



MANAGEMENT RECOMMENDATIONS **FOR FIRESCAPE 3**

of the First Analysis Area

REPORT

FROM THE FOUR FOREST RESTORATION INITIATIVE

STAKEHOLDER GROUP TO THE USFS 4FRI PLANNING TEAM

February 8, 2011

FIRESCAPE 3 MANAGEMENT RECOMMENDATIONS

This document contains general management recommendations for Firescape 3 of the Four Forest Restoration Initiative (“4FRI”) area and, when appropriate, more specific recommendations for the treatment areas located within Firescape 3. All management recommendations provided in this document are intended to help the Forest Service plan, design, and implement treatments that will achieve the firescape-scale Desired Future Conditions (“DFCs”) identified in the Landscape Restoration Strategy for the First Analysis Area Report (“LRS Report”). Therefore, all management recommendations in this document are tiered under the firescape-scale DFCs previously identified in the LRS Report.

To facilitate Forest Service planning, the management recommendations provided in this document have been grouped into six different categories: (1) mechanical thinning treatments, (2) fire management, (3) wildlife habitat, (4) multiple-use management, (5) watershed management, and (6) invasive species management and other restoration activities.

Although many of the recommendations provided in this document can be used by the Forest Service to design treatments under the Proposed Action for 4FRI’s first analysis area, some management recommendations will be beyond the scope of the Forest Service’s Proposed Action. The 4FRI collaborative hopes that the Forest Service, stakeholders, and other partners will use these recommendations to plan, design, and implement additional activities that will help achieve comprehensive restoration within the 4FRI area.

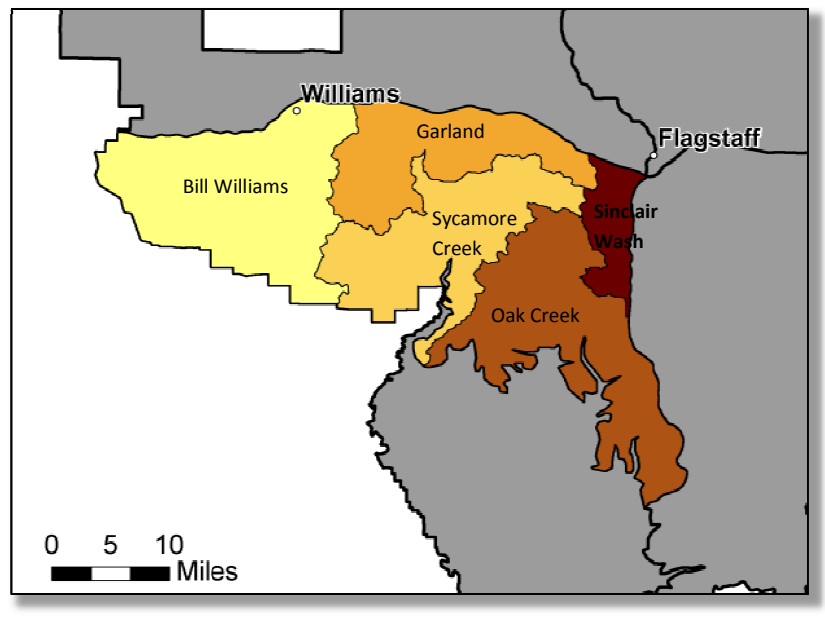


Figure 1. Firescape 3 is located southwest of Flagstaff and consists of five treatment areas: Bill Williams, Garland, Sycamore Creek, Oak Creek, and Sinclair Wash Treatment Areas.

MECHANICAL THINNING TREATMENT RECOMMENDATIONS

FIRESCAPE DFC: Mechanical thinning treatments result in forests that trend toward natural variability, self-regulation, and are better positioned to adapt to climate change without large, rapid, type shifts.

FIRESCAPE RECOMMENDATIONS

- Use site-specific biotic and abiotic factors to design mechanical treatments that result in the full range of variability of forest structural parameters (e.g., basal area, canopy cover, group size, density, etc.). Historically, site-specific prescriptions have generally targeted only the mean or minimum of the range of variability; instead, we desire a full range of prescriptions that create a heterogeneous forest structure across the landscape.

FIRESCAPE DFC: Mechanical thinning treatments allow natural disturbance processes (e.g., fire, endemic pests and pathogens) to occur at a range of endemic levels.

FIRESCAPE RECOMMENDATIONS

- Mechanical treatment design should consider natural rates of mortality associated with endemic levels of natural disturbances as an additional mechanism for achieving the natural range of variability. Endemic levels of natural disturbance events can and should be used as a means for achieving restoration goals.
- Mechanical treatments should not be designed to eradicate or sanitize the occurrence of endemic levels of natural disturbance processes (e.g., dwarf mistletoe, tornado damage, etc.).
- When designing mechanical thinning treatments in areas containing dwarf mistletoe, treatment activities should be consistent with guidance identified in the “4FRI Large Tree Retention Plan” (“LTRP”) and “Dwarf Mistletoes and their Management in the Southwest” (Conklin and Fairweather 2010).
- Salvage logging projects should be individually assessed, weighing planning and administrative costs, restoration opportunity costs, wildlife habitat values, fire hazard reduction value, and the use of areas as natural fire breaks. Salvage logging is not ecological restoration (Noss et al. 2006).

TREATMENT AREA-SPECIFIC RECOMMENDATIONS

❖ Garland Treatment Area-Specific Recommendations

- In tornado damaged areas, salvage logging projects should be individually assessed within a landscape context, weighing planning and administrative costs, restoration opportunity costs, wildlife habitat values, fire hazard reduction value, and the use of areas as natural fire breaks.
- The prioritization of treatment of tornado damaged areas should be integrated with other thinning and burning activities.

❖ **Sycamore Creek Treatment Area-Specific Recommendations**

- In tornado damaged areas, salvage logging projects should be individually assessed within a landscape context, weighing planning and administrative costs, restoration opportunity costs, wildlife habitat values, fire hazard reduction value, and the use of areas as natural fire breaks.
- The prioritization of treatment of tornado damaged areas should be integrated with other thinning and burning activities.

❖ **Oak Creek Treatment Area-Specific Recommendations**

- In tornado damaged areas, salvage logging projects should be individually assessed within a landscape context, weighing planning and administrative costs, restoration opportunity costs, wildlife habitat values, fire hazard reduction value, and the use of areas as natural fire breaks.
- The prioritization of treatment of tornado damaged areas should be integrated with other thinning and burning activities.

FIRESCAPE DFC: Following mechanical thinning treatments, there is low potential for unnaturally severe fire¹ to spread across the Firescape.

FIRESCAPE RECOMMENDATIONS

- The Stakeholder Group would like to go through an iterative modeling process and fire simulations with the Forest Service and Forest ERA to help the Forest Service determine what portion of a firescape must be treated to prevent the spread of unnaturally severe fire.
 - EXAMPLE RESULT OF MODELING PROCESS -- Treat x% of areas exhibiting the potential for active crown fire under 97th percentile conditions, as described in the LRS Report, with strategically placed mechanical thinning to preclude crown fires larger than [##-##] contiguous acres.
- Treatment design should build on the objectives of the Community Wildfire Protection Plans for Flagstaff and Williams.

¹ Examples of “unnaturally severe” fires may include fires of extreme size or intensity, such as the Hochderffer-Horseshoe Fire (1996), Pumpkin Fire (2000), Rodeo-Chedeski Fire (2002), Warm Fire (2006), Woody Fire (2006), Hardy Fire (2010), and Shultz Fire (2010).

FIRESCAPE DFC: Strategically placed mechanical thinning treatments allow fire managers to safely manage prescribed fires and naturally ignited fires in a way that benefits and enhances the resilience of forest ecosystems.

TREATMENT AREA-SPECIFIC RECOMMENDATIONS

❖ **Bill Williams Treatment Area-Specific Recommendations**

- In addition to implementing treatments in the NEPA-completed areas within the Treatment Area, mechanical thinning treatments should be implemented in the Sycamore Canyon priority area identified in the Kaibab Forest Health Focus and the LRS Report.

❖ **Garland Treatment Area-Specific Recommendations**

- Some portion of all candidate areas within the Treatment Area should receive treatment (thinning, burning, or both); however, there are three goshawk nest cores that overlap with candidate treatment areas. These will require additional evaluation to determine appropriate treatment.
- In the southwestern portion of the Treatment Area, mechanical thinning treatments should focus on protecting the headwaters of Sycamore Canyon from unnaturally severe fire (and allow for safe management of fire around Sycamore Canyon).
- Coordinate with Camp Navajo to focus on protecting the headwaters of Volunteer Canyon from unnaturally severe fire.
- In the southwestern portion of the Treatment Area, mechanical thinning treatments should retain larger tree groups that are oriented with their long axis perpendicular to the prevailing winds in order to maintain and enhance existing wildlife corridors and meet fire management objectives (i.e., management of fire at larger than current scales).

❖ **Sycamore Creek Treatment Area-Specific Recommendations**

- Mechanical thinning treatments should be concentrated in areas with predicted active crown fire under 97th percentile conditions, as described in the LRS Report.
- Mechanical thinning treatment intensity should vary based on topography. Higher intensity treatments (i.e., treatments resulting in lower density, crown cover, and basal area) should be implemented in flatter areas (e.g., meadows and swales), with lower intensity treatments occurring on steeper slopes of isolated hills and knobs.

❖ **Oak Creek Treatment Area-Specific Recommendations**

- Mechanical thinning treatments should be prioritized in areas adjacent to canyon rims and Wilderness, even if not identified as “candidate areas,” to facilitate the use of natural fire in unthinnable areas (e.g., steep slopes and Wilderness) while protecting wildlife habitat and other resources outside canyons from the spread of fire out of the canyon.
- Areas with predicted crown fire under 97th percentile conditions, as described in the LRS Report, should be treated with mechanical thinning. Note, however, that areas of predicted active crown fire south of Woods Canyon may not be regarded as priority areas for treatment, as several Stakeholders believe there is a possibility that the model is being exaggerated by the presence of piñon-juniper forest type.
- Other candidate areas in this Treatment Area may or may not require mechanical thinning treatments.

❖ **Sinclair Wash Treatment Area-Specific Recommendations**

- Due to previously implemented treatments and already planned projects, this Treatment Area may not contain high priority areas for additional mechanical thinning. The need for additional mechanical treatments in this Treatment Area will be dependent upon an assessment of the intensity and completion of ongoing projects in the Treatment Area.

FIRESCAPE DFC: Strategically placed mechanical thinning treatments maintain and enhance, but do not degrade habitat for listed, rare, and sensitive species.

FIRESCAPE RECOMMENDATIONS

- For general wildlife habitat recommendations, we recommend consideration of the AGFD-USFWS-ERI draft publication “Desired Forest Conditions for Wildlife in Arizona’s Ponderosa Pine Forests.”
- For each treatment area, we provide occurrence and locality information for special status plants and animals (see Appendix). The following management recommendations should be used to guide restoration activities in treatment areas to provide for a variety of special status species.
 - Retain snags during mechanical treatments.
 - Retain large trees and snags near water sources (e.g., tanks, drinkers, wetlands, lakes), consistent with the LTRP.
 - Follow Forest Plan direction for implementing the Northern Goshawk Management Recommendations.
 - Implement the Recovery Plan for the Mexican spotted owl.
 - Emphasize retention of large trees and snags on north-facing slopes near highways, lakes, and wetlands for bald eagles.
 - Avoid creating landings on or skid trails across forest openings and meadows.
 - Retain coarse and fine woody debris where possible.
- For rare and sensitive plants:
 - Conduct surveys for rare and sensitive plant species.
 - In areas where rare and sensitive plant species are known to occur, avoid disturbance and trampling.
- Reduce road density by obliterating roads identified in the Travel Management Rule (“TMR”).

TREATMENT AREA-SPECIFIC RECOMMENDATIONS

❖ **Bill Williams Treatment Area-Specific Recommendations**

- Treatments in pine-oak forest types should be implemented in a manner consistent with the Recovery Plan for the Mexican spotted owl.
- See Appendix for Heritage Data Management System special status species localities.

❖ **Garland Treatment Area-Specific Recommendations**

- See Appendix for Heritage Data Management System special status species localities.
- There are at least two fairly new and mostly undescribed species (*Potentilla arizonica* and another possible hybrid or subspecies that hasn't been named) that are endemic to the Garland Prairie and Centennial Forest area. Because they are basically undescribed, they are not currently protected by any laws; however, monitoring should still be established for these species.
- ❖ **Sycamore Creek Treatment Area-Specific Recommendations**
 - Treatments in pine-oak forest types should be implemented in a manner consistent with the Recovery Plan for the Mexican spotted owl.
 - See Appendix for Heritage Data Management System special status species localities.
- ❖ **Oak Creek Treatment Area-Specific Recommendations**
 - See Appendix for Heritage Data Management System special status species localities.
- ❖ **Sinclair Wash Treatment Area-Specific Recommendations**
 - See Appendix for Heritage Data Management System special status species localities.

FIRESCAPE DFC: Invasive non-native species are rare or absent and do not create novel ecological communities following implementation of mechanical thinning treatments.

FIRESCAPE RECOMMENDATIONS

- Implement the Three Forest Weed EIS.
- Where possible, avoid implementing mechanical thinning treatments in areas where current conditions are identified as “at risk” of invasion or expansion of exotic species. When possible, implementation of mechanical thinning treatments should be postponed for “at risk” areas until actions have been taken to reduce the risk of invasion or expansion of exotic species, creating a more favorable environment for treatment implementation.
- Expand and test the predictive models for cheatgrass from the North Kaibab Ranger District to encompass the 4FRI area.
- When implementing mechanical treatments that buffer Wilderness and canyons, sequence treatments to reduce the likelihood of spread of invasive species into Wilderness and canyons (i.e., treat areas adjacent to unaffected areas where exotic species occurrence is low first to reduce chances of spread through treatments).

FIRESCAPE DFC: Old-growth forest structure² is protected³ from damage when implementing mechanical thinning treatments.

FIRESCAPE RECOMMENDATIONS

- In accordance with the LTRP, do not remove old-growth trees for any reason.
- Manage identified target/threshold habitats (based on Recovery Plan for the Mexican spotted owl) to allow for future recruitment of old-growth forest structure.

TREATMENT AREA-SPECIFIC RECOMMENDATIONS

❖ **Oak Creek Treatment Area-Specific Recommendations**

- Create buffer to protect old-growth forest structure and research plots on private land near Barney Springs.

❖ **Sinclair Wash Treatment Area-Specific Recommendations**

- Old-growth forest structure near Pumphouse Wash, Kelly Canyon, Fry Canyon and James Canyon should be protected.
- Old-growth trees near Dry Lakes, Woody Mountain, and Woody Ridge should be protected for recruitment of old growth forest structure.

² Old-growth forest structure is defined as trees, snags, and coarse woody debris originating from trees present before settlement, circa 1880.

³ Old-growth forest structure protection may be accomplished by strategically placing mechanical thinning treatments adjacent to old-growth forest structure to help manage or control the spread of fire into old-growth forest structure, or by (1) carefully locating skid trails to avoid old-growth trees, (2) raking fuels from around the base of old-growth forest structure, (3) using wet-lining or applying foam retardant to retard burning, or (4) burning in the spring before the base of snags and large coarse woody debris has dried out sufficiently to burn. These protection measures should be tested during the adaptive management process. The Stakeholders acknowledge that old-growth forest structure protection measures often require intensive resources; therefore, the use of the most costly implementation measures (i.e., raking and wet-lining or foam retardants) should primarily be used in targeted, high-priority areas.

FIRE MANAGEMENT RECOMMENDATIONS

FIRESCAPE DFC: Where possible, natural fire regimes regulate forest structure and composition and align forest changes with climate change.

FIRESCAPE RECOMMENDATIONS

- Use site-specific biotic and abiotic factors to design burning activities that result in the full range of variability of forest structural parameters (e.g., basal area, canopy cover, group size, density, etc.).
- Coordinate with local governments to implement Firewise guidance in county, regional, and small community plans.

TREATMENT AREA-SPECIFIC RECOMMENDATIONS

❖ Bill Williams Treatment Area-Specific Recommendations

- After completion of mechanical thinning treatments, this Treatment Area, with the exception of the northeast corner, could be managed using fire at larger than current scales.

❖ Garland Treatment Area-Specific Recommendations

- In the eastern portion of the Treatment Area, private lands and other constraints require that fire be managed at current scales.
- In the western portion of the Treatment Area, treatments should be implemented to facilitate management of fire at larger than current scales.
- Cooperation with Camp Navajo, Camp Raymond, State Forestry is essential to increasing the scale at which fire can be managed.
- The Forest Service and Stakeholders should coordinate with local fire districts (i.e., Ponderosa Fire) to help educate and involve private landowners in efforts to increase the scale at which fire can be managed.

❖ Sycamore Creek Treatment Area-Specific Recommendations

- Following mechanical thinning of areas with predicted active crown fire under 97th percentile conditions, as described in the LRS Report, the area west of Sycamore Canyon could be managed with fire at larger than current scales.
- The occurrence of State lands, including Centennial Forest, and private lands east of Sycamore Canyon will require a high degree of cooperation to increase the scale at which planned and unplanned fire can be managed within this treatment area.

❖ Oak Creek Treatment Area-Specific Recommendations

- In the northern portion of the treatment area, the use of fire at larger than current scales may be restricted by smoke impacts on the 365 kV 230-2 transmission line transecting the treatment area.
- The high occurrence of State lands, including Centennial Forest, will require a high degree of cooperation to increase the scale at which fire can be managed. This is the priority area for the Arizona State Land Department to focus their fuel reduction and forest management efforts in accordance with the Statewide Strategy for Restoring Arizona's Forests.

❖ **Sinclair Wash Treatment Area-Specific Recommendations**

- Managed fire at current scales should be used to enhance the forest structure established by previously implemented mechanical thinning and burning treatments.

FIRESCAPE DFC: Natural and prescribed fires maintain and enhance, but do not degrade habitat for listed, rare, and sensitive species.

FIRESCAPE RECOMMENDATIONS

- For each treatment area, we provide occurrence and locality information for special status plants and animals. The following management recommendations should be used to guide restoration activities in treatment areas. See Appendix for special status species locality information by Treatment Area.
 - Prep snags >24" dbh (Rabe et al. 1998) prior to fire treatments by raking duff away from the base (Fowler et al. 2010).
 - Avoid smoke inundation of known raptor breeding areas during the breeding seasons
 - Follow Forest Plan direction for implementing the Northern Goshawk Management Recommendations.
 - Implement the Recovery Plan for the Mexican spotted owl.
 - Identify sensitive or rare plants within the burn area and consider individual species' response to fire prior to treating area.
 - Manage the seasonality of planned fires in large meadow systems to promote a diversity of warm- and cool-season grasses.

FIRESCAPE DFC: Natural and prescribed fires support diverse native plant communities and their associated biodiversity.

FIRESCAPE RECOMMENDATIONS

- Understory vegetation must be managed to allow for the accumulation of fuels that can sufficiently restore a frequent fire regime.
- Livestock grazing and ungulates should be managed to allow for the generation of a sufficient accumulation of understory fuels.

TREATMENT AREA-SPECIFIC RECOMMENDATIONS

❖ **Bill Williams Treatment Area-Specific Guidance**

- Where fire spread across adjacent lands is appropriately buffered, fire should be used to recruit and restore aspen stands.

❖ **Garland Treatment Area-Specific Recommendations**

- Efforts should be initially concentrated at Garland prairie, McDougal flat, and other grasslands and meadows (e.g., the area southeast of Spring Canyon).

- Additional treatment efforts should focus on treatment of areas with predicted surface fire larger than 500 acres.
- ❖ **Sycamore Creek Treatment Area-Specific Recommendations**
 - There is a high occurrence of areas with diverse understory communities in this Treatment Area. Efforts should be made to survey and identify specific areas containing rare and sensitive species.
 - Treatments should be initially concentrated at Roger’s Lake, Volunteer Canyon, and Sycamore Canyon to promote and protect rare and sensitive species in these areas.
- ❖ **Oak Creek Treatment Area-Specific Recommendations**
 - Efforts should be initially concentrated at Clay Park, Fry Park, Mill Park, and other grasslands and areas with uncommon understory species (e.g., blue spruce and big-tooth maple cohorts in Fry Canyon).
- ❖ **Sinclair Wash Treatment Area-Specific Recommendations**
 - Efforts should be concentrated at Dry Lakes, Pumphouse Wash, Sinclair Wash, Kelly Canyon, Fry Canyon, James Canyon, Woody Spring, Garden Spring, Griffith Spring, Kelly Seep, Mortgage Spring, Wilson Seep, and Scott Spring.

FIRESCAPE DFC: Exotic non-native species are rare or absent and do not create novel ecological communities following natural and prescribed fires.

FIRESCAPE RECOMMENDATIONS

- Explore expanding and testing the predictive models for cheatgrass from the North Kaibab Ranger District to encompass the 4FRI area.
- Where possible avoid implementing burning treatments in areas where current conditions are identified as “at risk” of invasion or expansion of exotic species, including cheatgrass. Implementation of burning treatments in these areas should not occur until invasive species management creates a favorable environment for treatment implementation.

TREATMENT AREA-SPECIFIC RECOMMENDATIONS

- ❖ **Garland Treatment Area-Specific Recommendations**
 - The cheatgrass infestation of the greater Woody Mountain area is of particular concern and should be considered when planning and managing fire in this area.
- ❖ **Sycamore Creek Treatment Area-Specific Recommendations**
 - When conducting burning activities adjacent to Roger’s Lake, Wilderness, and canyons, sequence treatments to prevent the spread of invasive species.
 - The cheatgrass infestation of the greater Woody Mountain area should be considered when planning and managing fire in this area.
- ❖ **Oak Creek Treatment Area-Specific Recommendations**
 - When conducting burning activities that buffer Wilderness and canyons, sequence treatments to prevent the spread of spotted knapweed into Wilderness and canyons.

- The cheatgrass infestation of the greater Woody Mountain area should be considered when planning and managing fire in this area.
- ❖ **Sinclair Wash Treatment Area-Specific Recommendations**
 - The cheatgrass infestation of the greater Woody Mountain area should be considered when planning and managing fire in this area.

FIRESCAPE DFC: Old-growth forest structure is protected during prescribed burns and naturally ignited fires.

TREATMENT AREA-SPECIFIC RECOMMENDATIONS

- ❖ **Oak Creek Treatment Area-Specific Recommendations**
 - Create buffer to protect old-growth forest structure and research plots on private land near Barney Springs.
- ❖ **Sinclair Wash Treatment Area-Specific Recommendations**
 - Old-growth forest structure near Pumphouse Wash, Kelly Canyon, Fry Canyon and James Canyon should be protected.
 - Old-growth trees near Dry Lakes, Woody Mountain, and Woody Ridge should be protected for recruitment of old growth forest structure.

FIRESCAPE DFC: Fire managers manage planned and unplanned fires in locations, seasons and conditions that maximize smoke dispersion and minimize smoke impacts.

FIRESCAPE RECOMMENDATIONS

- This Firescape’s proximity to the Mogollon Rim and the likelihood of smoke concentration necessitates additional outreach to residents of the Verde Valley.
- Additional attention should be paid to implementing Emission Reduction Techniques for prescribed burns conducted in this Firescape.

WILDLIFE HABITAT RECOMMENDATIONS

FIRESCAPE DFC: Habitat management is contributing to the recovery of listed, rare, and sensitive species.

TREATMENT AREA-SPECIFIC RECOMMENDATIONS

❖ Bill Williams Treatment Area-Specific Recommendations

- Potential restoration of northern leopard frogs at Coleman Lake and vicinity (e.g., Metate Tank)
 - Assess bullfrog distribution within 5 mile radius; eradicate if possible
 - Maintain enclosure fence, deepen perennial pools

❖ Garland Treatment Area-Specific Recommendations

- Build roost platforms for double-crested cormorants and osprey at Scholz Lake (in addition to retention of large trees and snags)

❖ Sycamore Creek Treatment Area-Specific Recommendations

- Potential restoration of northern leopard frogs west of Sycamore Canyon
 - Assess bullfrog distribution; eradicate if possible
 - Fence several waters (to be identified in collaboration with AGFD and USFWS) for livestock exclusion and clean them out
 - Prioritize northern leopard frog reintroduction in the Deadman Pocket area
- Construct osprey platforms (in addition to retention of large trees and snags) at White Horse Lake and JD Dam Lake
- Increase the open water to wetland vegetation ratio at Rankin Tank to enhance habitat for marsh birds

❖ Sinclair Wash Treatment Area-Specific Recommendations

- Explore potential for northern leopard frog reintroduction at Griffiths Spring and tank
- Reduce impacts of dispersed recreation along the western boundary of Rogers Lake

MULTIPLE-USE MANAGEMENT RECOMMENDATIONS

FIRESCAPE DFC: Livestock grazing is compatible with and does not compromise native plant and wildlife biodiversity.

FIRESCAPE RECOMMENDATIONS

- Livestock grazing is managed to minimize its inhibition of native understory composition, productivity, and biodiversity.
- Livestock grazing is managed to reestablish the competition-fire filter (herbaceous vegetation outcompetes pine regeneration and is sufficient to carry fire that reduces regeneration when it occurs).
- Livestock grazing is managed to allow for the accumulation of fuels that are sufficient to carry fire.
- Allotment management plans should be consistent with forest restoration objectives as expressed in the LRS Report (and consistent with Forest Plans).
- Management recommendations identified in the Apache-Sitgreaves Burned Area Restocking Guidelines are implemented across the 4FRI Project Area.

FIRESCAPE DFC: Off-road vehicle use is compatible with and does not compromise native biodiversity.

FIRESCAPE RECOMMENDATIONS

- The TMR is implemented and enforced.
- Mechanical thinning treatment task orders should include road obliteration activities identified in the TMR.
- The off-road vehicle policy is enforced to ensure that Gambel oak stands that are visible post-thinning are protected from unauthorized fuelwood harvest.

TREATMENT AREA-SPECIFIC RECOMMENDATIONS

❖ Garland Treatment Area-Specific Recommendations

- Continue managing vehicular access to lakes and tanks.

❖ Oak Creek Treatment Area-Specific Recommendations

- Prioritize implementation of the TMR to restrict cross country travel in the Treatment Area's numerous parks and riparian areas.

❖ Sinclair Wash Treatment Area-Specific Recommendations

- This is a high priority area for implementing and enforcing the TMR.

FIRESCAPE DFC: Recreational use is compatible with and does not compromise native biodiversity.

FIRESCAPE RECOMMENDATIONS

- Rehabilitation efforts are focused on restoring degraded areas and protecting existing biodiversity in areas receiving heavy recreational use.
- Work cooperatively with recreation interest groups and coordinate rehabilitation efforts to take place in concert with nearby mechanical thinning and fire treatments.
- Do not create new roads or access to Wilderness areas when conducting treatment activities.

TREATMENT AREA-SPECIFIC RECOMMENDATIONS

❖ **Garland Treatment Area-Specific Recommendations**

- Reduce social trails into Paradise Forks climbing area.
- Use byproducts of small diameter thinning to provide firewood to campers at White Horse Lake and other high-use camping areas to discourage fuel-wood harvest.

○ **Sycamore Creek Treatment Area-Specific Recommendations**

- Use byproducts of small diameter thinning to provide firewood to campers at JD Draw and White Horse Lake and other high-use camping areas to discourage fuel-wood harvest.
- Work with Coconino County to develop an interpretive trail at Rogers Lake that also connects to Fort Tuthill.

WATERSHED MANAGEMENT RECOMMENDATIONS

FIRESCAPE DFC: Stable, restored forested ecosystems foster watersheds that yield enhanced water quantity and quality and are resilient to climatic variability.

FIRESCAPE RECOMMENDATIONS

- This Firescape contains a portion of the headwaters of the Verde River and Little Colorado River.
- Regional groundwater recharge and streamflow are greatly affected by hydrologic processes in the Ponderosa pine forest. Natural and human systems rely on these water resources.
- Prioritize grassland and meadow restoration in this Firescape.
- Integrate mechanical thinning and prescribed burning treatments with other comprehensive restoration activities.
- Prioritize road obliteration on roads that contribute to watershed degradation.
- Engineer road system placement and drainage to reduce erosion potential.
- Consider maximizing snow accumulation potential, in conjunction with other values, when designing mechanical thinning prescriptions. Utilize forest openings shaded by clumps and groups of trees to promote snow accumulation and retention.
- In conjunction with management for other resource values, plan for use of prescribed fire at appropriate intervals to reduce evapotranspiration and enhance groundwater recharge and surface water discharge.

TREATMENT AREA-SPECIFIC RECOMMENDATIONS

❖ Garland Treatment Area-Specific Recommendations

- As part of the Sycamore Canyon watershed, treatments that benefit water quality, groundwater recharge and water yield are desirable for this treatment area.

❖ Sycamore Creek Treatment Area-Specific Recommendations

- As part of the Sycamore Canyon watershed, treatments that benefit water quality, groundwater recharge and water yield are desirable for this treatment area.
- Install a streamflow gauge in Sycamore Creek to monitor flow. Partnerships may be developed with the U.S. Geological Survey, Salt River Project and/or the Yavapai County Flood Control District to fund installation and operation of the gauge.

INVASIVE SPECIES MANAGEMENT AND OTHER RESTORATION ACTIVITIES RECOMMENDATIONS

FIRESCAPE DFC: Exotic species are rare or absent and do not create novel ecological communities following disturbance.

FIRESCAPE RECOMMENDATIONS

- Implement the Three Forest Weed EIS.
- Coordinate invasive species treatments to occur concurrently with mechanical thinning and fire treatments.
- Work cooperatively with Weed Management Areas and volunteer groups to provide follow-up surveys and treatment following mechanical thinning and fire.

TREATMENT AREA-SPECIFIC RECOMMENDATIONS

❖ Garland Treatment Area-Specific Recommendations

- Identify waters supporting invasive bullfrogs and crayfish and develop plan for reduction and/or removal of these species.
- Sherwood Forest – Knapweed concern

❖ Sycamore Creek Treatment Area-Specific Recommendations

- Prioritize implementation of the Three Forest Weed EIS in areas buffering wilderness and canyons.
- Identify waters supporting invasive bullfrogs and crayfish and develop plan for reduction and/or removal of these species.

❖ Oak Creek Treatment Area-Specific Recommendations

- Prioritize implementation of the Three Forest Weed EIS in areas adjacent to wilderness and canyons.

❖ Sinclair Wash Treatment Area-Specific Recommendations

- This Treatment Area is a priority area for implementing the Three Forest Weed EIS.