

Airport Hazardous Fuels Reduction Project Proposed Action

**Tusayan Ranger District
Kaibab National Forest**

November 2008

Introduction

The Tusayan Ranger District is proposing to reduce forest tree densities and hazardous fuel conditions through a combination of noncommercial tree felling and prescribed burning. The Airport Hazardous Fuels Reduction Project encompasses approximately 3,059 acres on national forest system lands. The project area is adjacent to private property, Grand Canyon Airport, and Grand Canyon Railway. The project area is located approximately one mile west of State Route 64 and one-quarter mile south of the community of Tusayan, Arizona. The project area is within Ecosystem Management Area 8, Arizona Game and Fish Department's Game Management Unit (GMU) 9, and a portion of the Rain Tank Grazing Allotment which is currently vacant. The project area's legal location is T30N, R2E, Sections 14, 15, 21, 22, 23, 26, 27, 28, 33, and 34 of the G&SRBM (see attached project vicinity map).

Purpose and Need for Action

The Airport Project is a continuation of the district's wildland-urban interface planning process to lower the risk of severe stand-replacing wildland fires in forested lands that surround the community of Tusayan and lie just south of Grand Canyon National Park. Accumulations of dead and down woody debris, "ladder fuels", unnaturally high tree densities, and the long-term drought have all contributed to increased wildland fire potential. The proximity of these fuels to private land, the community of Tusayan, Grand Canyon Airport, Grand Canyon Railway, and Grand Canyon National Park make the Airport Project a priority for vegetation and prescribed fire treatments.

This action supports the goals of the National Fire Plan (2001) and related documents, the Kaibab National Forest Management Plan (as amended), and the Tusayan Community Wildfire Protection Plan (2006) by reducing hazardous forest fuels and creating a more wildfire defensible community, reducing the risk to firefighters and costs associated with fire suppression efforts, and restoring fire-adapted ecosystems. This project meets the Forest Service's Southwestern Region definition for the wildland-urban interface (WUI) which includes "... those areas of resident populations at imminent risk from wildfire, and human developments having special significance." (FSM 5100, Chapter 5140, R3 Supplement No. 5100-2002-2, 1/22/2000).

Desired Condition

The overall desired condition for the Airport Project is to restore the functionality of a fire-adapted ecosystem by reducing hazardous fuels and reintroducing managed fire back into the area; thereby improving overall forest health and sustainability. The project area

would be composed of more open vegetation with grassy openings. The increased grassland production would support a more historic fire regime. Treatments would also improve watershed condition, benefit wildlife and their habitat, increase wildlife viewing opportunities, create a more visually pleasing setting, and provide wood products to residents.

Current Condition

The potential for high-intensity wildland fire within the project area is currently moderate, but increasing over time.

Presently, the project area contains a variety of overstory vegetation with pinyon pine and Utah juniper as the dominant tree species. Ponderosa pines are found on moister sites and Gambel oaks are scattered throughout. Some scattered “yellow pines” are also present. (A yellow pine is a mature ponderosa pine generally older than 130 years with greater than 40% of its bark on the trunk a light brown or tan and “plating” at the tree’s base.)

The understory and openings are dominated by blue grama grass. There are scattered shrubs including big sage, cliffrose, fernbush, wild currant, rabbitbrush, and skunkbush.

A noxious weed, Dalmatian toadflax (*Linaria dalmatica*), occurs near the western boundary of the Grand Canyon Airport and within the project area.

Recreation use within the project area is high. Big game hunting, gathering of forest products (i.e. fuelwood), hiking, and biking are common uses in the area. Overnight dispersed camping also occurs in the project area. There are approximately 9.2 miles of Forest Service roads within the project area. These roads are needed for administrative purposes, resource work, and recreational opportunities.

The Recreation Opportunity Spectrum (ROS) and Scenery Management System (SMS) are recreation management tools used to determine the types and extent of land management practices allowable in a project area. The entire project lies within the Roaded Natural (RN) classification as identified in the Kaibab National Forest Plan. Roaded Natural landscapes are carefully managed to maintain or enhance recreation and scenic values, sites and features, and are to be natural-appearing with changes designed to appear in harmony with the natural setting. Scenic Integrity Objectives (SIO’s) are a combination of the scenic characteristics and visual diversity of an area and how sensitive an area is to viewers. The Scenic Integrity Objective for this project is SIO-3, Moderate. This means the general setting description or desired condition is slightly altered. Noticeable deviations remain visually subordinate to the landscape character being viewed at the end of project activities.

The Airport Project has three visually sensitive areas:

- Grand Canyon Airport and its western boundary fence that are adjacent to the project area’s eastern boundary;

- Private property boundaries that are adjacent to the project area on its northern and southern boundaries; and the
- Grand Canyon Railway right-of-way that is adjacent to the project area's western boundary.

There are no perennial waters, wetlands, or floodplains within the project area. The project area is not part of any municipal watershed or other domestic water supply.

The topography is generally rolling with an elevation that ranges from 6500 to 6693 feet. Slope generally ranges between zero and fifteen percent. Coconino Wash is a steeper-sided wide drainage in the northern portion of the project area. Run-off from the northern portion of the project area drains to Coconino Wash, a component of the Heather Wash Fifth Code watershed. Run-off from the southern portion of the project area drains into Rain Tank Wash. The ephemeral drainages are stable. Soils within the project area are primarily derived from limestone bedrock and are very fine sandy loams in texture. They are shallow and contain large amounts of rock.

Heritage resource specialists have conducted sample inventories within the area in compliance with Section 106 of the National Historic Preservation Act of 1966. There are known heritage resource sites located within the project boundary. These sites range from Cohonina occupation of the area around A.D. 700 to 100 to Anglo-European logging activity of the area after A.D. 1900.

There is no designated critical habitat for any species listed under the Endangered Species Act within the project area. There also is no suitable habitat for Mexican Spotted owls in the project area. California condors are listed under the Endangered Species Act and are common north of the project area within and along the rim of the Grand Canyon, but this species rarely occurs on the Tusayan Ranger District. Forest Service Sensitive species known to occur or that potentially occur within the project area include Tusayan rabbitbrush, bald eagle, northern goshawk, Merriam's shrew, spotted bat, Allen's lappet-browed bat, Townsend's big-eared bat, and Mogollon vole. Elk, mule deer, and wild turkeys are common in the project area, as are numerous other wildlife species.

The following objectives were identified for the Airport Project:

1. Improve ecosystem health and sustainability by decreasing tree densities; increasing tree vigor; reducing the susceptibility of impacts from bugs and disease; increasing native understory plant production; and improving nutrient cycling.
2. Reduce the risk for uncharacteristically intense stand-replacement wildland fire by creating openings in the forest canopy, reducing forest fuel loads (dead down woody debris), reducing ladder fuels (includes increasing the distance from the ground to lower live tree branches), and reducing current tree densities.
3. Reduce the potential for wildland fire to enter private property, the community of Tusayan, Grand Canyon Airport, Grand Canyon Railway, Grand Canyon National Park, and the Grand Canyon school site from the forest.

4. Provide for firefighter and public safety in wildland fire situations within the wildland-urban interface.

Kaibab National Forest Plan Management Direction

The Kaibab Forest Plan contains the following direction relating to the proposed project:

- Do not allow fires to spread to lands of other ownership;
- Protect human life and improvements;
- Maintain or enhance species diversity;
- Maintain vertical diversity through retention of groups of older and larger trees;
- Improve stand diversity and habitat through integrated resource management;
- Give priority to areas in need of additional forage for elk and mule deer when scheduling pinyon-juniper cutting for wildlife habitat improvement;
- Manage Gambel oak for increased hard mast production, cavities, and deciduous foliage volume to promote and enhance wildlife habitat;
- Manage for uneven-aged conditions to sustain a mosaic of vegetation densities, age classes, and species composition well distributed across the landscape;
- Provide for reserve trees, snags and down woody debris; and
- Maintain soil productivity and watershed (i.e. soil) condition. Rehabilitate non-productive lands on a planned basis to eliminate unsatisfactory watershed condition by 2020. Maintain a high quality sustained water yield for Forest users and others. Identify and protect wetlands and floodplains.

National Fire Plan Direction

- Reduce the total number of acres at risk to severe wildland fire.
- Ensure communities at risk in the wildland-urban interface receive priority for hazardous fuels treatment.
- Expand and improve integration of hazardous fuels management programs to reduce severe wildland fires to protect communities and the environment.

Current and Desired Conditions by Vegetative Types

The project area contains a variety of vegetation with pinyon pine and Utah juniper as the dominant overstory species. However, ponderosa pines are found on moister sites and Gambel oaks are scattered throughout. The project area was divided into three analysis areas based upon vegetation types. Common stand exam data was collected in this analysis area in 1996. The Forest Vegetation Simulator software program was utilized to simulate stand growth to current, present day conditions.

Pinyon – Juniper Cover Type

Current Condition

This vegetation type is characterized by a mix of pinyon pine and Utah juniper. It covers approximately 2225 acres or 73% of the project area. The average number of trees per acre across the analysis area within this vegetation type is 853, with a range from 232 to 1541 trees per acre. The average tree diameter is 4.6 inches with a range from 3.6 to 4.9 inches diameter at root collar (drc). There are a few larger diameter pinyon and juniper

that do exist within this vegetation type, but the majority of trees are in the smaller diameter classes. These numerous small diameter trees are impacting the larger trees by competing for resources (i.e. water, nutrients, sunlight) that result in decreased vigor. The increase in the number of trees per acre from historic levels has also resulted in the decline of understory grasses and forbs.

Current stand structure is a direct result of stand development within the last 120 years, or since the introduction of livestock grazing and fire exclusion (result of fire suppression activities). Much of the area within these sites was occupied by grasses, forbs, and shrubs that filled the interspaces between small groups of large trees. In the last 120 years, pinyon and juniper reproduction has been steadily filling these interspaces. Because of the heavy-seeded nature of these trees and the way pinyon jays often distribute pinyon seed in the shade of existing trees, tree regeneration has progressed outward from established trees. As a result, there is a distribution of small diameter trees that have almost entirely filled the open spaces in the tree canopy on these sites.

Desired Condition

The desired condition in this type would be a sustainable stand with tree stocking similar to historic levels and a well-established, diverse grass understory. Historic conditions on these sites were 10-40 trees per acre of primarily large (greater than 16 inches drc) pinyon and juniper arranged in small groups or as scattered large individuals. A multi-age class structure would be present as outlined in the Kaibab Forest Plan. Tree vigor would be high due to adequate resources and available growing space that would also provide for more abundant production of pinyon and juniper seed as mast for wildlife. A well-established, continuous cover of shrubs and grasses would allow for low to moderate fire in order to maintain this stand condition. Soils would be stable, forage production would be high, and nutrient cycling would be occurring.

Ponderosa Pine Cover Type

Current Condition

This vegetation type is characterized by individual trees, as well as small groups of large, mature ponderosa pine with a dense second story of small diameter trees. Ponderosa pine covers about 600 acres or 20% of the project area. The average number of trees per acre within this vegetation type is 620, with a range across the site from 86 trees per acre to 1395 trees per acre. The average diameter for this vegetation type is 6.1 inches with an average range from 3.8 to 10.4 inches diameter at breast height (dbh). Historic evidence suggests that these sites were stocked with only a few trees of large diameter that existed in groups or as individuals with a well-established shrub/grass understory. Stocking levels were likely around 10-15 trees per acre. The large number of trees in the small diameter class has developed due to fire suppression activities within the last century. The increase in the number of trees growing on these sites has resulted in a decrease in the grass/shrub cover and vigor. The health and vigor of the trees within these stands is less than it was historically due to increased competition for water, nutrients, and sunlight.

Desired Condition

The long-term desired condition for these sites is a multi-storied ponderosa pine stand with most of the pine in small groups (1/20 to 1/4 acre) throughout these sites, as well as scattered large individuals. These areas would be dominated by larger trees. Ground vegetation of grasses and shrubs would be well-established within the groups as well as between groups. Openings would be present to promote the establishment of regeneration. The stand would be healthier and more resilient to disease and bug impacts. Canopy closure within Vegetative Structural Stages (VSS) 4, 5, and 6 would be maintained at its current condition. This stand condition would be maintained through periodic burning.

Sagebrush / Grassland Cover Type

Current Condition

This vegetation type is characterized by open sites that were historically sagebrush and grassland communities. It covers about 134 acres or 7% of the project area. Currently, these areas are predominately open, but have light stocking (15-25 trees per acre) of ponderosa pine, pinyon pine, and juniper trees across the site. Historically, fires maintained this ecosystem, but fire suppression and other activities have allowed for the encroachment of tree species. Throughout the analysis area, evidence of trees in these flatlands is lacking indicating that invasion has taken place in recent decades. Sagebrush and grasses are still well-established across most of these sites but are showing signs of competition and decadence from encroaching tree species and a lack of disturbance.

Desired Condition

The desired condition in this type would be a healthy sagebrush – grassland ecosystem that is not dominated by a tree overstory. The sagebrush and grass communities would not need to compete for resources with tree species and would be allowed to thrive in their historic locations.

Proposed Action

Pinyon – Juniper Cover Type

Proposed Treatment

Large diameter trees will be retained along with a few smaller diameter trees that are healthy. Trees will be retained in small groups with openings between these groups. Areas where grass currently exists will be the target location for these openings, as these areas were historically void of trees. This will also provide a seed source for additional grasses and forbs to develop. Thinning will occur from below (cutting smaller diameter trees) to retain the large, older trees along with a few smaller trees. Thinning will be more extensive in areas dominated by small trees. Slash will be treated with broadcast burning after sufficient time has passed to allow the fuels to dry.

Ponderosa Pine Cover Type

Proposed Treatment

Much of this vegetation type will be treated with a burn-thin-burn strategy. In denser treed areas where thinning activities will generate a fair concentration of slash, a light

underburn will be conducted first to reduce natural fuels that are already on the ground. Some areas that are more open currently will be treated with a thin then burn strategy. Thinning will occur on these sites followed by a second burn a few years later to reduce the slash that is left. This strategy should result in the majority of the residual stand receiving minimal negative impacts during prescribed burning operations.

Thinning prescriptions will be developed to reduce ladder fuels and create a more open stand. A thinning from below method will be used so that larger, older trees will be retained along with a few higher quality, smaller diameter trees.

Sagebrush / Grassland Cover Type

Proposed Treatment

This vegetation type will be returned to its historic condition through the removal of encroaching trees. All trees will be mechanically removed from the open sagebrush / grasslands unless there is evidence that there was a tree there historically. This evidence is usually an historic stump or an old down log.

Project-wide Treatments

Cutting prescriptions will be developed to maintain and enhance Gambel oak due to its scarcity in the project area and its importance to wildlife. Portions of the project area may be opened to fuelwood gathering as long as there are no conflicts with other resource areas. The slash will be burned after an appropriate amount of time has passed for the fuels to cure. Allowable mortality from the burning will be as follows:

- Less than 5% mortality in yellow pines;
- Less than 5% mortality in large oak.

Burning would be implemented when conditions are favorable for smoke management, consumption, control, and desired fire and resource effects. Maintenance burning may occur to maintain ecosystem health and satisfactory stand structure.

Road Access

The existing forest road system provides adequate access for implementation of project activities. Therefore, a site-specific roads analysis process (RAP) will not be undertaken for this project.

Mitigation Measures

Mitigation measures are measures that are taken to minimize potential negative impacts that may occur due to implementation of the proposed action. Mitigation measures are also developed to address concerns that might be raised about the proposed action. Further mitigation measures may be developed as more project input is received. Following are the mitigation measures developed for the proposed action, to date:

Vegetation

1. Prior to prescribed burning, slash will be lopped to a height of two feet or less and bucked.

2. Mechanical treatments may try to avoid the time period of January 1 and July 1 to reduce the threat of *Ips* bark beetle outbreaks within and around adjoining stands where there is heavy thinning slash in the ponderosa pine cover type. This timeframe may be shortened by the zone silviculturist if drought conditions subside and/or monitored bark beetle populations decrease.
3. Where it is determined necessary to reduce excess mortality of large diameter trees during broadcast burning, thinning slash may be pulled back from designated large trees during thinning operations. This may include yellow pine, large pinyon pine, large juniper, and large oak.
4. Timing of burning will be carefully considered in order to keep tree mortality within desired thresholds.

Prescribed Burning

5. Prescribed burning prescriptions will be designed to limit mortality in large old trees. Standard burn preparation will include such measures as lining snags, removing dead fuels near large oak and yellow pine, and reducing excessive duff layers around sensitive yellow pine.
6. Smoke management mitigation measures include allowing for fuelwood harvesting, avoiding direct ignition of stumps and large logs, burning smaller blocks of land, burning with adequate ventilation, and burning in the later afternoon/evening to take advantage of downslope/down valley airflow away from sensitive areas.
7. Power lines, cell tower, and railroad features will be protected from negative prescribed burn impacts.
8. Pre-burn preparation will be conducted around all fire sensitive sites as necessary to assure no adverse impact.

Heritage

9. An archaeologist must be present at the initial implementation tailgate safety meetings to discuss any sites that must be avoided during implementation.
10. Site boundaries will be flagged or painted for avoidance during the various stages of implementation.
11. Burning operations may not be conducted within sites that contain fire-sensitive features.
12. Broadcast burning may occur through sites that are not sensitive to fire. However, fire managers must consult with the Forest or District archaeologist prior to project implementation to ensure that fuel conditions are such that they will not burn with prolonged or extreme heat within the project area.
13. The use of heavy or mechanized equipment will be prohibited within site boundaries and unsurveyed areas.
14. Planned firelines must avoid all known heritage sites.
15. Sites must be avoided during road maintenance activities.
16. Fuel piling must not occur on any known sites.

17. Mechanized piling is prohibited in unsurveyed areas.
18. If any unrecorded heritage resource sites are discovered during project implementation, work in the vicinity of the site must cease immediately and the Forest Archaeologist must be notified immediately.
19. If additional ground disturbing activities are proposed, project managers must first contact the Forest Archaeologist so a clearance can be drafted and submitted for review.

Recreation and Scenery Resources

20. To meet Scenic Integrity Objective Level 3 (Moderate), all thinning should be done in a way as to create a clumping or grouping effect when possible.
21. Along private property boundaries (Wolfe to the north and APEX to the southwest), thinning slash will be pulled back 50 feet and piled in areas where it is not feasible to lop and burn without killing residual trees.
22. Thinning slash along the Grand Canyon Railroad will be lopped to within one foot of the ground and scattered in a way that residual trees will not be affected when burned. If this can't be achieved in areas of thicker vegetation, hand piles will be utilized. Stumps within the first 200 feet from the rail will be cut horizontally to the ground and be no more than four inches high.
23. Thinning slash along the Grand Canyon Airport boundary will be lopped to within one foot in height for 200 feet.
24. Slash piles should be treated as soon as possible, generally within two years near sensitive areas.
25. All thinning unit boundary marks will be done in a way as to not draw attention by the average forest user.

Wildlife and Habitat

26. If an active goshawk nest is found within the project area at any time during project planning or implementation, silviculture, timber, and wildlife staff will coordinate to ensure that the proposed action and silvicultural prescriptions, as well as any existing thinning or timber sale contracts, are consistent with Forest Plan goshawk standards and guidelines.
27. If any other active raptor nest is found within the project area during project planning or implementation, minimize human activity and avoid the use of chainsaws or heavy equipment within a 1/4-mile radius (1,320 feet) of the nest tree between April 1 and August 31 unless cleared by the wildlife biologist.
28. Incorporate measures into the project burn plan to minimize prescribed fire loss of the following key wildlife habitat features:
 - yellow pines and other large-diameter pines (greater than 24 inches dbh);
 - large-diameter snags (greater than 18 inches dbh);
 - live or dead trees with cavities;
 - large oaks (greater than 8 inches dbh); and
 - large logs (greater than 12 inches diameter at midpoint and greater than 8 feet long).

Potential measures to minimize loss of these key habitat features include: 1) specification of burning prescription parameters designed to achieve low to moderate burn intensities; 2) avoidance of direct ignition of key habitat features; 3) reducing accumulations of fine fuels around key habitat features where practical; and 4) adjusting ignition techniques and patterns to minimize fire impacts in areas where key habitat features occur or are concentrated.

Sensitive Plants

29. Known populations of sensitive species will be flagged and withdrawn from treatment if analysis shows that the species will be negatively impacted by the treatment.
30. If populations of any sensitive species are found before or during project implementation, the project manager will coordinate with the district sensitive plant coordinator in order to restrict negative impacts.
31. Proposed locations of temporary roads and slash piles will be surveyed for sensitive plants before construction or piling begins if sensitive plant populations are known to exist nearby.
32. All slash will be hand piled in areas with sensitive plants.
33. No use of bulldozers off roads to clear trees and slash in areas with populations of sensitive plants.
34. Do not seed near populations of sensitive plants after thinning or burning, in order to prevent the introduction of invasive species and to prevent attracting wild ungulates and livestock to the area.

Implement Best Management Practices. (See list of BMP's in the Project File.)

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