# Kaibab National Forest

# Forest Plan Monitoring Report

# Fiscal Year 2009

### Forest Supervisor Certification

I certify that the Kaibab National Forest Plan as amended is sufficient to guide management of the forest over the next year. Changes that should be considered over time to maintain the viability of the Plan are identified in this document.

/s/ Michael R. Williams
Michael R. Williams
Forest Supervisor

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Date

## Introduction

The Monitoring Plan for the Kaibab National Forest Plan identifies 58 items to be tracked as measures of the effectiveness of the forest plan. This report provides information on current and recent accomplishments by resource or concern area. For more information about Forest plan monitoring items, see previous year monitoring reports at http://fs.usda.gov/goto/kaibab/plan_rev_docs or by request.

The management situation was analyzed in the 2009 Comprehensive Evaluation Report (CER) and Supplement to the CER (2010). The CER evaluated the need for change in light of how management under the current Plan (as amended) was affecting the conditions and trends related to sustainability. The Supplement to the CER contains additional analysis and information about projections of demand, benchmarks, and species considerations. Together, these documents meet the content requirements of the Analysis of the Management Situation (AMS). These documents are available for review and are located on the forest's Web site at http://fs.usda.gov/goto/kaibab/plan_revision or by request.

## Timber

The timber program is an integral part of the Kaibab National Forest's efforts in fuels reduction, forest health, wildlife habitat enhancement, and watershed improvement. Timber sales are an efficient way to accomplish needed thinning and other treatments by capitalizing on the value of the wood removed. The Kaibab Forest plan was amended in 1996. Since then, most harvests have been commercial thinning or group selection cuts designed to make progress towards the desired size-class distribution of ponderosa pine and reduce hazardous fuels that are the result of decades of fire suppression.

The downturn in the economy, especially the housing market, had a severe negative impact on the timber industry. The decline in demand for wood products (everything from structural lumber to wood pallets for carrying construction materials) drove prices down, often below the cost of harvesting, hauling, and processing purchased timber. However, a few commercial timber projects continue to take place.

On the *South Zone* (Williams and Tusayan Ranger Districts) the Pineaire Timber Sale was awarded in 2009 which will treat 177 acres within the community of Parks to lessen fire risk in the community. Also awarded was the Dogtown Stewardship Agreement which will treat 1,743 acres with commercial logging as well as accomplish other stewardship treatments such as non-commercial thinning, aspen protection, and road improvements. These two contracts will provide 12,636 CCF of commercial wood fiber. Logging of contracts awarded in prior years

resulted in the treatment of about 1,200 acres of forest and provided 8,327 CCF (around four million board feet) of commercial and non-commercial wood products.

In addition to the timber sales program, the *South Zone* sold 489 cords of pinyon/juniper commercial fuelwood to accomplish range, wildlife and watershed objectives on 150 acres in pinyon/juniper woodlands. Another 5,221 cords of fuelwood were provided for personal use to meet local home heating needs. Permits were also sold for Christmas trees, fence posts, pine poles, decorative wood, wilding transplants, and pine cones.

On the North Kaibab Ranger District, the Fracas Timber Sale was completed as part of the 1,200-acre Fracas Wildlife Habitat Improvement Project. Commercial thinning occurred on 675 acres of the project area which produced 1,540 CCF. The FR641U_225 Hazard Tree Salvage Timber Sale was also completed. This salvage sale resulted in the removal of 385 CCF of commercial wood fiber on 64 acres. The Warm Fire salvage sale involved removing dead, hazardous trees that had burned and were threatening public roads. This project harvested 965 CCF on approximately 220 acres. Finally, the NKRD completed stand exams for 5,000 acres.

**Table 1. Timber resource outputs and accomplishments for FY09.**

| Resource | Monitoring Item | Unit of Measure | FY09 Output |
|---|---|---|---|
| Precommercial Thinning | Timber 1 | Acres | 5,630 |
| Commercial Thinning | Timber 2 | Acres | 1,645 |
| Regeneration Cutting | Timber 3 | Acres | 198 |
| Planting | Timber 5 | Acres | 4 |
| Sanitation Cutting | NA | Acres | 11 |
| Sawtimber and Roundwood | Timber 8 | CCF | 11,217 |
| Pinyon-Juniper Fuelwood | Timber 9 | CCF | 8,820 |
| Christmas Trees | NA | Each | 2,146 |

## Insect and Disease

The KNF plan revision team identified insect/disease outbreaks as a moderate risk to **ponderosa pine** (Kaibab National Forest 2008a). This risk is largely a function of stand density. Across the southwest increased stand densities resulting from years of fire exclusion have created prime conditions for insect epidemics and disease outbreaks, particularly among older trees (Arno

2008). In general, ponderosa pine mortality in the southwest has increased as a result of drought and more frequent bark beetle attacks (Kolb et al. 2007).

Historically, the western pine beetle was the most aggressive damaging agent to ponderosa pine (Lynch et al. 2008). In general, tree mortality from mountain pine beetle outbreaks has decreased on the Kaibab plateau since 1997 (USDA 2008b). Since 2003 however, damage by western pine beetle has been surpassed by the *Ips* genus, an aggressive beetle that favors denser forests and smaller tree diameters. It is expected the high levels of ponderosa pine mortality will continue to occur throughout the region as a result of high population sizes and dispersal distances associated with *Ips* and other aggressive bark beetles (Allender et al. 2008).

In general, **spruce-fir** is less prone to large-scale insect outbreaks than ponderosa pine because it occurs in such limited amounts, in colder environments, and because fire suppression has not had an overt impact on this particular forest type. Minor outbreaks may occur every 2-4 decades (Lynch et al. 2008). Spruce beetle outbreaks have been minimal on the KNF. The most significant outbreak affected approximately 1000 acres in the 1990s. Defoliator activity continues to be low due to limited host availability (USDA 2008b). There is no evidence of western balsam bark beetle attacks that primarily affect corkbark and subalpine fir (Lynch 2008). On the NKRD, root disease has caused continued mortality since 1991at the De Motte Campground.

Although common continentally, **aspen** are threatened regionally. As a result of increased fire suppression activities, unchecked forest succession, overgrazing and over browsing by elk, aspen stands are currently in decline in most of the southwest. Disease and insects have also impacted aspen. The KNF has experienced extensive defoliation events caused by Western tent caterpillars, large aspen tortrix, melamspora rust, and black rust since the 1940s, although in general, mortality has been minimal until now. Recently however, the effects of these causal agents have been exacerbated by weather events such as severe drought. Since the late 1990s, these abiotic agents have acted cumulatively with regard to disease and insects to cause accelerated dieback and mortality (Lynch 2008).

Increases in tree density, canopy cover and loss of understory plant cover and diversity were identified as the primary threats to **pinyon-juniper** (Kaibab National Forest 2008a). Several studies have shown that density dependent factors are especially impacting the pinyon pine component of the pinyon-juniper system. Areas with high tree density experience higher levels of competition. In the past, fire has been the primary disturbance agent affecting pinyon-juniper, but insects, drought, and disease are becoming more influential. Increasing levels of mortality caused by the pinyon *Ips* beetle may be attributable to increased levels of dwarf mistletoe infection, competition from higher densities of large diameter trees, and stressors inherent in

drought and higher temperatures (Allen 2007, Lynch 2008). Climate change is not likely to help the situation.

Forest insect and disease aerial detection surveys for the KNF were completed Arizona Zone Office, Forest Health staff. Additional ground surveys identified sawfly activity on the north side of Kendrick Mountain and western spruce budworm activity on the NKRD. See Tables 2 and 3 below.

**Table 2.** Bark Beetle Conditions Report for the Kaibab National Forest in Acres*

| Bark Beetle | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|
| **Western pine beetle** | 15 | 0 | 7,833 | 3 | 26 | 410 | 9 | 94 | 16 |
| **Mountain pine beetle** | 0 | 4 | 79 | 0 | 0 | 0 | 3 | 0 | 0 |
| **Ponderosa pine *Ips*** | 35 | 6,012 | 64,195 | 29,807 | 23 | 6,850 | 215 | 343 | 196 |
| **Douglas-fir beetle** | 0 | 0 | 1,282 | 615 | 2,510 | 850 | 251 | 106 | 89 |
| **True fir complex**† | 80 | 80 | 365 | 1,065 | 1,211 | 105 | 252 | 17 | 57 |
| **Cedar bark beetle** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **Pinyon ips** | 470 | 1,269 | 158,951 | 6,922 | 6 | 15 | 0 | 1 | 0 |
| **Total:** | 600 | 7,365 | 232,705 | 38,412 | 3,776 | 8,230 | 730 | 561 | 359 |

*Acreages are only reported for the Kaibab National forest in this table. Associated maps provide acreages for surrounding areas within the flown region.
†True fir complex includes fir engraver and/or western balsam bark beetle.

**Table 3.** Defoliator Conditions Report for the Kaibab National Forest in Acres*

| Defoliator | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|
| **Spruce budworm** | 9,515 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Sawflies** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,223 |
| **Aspen defoliation** | 11,525 | 16,370 | 951 | 17,782 | 22,664 | 28,415 | 76,185 | 65,204 | 4,667 |
| **Abiotic** | 0 | 4,129 | 2,522 | 14,683 | 2,988 | 210 | 0 | 1,738 | 231 |
| **Total:** | 21,040 | 20,499 | 3,473 | 32,465 | 25,652 | 28,625 | 76,185 | 66,942 | 1,223 |

*Acreages are only reported for the Kaibab National forest in this table. Associated maps provide acreages for surrounding areas within the flown region.

## Fuels Management

Restoring fire adapted ecosystems remains one of the Forest's highest priorities. In 2009, Fire Managers used their Hazardous Fuels Reduction budget to reduce fire hazard on 13,874 acres of Kaibab National Forest lands. Fuels treatments included broadcast burning, thinning, piling, and pile burning.

Most of these acres were treated with broadcast burns lit under prescribed conditions to produce low to moderate intensity fires that remove accumulations of forest litter and debris. It remains

the most cost effective and immediate fire hazard reduction treatment available to fire managers. In 2009, 10,393 acres were treated with broadcast burns. Just under half these acres – 6,274 - occurred within the wildland urban interface where the forest and communities meet. Most urban interface treatments were on the Williams District where there is the highest density of private in holdings and municipal lands, though 800 acres around the city of Tusayan on the Tusayan Ranger District also received prescribed burn treatment.

In addition to broadcast burning, Kaibab Hazardous Fuels Reduction funding was also used to thin 378 acres, to pile 1,790 acres of slash, and to burn 378 acres of slash piles. Thinning, and piling slash in dense stands of timber, while considerably more costly than burning, has a longer term effect on reducing fire hazard. The majority of these treatments took place in the WUI where the higher cost of these treatments is easily justified to protect residences and improvements on private lands, as well as the watersheds and infrastructure that are located on Forest lands.

Kaibab Fire Managers continue to use lightning caused wildfires to accomplish hazardous fuel reduction objectives when weather and forest fuel moisture conditions are right. These naturally caused fires have other resource benefits as well such as improving and protecting wildlife habitat, recycling nutrients into the soil, improving forage production, and maintaining or improving stand structure. These fires typically burn at low intensities, with isolated pockets of moderate to intense fire behavior. Not simply allowed to burn, these fires are actively managed; specialists from all forest resource disciplines participate in the decision process to determine where the fires will be allowed to spread, what values are at risk, and how they will be protected. Fire Managers and firefighters implement those plans, often over the course of several weeks. In fiscal year 2009, twelve fires on the Kaibab were managed to achieve resource benefits, burning a total of 44,568 acres. On the Williams Ranger District were the Wild Horse Fire – 11,587 acres, the Marteen Fire – 10,288 acres, and the Cross Fire – 7,718 acres. The Tusayan District managed five wildfires for resource benefit objectives including the Ruby Fire – 4,102 acres, the Miller Fire – 3,160 acres, the Indian-Rae Fire – 2,005 acres, the Anderson Fire – 1,238 acres, and the Rain Fire – 40 acres. The North Kaibab managed the Fracas Fire – 2,339 acres, the Pipeline Fire – 1,441 acres, the Castle Fire – 432 acres, and the Dee Fire – 213 acres to achieve resource benefits.

Between the 13,874 acres that were treated using funds allocated to the Forest for hazardous fuels reduction, and the 44,568 acres of wildfires managed to achieve resource objectives, a total of 58,442 acres, primarily in the Ponderosa Pine type, were treated in the 2009 fiscal year. This equates to approximately 10% of the pine type on the Forest, and unprecedented rate of treatment for the Forest.

## Range

The Forest administered grazing on 31 allotments during 2009. In 2009, *permitted use* on the KNF was **65,174** Animal Unit Months (AUM) and *actual use* was **47,790** AUMs. Permitted use has stabilized and expected to remain relatively constant for the foreseeable future. Information on permitted use and actual use in 2009, by Ranger District, are shown in Table 4.

**Table 4. Permitted and actual use (AUMs), by Ranger District, 2009**

| District | Permitted Use | | | | Actual Use | | |
|---|---|---|---|---|---|---|---|
| | Horses | Sheep | Cattle | | Horses | Sheep | Cattle |
| | | | | | | | |
| North Kaibab | 0 | 0 | 10,946 | | 0 | 0 | 5,627 |
| Tusayan | 0 | 0 | 12,626 | | 0 | 0 | 2.165 |
| Williams | 252 | 13,997 | 27,353 | | 252 | 12,393 | 27,353 |
| | | | | | | | |
| **Total** | **252** | **13,997** | **50,925** | | **252** | **12,393** | **35,145** |

### Wild Burro Population

The KNF conducted a helicopter survey of burro populations on June 16, 2009. A total of 73 burros were seen (61 adults and 12 juveniles). The 73 burros are believed to represent 30-50% of the actual population. Ohmart et al (1978) suggests that the best any aerial survey can count is approximately 30-35% of a population. The 30-50% range results in an estimated burro population at 110-124 head. Burro populations are significantly higher than the desired range of 22-35 animals.

### Noxious Weeds

The Forest completed 3,025 acres of noxious weed control through the use of herbicide, hand pulling and biological treatments. Species treated included dalmatian toadflax, bull thistle, leafy spurge, scotch thistle, musk thistle, diffuse knapweed, and cheatgrass. These treatments improve native plant composition and density, with increased ground cover and watershed protection benefits.

## Recreation

In fiscal year 2009, recreation managers completed the Kaibab National Forest Pocket Guide, a free publication intended to provide valuable information to Forest visitors. The guide includes a simplified Forest map with major access roads, general Forest information, and a listing of developed recreation facilities.

**Table 5. Developed Recreation Capacity, by Site Type, 2009.**

| Site Type | Capacity Offered 2009 In PAOT |
|---|---|
| Campground | 371,013 |
| Day Use Areas | 16,260 |
| Fishing Sites | 157,045 |
| Group Campground | 40,781 |
| Interpretive Sites | 150,788 |
| Rental Cabins | 4,380 |
| Observation Sites | 41,810 |
| Snowplay Area | 4,770 |
| Picnic Areas | 59,940 |
| Trailheads | 334,315 |

**Sites Fees Collected Under the Recreation Enhancement Act of 2005 (PL-108-447)**

Ten-X Campground and Group Campground and Spring Valley Rental Cabin are operated under the Recreation Enhancement Act of 2005. In 2009, $90,195 in fee revenue was collected, and $60,645 was expended on operations, maintenance and improvements. Remaining income is carried forward to the next fiscal year, and is used for that year's operations, maintenance and improvements. Improvements were started on Hull Cabin on Tusayan RD in order to bring it into the Cabin Rental program. It is expected to be available in 2010.

Another phase of the ongoing rehabilitation of Kaibab Lake Campground was completed as campsites on two additional road loops were outfitted with new tables and fire rings. Three toilet buildings were replaced at White Horse Lake Campground and water hydrants were moved and placed in close proximity to the restrooms..

## Heritage Resources

Kaibab National Forest archaeologists received statewide recognition as part of the Governor's Heritage Preservation Honor Awards. The awards recognize people, organizations, and projects that represent outstanding achievements in preserving Arizona's prehistoric and historic resources.

The Forest heritage program conducted 57 projects, surveyed 1,622 acres of land, recorded 74 new National Register-eligible archaeological sites, and monitored the condition of about 209 previously recorded sites during fiscal year 2009. Archaeologists planned and led restoration efforts at the historic Jump Up Cabin on the North Kaibab Ranger District and continued rehabilitation of the Tusayan district's Hull Cabin in preparation for its entry into the Arizona Cabin Rental Program. The Heritage staff also provided support and resource counsel on one (1) prescribed fire, twelve (12) wildland fire use fires, and three (3) wildfires.

## Soils and Watershed

The Forest partnered with Arizona Game and Fish Department and range permittees to improve soil and watershed conditions on 2,701 acres of grasslands. The work focused on cutting pinyon and juniper trees that have encroached historic grasslands. Monitoring following the grassland treatments has shown substantial improvement in ground cover conditions. Additionally, the Forest treated 525 acres in the areas burned by the Slide and Warm fires on the North Kaibab Ranger District. Treatments included reseeding, establishing erosion control, and fence repair.

## Wildlife

The Forest partnered with Arizona Game and Fish Department (AZGFD) on a large multi-year project to improve habitat within critical **mule deer** winter range on the west side of the North Kaibab District. Habitat improvements completed in 2009 included planting key mule deer browse plants (cliffrose, four-wing saltbush and sagebrush), thinning junipers to increase forage and browse production, and herbicide treatments of cheatgrass.

Pronghorn **antelope** populations have declined from historic levels in northern Arizona. The Forest partnered with AZGFD to cut down juniper trees from 3,450 acres of the Ida project area on the Williams District in order to improve habitat for pronghorn and other grassland species.

**Wetlands** provide important habitat for a wide variety of plant and animal species and are especially important on the dry Kaibab. The Forest worked with Grand Canyon Trust and volunteers to build post-and-pole fences around Murray's Lake and Glen Lake on the North Kaibab District. The Williams District initiated a project to add a quarter-inch steel cable to the top of existing fences around four large ephemeral wetlands (Davenport Lake, Coleman Lake,

Moritz Lake and JD Lake). These enhancements will substantially improve long-term effectiveness and reduce maintenance costs of the fences.

**Aspen** forests are widely recognized for their importance as biologically diverse wildlife habitat, as well as their aesthetic and recreational values. These values are at risk on the Williams District because aspen conditions are poor and declining. A variety of factors are likely impacting aspen, but one problem is lack of recruitment (young aspen trees surviving long enough to reach maturity) due to frequent browsing by elk, deer and livestock. The Williams district built six (6) new fences around aspen stands and conducted maintenance on 30 existing fences.

Wildlife biologists monitored territory occupancy in each of the Forest's six **Mexican spotted owl** protected activity centers (PACs), all located on the Williams district. Biologists determined that five (5) of the six (6) PACs were occupied by spotted owls during the 2009 spotted owl breeding season.

Two (2) studies were produced by researchers from the Rocky Mountain Research Station and Northern Arizona University. The first dealt with "Small mammal communities of Garland and Government Prairies" (Ganey et al. 2009) and the second provided information on "Bird communities in sagebrush habitat on the Tusayan District" (Theimer et al. 2009).

## Facilities/Roads

Several important facilities and roads projects on the Kaibab National Forest were started or completed by the engineering team in fiscal year 2009. On the North Kaibab Ranger District, a new shower and laundry building is under construction at the Big Springs Work Center to complement the upcoming renovation of several living quarters. Preliminary planning and an environmental assessment were completed for the proposed consolidation of the North Kaibab Ranger Station and Tanglefoot Work Center into a new ranger station facility in Fredonia. Construction funding for this project is being pursued.

About 12 miles of forest roads 12 and 105 leading to White Horse Lake, JD Dam Lake, and then to Pine Flat were resurfaced with gravel. Annual maintenance and grading were completed on 799 miles of forest roads on the Williams, Tusayan and North Kaibab districts. Route marker signs at road junctions are being checked and new ones installed where necessary. So far, 100 percent of the route marker signs on the Tusayan district and 20 percent on the Williams district have been completed.

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