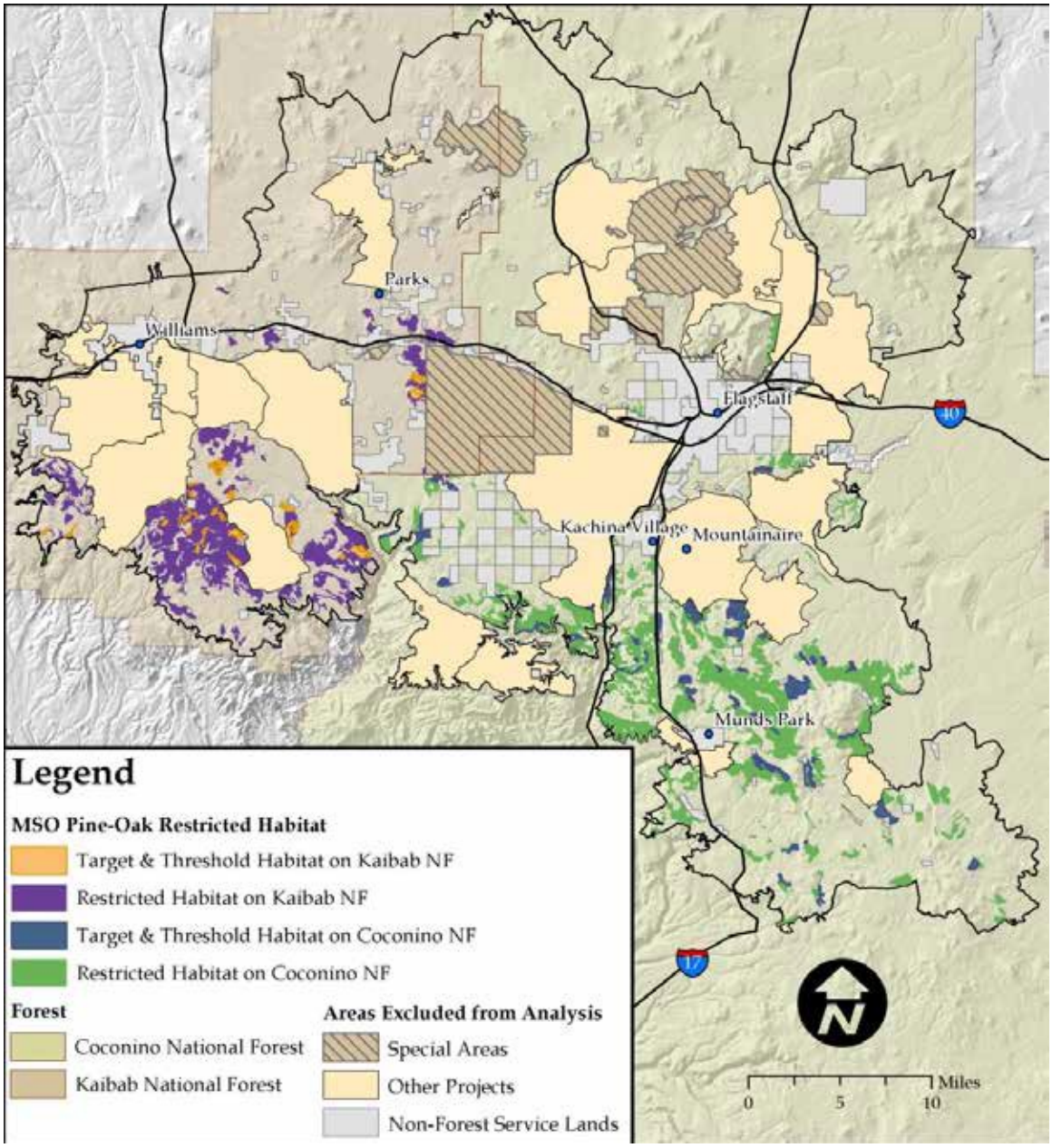

Figure 60. Alternative C amendment 1 landscape target and threshold analysis

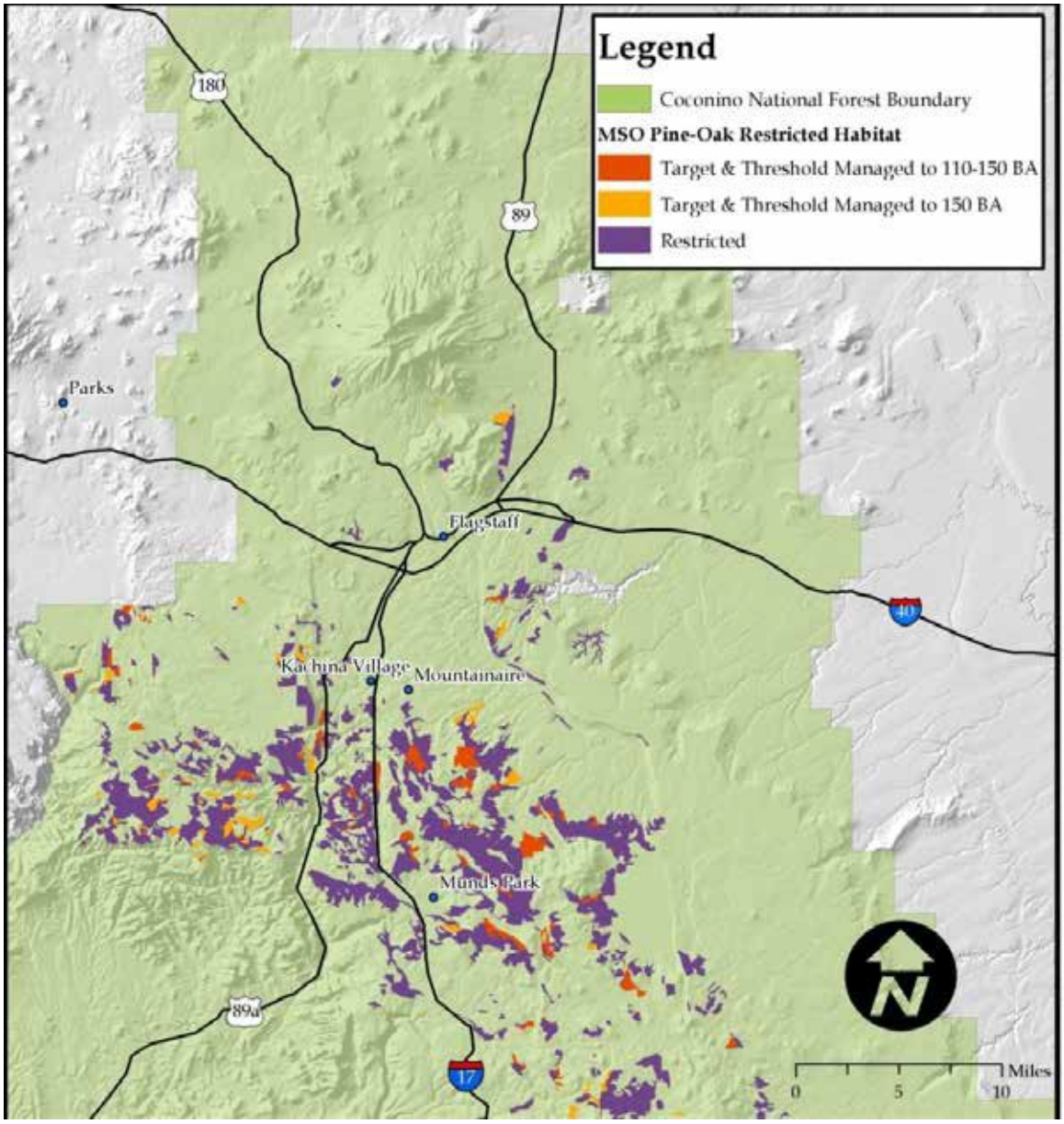

Figure 61. Alternative C amendment 1 general locations of MSO target and threshold habitat managed from 110 to 150 basal area (Coconino NF)

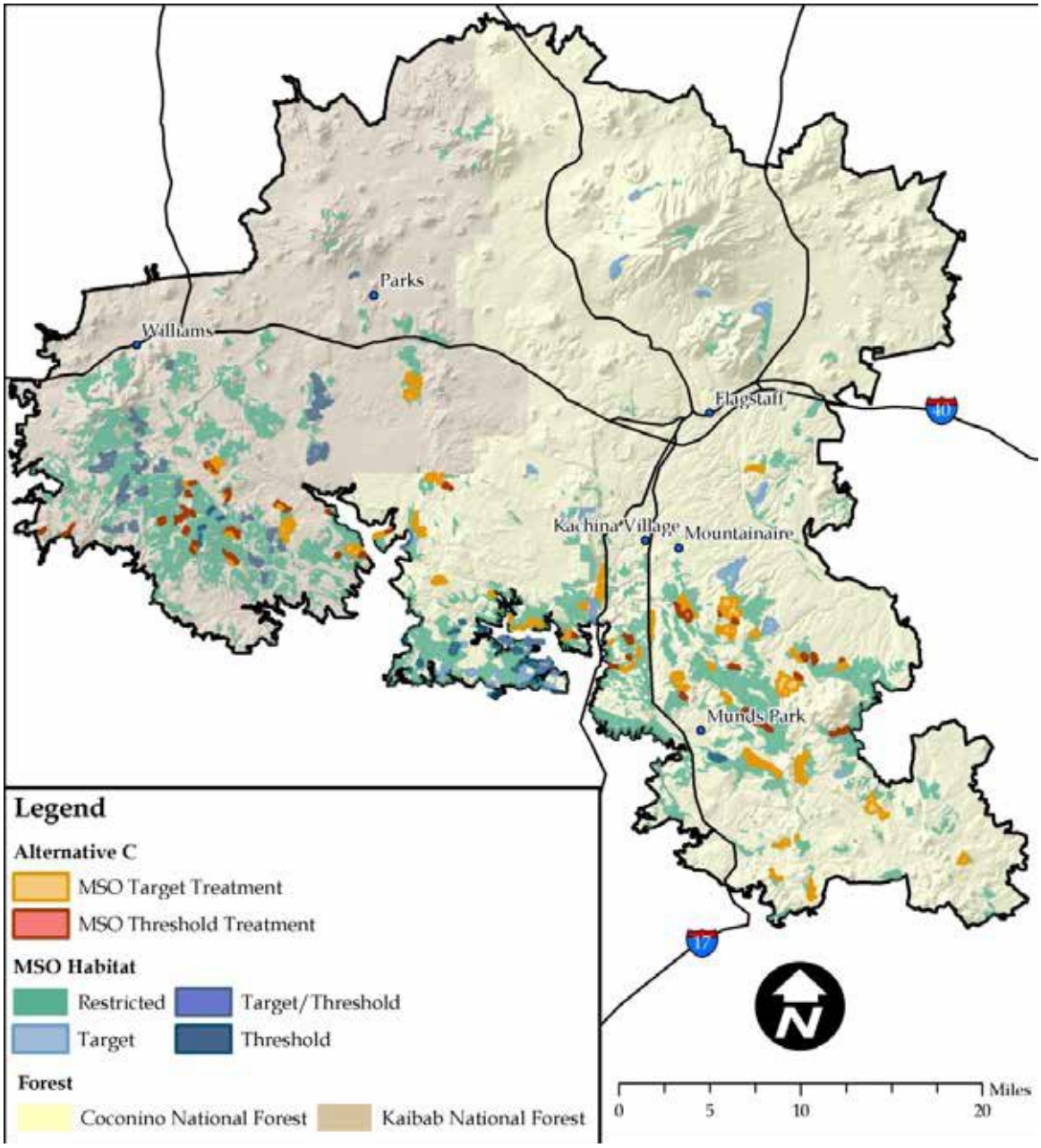

Figure 62. Alternative C amendment 1 locations of MSO target and threshold treatments

Consistency with the MSO Recovery Plan

Mechanical treatment up to 18-inch d.b.h. in select MSO PACs is consistent with the 1995 MSO recovery plan which is incorporated into the forest plan. The plan describes "large trees" as either greater than 18-inch d.b.h. (page 92) or greater than 19 inches (page 65) (USDI 1995). Treatments are also consistent with the definition of large trees in the 2012 revised MSO recovery plan.

Use of prescribed fire within MSO PAC core areas: By definition, PAC habitat and especially core areas have high fuel loading and the uncharacteristic accumulation of ground fuels puts them

at further risk. Reducing fuels to reduce the risk of high-severity fire in these important habitats would contribute toward conservation of this threatened species. A forest plan variance (allowing low intensity prescribed burning within the 100-acre core area) would eliminate the need for hand line and/or dozer line construction, allow for the maximum number of surrounding PAC acres to be treated with prescribed fire, and would potentially minimize up to 560 acres of ground disturbance to PAC habitat.

The 1995 recovery plan (USDI 1995) states "Two primary reasons were cited for the listing: historical alteration of its habitat as the result of timber management practices, specifically the use of even-aged silviculture…" and "The danger of catastrophic wildfire…" While the recovery plan is clear that the primary existing threat is high-severity wildland fire, the recovery plan also states that "[r]etaining large trees is desirable because they are impossible to replace quickly and because they are common features of nesting and roosting habitats for the owl." The recovery plan recognizes that "ecosystems are temporally dynamic [and] provisions are needed to ensure owl habitat in the long term." The primary objective to be achieved by the recovery plan guidelines is protection of the best available habitat for the MSO, while maintaining sufficient flexibility for land managers to abate high fire risks and to improve habitat conditions for the owl and its prey (page 89). The potential for using silviculture as a tool for meeting objectives such as maintaining and developing MSO habitat and enhancing various ecological factors is specifically identified in the recovery plan.

The original recovery plan recommends that recovery efforts concentrate on the recovery units with the highest owl populations and where significant threats exist. The project is located within the Upper Gila Mountain Recovery Unit (UGM RU). The UGM RU contains the largest known number of MSOs with approximately 55 percent of known spotted owl territories. The major land use within this recovery unit has been timber harvest.

The (1995) recovery plan describes a change in the size class distribution of trees that occurred on commercial forest lands in Arizona and New Mexico between the 1960s and 1980s. The density of large trees (greater than 19-inch d.b.h.) decreased by 20 percent and sapling-sized trees (1- to 4.9-inch d.b.h.) decreased in both absolute density and in relative contribution to the size class distribution. Trees 5- to 12.9-inch d.b.h. increased in density by 40 percent and in relative proportion of the size class distribution, and trees 13- to 19-inch d.b.h. increased in density but not in the relative proportion of the tree distribution. The decrease in large trees was described as "an alarming negative trend with respect to a very critical component of spotted owl habitat" (page 68) given that "the basis to maintain owl populations is to ensure that adequate habitat quality and quantity will be sustained through time." In order to achieve this, the recovery plan advocates using coarse and fine filters for ecosystem management.

Coarse filters should be used "to maintain the natural array of conditions that exist with the biotic and physical limits of the landscape" while fine filters may be used "to provide specialized habitats or habitat elements within that overall landscape." They recommend "innovative applications of uneven-aged management" for developing and maintaining important but difficult to replace spotted owl habitat elements, including large pine and oak trees, and key habitat components such as trees greater than 24-inch d.b.h. and prey habitat. The amendment allows for using silvicultural and prescribed fire treatments in select PACs at risk of losing key MSO habitat elements through declining forest health. Treatment objectives are to develop and maintain adequate MSO habitat quality and quantity through time.

The need to evolve from managing solely for firewood collection and fire risk abatement is reflected in the revised recovery plan for the MSO. The revised recovery plan states "Management is the most conservatively oriented toward owl management within PACs, but is by no means 'hands off.' The draft recognizes situations exist where management is needed to sustain or enhance desired future conditions for the owl..." It goes on to state "Mechanical treatments to achieve these objectives require a landscape analysis to determine where the needs are greatest" which is the process we are currently undergoing (USDI 2012).

Managing up to 10 percent restricted habitat as target or threshold habitat and 110 to 150 Basal Area:

Target and Threshold Habitat: This amendment would allow for managing up to10 percent of the designated restricted habitat as nest and roost habitat. MSO habitat is generally more abundant, more contiguous, and of higher quality on the Coconino NF than the Kaibab NF. This conclusion is based on forest data queries, years of on-the-ground experience of participants in the development of the restricted layer, and on presumed choices made by the owls themselves. MSOs are abundant and concentrated in pine-oak habitat on the Coconino NF. In contrast, there is only a single MSO detection dating from 1994 in pine-oak habitat on the Kaibab NF.

The MSO recovery plan describes past planning as operating at "limited spatial scale[s]" which precludes a more meaningful review of MSO habitat at ecological scales (USDI 1995). The scale of the 4FRI and the fact it transcends administrative boundaries allows managers to conduct a true landscape-scale analysis. Overall, about 11.5 percent (8,713 acres) of the 4FRI restricted habitat would be managed as current or future target or threshold habitat. On the Coconino NF portion of the project, where the most owls and the most MSO habitat occurs, 13 percent (6,465 acres) of the restricted layer would be designated as target or threshold habitat. The Kaibab NF portion of the 4FRI treatment area would have 8 percent (2,247 acres) of the restricted layer designated as target or threshold habitat. By creating more future nesting and roosting habitat on the Coconino NF, future MSO habitat would be more contiguous for dispersing MSOs, and occur in areas supporting higher densities of MSOs than if 10 percent of the restricted layer was designated by individual administrative boundaries.

This amendment meets the intent of the original (1995) and revised (2012) recovery plan by reducing the potential for creating excessively fragmented habitat and managing stands based on their capability to attain desired stand conditions. This amendment does not affect habitat designated in previous projects or in mixed-conifer habitat.

Basal Area of 110 to 150: Use of the best science is fundamental to achieving or moving toward a restored landscape. The 1995 recovery plan (USDI 1995) puts an emphasis on "the danger of catastrophic wildfire" and additionally states that "[r]etaining large trees is desirable because they are impossible to replace quickly and because they are common features of nesting and roosting habitats for the owl."

Managing for forest densities below 150 BA would better achieve both objectives. Management of forested ecosystems also needs to address forest health problems, return forested ecosystems to conditions within their natural range of variation, and work toward sustainable and resilient ecosystems (USDI 1995). Managing for conditions below 150 BA

immediately after treatment would better meet each of the respective objectives. Finally, the recovery plan recommends managers concentrate efforts on the recovery units with the highest owl populations and where significant threats exist, both of which fit the Upper Gila Mountain Recovery Unit where the 4FRI takes place. Managing for 110 to 150 basal area is consistent with the recommendations found in the revised MSO recovery plan (USDI 2012).

Significance Evaluation

Per FSM 1926.51, changes to the land management plan that are not significant can result from:

1. Actions that do not significantly alter the multiple-use goals and objectives for long term land and resource management.
2. Adjustments of management area boundaries or management prescriptions resulting from further onsite analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long term land and resource management.
3. Minor changes in standards and guidelines.
4. Opportunities for additional projects or activities that will contribute to achievement of the management prescription.

Per FSM 1926.52, circumstances that may cause a significant change to a land management plan include:

1. Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected (see section 219.10(e) of the planning regulations in effect before November 9, 2000 (see 36 CFR parts 200 to 299, revised as of July 1, 2000)), and
2. Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

Analysis demonstrated that the proposed amendment is nonsignificant (FSM 1926.51) because the actions would not measurably alter the multiple-use goals and objectives for long term land and resource management and the actions. How actions could potentially affect timing, location and size, relationship to forest goals, objectives, outputs, and management prescriptions was evaluated.

Timing: In terms of timing, the forest plan has been in place and amended several times since 1987, and revision efforts are underway. The forest plan incorporated direction (via an amendment) from the Forest Service Southwestern Region's 1996 "Amendment of Forest Plans Record of Decision" (USDA 1996).). The actions allowed via the amendment are consistent with existing forest plan direction in that it improves nesting and rooting habitat, reduces the risk of loss from fire, and will comply with the site-specific treatment and monitoring requirements in the FWS biological opinion. Forest plan direction may be amended to incorporate the revised MSO recovery plan (USDI 2012) which recognizes that habitat restoration, in addition to the reduction of fire risk, is key to improving habitat quality.

Location and Size: There are 168 MSO PACs (117,636 acres) occurring entirely on the Coconino NF. The amendment (including mechanical treatment up to 18 inch and prescribed fire in 56 core

areas) would affect 18 (11 percent) of all Coconino NF PACs. Prescribed burning within 56 core areas would potentially equal a minimum of about 5,600 acres of ground disturbance (100 acres per PAC) within 56 PACs.

Changing the minimum basal area value in restricted habitat would only apply to target and threshold acres, or those restricted acres being managed for nesting/roosting habitat as defined in the forest plans. A maximum of about 6,321 acres of restricted target or threshold habitat, or approximately 8 percent of all MSO restricted habitat (76,091acres) would be affected by using a basal area range of 110 to 150 within the treatment area on both the Coconino and Kaibab NFs.

Relationship to Forest Goals and Objectives: The amendment is consistent with forest plan goals for wildlife and fish of managing habitat to maintain viable populations of wildlife and fish species, and improving habitat for selected species (Coconino National Forest plan, replacement page 22-1). It is consistent with the goal to improve habitat for listed threatened, endangered, or sensitive species of plants and animals, and other species as they become threatened or endangered (Coconino National Forest plan, replacement page 23). The amendment is consistent with goals and objectives by protecting conditions and structures used by MSOs where they exist and to set other stands on a trajectory to grow into replacement nest habitat or to provide conditions for foraging and dispersal (USDI 1995, 2012).

Relationship to Management Prescriptions: Mechanical thinning up to 18-inch d.b.h. in 18 MSO PACs would affect between 1 and 3 percent of the forestwide MA acres (table 102). Using prescribed fire within 56 MSO PAC core areas (about 5,600 acres) would affect between 1 and 5 percent of the forestwide MA acres. Managing 6,321 acres of restricted habitat to a range of 110 to 150 BA would affect less than 1 percent to 3 percent of the forestwide MAs. The amendment intent is consistent with the management emphasis of providing for multiple uses that includes wildlife habitat and meeting MSO standards and guidelines which emphasize improving and maintaining the quality of the habitat (MA 3) and moving ponderosa pine toward desired forest structure, including northern goshawk and MSO habitats (MA 35).

Table 102. Alternative C MSO amendment 1 management area acres

MA	MA Description	Forestwide Acres	Proposed Amendment Acres	Forestwide Acres Affected (Percent)
Mechanical Treatment Up to 18-inch d.b.h.				
MA 3	Ponderosa pine below 40 percent slopes	511,015	5,384	1
MA 35	Lake Mary watershed	62,536	1,782	3
MA 4, 10, 5, 9, 12, and 6	See chapter 1, table 14	307,011	187	<1
Prescribed Fire within 56 MSO PAC Core Areas				
MA 3	Ponderosa pine below 40 percent slopes	511,015	3,800	1
MA 35	Lake Mary watershed	62,536	1,614	3
MA 5	Aspen	3,450	186	5

MA	MA Description	Forestwide Acres	Proposed Amendment Acres	Forestwide Acres Affected (Percent)
110 to 150 Basal Area in MSO Restricted Habitat				
MA 3	Ponderosa pine below 40 percent slopes	511,015	3,956	1
MA 35	Lake Mary watershed	62,536	1,926	3
MA 37 and MA 38	Walnut Canyon and West	20,566 to 36,298	312	<1
Various MAs	Various		127	

Relationship to Outputs: Outputs identified in the forest plan are associated with MMBF of sawtimber sales and products (meet demand for timber while reducing conflict with other resources), MMBF of firewood sold and free use (provide access to firewood), grazing capacity (MAUM), and permitted livestock use (MAUM).The amendment would not affect outputs or change the long-term relationship between levels of goods (timber, firewood) and services. Due to the minimal acres affected, the amendment would not alter outputs on a forestwide basis or change the long-term relationship between levels of goods (timber, firewood) and services.

In comparison the forest's total suitable timber lands (626,326 acres), the amendment would affect about 1 percent of those lands. For this reason, mechanical treatment within PACs and the minimal (6,465) acres treated in restricted habitat do not measurably increase or decrease timber outputs or firewood availability. There would be no measurable effect to outputs on a forestwide basis or the long-term relationship between levels of goods (timber, firewood) and services from using prescribed fire in 56 core areas, managing restricted habitat up to 10 percent, managing restricted habitat for a basal area of 110 to 150, or deferring the final design of treatments and monitoring to the project's biological opinion. The amendment would not affect decisions that have been made through separate analyses on grazing capacity or permitted livestock use.

Amendment 2. Management of Canopy Cover and Ponderosa Pine with an Open Reference Condition Within Goshawk Habitat (Coconino NF)

Amendment 2 is a specific, one-time variance for the Coconino NF restoration project. Once the project is complete, current forest plan direction would apply to the project area. The language proposed does not apply to any other forest project. The amendments would be authorized per direction in the National Forest Management Act of 1976 (NFMA) and its implementing regulations found in 36 CFR 219 (1982).

Amendment Description

In the "Vegetation Management – Landscapes Outside Goshawk Post-fledgling Family Areas" and "Vegetation Management –Within Post-fledgling Family Areas" section of the forest plan, a site-specific, nonsignificant plan amendment would: (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 29,017

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** are defined as the open space between tree groups intended to be managed for grass/forb/shrub vegetation during the long term. Interspaces may include scattered single trees.
- **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.

Background

Canopy cover is defined as “the percentage of a fixed area covered by the crowns of plants delimited by a vertical projection of the outermost perimeter of the spread of foliage” (Reynolds et al. 1992). Obtaining consistent results has been difficult; even the definition of the term is dependent on the method of measurement. To resolve this issue, the Forest Service used the Forest Vegetation Simulation (FVS) crown width model as the basis for developing stocking densities that would achieve desired canopy cover levels.

The forest plan directs projects to measure “vertical crown projection on average across the landscape” (see Coconino National Forest plan, page 65-9). Whereas the forest plan clearly provides direction for meeting minimum canopy cover percentages in VSS 4 to 6, the plans lack explicit language for measuring canopy cover. Although the forest plan provides direction and desired conditions for the vegetation structural stages, the forest plan does not describe the relationship between nonforested areas (interspace) and natural openings across the landscape.

Nonforested areas (interspaces) occur between individual trees, tree clumps, and tree groups. These nonforested areas (interspaces) are not equivalent to VSS 1. Whereas VSS 1 may provide openings in the short term, this structural stage is expected to regenerate tree cover in the long term. Refer to the silviculture report and the implementation plan (appendix D) which provides minimum stocking guidelines that have been developed to assure canopy cover requirements are met. Figure 63 displays the general locations in alternative C where canopy cover would be affected by the amendment on both forests. Figure 64 displays the general locations in alternative C where acres would be managed for an open reference condition on both forests.

Approximately 198,136 acres (61 percent) of the forested areas (within the project area) have an open reference condition that corresponds to mollic-integrade soils. The desired condition is to have a portion of these acres (29,017 acres) managed as a relatively open forest with trees typically aggregated in small groups within a grass/forb/shrub matrix (Woolsey 1911, Cooper 1960, White 1985, Pearson 1950, Covington et a1.1997, Abella and Denton 2009). See the soils specialist report for detailed information.

Current forest plan language and edited or added/new text is **bolded** in table 103.

Table 103. Alternative C amendment 2 management of canopy cover and ponderosa pine with an open reference condition in goshawk habitat (Coconino NF)

Current Coconino NF Forest Plan Direction	Proposed New Guideline Language*
Landscapes Outside Goshawk PFAs	
No similar direction in forest plan	**General: Within ponderosa pine stands, manage over time for uneven-aged stand conditions composed of heterogeneous mosaics of tree groups and single trees, with interspaces between tree groups. The size of tree groups, as well as sizes and shapes of interspaces, should be variable. Over time, the spatial location of the tree groups and interspaces may shift within the uneven-aged stand.**
General: The distribution of vegetation structural stages for ponderosa pine, mixed conifer and spruce-fir forests is 10% grass/forb/shrub (VSS 1), 10% seedling-sapling (VSS 2), 20% young forest (VSS 3), 20% mid-aged forest (VSS 4), 20% mature forest (VSS 5), 20% old forest (VSS 6). NOTE: The specified percentages are a guide and actual percentages are expected to vary + or – up to 3% (Coconino NF forest plan, p. 65-9).	General: **For the areas managed for tree crown development**, the distribution of vegetation structural stages for ponderosa pine, mixed conifer and spruce-fir forests is 10 percent grass/forb/shrub (VSS 1), 10 percent seedling-sapling (VSS 2), 20 percent young forest (VSS 3), 20 percent mid-aged forest (VSS 4), 20 percent mature forest (VSS 5), and 20 percent old forest (VSS 6). Note: the specified percentages are a guide, and actual percentages are expected to vary plus or minus up to 3 percent.
The distribution of VSS, tree density, and tree age are a product of site quality in the ecosystem management area. Use site quality to guide in the distribution of VSS, tree density, and tree ages. Use site quality to identify and manage dispersal PFA and nest habitat at 2 - 2.5 mile spacing across the landscape (Coconino NF forest plan, p. 65-9).	No Change
Snags are 18" or larger d.b.h. and 30 feet or larger in height, downed logs are 12 inches in diameter and at least 8 feet long, woody debris is 3 inches or larger on the forest floor, canopy cover is measured with vertical crown projection on average across the landscape (Coconino NF forest plan, p. 65-9).	Snags are 18" or larger d.b.h. and 30 feet or larger in height, downed logs are 12 inches in diameter and at least 8 feet long, woody debris is 3 inches or larger on the forest floor, **canopy cover as defined by vertical crown projection is evaluated within mid-aged to old forest vegetation structural stage groups (VSS 4, 5, and 6).**
No corresponding forest plan direction	**Develop and maintain a highly diverse vegetation mosaic: 30 to 90 percent of the uneven-aged stand should be under ponderosa pine and deciduous tree crowns. Within areas managed for an open reference condition, 10 to 30 percent of**

Current Coconino NF Forest Plan Direction	Proposed New Guideline Language*
	the uneven-aged stand should be under ponderosa pine and deciduous tree crowns.
No corresponding forest plan direction	**Tree group spatial distribution may be highly variable based on local site and current conditions; the interspaces between groups may range from 20 to 200 feet, but generally between 25 and 100 feet apart from drip line to adjacent drip line. This spacing of groups is not affected by single trees in the interspace.**
No corresponding forest plan direction	**Each tree group is generally dominated by one vegetation structure stage. The spatial arrangement of trees, high dispersion of vegetation structural stage diversity, and interspaces comprise each uneven-aged forest stand. Collectively these stands aggregate to uneven-aged forest landscapes, similar to natural conditions.**
The order of preferred treatment for woody debris is: (1) prescribed burning, (2) lopping and scattering, (3) hand piling or machine grapple piling, (4) dozer piling (Coconino NF forest plan, p. 65-9).	No Change
Canopy Cover: Canopy cover guidelines apply only to mid-aged to old forest structural stages (VSS 4, VSS 5, and VSS 6) and not to grass/forb/shrub to young forest structural stages (VSS 1, VSS 2, and VSS 3) (Coconino NF forest plan, p. 65-9).	Canopy Cover: Canopy cover guidelines apply only to mid-aged to old forest structural stage **groups** (VSS 4, VSS 5, and VSS 6) and not to grass/forb/shrub to young forest structural stage **groups** (VSS 1, VSS 2, and VSS 3) **or in interspaces, natural meadows, grasslands, or other areas not managed for forest cover.**
Spruce-Fir: Canopy cover for mid-aged forest (VSS 4) should average 1/3 60% and 2/3 40%, mature forest (VSS 5) should average 60+%, and old forest (VSS 6) should average 60+%. Maximum opening size is 1 acre with a maximum width of 125 feet. Provide 2 groups of reserve trees per acre with 6 trees per group when opening size exceeds 0.5. Leave at least 3 snags, 5 downed logs, and 10–15 tons of woody debris per acre (Coconino NF forest plan, p. 65-9).	No Change
Mixed Conifer: Canopy cover for mid-aged forest (VSS 4) should average 1/3 60+% and 2/3 40+%, mature forest (VSS 5) should average 50+%, and old forest (VSS 6) should average 60+%. Maximum opening size is up to 4 acres with a maximum width of up to 200 feet. Retain 1 group of reserve trees per acre of 3–5 trees per group for openings greater than 1 acre in size. Leave at least 3 snags, 5 downed logs, and 10–15 tons of woody debris per acre (Coconino NF forest plan, p. 65-10).	No Change

Current Coconino NF Forest Plan Direction	Proposed New Guideline Language*
Ponderosa Pine: Canopy Cover for mid-aged forest (VSS 4) should average 40+%, mature forest (VSS 5) should average 40+%, and old forest (VSS 6) should average 40+%. Opening size is up to 4 acres with a maximum width of up to 200 feet. One group of reserve trees, 3–5 trees per group, will be left if the opening is greater than an acre in size. Leave at least 2 snags per acre, 3 downed logs per acre, and 5–7 tons of woody debris per acre (Coconino NF forest plan, p. 65-10).	Ponderosa Pine: Canopy cover for mid-aged forest (VSS 4) should average 40+ percent, mature forest (VSS 5) should average 40+ percent, and old forest (VSS 6) should average 40+ percent. Opening size is up to 4 acres with a maximum width of up to 200 feet. One group of reserve trees, three to five trees per group, will be left if the **created regeneration** opening is greater than an acre in size. Leave at least two snags per acre, three downed logs per acre, and 5–7 tons of woody debris per acre. **In acres managed for an open reference condition, canopy cover guidelines for VSS 4 through VSS 6 groups do not apply. One group of reserve trees, with a minimum of one to two trees per group will be left if the interspace size is greater than an acre in size. Interspace size is up to 4 acres.** Leave at least two snags per acre, three downed logs per acre, and 5–7 tons of woody debris per acre
Woodland: manage for uneven age conditions to sustain a mosaic of vegetation densities (overstory and understory), age classes, and species composition well distributed across the landscape. Provide for reserve trees, snags, and down woody debris (Coconino NF forest plan, p. 65-10).	No Change
Vegetation Management – Within Post-fledgling Family Areas	
General: Provide for a healthy sustainable forest environment for the post-fledging family needs of goshawks. The principle difference between within the post-fledging family area and outside the post-fledging family area is the higher canopy cover within the post-fledging family area and smaller opening size within the post-fledging family area. Vegetative Structural Stage distribution and structural conditions are the same within and outside the post-fledging family area (Coconino NF forest plan, p. 65-10).	No Change
No similar direction in forest plan	**Canopy cover is evaluated at the group level within mid-aged to old forest structural stages groups (VSS 4, VSS 5, and VSS 6) and not within grass/forb/shrub to young forest structural stage groups (VSS 1, VSS 2, and VSS 3) or in interspaces, natural meadows and grasslands, or other areas not managed for forest conditions.**
Spruce-fir: Canopy Cover for mid-aged forest (VSS 4) should average 60+% and for mature (VSS 5) and old forest (VSS 6) should average 70+% (Coconino NF forest plan, p. 65-10).	No Change
Mixed Conifer: Canopy Cover for mid-aged (VSS 4) to old forest (VSS 6) should average 60+%.	No Change

Current Coconino NF Forest Plan Direction	Proposed New Guideline Language*
Ponderosa Pine: Canopy Cover for mid-aged forest (VSS 4) should average 1/3 60+% and 2/3 50+%. Mature (VSS 5) and old forest (VSS 6) should average 50+% (Coconino NF forest plan, p. 65-10).	No Change
No corresponding forest plan direction	**Develop and maintain a highly diverse vegetation mosaic: 30 to 90 percent of the uneven-aged stand should be under ponderosa pine and deciduous tree crowns.**
No corresponding forest plan direction	**Tree group spatial distribution may be highly variable based on local site and current conditions; the interspaces between groups may range from 20 to 200 feet, but generally between 25 and 100 feet apart from drip line to adjacent drip line. This spacing of groups is not affected by single trees in the interspace.**
No corresponding forest plan direction	**Each tree group is generally dominated by one vegetation structure stage. The spatial arrangement of trees, high dispersion of VSS structural stage diversity, and interspaces comprise each uneven-aged forest stand. Collectively these stands aggregate to uneven-aged forest landscapes, similar to natural conditions.**
Glossary	
No corresponding forest plan language	**Interspaces: The open space between tree groups intended to be managed for grass/forb/shrub vegetation during the long term. Interspaces may include scattered single trees.**
No corresponding forest plan language	**Open reference condition: 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.**
No corresponding forest plan language	**Stands: 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.**

* Edited and new/added text is **bolded.**

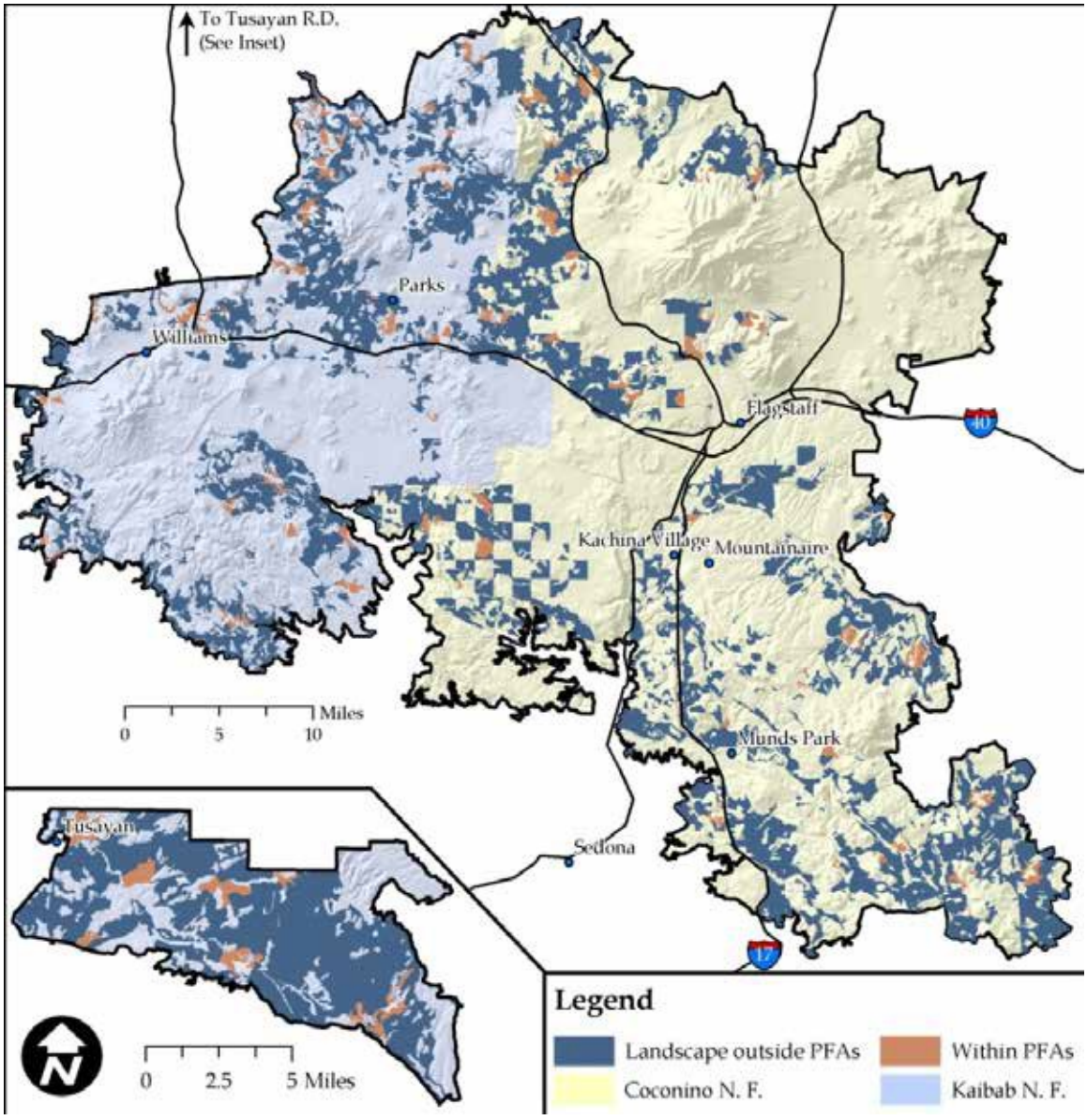

Figure 63. Alternative C general location of goshawk habitat subject to canopy cover requirements in VSS 4 to VSS 6 (Coconino NF and Kaibab NF)

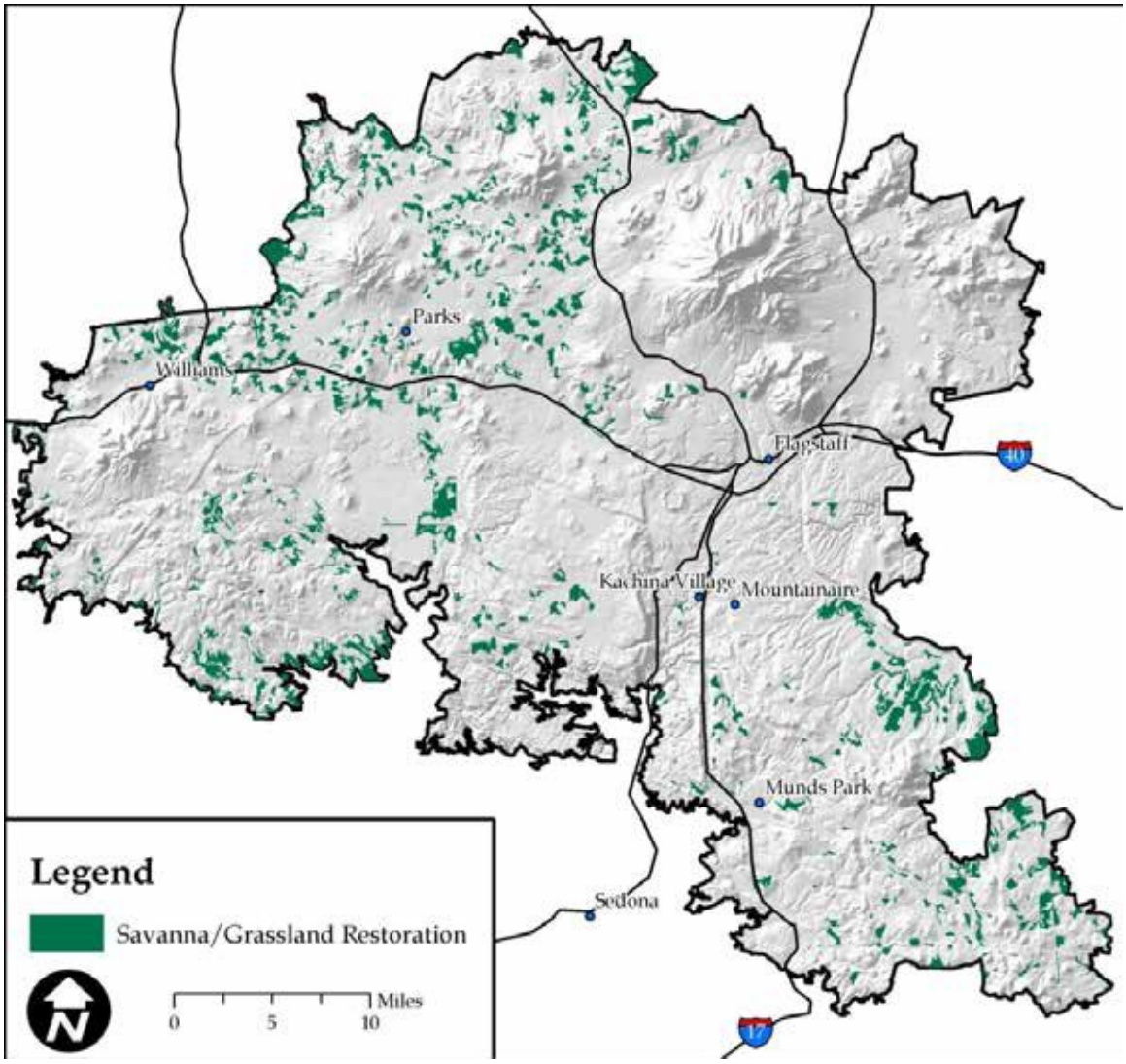

Figure 64. Alternative C amendment 2 general locations of savanna and grassland restoration treatments (Coconino NF and Kaibab NF)

Significance Evaluation

Per FSM 1926.51, changes to the land management plan that are not significant can result from:

1. Actions that do not significantly alter the multiple-use goals and objectives for long-term land and resource management.
2. Adjustments of management area boundaries or management prescriptions resulting from further onsite analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long term land and resource management.
3. Minor changes in standards and guidelines.
4. Opportunities for additional projects or activities that will contribute to achievement of the management prescription.

Per FSM 1926.52, circumstances that may cause a significant change to a land management plan include:

1. Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected (see section 219.10(e) of the planning regulations in effect before November 9, 2000 (see 36 CFR parts 200 to 299, revised as of July 1, 2000)), and
2. Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

Analysis demonstrated that the proposed amendment is nonsignificant (FSM 1926.51) because the actions would not significantly alter the multiple-use goals and objectives for long term land and resource management and the actions. How actions could potentially affect timing, location and size, relationship to forest goals, objectives, outputs, and management prescriptions was evaluated.

Timing: In terms of timing, the forest plan has been in place (and amended) since 1987 and plan revision efforts are underway.

Location and Size: Suitable goshawk habitat on the Coconino NF encompasses about 791,897 acres (Green 2011, draft unpublished data). Approximately 399,633 acres of goshawk habitat is within the 4FRI project area.

- The canopy cover portion of the amendment would affect 139,161 acres (18 percent) of all goshawk habitat on the Coconino NF and about 35 percent of goshawk habitat within the project area. For this reason, location (confined to the ponderosa pine cover type) and size was determined to be non-significant.
- Managing 29,017 acres of ponderosa pine for an open reference condition would affect approximately 4 percent of all suitable goshawk habitats on the forest and about 8 percent of goshawk habitat within the project area.

For these reasons, location and size was determined to be nonsignificant. The amendment would facilitate moving over 139,000 acres toward the desired forest structure (groups and clumps with herbaceous openings) that maximizes prey base species habitat and allows for the reintroduction of fire into the ecosystem; and moves over 29,000 acres toward historic reference conditions.

Relationship to Forest Goals and Objectives: Alternative C would meet goshawk forest plan canopy cover requirements in VSS 4 to 6 in all acres except the 29,054 acres managed for an open reference condition. In all acres but the open reference condition acres, actions would move toward the desired VSS size class distribution.

The amendment is consistent with forest goals for wildlife and fish of managing habitat to maintain viable populations of wildlife and fish species and improve habitat for selected species (Coconino National Forest plan, replacement page 22-1). It is consistent with the goal to improve habitat for listed threatened, endangered, or sensitive species of plants and animals and other species as they become threatened or endangered (Coconino National Forest plan, replacement page 23).

Relationship to Management Prescriptions: Table 104 displays the acres associated with Coconino NF management areas (MAs).

Canopy Cover: The acres of forestwide MAs affected by the canopy cover portion of the amendment (139,161 acres total) would range from 3 percent (MA 4) to 35 percent (MA 38). The amendment is specific to this project and would not impose definition and clarification requirements on the future management of canopy cover within goshawk habitat.

Open Reference Condition: The acres of forestwide MAs affected by the open reference condition portion of the amendment (29,054 acres total) would range from 1 percent (MA 10) to 9 percent (MA 35). The amendment is consistent with the management emphasis of providing for multiple uses that includes wildlife habitat (MA 3) and moving ponderosa pine toward desired forest structure, including northern goshawk habitats (MA 35). The amendment is specific to this project and would not impose requirements on future management of the 29,017 acres of goshawk non-PFA; however, forest plan revision decisions may.

Table 104. Alternative C Amendment 2 MA Acres

MA	MA Description	Forestwide Acres	Proposed Amendment Acres	Forestwide Acres Affected (Percent)
Canopy Cover				
MA 3	Ponderosa pine below 40 percent slopes	511,015	92,204	18
MA 35	Lake Mary watershed	62,536	14,287	23
MA 38	West	36,298	12,844	35
MA 6	Unproductive timber lands	67,146	4,929	7
MA 37	Walnut Canyon	20,566	4,536	22
MA 20	Highway 180 corridor	7,608	2,087	27
MA 4	Ponderosa pine and mixed conifer >40%	46,382	1,612	3
MA 36	Schultz	21,289	1,815	9
*MA 28, 4, 9, 5, 8, 10, 7, 34, 12, 15, 14	See chapter 1, table 14	511,301	4,847	<1
Open Reference Condition				
MA 3	Ponderosa pine below 40 percent slopes	511,015	19,010	4
MA 35	Lake Mary watershed	62,536	5,840	9
MA 10	Transition grassland	160,494	1,288	1
MA 38	West	36,298	1,073	3

MA	MA Description	Forestwide Acres	Proposed Amendment Acres	Forestwide Acres Affected (Percent)
**MA 6, 20, 4, 37, 9, 36, 7, 12, 34, 28, 5	See chapter 1, table 14	221,928	1,806	<1

*All MA acres ranging from 1 to 1,215 were aggregated into the various categories.
**All MA acres ranging from 3 to 655 were aggregated into the various categories.

Relationship to Outputs: Outputs identified in the forest plan are associated with MMBF of sawtimber sales and products (meet demand for timber while reducing conflict with other resources), MMBF of firewood sold and free use (provide access to firewood), grazing capacity (MAUM), and permitted livestock use (MAUM).The amendment would not affect outputs or change the long-term relationship between levels of goods (timber, firewood) and services.

The canopy cover portion of the amendment provides clarification and disclosure of methods for meeting forest plan requirements. It has no relationship to outputs or to the relationship between the level of goods (timber, firewood) and services and would not result in a change in land productivity or timber suitability classification.

Managing a portion of the landscape for an open reference condition affects about 29,017 acres of an estimated 626,326 acres of suitable timber lands. The management strategy on these acres would result in an extended rotation period between treatments beyond what was considered in developing the long-term sustained yield output in the forest plan. In the short term (10-year period), the amendment affects about 5 percent of the suitable land base. However, due to the minimal acres affected, the amendment would not measurably alter outputs in the foreseeable future on a forestwide basis; or change the long-term relationship between levels of goods (timber, firewood) and services. There would be no change in land productivity; therefore, it would not affect timber suitability classification.

Whether the 29,017 acres would continue to be managed as suitable timber in the long term will be evaluated during the forest plan revision process. No portion of the amendment would affect decisions that have been made through separate analyses on grazing capacity or permitted livestock use.

Amendment 3. Effect Determination for Cultural Resources

Amendment 3 is a specific, one-time variance for the Coconino NF restoration project. Once the project is complete, current forest plan direction would apply to the project area. The language proposed does not apply to any other forest project. The amendments would be authorized per direction in the National Forest Management Act of 1976 (NFMA) and its implementing regulations found in 36 CFR 219 (1982).

Amendment Description

The amendment deletes the standard that addresses achieving a “no effect” determination and adds the words “or no adverse effect” to the remaining standard. Management strives to achieve a “no effect” or “no adverse effect” determination.

Background

The Coconino NF forest plan as written has some conflicting direction regarding managing significant or potentially significant sites. One standard (which would be amended for this project) directs management to **strive** to achieve a "no effect" determination. A second standard (which would be deleted for this project) directs management to achieve a "no effect" determination in consultation with SHPO and ACHP (36 CFR 800). An amendment is proposed to recognize that there could be effects that are not adverse, and that there could be adverse effects that may or may not be fully mitigated. Table 105 displays current and proposed forest plan language. New or edited text is displayed in **bold** text.

Table 105. Alternative C amendment 3 effect determination for cultural resources

Current Coconino NF Forest Plan Direction	Proposed New Standards and Guidelines Language*
Cultural Resources	
Consult with Native Americans when projects and activities are planned in sites or areas of known religious or cultural importance (Coconino NF forest plan, page 52).	No Change
Make boughs and herbaceous plant parts used for Native American religious and ceremonial purposes available under conditions and procedures that minimize restrictions, consistent with laws, regulations, and agreements with tribes. The written authorization to the Hopi Tribe for gathering without specific individual permits is an example. This authorization does not include such items as firewood removed from the forest or Kiva logs, which do require a permit (Coconino NF forest plan, page 52).	No Change
The forest complies with the National Historic Preservation Act (NHPA) in decisions involving interactions between cultural and other resources. Cultural resources are managed in coordination with the State Historic Preservation Plan (SHPO). Until evaluated, the minimal level of management for all sites is avoidance and protection (Coconino NF forest plan, page 52).	No change
Specific standards and guidelines derived from the settlement agreement for the Save the Jemez lawsuit are subject to adjustment, should that agreement be modified. In that event an amendment to the forest plan will be issued (Coconino NF forest plan, page 52).	No Change
Project undertakings are inventoried for cultural resources and areas of Native American religious use. Inventory intensity complies with regional policy, and the settlement agreement for the Save The Jemez Lawsuit, and is determined in consultation with the State Historic Preservation Officer (SHPO). Generally, inventory standards are: One hundred percent survey of all projects causing complete surface disturbance; When less than 100 percent survey is deemed appropriate, the specific sample fraction surveyed is determined in consultation with the State Historic Preservation Officer and is generally greater than 10 percent. Factors determining when sampling is appropriate include projects with dispersed or minimal impacts, low expected archaeological site density, ground cover, and types of archaeological sites present in the area; Consultation with appropriate Native American groups; Consultation with the SHPO, and if necessary, the Advisory Council on Historic Preservation (ACHP), before project implementation (Coconino NF forest plan, page 52-1).	No Change

Current Coconino NF Forest Plan Direction	Proposed New Standards and Guidelines Language*
Significant, or potentially significant, inventoried sites are managed to achieve a "No Effect" determination, in consultation with the SHPO and ACHP (36 CFR 800) (Coconino NF forest plan, page 53).	**Standard would be removed**
Monitoring during and after project implementation is done to document site protection and condition (Coconino NF forest plan, page 53).	No Change
Management strives to achieve a "No Effect" determination (Coconino NF forest plan, page 53).	**Management strives to achieve a "no effect" or "no adverse effect" determination**
When sample surveys, rather than 100 percent survey coverage, are done for project clearances, survey locations and sample intensity are based on areas of greatest project impact, likely locations for cultural resource sites based on archaeological experience, land management planning, dispersion of sample coverage, certain topographic features specified in the Save the Jemez lawsuit settlement agreement, and likely areas based on the Forest site density predictions (Coconino NF forest plan, page 53).	No Change
Identified sites are evaluated for their National Register eligibility when they are severely damaged, when they will be impacted by an undertaking, or information about the uniqueness, commonness, and characteristics of their site class are sufficiently known to make an informed decision. Sites for which determinations of eligibility have not been made are managed as if they are eligible, unless consultation with the SHPO indicates otherwise (Coconino NF forest plan, page 53).	No Change
For each full-time professional cultural resource specialist employed by the forest, at least two site nominations, one archaeological district nomination, or one thematic or multiple resource nomination will be made each year to the National Register of Historic Places. Or, alternatively, the forest will coordinate with other forests to prepare a joint district, thematic, or multiple resource nomination (Coconino NF forest plan, page 53).	No Change
Inventoried sites allocated to management categories, and/or eligible or potentially eligible for the NRHP or potentially eligible for the NRHP are systematically revisited by regularly scheduled patrols, and by cultural resources specialists to assess natural deterioration, vandalism, or pilfering. Inspections are made at least biannually of properties that have been listed in or nominated to the National Register. Sites most susceptible to natural deterioration and/or human disturbance are monitored frequently. Rapid natural deterioration, or susceptibility to such, requires stabilization, restoration, and/or data recovery. Vandalism or pilfering requires protective measures such as signing, remote sensing, increased patrolling, investigations, stabilization, restoration, and/or data recovery. Specific sites or areas may be closed to off-road driving and withdrawn from mineral entry. Law enforcement is planned and implemented to minimize resource damage and user conflicts. Signing is appropriate to inform and educate the public and minimize direct law enforcement activity. Aggressively pursue violations (Coconino NF forest plan, page 53).	No Change
Continue to interpret cultural resources through lectures, tours, papers, reports, publications, brochures, displays, films, trails, signs, and other opportunities. (Coconino NF forest plan, page 54).	No Change

Current Coconino NF Forest Plan Direction	Proposed New Standards and Guidelines Language*
Develop a program to complete 100 percent coverage of the Forest's cultural resource inventory by 2000 (Coconino NF forest plan, page 54).	No Change
The first priorities for cultural resources protection, enhancement, and interpretation are those sites that are easily accessible, have major interpretive potential, or are in major need of repair. Priority sites for signing are the C. Hart Merriam Base Camp, Honanki Cliff Dwellings, Elden Pueblo, Sacred Mountain, Palatki Cliff Dwellings, and Clear Creek Ruins. Priority sites for repair and stabilization are Honanki Cliff Dwellings, Palatki Cliff Dwellings, Sacred Mountain, Clear Creek Cliff Dwelling, and General Springs Cabin. Priority sites for developing interpretive brochures are Elden Pueblo, Sacred Mountain, Red Tank Draw Petroglyphs, Honanki Cliff Dwellings, Palatki Cliff Dwellings, and Clear Creek Ruins. Priorities are to: Survey to clear projects. Survey to fill in gaps in existing inventory coverage. Survey areas of known high site densities. Survey areas that would do the most to answer current archaeological questions (Coconino NF forest plan, page 54).	No Change
Computerize cultural resource site information by 1990 (Coconino NF forest plan, page 54).	No Change
Maintain a form for tracking compliance of each undertaking with the requirements of the National Historic Preservation Act (Coconino NF forest plan, page 54).	No Change
Stabilize or repair damaged National Register sites or other sites funded by regional priority (Coconino NF forest plan, page 54).	No Change
Continue to develop the Elden Pueblo Interpretive Site and the cooperative education program with the Museum of Northern Arizona (Coconino NF forest plan, page 54).	No Change
Encourage universities to conduct summer field schools to assist in cultural resource survey and excavation work and to provide the forest with scientific knowledge (Coconino NF forest plan, page 54).	No Change
Periodically focus media attention on Elden Pueblo and/or other sites to educate the public and further volunteer interest in resource management. Work with community organizations, businesses, and other agencies to promote Arizona Archaeology Week. Feature significant finds and significant damage in the media to increase public awareness of benefits and problems (Coconino NF forest plan, page 54).	No Change

* Edited and new/added text is **bolded**.

Significance Evaluation

Per FSM 1926.51, changes to the land management plan that are not significant can result from:

1. Actions that do not significantly alter the multiple-use goals and objectives for long term land and resource management.

2. Adjustments of management area boundaries or management prescriptions resulting from further onsite analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long term land and resource management.
3. Minor changes in standards and guidelines.
4. Opportunities for additional projects or activities that will contribute to achievement of the management prescription.

Per FSM 1926.52, circumstances that may cause a significant change to a land management plan include:

1. Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected (see section 219.10(e) of the planning regulations in effect before November 9, 2000 (see 36 CFR parts 200 to 299, revised as of July 1, 2000)), and
2. Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

The proposed amendment is nonsignificant (FSM 1926.51) because multiple-use goals and objectives for long term land and resource management and its actions would not be altered. How the amendment could potentially affect timing, location and size, relationship to forest goals, objectives, outputs, and management prescriptions was evaluated.

Timing: In terms of timing, the forest plan has been in place (and amended) since 1987, and plan revision efforts are underway.

Location and Size: The amendment is specific to the 593,211 acres of proposed treatments in this project. This affects about 33 percent of the Coconino NF which is about 1,821,495 acres in size. This would not have an important effect on the entire land management plan or a large portion of the planning area. For this reason, location and size was determined to be nonsignificant.

Relationship to Forest Goals and Objectives: The amendment would not affect attainment of forest goals and objectives for cultural resources. Cultural resource sites would be located and protected from project activities according to direction in FSM 2360 and 2430 (Coconino NF forest plan, page 50) and the requirements of 36 CFR 800 including 36 CFR 800.5 which provides direction for assessing adverse effects and proposing a finding of no adverse effect. Consultation with AZ SHPO would occur as required and regulation 36 CFR 800 would be followed and met.

Relationship to Management Prescriptions: The amendment would apply to all 23 management areas (MAs) as described in the Coconino National Forest plan (pages 46 to 206-113) and in chapter 1 of the DEIS. The amendment would not affect the management of the MAs. All cultural resources are currently managed to minimize impacts and to achieve a “no effect” or “no adverse effect” determination whenever possible, in consultation with AZ SHPO, the council, and other consulting parties.

Relationship to Outputs: Outputs identified in the forest plan are associated with MMBF of sawtimber sales and products (meet demand for timber while reducing conflict with other resources), MMBF of firewood sold and free use (provide access to firewood), grazing capacity

(MAUM), and permitted livestock use (MAUM).The amendment would not affect outputs or change the long-term relationship between levels of goods (timber, firewood) and services.

The amendment would not affect outputs or change the long-term relationship between levels of goods (timber, firewood) and services. All cultural resources are managed to minimize impacts and to achieve a "no effect" or "no adverse effect" determination whenever possible, in consultation with AZ SHPO, the council, and other consulting parties regardless of forest plan desired outputs.

Alternative C – Kaibab National Forest Site-Specific Nonsignificant Forest Plan Amendments

Three site-specific, nonsignificant forest plan amendments are proposed for alternative C. The potential impacts of two related planning efforts was evaluated.

A revised MSO recovery plan, issued by the FWS was finalized in December of 2012 (USDI 2012). At some point in time, the Kaibab NF may amend its current forest plan to be consistent with this recovery plan. For this analysis, a forest plan amendment would be needed to utilize the 2012 recovery plan direction as it differs from what is currently included in the Kaibab NF forest plan.

Currently, the Kaibab NF is revising its forest plan (USDA 2012). A revised forest plan may affect the need for amendments 1 through 3 in the following ways:

Amendment 1: The current Kaibab NF forest plan has canopy cover requirements in VSS 4 to VSS 6, has requirements for managing goshawk habitat for a balance of VSS,, and requirements for managing reserve trees in management created openings (greater than 1 acre in ponderosa pine in goshawk foraging areas and PFAs) is presented differently in the draft forest plan, as currently written (USDA 2012, page 14 to page 18). Amendment 1 would be in alignment with the draft forest plan (as currently written) as it: (1) provides for managing crowns of trees within the mid-aged to old groups as interlocking or nearly interlocking (USDA 2012 page 15); (2) manages forest conditions in some areas (e.g., goshawk PFAs, MSO protected areas, drainages, and steep north-facing slopes) with 10 to 20 percent higher basal area in mid-aged to old tree groups (USDA 2012, Page 16); and (3) manages for known and replacement nest areas (USDA 2012, page 45).

The draft forest plans allow for project specific plan amendments. The portion of the amendment that allows deviation from maintaining three to five reserve trees per acre and having openings up to 90 percent for lands managed for an open reference condition would be consistent with what is allowed at the project level. The desired condition in ponderosa pine at the landscape scale is a ponderosa pine forest vegetation community with a mosaic of forest conditions composed of structural stages ranging from young to old trees. The forest is generally uneven-aged and open. Groups of old trees are mixed with groups of younger trees. Occasional areas of even-aged structure are present. Denser tree conditions exist in some locations such as north-facing slopes, canyons, and drainage bottoms (USDA 2012, page 16).

The terms "interspaces," "open reference condition," and "stands" do not appear in the draft forest plan (as currently written). The amendment would provide additional site-specific

direction and definitions that apply to landscape restoration that are not precluded by the draft forest plan.

Amendment 2 would allow for mechanically treating and using prescribed fire in the proposed Garland Prairie RNA. The amendment would no longer be needed once the new forest plan is put in place. The formerly proposed RNA would be managed as a grassland management area (MA). The restoration project would be consistent with the desired conditions for this MA (as currently written).

Amendment 3: The amendment would be in alignment with the draft forest plan (as currently written) in that it defers management of MSOs to direction in the MSO recovery plan. The revised (2012) MSO recovery plan does not require a specific method for habitat monitoring, does not require treatments in increments, and the proposed basal area in nest/roost habitat is referenced in the 2012 revised plan. In the recovery plan, project monitoring is deferred to the management agency. For this project, monitoring and the final design of treatments (addressing incremental treatment) would be determined in consultation with the FWS.

Although restricted habitat is referred to as "recovery habitat" and "nest/roost habitats" in the 2012 revised plan (USDI 2012, pp. 3, 4), the project's desired conditions for nesting and roosting habitat is consistent with the revised recovery plan. The revised plan still recommends that a percentage (10 to 25 percent) of recovery habitat be managed as nesting/roosting (USDI 2012, page VIII). Designating habitat in the project with the best potential would move toward desired percentages in recovery habitat. Amendment 3 would provide additional site-specific requirements at the project scale that would not be precluded by the revised forest plan or the new recovery plan (USDI 2012).

Amendment 1. Management of Canopy Cover and Ponderosa Pine With an Open Reference Condition Within Goshawk Habitat (Kaibab NF)

Amendment 1 is a specific, one-time variance for the Kaibab NF portion of the restoration project. Once the project is complete, current forest plan direction would apply to the project area. The language proposed does not apply to any other forest project. The amendments would be authorized per direction in the National Forest Management Act of 1976 (NFMA) and its implementing regulations found in 36 CFR 219 (1982).

Amendment Description

In the "Vegetation Management – Landscapes Outside Goshawk Post-fledgling Family Areas" and "Vegetation Management –Within Post-fledgling Family Areas" section of the forest plan, a nonsignificant plan amendment would: (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 27,675 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 Kaibab National 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** are defined as the open space between tree groups intended to be managed for grass/forb/shrub vegetation during the long term. Interspaces may include scattered single trees.
- **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.

Background

Canopy cover is defined as “the percentage of a fixed area covered by the crowns of plants delimited by a vertical projection of the outermost perimeter of the spread of foliage” (Reynolds et al. 1992). Obtaining consistent results has been difficult; even the definition of the term is dependent on the method of measurement. To resolve this issue, the Forest Service used the Forest Vegetation Simulation (FVS) crown width model as the basis for developing stocking densities that would achieve desired canopy cover levels.

The forest plan directs projects to measure “vertical crown projection on average across the landscape” (see Kaibab NF forest plan, page 29). Whereas the forest plan clearly provides direction for meeting minimum canopy cover percentages in VSS 4 to 6, the plans lack explicit language for measuring canopy cover. Although the forest plan provides direction and desired conditions for the vegetation structural stages, the forest plan does not describe the relationship between nonforested areas (interspace) and natural openings across the landscape.

Nonforested areas (interspaces) occur between individual trees, tree clumps, and tree groups. These nonforested areas (interspaces) are not equivalent to VSS 1. Whereas VSS 1 may provide openings in the short term, this structural stage is expected to regenerate tree cover in the long term. Refer to the silviculture report and the implementation plan (appendix D) which provides minimum stocking guidelines that have been developed to assure canopy cover requirements are met.

Approximately 198,136 acres (61 percent) of the forested areas (within the project area) have an open reference condition that corresponds to mollic-integrade soils. The desired condition is to have a portion of these acres (27,675 acres) managed as a relatively open forest with trees typically aggregated in small groups within a grass/forb/shrub matrix (Woolsey 1911, Cooper 1960, White 1985, Pearson 1950, Covington et a1. 1997, Abella and Denton 2009). See the soils specialist report for detailed information. Figure 65 displays the general locations of areas subject

to canopy cover requirements in VSS 4 to VSS 6 on the Coconino and Kaibab NFs. Figure 66 displays the general locations that would be managed for an open reference condition and grassland restoration. Edited or added/new text is **bolded** in the "Proposed New Guideline Language" column in table 106.

Table 106. Alternative C amendment 1 – management of canopy cover and ponderosa pine with an open reference condition in goshawk habitat (Kaibab NF)

Current Kaibab NF Forest Plan Direction	Proposed New Guideline Language*
Landscapes Outside Goshawk Post-fledgling Family Areas	
No corresponding forest plan direction (see Kaibab NF forest plan, p. 29).	**General: Within ponderosa pine stands, manage over time for uneven-aged stand conditions composed of heterogeneous mosaics of tree groups and single trees, with interspaces between tree groups. The size of tree groups, as well as sizes and shapes of interspaces, should be variable. Over time, the spatial location of the tree groups and interspaces may shift within the uneven-aged stand.**
General: The distribution of vegetation structural stages for ponderosa pine, mixed conifer and spruce-fir forests is 10% grass/forb/shrub (VSS 1), 10% seedling-sapling (VSS 2), 20% young forest (VSS 3), 20% mid-aged forest (VSS 4), 20% mature forest (VSS 5), 20% old forest (VSS 6). NOTE: The specified percentages are a guide and actual percentages are expected to vary + or – up to 3% (Kaibab NF forest plan, p. 29).	General: **For the areas managed for tree crown development**, the distribution of vegetation structural stages for ponderosa pine, mixed conifer and spruce-fir forests is 10 percent grass/forb/shrub (VSS 1), 10 percent seedling-sapling (VSS 2), 20 percent young forest (VSS 3), 20 percent mid-aged forest (VSS 4), 20 percent mature forest (VSS 5), and 20 percent old forest (VSS 6). Note: the specified percentages are a guide and actual percentages are expected to vary plus or minus up to 3 percent.
The distribution of VSS, tree density, and tree age are a product of site quality in the ecosystem management area. Use site quality to guide in the distribution of VSS, tree density and tree ages. Use site quality to identify and manage dispersal PFA and nest habitat at 2 to 2.5 mile spacing across the landscape (Kaibab NF forest plan, p.29).	No Change
Snags are 18" or larger d.b.h. and 30 feet or larger in height, downed logs are 12 inches in diameter and at least 8 feet long, woody debris is 3 inches or larger on the forest floor, canopy cover is measured with vertical crown projection on average across the landscape (Kaibab NF forest plan, p. 29).	Snags are 18" or larger d.b.h. and 30 feet or larger in height, downed logs are 12 inches in diameter and at least 8 feet long, woody debris is 3 inches or larger on the forest floor, **canopy cover as defined by vertical crown projection is evaluated within mid-aged to old forest vegetation structural stage groups (VSS 4, 5, and 6).**
No corresponding forest plan direction	**Develop and maintain a highly diverse vegetation mosaic: 30 to 90 percent of the uneven-aged stand should be under ponderosa pine and deciduous tree crowns. Within areas managed for an open reference condition, 10 to 30 percent of the uneven-aged stand should be under ponderosa pine and deciduous tree crowns.**

Current Kaibab NF Forest Plan Direction	Proposed New Guideline Language*
No corresponding forest plan direction	**Tree group spatial distribution may be highly variable based on local site and current conditions; the interspaces between groups may range from 20 to 200 feet, but generally between 25 and 100 feet apart from drip line to adjacent drip line. This spacing of groups is not affected by single trees in the interspace.**
No corresponding forest plan direction	**Each tree group is generally dominated by one vegetation structure stage. The spatial arrangement of trees, high dispersion of vegetation structural stage diversity, and interspaces comprise each uneven-aged forest stand. Collectively these stands aggregate to uneven-aged forest landscapes, similar to natural conditions.**
The order of preferred treatment for woody debris is: (1) prescribed burning, (2) lopping and scattering, (3) hand piling or machine grapple piling, (4) dozer piling (Kaibab NF forest plan, p. 29).	No Change
Canopy Cover: Canopy cover guidelines apply only to mid-aged to old forest structural stages (VSS 4, VSS 5, and VSS 6) and not to grass/forb/shrub to young forest structural stages (VSS 1, VSS 2, and VSS 3) (Kaibab NF forest plan, p. 29).	Canopy Cover: Canopy cover guidelines apply only to mid-aged to old forest structural stage **groups** (VSS 4, VSS 5, and VSS 6) and not to grass/forb/shrub to young forest structural stage **groups** (VSS 1, VSS 2, and VSS 3) **or in interspaces, natural meadows, grasslands, or other areas not managed for forest cover.**
Spruce-Fir: Canopy cover for mid-aged forest (VSS 4) should average 1/3 60% and 2/3 40%, mature forest (VSS 5) should average 60+%, and old forest (VSS 6) should average 60+%. Maximum opening size is 1 acre with a maximum width of 125 feet. Provide 2 groups of reserve trees per acre with 6 trees per group when opening size exceeds 0.5. Leave at least 3 snags, 5 downed logs, and 10–15 tons of woody debris per acre (Kaibab NF forest plan, p. 29).	No Change
Mixed Conifer: Canopy cover for mid-aged forest (VSS 4) should average 1/3 60+% and 2/3 40+%, mature forest (VSS 5) should average 50+%, and old forest (VSS 6) should average 60+%. Maximum opening size is up to 4 acres with a maximum width of up to 200 feet. Retain 1 group of reserve trees per acre of 3–5 trees per group for openings greater than 1 acre in size. Leave at least 3 snags, 5 downed logs, and 10–15 tons of woody debris per acre (Kaibab NF forest plan, pp. 29–30).	No Change

Current Kaibab NF Forest Plan Direction	Proposed New Guideline Language*
Ponderosa Pine: Canopy Cover for mid-aged forest (VSS 4) should average 40+%, mature forest (VSS 5) should average 40+%, and old forest (VSS 6) should average 40+%. Opening size is up to 4 acres with a maximum width of up to 200 feet. One group of reserve trees, 3–5 trees per group, will be left if the opening is greater than an acre in size. Leave at least 2 snags per acre, 3 downed logs per acre, and 5–7 tons of woody debris per acre (Kaibab NF forest plan, p. 30).	Ponderosa Pine: Canopy cover for mid-aged forest (VSS 4) should average 40+ percent, mature forest (VSS 5) should average 40+ percent, and old forest (VSS 6) should average 40+ percent. Opening size is up to 4 acres with a maximum width of up to 200 feet. One group of reserve trees, three to five trees per group, will be left if the **created regeneration** opening is greater than an acre in size. Leave at least two snags per acre, three downed logs per acre, and 5 to 7 tons of woody debris per acre. **In acres managed for an open reference condition, canopy cover guidelines for VSS 4 through VSS 6 groups would not apply. One group of reserve trees, with a minimum of one to two trees per group will be left if the interspace size is greater than an acre in size. Interspace size is up to 4 acres. Leave at least two snags per acre, three downed logs per acre, and 5 to7 tons of woody debris per acre.**
Woodland: manage for uneven age conditions to sustain a mosaic of vegetation densities (overstory and understory), age classes, and species composition well distributed across the landscape. Provide for reserve trees, snags, and down woody debris (Kaibab NF forest plan, p. 30).	No Change
Vegetation Management – Within Post-fledgling Family Areas	
General: Provide for a healthy sustainable forest environment for the post-fledging family needs of goshawks. The principle difference between within the post-fledging family area and outside the post-fledging family area is the higher canopy cover within the post-fledging family area and smaller opening size within the post-fledging family area. Vegetative Structural Stage distribution and structural conditions are the same within and outside the post-fledging family area (Kaibab NF forest plan, p. 30).	No Change
No corresponding forest plan direction	**Canopy cover is evaluated at the group level within mid-aged to old forest structural stages groups (VSS 4, VSS 5, and VSS 6) and not within grass/forb/shrub to young forest structural stage groups (VSS 1, VSS 2, and VSS 3) or in interspaces, natural meadows and grasslands, or other areas not managed for forest conditions.**
Spruce-fir: Canopy Cover for mid-aged forest (VSS 4) should average 60+% and for mature (VSS 5) and old forest (VSS 6) should average 70+% (Kaibab NF forest plan, p. 30).	No Change
Mixed Conifer: Canopy Cover for mid-aged (VSS 4) to old forest (VSS 6) should average 60+% (Kaibab NF forest plan, p. 30).	No Change

Current Kaibab NF Forest Plan Direction	Proposed New Guideline Language*
Ponderosa Pine: Canopy Cover for mid-aged forest (VSS 4) should average 1/3 60+% and 2/3 50+%. Mature (VSS 5) and old forest (VSS 6) should average 50+% (Kaibab NF forest plan, p. 30).	No Change
Woodland: Maintain existing canopy cover levels (Kaibab NF forest plan, p. 30).	No Change
No corresponding forest plan direction	**Develop and maintain a highly diverse vegetation mosaic: 30 to 90 percent of the uneven-aged stand should be under ponderosa pine and deciduous tree crowns.**
No corresponding forest plan direction	**Tree group spatial distribution may be highly variable based on local site and current conditions; the interspaces between groups may range from 20 to 200 feet, but generally between 25 and 100 feet apart from drip line to adjacent drip line. This spacing of groups is not affected by single trees in the interspace.**
No corresponding forest plan direction	**Each tree group is generally dominated by one vegetation structure stage. The spatial arrangement of trees, high dispersion of vegetation structural stage diversity, and interspaces comprise each uneven-aged forest stand. Collectively these stands aggregate to uneven-aged forest landscapes, similar to natural conditions.**
Glossary	
No corresponding forest plan direction	**Interspaces: The open space between tree groups intended to be managed for grass/forb/shrub vegetation during the long term. Interspaces may include scattered single trees.**
No corresponding forest plan direction	**Stands: 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.**
No corresponding forest plan direction	**Open reference condition: 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.**

Edited and new text is **bolded**.

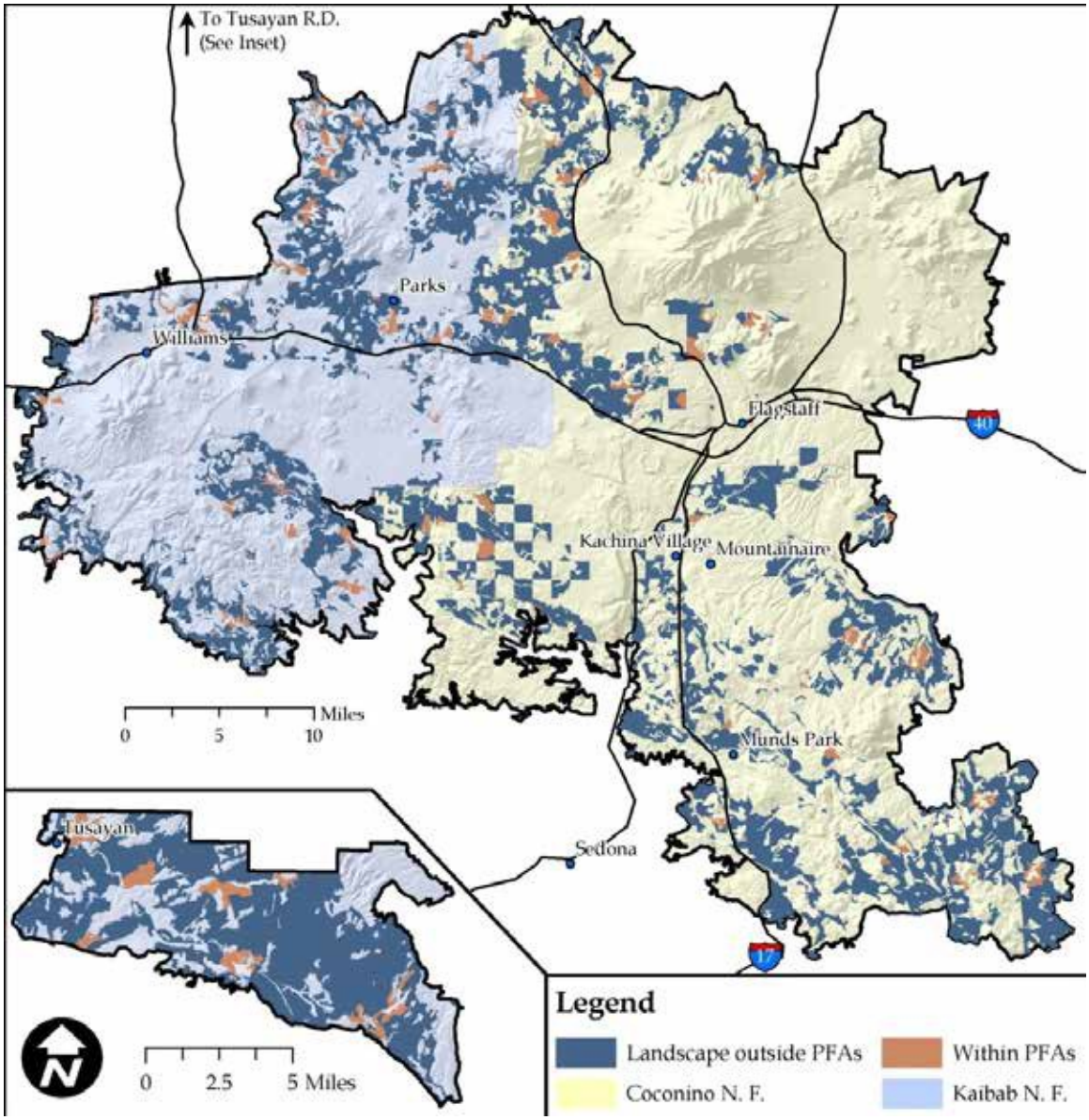

Figure 65. Alternative C general location of goshawk habitat subject to canopy cover requirements in VSS 4 to VSS 6 (Coconino NF and Kaibab NF)

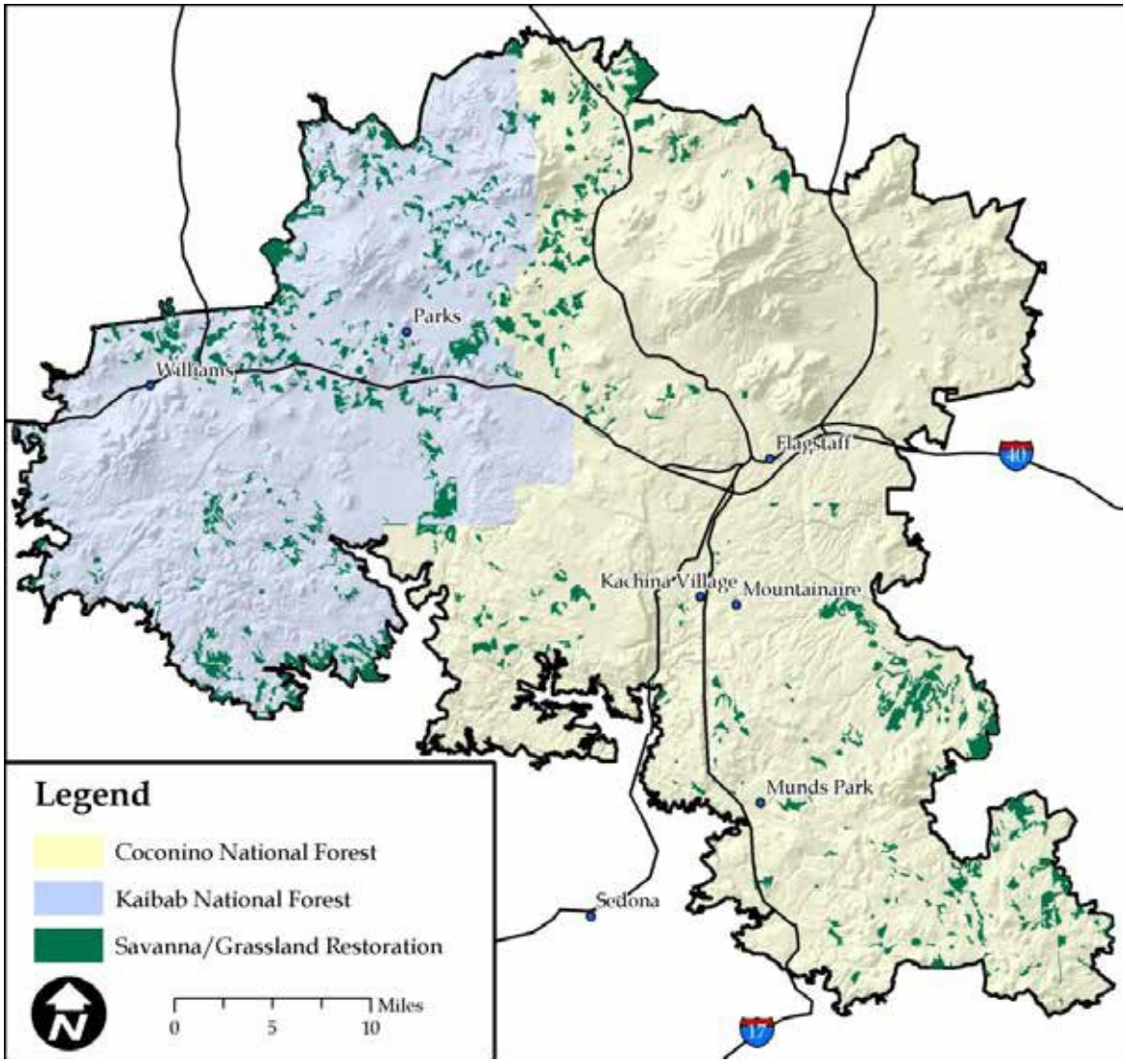

Figure 66. Alternative C general locations of savanna and grassland restoration treatments (Coconino NF and Kaibab NF)

Significance Evaluation

Per FSM 1926.51, changes to the land management plan that are not significant can result from:

1. Actions that do not significantly alter the multiple-use goals and objectives for long term land and resource management.
2. Adjustments of management area boundaries or management prescriptions resulting from further onsite analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long term land and resource management.
3. Minor changes in standards and guidelines.
4. Opportunities for additional projects or activities that will contribute to achievement of the management prescription.

Per FSM 1926.52, circumstances that may cause a significant change to a land management plan include:

1. Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected (see section 219.10(e) of the planning regulations in effect before November 9, 2000 (see 36 CFR parts 200 to 299, revised as of July 1, 2000)), and
2. Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

Analysis demonstrated that the proposed amendment is nonsignificant (FSM 1926.51) because the actions would not measurably alter the multiple-use goals and objectives for long term land and resource management. How actions could potentially affect timing, location and size, relationship to forest goals, objectives, outputs, and management prescriptions was evaluated.

Timing: The Kaibab National Forest forest plan has been in place (and amended) since 1988, and plan revision efforts are underway. While the amendment does provide clarification that has been lacking since the forest plan was implemented, it is specific to this project.

Location and Size: Suitable goshawk habitat on the Kaibab NF encompasses approximately 541,000 acres (Keckler 2011, personal communication) and the project area is comprised of about 399,633 acres of goshawk habitat. The amendment would affect approximately 20 percent of all suitable goshawk habitats on the forest and about 27 percent of goshawk habitat within the project area. For this reason, location and size was determined to be nonsignificant.

Relationship to Forest Goals and Objectives: Alternative C would meet goshawk forest plan canopy cover requirements in VSS 4 to 6 in all acres except the 27,675 acres managed for an open reference condition. In all acres but the open reference condition acres, actions would move toward the desired VSS size class distribution.

For this reason, the amendment is consistent with forest goals for wildlife and fish that promotes improving habitats through the development of habitat quality and diversity and the identification and protection of key habitats; and for improving habitats for listed threatened, endangered, or sensitive species of plants and animals and other species as they become threatened or endangered (Kaibab NF forest plan, page18).

Relationship to Management Prescriptions: Table 107 displays the acres associated with Kaibab NF geographic areas (GAs) and land use zones (LUZ).

Canopy Cover: The acres of forestwide GAs and LUZ affected by the canopy cover portion of the amendment (105,847 acres total) would range from less than 1 percent (LUZ 21) to 33 percent (GA 10). The amendment is specific to this project and would not impose requirements on the future management of canopy cover within these acres of goshawk habitat.

Open Reference Condition: The acres of forestwide GAs affected by the open reference condition portion of the amendment (27,675 acres total) would range from less than 1 percent (GA 1) to 9 percent (GA 2).The amendment is consistent with the management emphasis of providing for multiple uses that includes wildlife habitat and moving ponderosa pine toward

desired forest structure, including northern goshawk habitats. The amendment is specific to this project and would not impose requirements on the future management of the 27,675 acres of goshawk non-PFA; however, forest plan revision decisions may.

Table 107. Alternative C amendment 1 geographic area acres (Kaibab NF)

GA	GA Description	Forestwide Acres	Proposed Amendment Acres	Forestwide Acres Affected (Percent)
Canopy Cover				
GA 2	Williams Forestland	308,394	72,614	24
GA 10	Tusayan Forestland	86,250	28,247	33
GA 3	North Williams Woodland	65,533	1,287	2
GA 1	Western Williams Woodland	169,041	1,970	1
GA 8	Tusayan Woodland	195,118	1,025	1
LUZ 21	Developed recreation sites	1,556	702	<1
Mapping Error	Camp Navajo	NA – Not in land management plan area	2	NA
Open Reference Condition				
GA 2	Williams Forestland	308,394	26,869	9
GA 3	North Williams Woodland	65,533	500	1
GA 1	Western Williams Woodland	169,041	302	<1
Mapping Error	Camp Navajo	NA – Not in land management plan area	4	<1

Relationship to Outputs: Outputs identified in the forest plan are associated with sawtimber and other product harvest levels (meet demand for timber while reducing conflict with other resources), commercial and personal use firewood programs (MBF), grazing capacity (AUM), watershed (acres in unsatisfactory condition and water yield), developed recreation (management of public sites at the standard service level), developed and dispersed recreation outputs (RVD), transportation (acres closed to off-road vehicle use), habitat diversity (change in habitat diversity index), old growth habitat (acres), and average annual wildlife and fish use (WFUD).

The canopy cover portion of the amendment provides clarification and disclosure of methods for meeting forest plan requirements. It has no relationship to outputs or to the relationship between the level of goods (timber, firewood) and services and would not result in a change in land productivity or timber suitability classification.

Managing a portion of the landscape for an open reference condition affects about 27,675 acres of an estimated 490,368 acres of suitable timber lands. The management strategy on these acres would result in an extended rotation period between treatments beyond what was considered in developing the long-term sustained yield output in the forest plan. In the short term (10-year period), the amendment affects about 6 percent of the suitable land base. Due to the minimal acres affected, the amendment would not measurably alter outputs in the foreseeable future on a forestwide basis or change the long-term relationship between levels of goods (timber, firewood) and services. There would be no change in land productivity; therefore, it would not affect timber suitability classification.

Whether the 27,675 acres would continue to be managed as suitable timber in the long term will be evaluated during the forest plan revision process. No portion of the amendment would affect decisions that have been made through separate analyses on grazing capacity or permitted livestock use.

Amendment 2. Mechanical Treatment and Prescribed Fire in the Proposed Garland Prairie Research Natural Area (RNA) (Kaibab NF)

Amendment 2 is a specific, one-time variance for the Kaibab NF portion of the restoration project. Once the project is complete, current forest plan direction would apply to the project area. The language proposed does not apply to any other forest project. The amendments would be authorized per direction in the National Forest Management Act of 1976 (NFMA) and its implementing regulations found in 36 CFR 219 (1982).

Background

Management of the proposed Garland Prairie Research Natural Area (RNA) was addressed in the current forest plan but the designation (through an official establishment record) was never completed. When Garland Prairie was originally recommended as a RNA, there was a need for montane grassland type representation. This is no longer true and, as a result, it does not meet the criteria identified in Southwestern Region research natural area process. In the forest plan revision process, it is proposed to be managed as the “Garland Prairie Management Area.”

Currently, the proposed RNA is heavily encroached upon by small to mid-diameter ponderosa pine trees and infestations of Dalmation toadflax. Historically, grassland communities on the forest had less than 10 percent tree cover. Impacts from grazing, logging, and fire suppression practices reduced or eliminated the vegetation necessary to carry low intensity surface fires across the landscape, thereby altering the natural fire regimes and allowing uncharacteristic forest succession to take place. In addition to past practices, the location of the proposed RNA within the urban interface has hindered the ability to use fire as a natural process within the RNA (Kaibab NF 2012).

Amendment Description

The amendment would add language to allow prescribed fire and mechanical treatments in order to maintain and/or restore the ecological qualities of the proposed RNA. Figure 67 displays the proposed mechanical and prescribed fire treatments. Edited or added/new text is **bolded** in table 108.

Table 108. Alternative C amendment 2 Kaibab NF proposed Garland Prairie Research Natural Area (RNA)

Current Kaibab NF Forest Plan Direction	Proposed New Guideline Language*
No corresponding plan direction (see Kaibab NF forest plan, pp.95–96).	**Vegetation Management Planning and Analysis** **Utilize mechanical treatment and prescribed burning to reestablish the role of fire as a natural process when needed to maintain or restore the high elevation grassland ecotone habitat dominated by Arizona fescue and mountain muhly, to maintain genetic diversity, and move toward historic reference condition. Do not construct fire line.**

* Edited text is **bolded.**

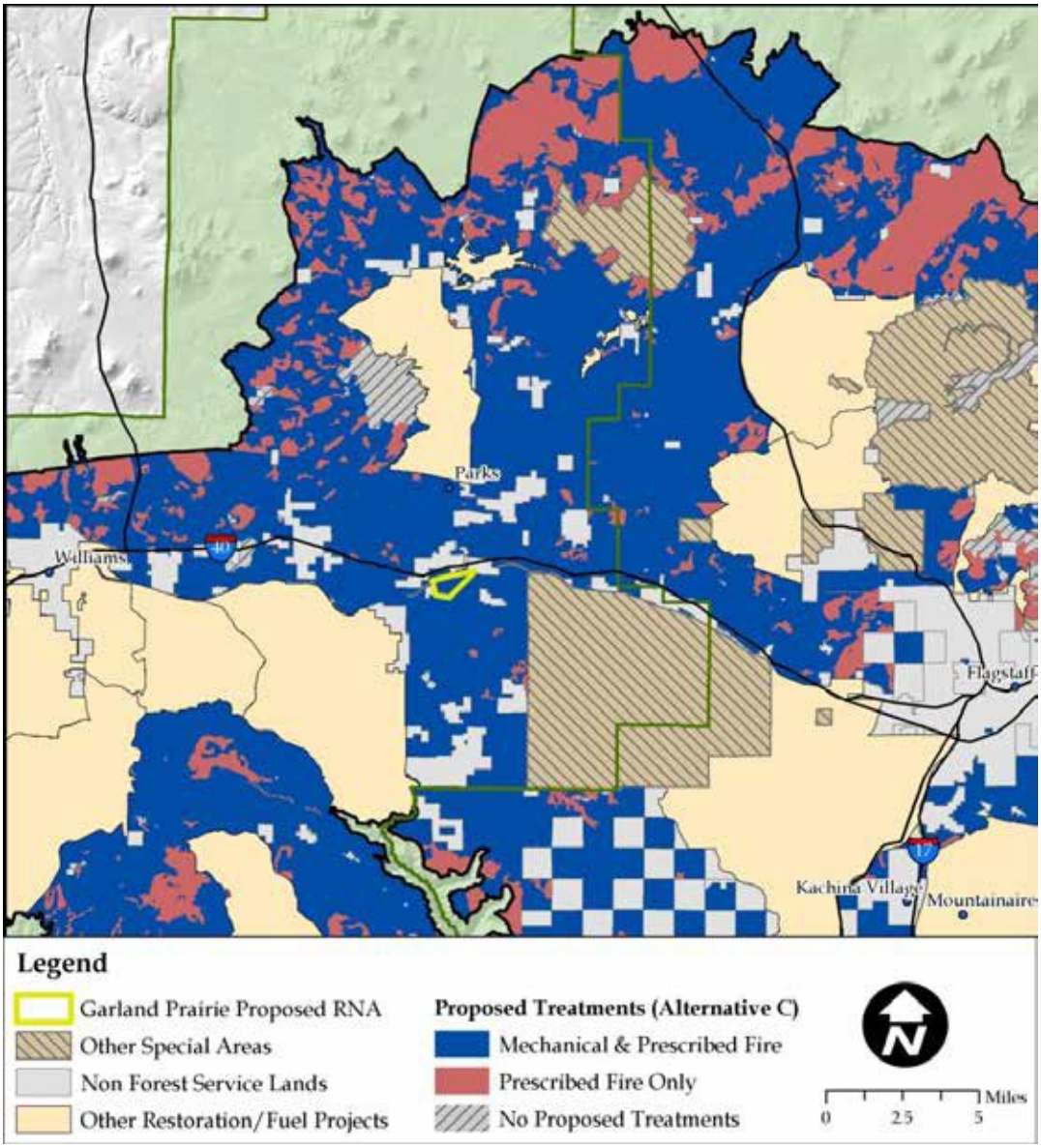

Figure 67. Alternative C treatments in the Garland Prairie proposed RNA (Kaibab NF)

Significance Evaluation

Per FSM 1926.51, changes to the land management plan that are not significant can result from:

1. Actions that do not significantly alter the multiple-use goals and objectives for long term land and resource management.
2. Adjustments of management area boundaries or management prescriptions resulting from further onsite analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long term land and resource management.
3. Minor changes in standards and guidelines.
4. Opportunities for additional projects or activities that will contribute to achievement of the management prescription.

Per FSM 1926.52, circumstances that may cause a significant change to a land management plan include:

1. Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected (see section 219.10(e) of the planning regulations in effect before November 9, 2000 (see 36 CFR parts 200 to 299, revised as of July 1, 2000)), and
2. Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

Analysis demonstrated that the proposed amendment is nonsignificant (FSM 1926.51) because the actions would not measurably alter the multiple-use goals and objectives for long term land and resource management and actions. How actions could potentially affect timing, location and size, relationship to forest goals, objectives, outputs, and management prescriptions was evaluated.

Timing: The Kaibab NF forest plan has been in place (and amended) since 1988, and plan revision efforts are underway.

Location and Size: The amendment would affect 100 percent of the 300-acre proposed RNA (Special Area 7) and acres adjacent to the area. In the context of the forest, it would have no effect on other special areas that have been designated because of their unique or special characteristics including other RNAs, wilderness, botanical areas, and national recreation trails. While the amendment would affect 100 percent of the proposed Garland Prairie RNA, in the context of all forest special areas, location and size was determined to be nonsignificant. In the draft forest plan (as currently written in 2012), the area would no longer be proposed as a RNA. It would be managed as a grassland management area.

Relationship to Forest Goals and Objectives: The amendment is consistent with Forest Service policy (FSM 4063.02) by maintaining and/or restoring the ecological values associated with the proposed RNA.

Relationship to Outputs: The proposed amendment would affect approximately 100 percent of Special Area 7. The RNA is managed as high elevation grassland and is not part of the suitable land base (timber, grazing, recreation, minerals, and energy resource activities). Therefore, the

amendment would not alter outputs or change the long-term relationship between levels of goods (timber, commercial and personal use firewood) and services. No grazing capacity exists for the proposed RNA and livestock grazing has been excluded since 1989 (Kaibab NF 2012). Therefore, the amendment would not affect decisions that have been made through separate analyses on grazing capacity or permitted livestock use and would not impose requirements on future management of the RNA.

Amendment 3 – MSO Habitat Management (Kaibab NF)

Amendment 3 is a specific, one-time variance for the Kaibab NF portion of the restoration project. Once the project is complete, current forest plan direction would apply to the project area. The language proposed does not apply to any other forest project. The amendment would be authorized per direction in the National Forest Management Act of 1976 (NFMA) and its implementing regulations found in 36 CFR 219 (1982).

Amendment Description

The amendment, which is specific to restricted habitat in pine-oak, would allow for designating less than 10 percent of restricted habitat on the Kaibab NF as target or threshold (i.e., future nesting and roosting habitat) based on the quality of the habitat. Definitions of target and threshold habitat would be added since the current forest plan refers to "threshold" in terms of values and desired conditions (see Kaibab NF forest plan, page 25) within restricted habitat and there is no reference to "target" conditions. In restricted pine-oak habitat, the amendment would allow 2,090 acres of restricted habitat to be managed for a minimum range of 110 to 150 basal area.

The amendment would remove language that limits PAC treatments in the recovery unit to 10 percent increments and language that requires the selection of an equal number of untreated PACs as controls. The amendment would remove language referencing monitoring (pre- and post-treatment, population, and habitat). Replacement language would defer final project design and monitoring to the FWS' biological opinion specific to MSO for the project.

Background

Incremental Treatments and Monitoring Responses to MSO Treatments

Monitoring assesses the effectiveness of management actions and provides the adaptive framework for more successful management guidelines. Monitoring habitat allows for the modeling future forest conditions to determine if there will be adequate habitat to support MSO populations. Monitoring and final project design (addressing incremental treatments) for all proposed activities in all MSO habitat would be developed in consultation with the FWS in a manner specific to this project.

Manage for Less than 10 Percent Restricted Habitat on the Kaibab NF

Overall, about 11.5 percent (8,713 acres) of the 4FRI restricted habitat would be managed as current or future threshold habitat. On the Coconino NF portion of the project, where the most owls and the most MSO habitat occurs, 13 percent (6,465 acres) of the restricted layer would be

designated as threshold habitat. The Kaibab NF portion of the 4FRI treatment area would have 8 percent (2,247 acres) of the restricted layer designated as threshold habitat. By creating more future nesting and roosting habitat on the Coconino NF, future MSO habitat would be more contiguous, better connected for dispersing MSOs, and occur in areas supporting higher densities of MSOs than if 10 percent of the restricted layer was designated by individual administrative boundaries.

Manage 2,090 Acres of MSO Restricted Target or Threshold Habitat for a Minimum of 110 to 150 Basal Area

The development of 2,090 acres of restricted target and threshold habitats would be managed toward meeting a 110 to 150 basal area for MSO nest and roost habitat as recommended in the revised MSO recovery plan (USDI 2012). It would allow more of the uncharacteristic in-growth of mid-aged and mid-sized trees that currently dominate the 4FRI landscape to be removed while retaining nesting and roosting habitat components. Thinning more of these trees would improve forest health, increasing the ability to retain large trees, and increase large tree growth rates as described in the revised recovery plan. This would increase forest spatial heterogeneity, improve tree age diversity, and benefit prey habitat. Increasing the basal area range would provide opportunities to mimic canopy gap processes which produce horizontal variation in stand structure. These changes would both increase and retain nesting and roosting structure and increase understory cover. Research suggests that small mammal biomass (including voles and mice) drives spotted owl reproductive output, and thinning smaller trees would improve subcanopy flight zone, thereby increasing MSO foraging effectiveness.

Edited or added/new text is **bolded** in table 109.

Table 109. Alternative C amendment 3 current and proposed forest plan language

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
MSO Standards	
No corresponding direction currently exists	**The project will comply with the biological opinion that has been developed in consultation with the FWS.**
Provide three levels of habitat management -protected, restricted, and other forest and woodland types to achieve a diversity of habitat conditions across the landscape (Kaibab NF forest plan, page 22).	No Change
Protected areas include delineated protected activity centers; mixed conifer and pine-oak forests with slopes greater than 40% where timber harvest has not occurred in the last 20 years; and reserved lands which include wilderness, research natural areas, wild and scenic rivers, and congressionally recognized wilderness study areas (Kaibab NF forest plan, page 22).	No Change
Restricted areas include all mixed-conifer, pineoak, and riparian forests outside of protected areas (Kaibab NF forest plan, page 22).	No Change

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Other forest and woodland types include all ponderosa pine, spruce-fir, woodland, and aspen forests outside protected and restricted areas (Kaibab NF forest plan, page 22).	No Change
Survey all potential spotted owl areas including protected, restricted, and other forest and woodland types within an analysis area plus the area 1/2 mile beyond the perimeter of the proposed treatment area (Kaibab NF forest plan, page 23).	No Change
Establish a protected activity center at all Mexican spotted owl sites located during surveys and all management territories established since 1989 (Kaibab NF forest plan, page 23).	No Change
Allow no timber harvest except for firewood and fire risk abatement in established protected activity centers. For protected activity centers destroyed by fire, windstorm, or other natural disaster, salvage timber harvest or declassification may be allowed after evaluation on a case-by-case basis in consultation with US Fish and Wildlife Service (Kaibab NF forest plan, page 23).	No Change
Allow no timber harvest except for fire risk abatement in mixed conifer and pine-oak forests on slopes greater than 40% where timber harvest has not occurred in the last 20 years (Kaibab NF forest plan, page 23).	No Change
Limit human activity in protected activity centers during the breeding season (Kaibab NF forest plan, page 23).	No Change
In protected and restricted areas, when activities conducted in conformance with these standards and guidelines may adversely affect other threatened, endangered, or sensitive species or may conflict with other established recovery plans or conservation agreements; consult with US Fish and Wildlife Service to resolve the conflict (Kaibab NF forest plan, page 23).	No Change
Monitor changes in owl populations and habitat needed for de-listing (Kaibab NF forest plan, page 23).	**Deleted**
Guidelines– A. General – No Change	
Guidelines – B. Protected Areas, Protected Activity Centers	
Delineate an area of not less than 600 acres around the activity center using boundaries of known habitat polygons and/or topographic features. Written justification for boundary delineation should be provided (Kaibab NF forest plan, page 23).	No Change
The protected activity center boundary should enclose the best possible owl habitat configured in as compact a unit as possible, with the nest or activity center located near the center (Kaibab NF forest plan, page 23).	No Change

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
The activity center is defined as the nest site. In the absence of a known nest, the activity center should be defined as a roost grove commonly used during breeding. In the absence of a known nest or roost, the activity center should be defined as the best nest/roost habitat. (Kaibab NF forest plan, page 23)	No Change
Protected activity center boundaries should not overlap (Kaibab NF forest plan, page 23).	No Change
Submit protected activity center maps and descriptions to the recovery unit working group for comment as soon as possible after completion of survey (Kaibab NF forest plan, page 23).	No Change
Road or trail building in protected activity centers should be avoided but maybe permitted on a case-by-case basis for pressing management reasons (Kaibab NF forest plan, page 23).	No Change
Generally allow continuation of the level of recreation activities that was occurring prior to listing (Kaibab NF forest plan, page 23).	No Change
Require bird guides to apply for and obtain a special use permit. A condition of the permit shall be that they obtain a subpermit under the U.S. Fish and Wildlife Service Master Endangered Species permit. The permit should stipulate the sites, dates, number of visits and maximum group size permissible (Kaibab NF forest plan, pages 23 to 24).	No Change
Harvest firewood when it can be done in such a way that effects on the owl are minimized. Manage within the following limitations to minimize effects on the owl (Kaibab NF forest plan, page 24).	No Change
Retain key forest species such as oak (Kaibab NF forest plan, page 24).	No Change
Retain key habitat components such as snags and large downed logs (Kaibab NF forest plan, page 24).	No Change
Harvest conifers less than 9 inches in diameter only within those protected activity centers treated to abate fire risk as described below (Kaibab NF forest plan, page 24).	No Change
Treat fuel accumulations to abate fire risk (Kaibab NF forest plan, page 24).	No Change
Select for treatment 10% of the protected activity centers where nest sites are known in each recovery unit having high fire risk conditions. Also select another 10% of the protected activity centers where nest sites are known as a paired sample to serve as control areas (Kaibab NF forest plan, page 24).	**Deleted**

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Designate a 100 acre “no treatment” area around the known nest site of each selected protected activity center. Habitat in the no treatment area should be as similar as possible in structure and composition as that found in the activity center (Kaibab NF forest plan, page 24).	No Change
Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leafed woody vegetation, and hardwood trees larger than 10 inches in diameter at the root collar (Kaibab NF forest plan, page 24).	No Change
Select and treat additional protected activity centers in 10% increments if monitoring of the initial sample shows there were no negative impacts or there were negative impacts which can be mitigated by modifying treatment methods (Kaibab NF forest plan, page 24).	**Deleted**
Treat fuel accumulations to abate fire risk: Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel treatment and prescribed fire to abate fire risk in the remainder of the selected protected activity center outside the 100 acre "no treatment" area (Kaibab NF forest plan, p. 24).	No Change
Treat fuel accumulations to abate fire risk. Select for treatment 10% of the protected activity centers where nest sites are known in each recovery unit having high fire risk conditions. Also select another 10% of the protected activity centers where nest sites are known as a paired sample to serve as control areas (Kaibab NF forest plan, page 24).	Treat fuel accumulations to abate fire risk.
Use light prescribed fire in non-selected protected activity centers on a case-by-case basis. Burning should avoid a 100-acre “no treatment” area around the activity center. Large woody debris, snags, clumps of broad-leafed woody vegetation should be retained and hardwood trees larger than 10 inches diameter at the root collar (Kaibab NF forest plan, page 24).	No Change
Pre- and post-treatment monitoring should be conducted in all protected activity centers treated for fire risk abatement (See monitoring guidelines) (Kaibab NF forest plan, page 24).	**Deleted**
Steep Slopes (Mixed conifer and pine-oak forests outside protected activity centers with slopes greater than 40% that have not been logged within the past 20 years)	
No seasonal restrictions apply. Treat fuel accumulations to abate fire risk (Kaibab NF forest plan, page 24).	No Change
Use combinations of thinning trees less than 9 inches in diameter, mechanical fuel removal, and prescribed fire (Kaibab NF forest plan, page 24).	No Change
Retain woody debris larger than 12 inches in diameter, snags, clumps of broad-leafed woody vegetation, and hardwood tress larger than 10 inches in diameter at the root collar (Kaibab NF forest plan, page 24).	No Change

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Pre and post treatment monitoring should occur within all steep slopes treated for fire risk abatement (See monitoring guidelines) (Kaibab NF forest plan, page 24).	**Deleted**
Reserved Lands (Wilderness, Research Natural Areas, Wild and Scenic Rivers, and Congressionally Recognized Wilderness Study Areas	
Allow fire use where appropriate (Kaibab NF forest plan, page 25).	No Change
C. Restricted Areas (Mixed Conifer, Pine-Oak, and Riparian Forests)	
Mixed Conifer and Pine-oak Forests (See glossary definition)	
No corresponding direction	**Target habitat is a category of restricted habitat intended to provide future nesting and roosting habitat (see glossary definition for restricted habitat). The minimum values identified for the forest attributes represent the threshold for meeting nesting and roosting conditions (see the definition for threshold habitat). They can also be targets to be achieved with time and management. If less than 10 percent of the restricted habitat in ponderosa pine-Gambel oak qualifies as threshold habitat, the areas that can eventually achieve all threshold conditions simultaneously should be identified as target habitat and managed to achieve threshold conditions as rapidly as possible. Because no known nests or roosts occur in restricted habitat, target habitat is considered future nesting and roosting habitat.**
No corresponding direction	**Threshold habitat is a category of restricted habitat intended to provide for future nesting and roosting habitat (see definition for restricted habitat). A variety of forest structural attributes are used to define when nesting and roosting habitat is achieved (summarized in table III.B.1 of the 1995 recovery plan and table C-2 of the 2012 recovery plan). These values are targets that can be achieved with time and management (see definition for target habitat). When the minimum values identified for the forest attributes are met simultaneously, they represent the *threshold* of nesting and roosting conditions. Ten percent of restricted habitat in ponderosa pine-Gambel oak should be designated as threshold habitat. Management in threshold habitat cannot lower any of the forest attribute values below the nesting and roosting threshold unless a landscape analysis demonstrates an abundance of this habitat.**

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
	Because no known nests or roosts occur in restricted habitat, target habitat is managed as future nesting and roosting habitat.
Manage to ensure a sustained level of owl nest/roost habitat well distributed across the landscape. Create replacement owl nest/roost habitat where appropriate while providing a diversity of stand conditions across the landscape to ensure habitat for a diversity of prey species (Kaibab NF forest plan, page 25).	No Change
The following table displays the minimum percentage of restricted area which should be managed to have nest/roost characteristics. The minimum mixed conifer restricted area includes 10% at 170 basal area and an additional 15% of area at 150 basal area. The variables are for stand averages, are minimum threshold values and must be met simultaneously. In project design, no stands simultaneously meeting or exceeding the minimum threshold values should be reduced below the threshold values unless a district-wide or larger landscape analysis of restricted areas shows that there is a surplus of restricted area acres simultaneously meeting the threshold values. Management should be designed to create minimum threshold conditions on project areas where there is a deficit of stands simultaneously meeting minimum threshold conditions unless the district-wide or larger landscape analysis shows there is a surplus (Kaibab NF forest plan, page 25).	**Table 13** displays the minimum percentage of restricted area which should be managed to have nest/roost characteristics. The minimum mixed conifer restricted area includes 10 percent at 170 basal area and an additional 15 percent of area at 150 basal area. **In pine-oak, the minimum restricted area includes up to 10 percent at 170 BA and 15 percent of area at 110 to 150 basal area.** The variables are for stand averages, are minimum **target and** threshold **habitat** values, and must be met simultaneously. In project design, no stands simultaneously meeting or exceeding the minimum **target and** threshold **habitat** values should be reduced below the **target and** threshold values unless a districtwide or larger landscape analysis of restricted areas shows that there is a surplus of restricted area acres simultaneously meeting the threshold values. Management should be designed to create minimum **target and** threshold **habitat** conditions on project areas where there is a deficit of stands simultaneously meeting minimum **target and** threshold **habitat** conditions unless the districtwide or larger landscape analysis shows there is a surplus.

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*

Minimum Percentage of Restricted Areas Managed for Nest/Roost Characteristics

Variable	Mixed Conifer All RU	Mixed Conifer Other RU*	Pine-Oak Target and Threshold Habitat**
Restricted Area Percent	10%	+15%	**Up to** 10%
Stand Averages for:			
Basal Area	170	150	**110–150**
18 inch+ trees/ac	20	20	20
Oak Basal Area	NA	NA	20
Percent total existing:			
12–18”	10	10	15
18–24”	10	10	15
24+”	10	10	15

*__Mixed Conifer Other RU__ applies to the Kaibab NF.

**__Pine-Oak Target and Threshold Habitat__ applies to the Williams RD, Kaibab NF.

Attempt to mimic natural disturbance patterns by incorporating natural variation, such as irregular tree spacing and various patch sizes, into management prescriptions (Kaibab NF forest plan, page 25).	No Change
Maintain all species of native trees in the landscape including early seral species (Kaibab NF forest plan, page 25).	No Change
Allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure (Kaibab NF forest plan, page 25).	No Change
Extend rotation ages for even-aged stands to greater than 200 years. Silvicultural prescriptions should explicitly state when vegetative manipulation will cease until rotation age is reached (Kaibab NF forest plan, page 25).	No Change
Save all trees greater than 24 inches d.b.h. In pine-oak forests, retain existing large oaks and promote growth of additional large oaks (Kaibab NF forest plan, page 25).	No Change
Encourage prescribed and wildland fire use to reduce hazardous fuel accumulation. Thinning from below may be desirable or necessary before burning to reduce ladder fuels and the risk of crown fire (Kaibab NF forest plan, page 25).	No Change
Retain substantive amounts of key habitat components: Snags 18 inches in diameter and larger down logs over 12 inches midpoint diameter hardwoods for retention, recruitment, and replacement of large hardwoods (Kaibab NF forest plan, page 25).	No Change

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Riparian Areas – No Change	
Domestic Livestock Grazing – No Change	
Old Growth – No Change	
D. Other Forest and Woodland Types – No Change	
E. Specific Recovery Units on the Kaibab NF – No Change	
F. Monitoring Guidelines	
Monitoring and evaluation should be collaboratively planned and coordinated with involvement from each national forest, USFWS Ecological Services Field Office, USFWS Regional Office, USFS Regional Office, Rocky Mountain Research Station, recovery team, and recovery unit working groups (Kaibab NF forest plan, page 26).	**See "Standards" for monitoring direction**
Population monitoring should be a collaborative effort with participation of all appropriate resource agencies (Kaibab NF forest plan, page 26).	**Deleted**
Habitat monitoring of gross habitat changes should be a collaborative effort of all appropriate resource agencies (Kaibab NF forest plan, page 26).	**Deleted**
Habitat monitoring of treatment effects (pre- and post-treatment) should be done by the agency conducting the treatment (Kaibab NF forest plan, page 27).	**Deleted**
Range-wide: Track gross changes in acres of owl habitat resulting from natural and human caused disturbances. Acreage changes in vegetation composition, structure, and density should be tracked, evaluated, and reported. Remote sensing techniques should provide an adequate level of accuracy (Kaibab NF forest plan, page 27).	**Deleted**
In protected and restricted areas where silvicultural or fire abatement treatments are planned, monitor treated stands pre- and post-treatment to determine changes and trajectories in fuel levels; snag basal areas; live tree basal areas; volume of down logs over 12 inches in diameter; and basal area of hardwood trees over 10 inches in diameter at the root crown (Kaibab NF forest plan, page 27).	**Deleted**
Upper Gila Mountain, Basin and Range East, and Basin and Range West Recovery Units: Assist the recovery team and recovery unit working groups to establish sampling units consisting of 19 to 39 square mile quadrats randomly allocated to habitat strata. Quadrats should be defined based on ecological boundaries such as ridge lines and watersheds. Quadrat boundaries should not traverse owl territories (Kaibab NF forest plan, page 27).	**Deleted**

Current Kaibab NF Forest Plan Direction	Proposed New Standard or Guideline Language*
Twenty percent of the quadrats will be replaced each year at random. Using the sample quadrats, monitor the number of territorial individuals and pairs per quadrat; reproduction; apparent survival; recruitment; and age structure. Track population density both per quadrat and habitat stratum (Kaibab NF forest plan, page 27).	**Deleted**

* Edited text is **bolded.**

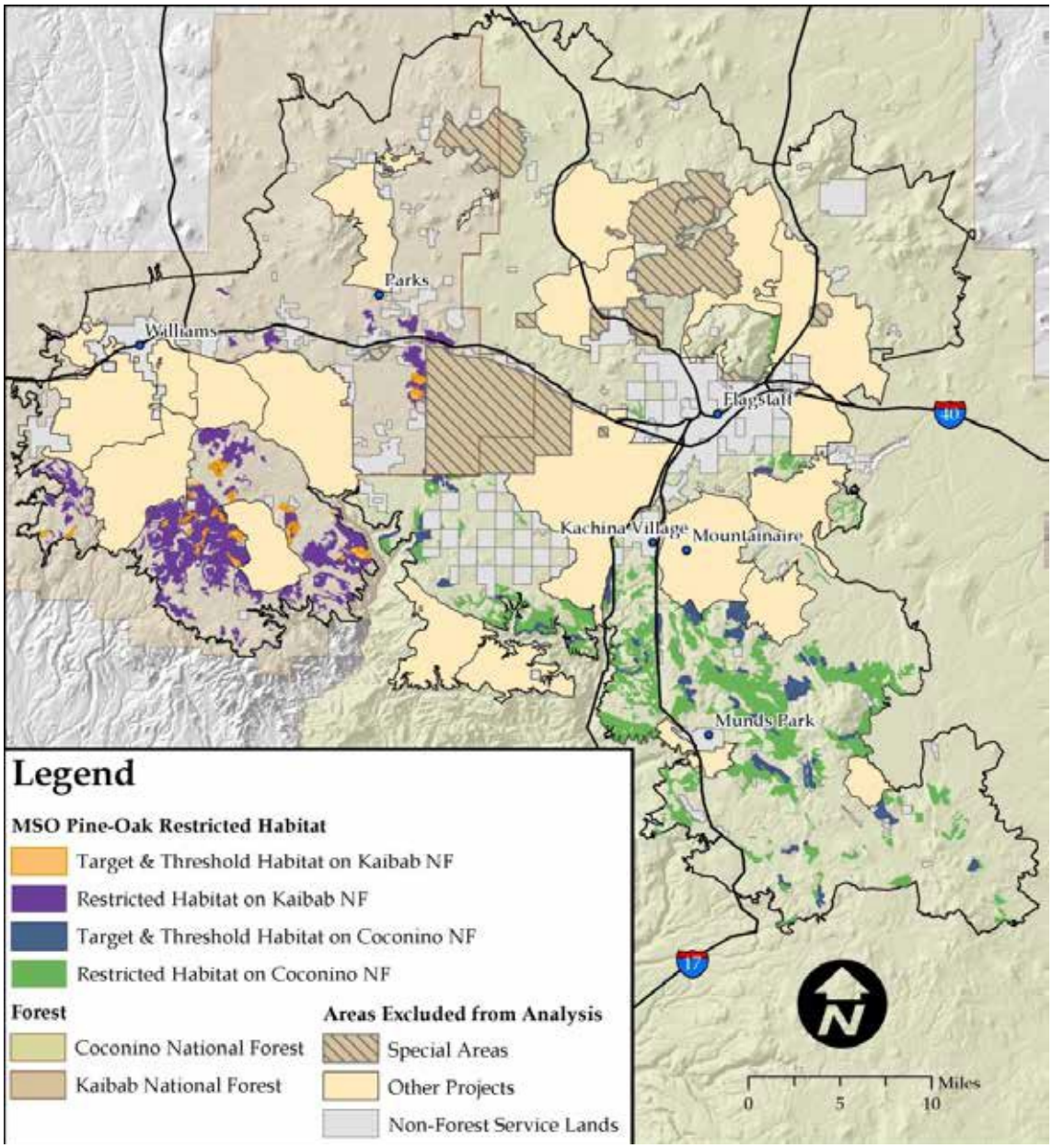

Figure 68. Alternative C amendment 3 landscape target and threshold analysis (Coconino NF and Kaibab NF)

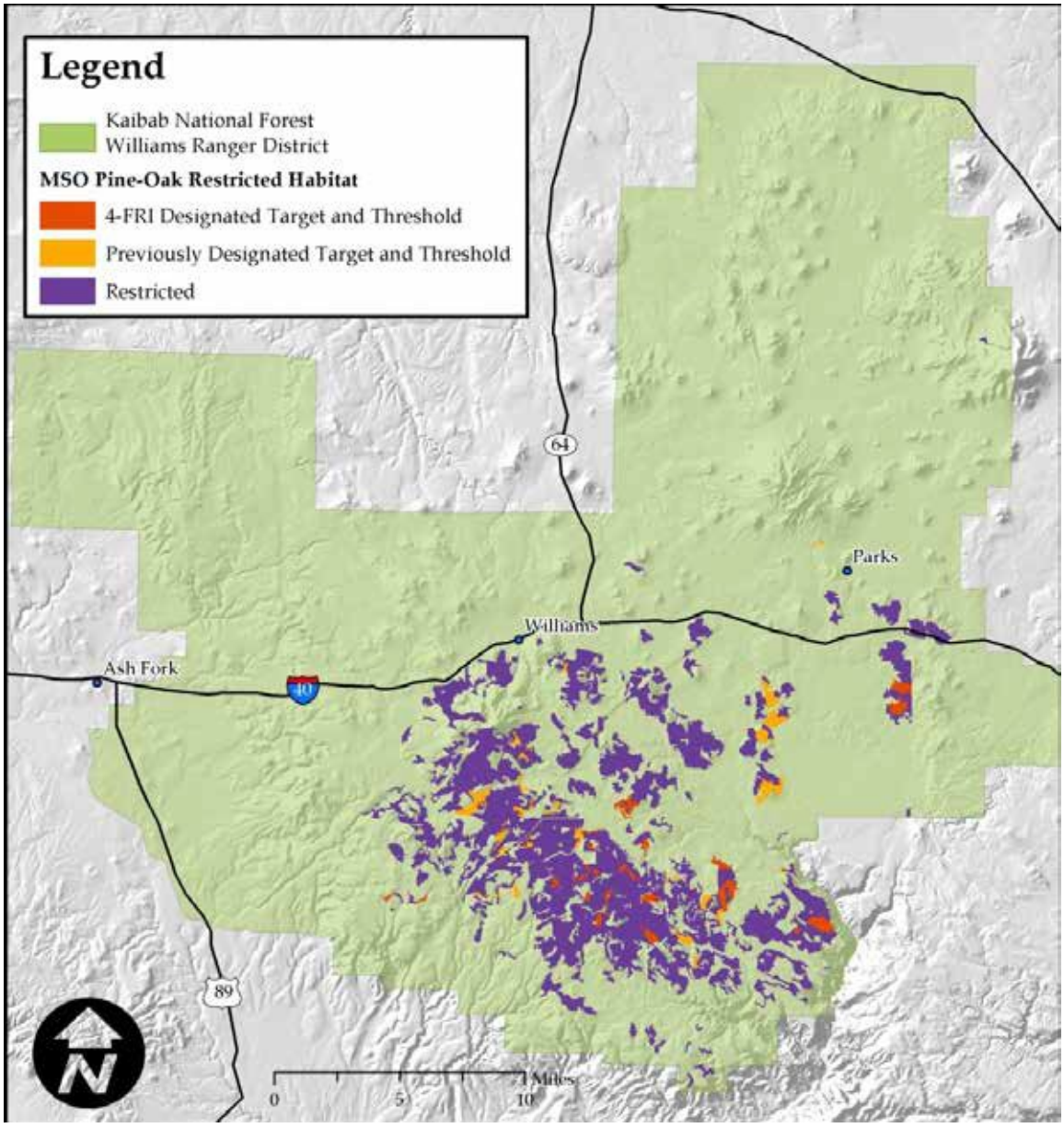

Figure 69. General locations of MSO threshold habitat on the Kaibab NF

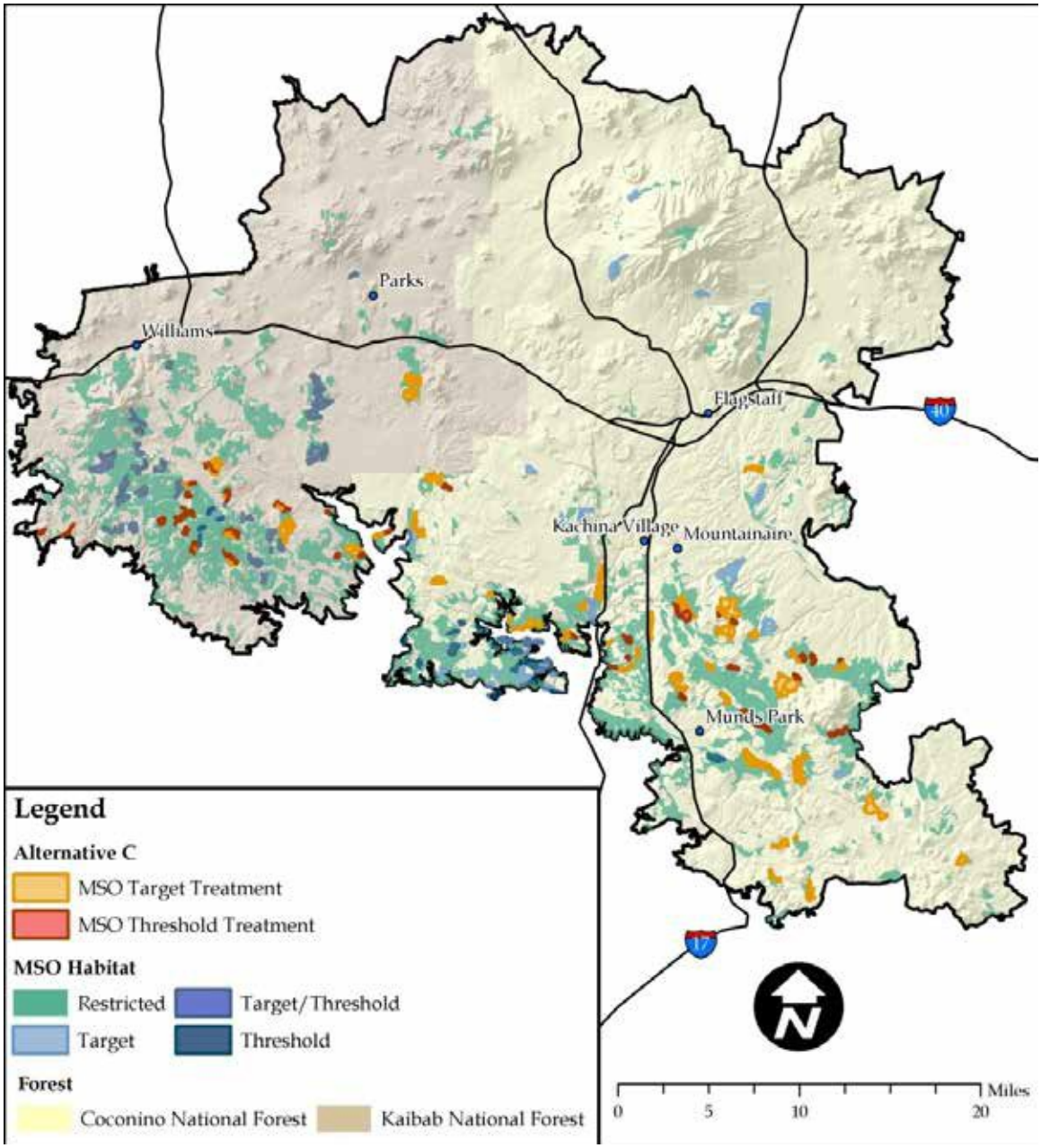

Figure 70. General location of MSO target and threshold habitat treatments within the project area (Coconino NF and Kaibab NF)

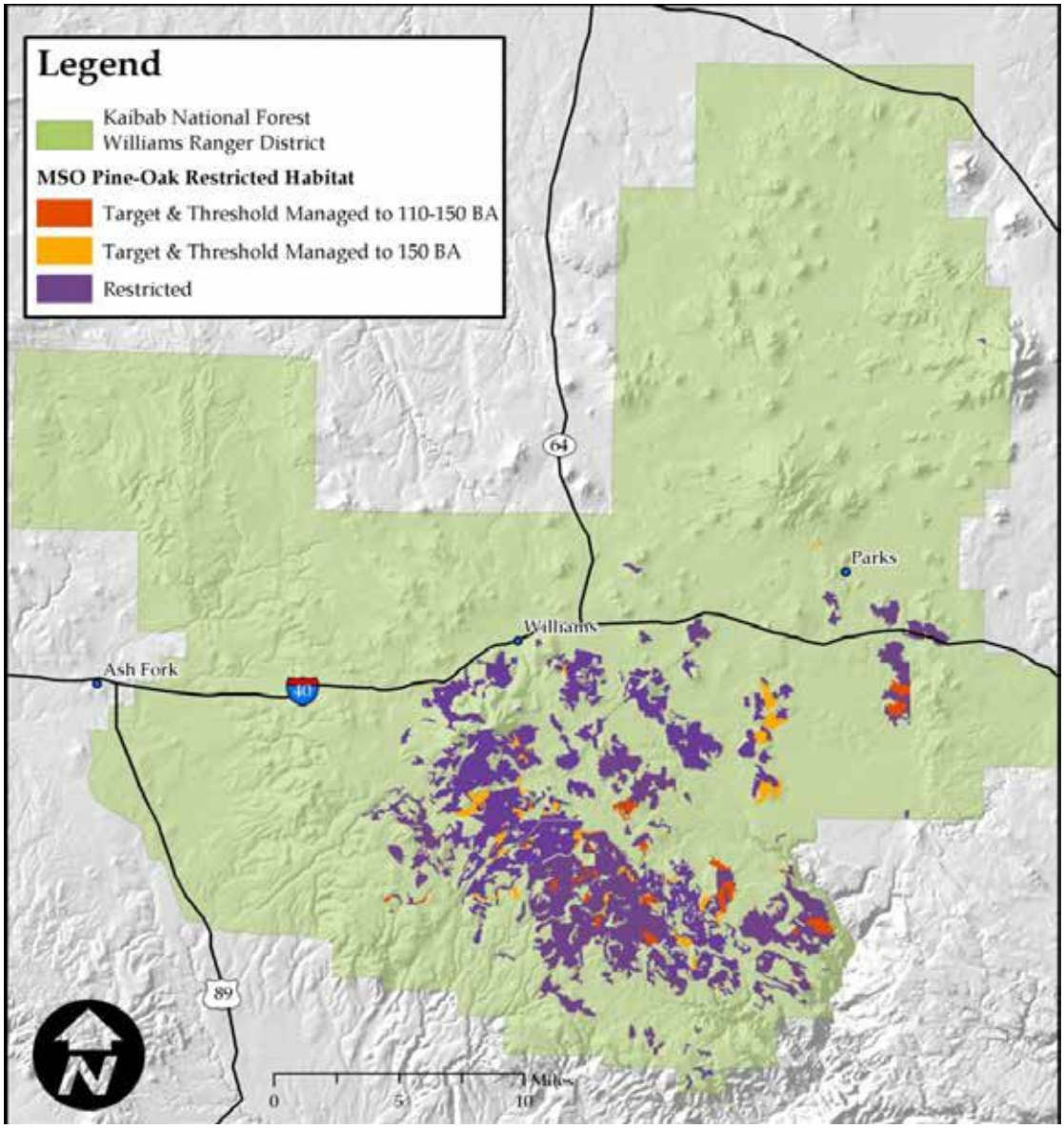

Figure 71. Alternative C amendment 1 general locations of MSO target and threshold habitat managed from 110 to 150 basal area (Kaibab NF)

Significance Evaluation

Timing: In terms of timing, the forest plan has been in place and amended several times since 1988, and revision efforts are underway. The forest plan incorporated direction (via an amendment) from the Forest Service Southwestern Region's 1996 "Amendment of Forest Plans Record of Decision" (USDA 1996). The actions allowed via the amendment are consistent with existing forest plan direction in that it designates future nesting and rooting habitat areas that at least minimally support target/threshold conditions or have the site potential to reach target conditions and whose current conditions most closely approaches target/threshold conditions.

Location and Size: There are 26,818 acres of MSO restricted habitat occurring entirely on the Kaibab NF. The amendment would affect the percentage of restricted acres designated as

threshold habitat (8 percent), resulting in 2,247 acres on the Kaibab NF. About 11.5 percent of the designated restricted habitat would be managed for future nesting/roosting habitat across the 4FRI treatment area. Approximately 2,090 acres of restricted target and threshold habitats would be managed toward meeting a 110 to 150 BA for MSO nest and roost habitat. Monitoring in all MSO habitat would be in compliance with the FWS biological opinion for the project.

Relationship to Forest Goals and Objectives: Changing the minimal target/threshold acres in restricted habitat (2,247 acres) would not change the overall direction to manage for future nesting/roosting habitat on 10 percent of restricted acres across the planning area landscape as described in the forest plan. About 8,713 acres (about 11½ percent) are classified as target and threshold habitat in the 4FRI treatment area on both the Kaibab and Coconino NFs.

The development of 2,090 acres of restricted target and threshold habitats would be managed toward meeting a 110 to 150 BA for MSO nest and roost habitat as recommended in the MSO recovery plan (USDI 2012). This equates to affecting 8 percent of all MSO habitat on the Kaibab NF. Thinning more of these trees would improve forest health and increase the ability to retain large trees and increase large tree growth rates as described in the 2012 recovery plan. This would increase forest spatial heterogeneity, improve tree age diversity, and benefit prey habitat. Increasing the BA range would provide opportunities to mimic canopy gap processes which produce horizontal variation in stand structure. These changes would both increase and retain nesting and roosting structure and increase understory cover. Research suggests that small mammal biomass (including voles and mice) drives spotted owl reproductive output, and thinning smaller trees could improve subcanopy flight zone, thereby increasing MSO foraging effectiveness.

The amendment is consistent with forest plan goals for wildlife and fish. The project would improve habitat quality and diversity in both the short and long term and provide quality old-growth habitats (Kaibab National Forest forest plan, page 12). It would improve habitat for listed threatened, endangered, or sensitive species of plants and animals and work toward recovery and delisting of species (Kaibab National Forest forest plan, page 18). The amendment is consistent with goals and objectives of the recovery plan to provide continuous replacement nest habitat over space and time, and by identifying stands that have the potential to reach target conditions and whose current conditions most closely approach those conditions (USDI 1995).

The amendment removes language that addresses pre- and post-treatment, population and habitat monitoring and replaces it with language that focuses on implementing the requirements in the FWS biological opinion. Delaying treatment in PACs would leave occupied MSO habitat at risk of loss from high-severity fire. Arizona's two largest fires account for nearly a million and half acres of forested land burned since 2002. Both fires included high-severity fire in PAC habitat. Other fires burning in the Upper Gila Recovery Unit have charred additional acres of MSO protected habitat. Most climate models suggest that the Southwest will experience higher temperatures and increased variability in precipitation, which will significantly affect fire regimes and forest health (Aumack et al. 2007).

The FWS urges a deliberate and cautious approach to management activities within PACs (USDI 2012). Silvicultural modeling of the proposed treatments indicates limited change to forest structure after implementation. However, the treatments are expected to include increased tree growth rates to reduce the time needed for developing large trees (defined as 18-inch d.b.h. and greater in the current recovery plan for the MSO), maintaining existing large trees, and decreasing

surface fuels and increasing crown base height. Combined, this should develop and maintain MSO nesting and roosting habitat, a key aspect of the recovery plans, while decreasing risk of crown fire.

Forest restoration and fuels reduction treatments would be evaluated over time. Monitoring would be designed and implemented to evaluate the effects of prescribed fire and hazardous fuel reduction treatments on spotted owl habitat, and to retain or move toward MSO desired future conditions as described in the draft recovery plan. The details on accomplishing the monitoring goals will be developed specifically for this approach through coordination with the FWS under formal consultation, as described in the ESA. In this way, work to protect and improve owl habitat can be accomplished in a timely manner while emphasizing monitoring and feedback loops to allow management to be adaptive. For these reasons, the amendment as it relates to pre- and post-treatment, population, and habitat monitoring is consistent with forest plan goals and objectives.

Designating target or threshold habitat in the project with the best potential would move toward desired percentages in restricted (recovery) habitat, consistent with forest plan goals and objectives.

Relationship to Management Prescriptions: The intent of managing 2,247 acres of restricted habitat to current or future threshold conditions and managing 2,090 acres toward 110 to 150 basal area is consistent with the management emphasis of providing for multiple uses that includes wildlife habitat and meeting MSO standards and guidelines which emphasize improving and maintaining the quality of the habitat and moving ponderosa pine toward desired forest structure, including MSO habitats (table 110). Both actions affect 1 percent or less of GA 2.

Table 110. Alternative B Kaibab NF Amendment 2 Geographic Area (GA) Acres

GA	GA Description	Forestwide Acres	Proposed Amendment Acres	Forestwide Acres Affected (Percent)
Manage Restricted Habitat for 110 to 150 Basal Area				
GA-2	Williams Forestland	308,394	2,090	< 0.01
Manage Restricted Habitat for Future Threshold Conditions				
GA -2	Williams Forestland	308,394	2,247	1

Relationship to Outputs: In comparison to the forest's total suitable timber lands (479,132 acres), the amendment would affect less than 0.01 percent of those lands. For this reason, mechanical treatment and management within current MSO threshold or future threshold (i.e., target) habitat would not measurably increase or decrease timber outputs or firewood availability. There would be no measurable effect to outputs from deferring the final design of treatments and monitoring to the project's biological opinion. The amendment would not affect decisions that have been made through separate analyses on grazing capacity or permitted livestock use.

Alternative D – Coconino National Forest Site-Specific Nonsignificant Forest Plan Amendments

Three nonsignificant, site-specific forest plan amendments are proposed for alternative D.

Amendment 1. MSO Habitat Management (Coconino NF)

Amendment Description

This amendment is the same as described for alternative B. Although alternative D reduces the acres that would receive prescribed fire, the amendment would still be required to address mechanical treatment above 9-inch d.b.h., eliminating incremental treatments within PACs, and deferring monitoring to the project's FWS biological opinion.

Amendment 2. Management of Canopy Cover and Ponderosa Pine With an Open Reference Condition Within Goshawk Habitat (Coconino NF)

This amendment is the same as described for alternative B. The key difference between the alternatives is the acres that would receive prescribed fire. In alternative D, the acres of prescribed fire would be reduced from 587,923 acres in alternative B to 178,790 acres. Any difference in acres of prescribed fire would not eliminate the need for a plan amendment that addresses managing acres for an open reference condition.

Amendment 3. Effect Determination for Cultural Resources (Coconino NF)

Amendment 3 is the same as described for alternative B. The reduction in acres to receive prescribed fire in alternative D would not eliminate the need for a plan amendment that addresses managing for "no effect" or "no adverse effect" for heritage resources.

Alternative D – Kaibab National Forest Site-Specific Nonsignificant Forest Plan Amendments

Two nonsignificant forest plan amendments are proposed in alternative D.

Amendment 1. Management of Canopy Cover and Ponderosa Pine With an Open Reference Condition Within Goshawk Habitat (Kaibab NF)

This amendment is similar alternative B. However, the acres to be managed for an open reference condition in alternative D would be reduced by about 40 acres when compared to alternative B. The effects of managing for a reduced number of acres (40 acres) is not measurable. The significance evaluation findings are the same as described in alternative B.

The key difference between alternative B and alternative D are the acres that would receive prescribed fire. In alternative D, the acres of prescribed fire would be reduced from 587,923 acres in alternative B to 178,790 acres. Any difference in acres of prescribed fire would not eliminate the need for a plan amendment that addresses managing acres for an open reference condition.

Amendment 2. MSO Habitat Management (Kaibab NF)

This amendment is the same as described for alternative B. Although alternative D reduces the acres that would receive prescribed fire, the amendment would still be required to eliminate incremental treatments within PACs, defer monitoring to the project's FWS biological opinion, and manage the project area for less than 10 percent restricted habitat.