United States
Department of
Agriculture

Forest
Service

**Southwestern
Region**

Environmental Assessment for DeMotte Campground Reconstruction Project

Kaibab National Forest

July 2004

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Chapter 1 – Purpose and Need

Document Structure:

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four parts:

- Introduction: The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- Comparison of Alternatives, including the Proposed Action: This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- Environmental Consequences: This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by environmental component. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.
- Agencies and Persons Consulted: This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- Appendices: The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the North Kaibab Ranger District Office in Fredonia, Arizona.

Background:

The campground is located on the North Kaibab Ranger District of the Kaibab National Forest, Coconino County, Arizona, approximately 45 miles south of Fredonia, Arizona - T35N R2E Section 24 (Figure 1). The project area has 23 campsites over 10 acres.

The campground was constructed in 1964. There have been no major facility upgrades since the campground was constructed. Thus, the campground sewer system, water system, picnic tables, and toilets are in a deteriorated condition. The parking spurs and interior road system do not accommodate the typical recreational vehicles forest visitors use today, and the toilets, campsites, picnic tables, fire grills, amphitheater, and entrance station do not meet current Americans with Disabilities Act (ADA) standards.

National quality standards have been developed for developed sites, these include the key measures of: health and cleanliness, resources setting, safety and security, responsiveness and condition of facilities. DeMotte CG had a condition survey completed in 2003. Two areas of concern were identified. First, under resource setting, the effects from recreation use are currently contributing to forest health issues. Soil compaction and user created trails throughout the site are affecting existing vegetation. There is also a need to continue the hazard tree removals as root rot infected trees are identified. Second, under condition of facilities, the constructed features are in disrepair, as the campground has exceeded the designed service life. Most if not all of the constructed features need to be replaced.

DeMotte Campground
North Kaibab Ranger District

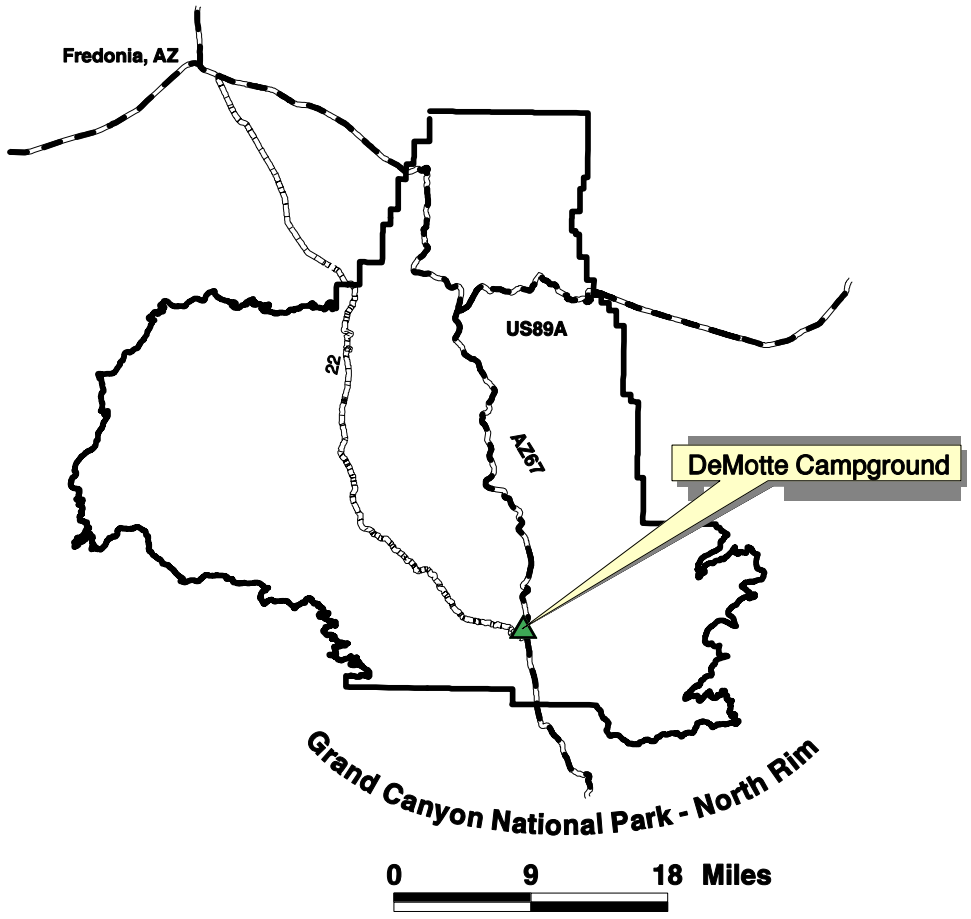

Figure 1. DeMotte Campground location map.

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With the proximity of DeMotte Campground to the North Rim of the Grand Canyon, visitation at the campground is near capacity throughout the summer. It is not uncommon to have the campground, actually, at full capacity during this time.

An unsafe vegetation condition has developed within DeMotte Campground, primarily created by the preclusion of both natural fire regimes and past (pre-European) burning practices, insect and disease infections, soil compaction, vehicle damage, and the initiation of certain timber management practices. The interplay of these five factors has occurred over a period of many decades.

There are many insects and pathogens affecting trees within the project area. The most common include: Western Spruce Budworm, *Choristoneura occidentalis;* Shoestring root rot, *Armillaria ostoyae;* Dwarf mistletoe, *Arceuthobium vaginatu subsp. cryptopodum;* and, Annosus Root Rot, *Heterobasidion annosum.* It is the two root rot pathogens, *A. ostoyae and H. annosum,* which are of greatest concern since they have been detected in all hazard tree failures in this campground over the past 14 years (DeMotte Campground Silviculture Report). Root rot causes the trees to become unstable, susceptible to windfall, and potentially hazardous to campers and facilities. Large diameter (10"diameter breast height (dbh) and above) spruce and fir trees are of particular concern.

Purpose and Need for Action:

There is a need for facility upgrades, vegetation treatments, and increased capacity at DeMotte Campground to improve public health and safety, and meet ADA requirements. Reconstruction of DeMotte Campground complies with the Kaibab National Forest Land Management Plan (as amended 6/96). Management Direction (Chapter 4) gives the following goals: "Manage the recreation resource and provide facilities to increase recreation opportunities for a wide variety of developed and dispersed experiences" and "manage facilities and use to minimize resource degradation, and to provide for the safety and well being of the public while in the Forest." In addition, in Ecosystem Management Area 21, the Forest Plan management direction is to reconstruction or replacement of substandard facilities in the following public sector developed sites: 3. DeMotte Campground (KNF Land Management Plan, page 109).

Proposed Action:

The Forest Service proposes the following activities to meet the purpose and need:

1. Replace existing vault toilet and existing flush toilet with new vault toilets. The new toilets will be barrier-free for access. Barrier-free access is defined as "facilities designed to accommodate people of all ages, genders, sizes and physical abilities."
2. Construct a new barrier-free amphitheater.
3. Reconstruct interior access roads, parking spurs, and interior pathways and provide barrier-free access from parking spurs to campsites.
4. Increase number of campsites from 23 to approximately 50. Each new site would have barrier-free fixtures.
5. Provide potable drinking water. Also construct a new water line to a fill station from the existing 40,000-gallon water tank. This tank would store water to be used for fire protection for the campground and adjacent Kaibab Lodge.
6. Relocate campground host site.
7. Construct barrier-free check-in station.

8. Construct a new group area site, including barrier-free covered ramada, picnic tables, potable water tank, fire grills, and vault toilet.
9. Remove existing hazardous spruce and fir trees in accordance with the District Hazard Trees Marking Guidelines. Approximately 400 trees ranging in size from 1" to 26" in diameter would be felled and removed from the campground. Only those ponderosa pine trees (various sizes) directly in the path of construction would be removed.
10. Construct a wooden pole fence around the campground to keep cattle out.
11. Replace existing aboveground power line with a buried line.
12. Abandon the existing leach line in place and construct a holding tank to which the campground hosts' site will be plumbed into.

Decision Framework:

Given the purpose and need, the Kaibab National Forest, Forest Supervisor will review the proposed action and other alternatives in order to make the following decisions:

1. Should the DeMotte Campground Reconstruction Project proceed as proposed?

2. If the project proceeds, what mitigation measures and monitoring requirements will be applied?

Public Involvement:

The proposal was listed in the Schedule of Proposed Actions the 1st Quarter of 2003. The proposal was provided to the public and other agencies for comment during scoping, February 28, 2003 through April 1, 2003. In addition, as part of the public involvement process, the agency mailed out 60 scoping letters. As a result of this activity, the North Kaibab Ranger District received 4 letters and/or e-mails. Three of the comments were in support of the proposed activities and the fourth one concerned a range issue.

Issues:

The Forest Service separates issues into two groups: significant and non-significant issues. Significant issues are used to formulate alternatives, prescribe mitigation measures, or analyze environmental effects. Issues are "significant" because of the extent of their geographic distribution, the duration of their effects, or the intensity of interest or resource conflict. No significant issues were identified during project scoping. Non-significant issues are: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; 4) conjectural and not supported by scientific or factual evidence; 5) addressed during processes or analyses routinely conducted by the ID Team; or 6) addressed through implementation of project specific mitigation measures.

The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…" A list of non-significant issues and reasons regarding their categorization as non-significant may be found in the project record (Appendix A - SUMMARY COMPARISON OF ALTERNATIVES).

Chapter 2 - Alternatives

The interdisciplinary team considered a range of alternatives before determining which alternatives should be considered in detail. Four alternatives for the DeMotte Campground Reconstruction Project were considered. The National Environmental Policy Act (NEPA) requires analysis of a proposed action and other reasonable alternatives, including no action. The no action alternative provides a baseline for estimating environmental effects. Additional action alternatives were developed to meet the purpose and need for action, and in response to the issues and concerns identified. Those alternatives eliminated from detailed study, along with the rationale for their elimination, are discussed below.

Alternatives Considered and Eliminated from Detailed Study:

Close the facilities permanently:

This alternative would close the facilities on a permanent basis. This alternative was dropped from detailed analysis because DeMotte Campground has many advantages including proximity to: Kaibab Lodge and related visitor services of store and gas station, the North Rim of the Grand Canyon National Park, developed scenic viewpoints and trailhead accesses. Demotte Campground serves as an overflow campground when the Park Service campground at the North Rim is full.

Construct DeMotte II Recreation Area:

The Kaibab National Forest Land Management Plan lists activities for preparing and advertising a prospectus for constructing, operating, and maintaining a new DeMotte II Recreation Area (campground) by the private sector. DeMotte II would be constructed in Ecosystem Management Area 22, approximately 23 miles north of DeMotte Campground.

This alternative would close the existing DeMotte Campground, and through the private sector, construct of a new campground. In the early 1990s, the District identified potential sites, and began a preliminary economic-viability analysis to determine whether or not a new campground was viable. Based upon raw construction costs and estimated projected gross annual income, the District determined that the potential for the construction of a new campground by the private sector was not economical at the time. Given this, and the recent fluctuation in the tourist industry due to past and present world events, this alternative was dropped from detailed analysis.

Alternatives Considered in Detail

The description of alternatives considered in detail responds to the various issues that were identified. This section provides a basis for choice among options by the Responsible Official. As new issues emerged or information was field verified, the interdisciplinary team made adjustments that responded to the new information.

Alternative 1: No Action

Under the No Action alternative, current management plans would continue to guide management of the project area. The Forest Service would continue to deal with health and safety issues within the campground and none of the existing facilities would comply with the Americans with Disabilities Act.

Alternative 2: Proposed Action – Reconstruct Existing Campground

Alternative 2 is the Proposed Action Identified in Chapter 1.

Alternative 2 Mitigation Measures:

In response to public comments on Alternative 2, mitigation measures, as identified below, were developed to address potential resource impacts.

Vegetation Resources:

- Disturbed areas will be seeded with native species in order to quickly re-establish ground cover. The Forest Botanist and Landscape Architect will provide input for the species mix.

- Ensure sanitation timber prescriptions are consistent with "Hazard Tree Management and Marking Guidelines on the North Kaibab Ranger District".

- The application of appropriate Best Management Practices is expected to reduce nonpoint sources of pollution from sediments to levels compatible with water quality standards. Specific mitigation methods would be incorporated in the timber sale contract.

- To protect water quality, several specific mitigation activities will be universally applied, including: a) there will be one-end suspension of all skidded logs and biomass material: b) after landings have served sale needs, the purchaser will ditch, rip or slope the log landings to permit drainage, infiltration and dispersion of water; c) all log landings and/or disposal sites will be located outside view areas unless otherwise agreed to by the Forest Service; d) use of existing skid trails and log landings will be emphasized to minimize disturbance; e) water bars will be constructed on all skid trails, or in lieu of water bars, backblading of skid trails will be done after timber harvest to help control erosion; and, f) skid trail layout will be agreed to in advance by the Sale Administrator and Purchaser.

- All residual vegetation and improvements will be protected to the extent practicable, employing directional felling, stage felling and skidding. Protection of improvements and residual vegetation will be a requirement in the timber sale contract.

Soils and Watershed:

- Ensure that management practices and the silvicultural prescription enhance or maintain long-term soil productivity and do not promote soil instability.

Wildlife Resources:

- A Limited Operating Period (LOP) from ***March 1 to August 15***, inclusive, will be in effect for all operations and activities within ¼ mile of active nest trees for northern goshawks.

- If a new pair of northern goshawks or nesting goshawks are located prior to or during project implementation, the LOP will be imposed and the District Wildlife Biologist will be consulted to determine whether or not a nest area or Post Fledgling Area (PFA) should be identified.

- Kaibab bladderpod and Kaibab paintbrush plants will be protected to the extent practicable.

- The application of Best Management Practices is expected to prevent transportation of noxious and invasive weeds to or from the project area.

Cultural Resources:

- All eligible or unevaluated sites will be marked for avoidance by the North Kaibab Ranger District Heritage Specialist prior to the initiation of construction project activities within the DeMotte Campground Reconstruction area.

Visual and Recreation:

- Locate log landings outside visually sensitive areas. Do not locate in areas within the campground that are visible from Highway 67, DeMotte Park meadows, or along the adjacent Kaibab Lodge permit boundary.

- Complete tree removal and slash treatment (vegetation management activities) prior to reconstruction of the campground facilities. Additional trees may be removed during construction of campground facilities; however, this work will be the responsibility of the recreation site contractor.

- Acceptable slash treatments are removal, chipping, piling and burning (if this can be implemented prior to campground reconstruction).

- Implement erosion control measures to minimize soil erosion and stormwater pollution during vegetation management and site reconstruction. Prepare a stormwater pollution prevention plan and apply for a permit with Arizona Department of Environmental Quality.

- Minimize resource damage and recreation impacts from increased dispersed camping (resulting from the campground being closed during construction) by: developing and implementing a communication plan which would address news releases, timely information at visitor contact points, signing the entrance to the campground with alternative camping site information, a projected timeline, increase patrols, and visitor contacts in the area.

- Plant ponderosa pine trees or other native plants where needed to provide screening between sites, between the campground and adjacent Kaibab Lodge, or along the east side of the campground visible from Highway 67.

- If trees are marked prior to closing the campground, place marks on the side facing away from interior campground roads, campsites, and other facilities.

- Minimize dust, construction noise, and disturbance to adjacent Kaibab Lodge facilities by watering roads, campsites, or other construction areas, and not beginning work before 8 a.m. and not working after 7 p.m. during the operating season.

Comparison of Alternatives:

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 1. Alternatives Comparison.

Indicator	Alternative 1 No Action	Alternative 2 Proposed Action Reconstruct Existing Campground
Number of Sites	23	50
Miles of Road Constructed	0	0.5
# of Trees Removed	As needed for safety	+/- 400 various sizes and species
Facilities Replaced	0	All facilities
Barrier Free Facilities Constructed	0	50
Experience or Setting Characteristic	Rural	Rural
Hazard Trees	Hazard trees would be removed as per the NKRD Hazard Tree Marking Guidelines. Greater potential for trees >12 inches dbh to fall before they can be removed.	Remove all infected fir trees 12 inches and larger as per the NKRD Hazard Tree Marking Guidelines. Mitigate the potential tree-falling hazard by removing all infected trees >12 inches dbh.
Insects and Disease	Root disease infected trees will continue to fail.	The management strategies outlined in the proposed action include activities to reduce the impact of root disease infection and the current level of hazard tree risk within DeMotte Campground. These actions will help reduce the level of root disease infection to regeneration.
Wildlife	See Appendix A	

Chapter 3 - Environmental Consequences

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential impacts to those environments due to implementation of the alternatives described in Chapter 2. It also presents the scientific and analytical basis for the comparison of alternatives presented in the chart on Table 1 above.

Insects and Disease:

Although root disease fungi affect conifers throughout the Southwest, they are more active in higher elevation forests like that found within DeMotte Campground and the surrounding area. Root diseases are believed to have become more prevalent over the past 100 years in areas where nonresinous conifers such as spruce and fir have become dominant over resinous conifers like ponderosa pine, because nonresinous conifers are more susceptible to root decay fungi. Root disease is prevalent in DeMotte Campground and has caused annual tree failure (death, felling by wind, snapped tops). Although the District has a hazard tree removal program in place, tree failure continues to occur because of the magnitude of root rot in this campground. One hazard tree incident resulted in damage to personal property. By definition, a hazard tree is a tree with a defect that gives it a potential to fail and is located where it has the potential to hit a target (people or property). The Insect and Disease report is in the DeMotte Campground Reconstruction Project Record.

Affected Environment

The impacts of root disease in DeMotte Campground were first realized about 15 years ago when the District initiated a hazard tree reduction program, and over 350 trees were removed within a 4-year period. Nearly 7 percent of the tree removals were dead trees (snags), most of which had been killed by root disease, and 30 percent were live trees determined to be unsound and structurally weakened by root decay. Although hazard tree risk was reduced by the District's active program, there have still been incidents of live tree failure, one that resulted in property damage and others that were close calls. Even though many tree failures in this campground have been associated with winter snow loading or a summer microburst, a more significant concern is the live tree failures that occur during relatively mild weather conditions when the campground is open and occupied.

Root disease infection has been observed in DeMotte Campground from fallen trees, stumps and roots left from hazard tree removal, and the roots of live symptomatic trees. The fungi identified include *Armillaria* spp. and *Inonotus tomentosus* in spruce, *Heterobasidion annosum* in subalpine fir, and *Phaeolus schweinitzii* in Douglas fir. Armillaria root rot is the most prevalent root disease observed in stumps (Figure 2) and fallen trees (Figures 3 and 4). Live trees with symptoms of root disease infection are found throughout the campground (Figure 5). In 1991, the forest surrounding the campground was surveyed; and the same root diseases were found to be prevalent.

Figure 2. Stumps in DeMotte Campground often show evidence of internal root decay.

Figure 3. Every year a few live trees fail in DeMotte Campground due to root disease.

Figure 4. Decay and mycelium of *Armillaria* spp.

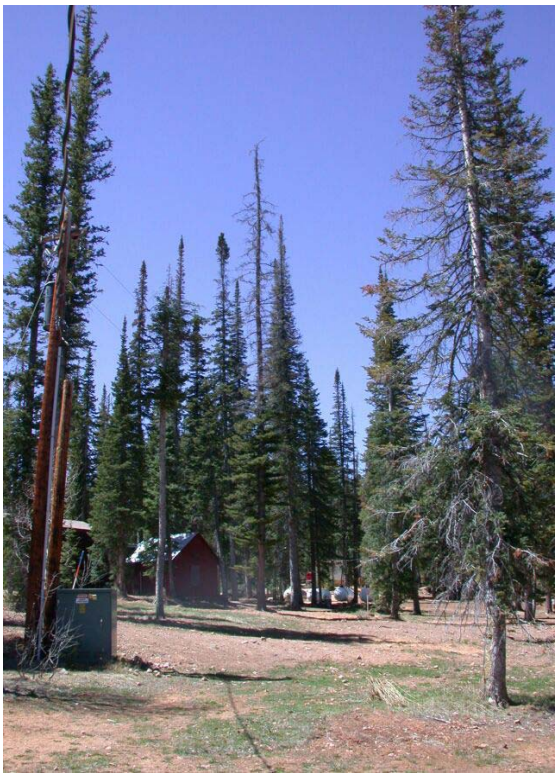

Figure 5. Crown thinning and die back due to root disease in DeMotte Campground.

Although root disease fungi can infect by means of windborne spores on fresh stumps or basal wounds, they more commonly infect via root contacts. The pathogens survive for decades as saprophytes on woody tissues of stumps and snags, which act as a food base. Spread occurs when healthy roots contact decayed roots, or, in the case of armillaria root disease, through root-like structures (rhizomorphs) that grow through the soil for short distances and penetrate root bark[1].

Root decay fungi attack the roots and root collar of trees of all ages, killing the cambium and inner bark and causing a decay of both sapwood and heartwood. Rapid death occurs when the fungus advances quickly through the inner bark and girdles the root collar. Root diseases typically persist on a site for decades by surviving in roots of stumps or snags [2] and on infected roots of live trees. They slowly spread outward in all directions, resulting in a slowly enlarging group of dying and dead trees. The oldest kills are located at the center of infection, with a fringe of recently killed and dying trees around the outer edge.

The aboveground symptoms of trees affected by root disease are chlorosis, reduced needle length, progressive thinning of foliage, fading crown, reduced tree growth, and death. These symptoms are similar to those caused by drought, high water table, and bark beetle attack. However, the decline of tree vigor affected by root disease usually extends over a period of a few to several years and not all trees succumb at the same time

[1] Shaw III, D.G., and G.A. Kile. 1991. Armillaria root diseases. USDA Forest Service Agricultural Handbook 691. 233 pp.

[2] Tkacz, B.M. and F.A. Baker. 1991. Survival of Inonotus tomentosus in spruce stumps after logging. Plant Disease 75:788-790.

Root disease can significantly alter stand structure and composition through time. Infection by root diseases results in reduced growth, increased mortality (often by bark beetle attack), altered stand structure, and, sometimes, large openings in forests. Some root diseases can kill young trees rapidly (especially trees planted off-site); but others slowly decay the roots and rob the trees of water, nutrients and structural support. They are called "diseases of the site," because they survive extended periods of time in woody material such as stumps or snags. Infection centers are typically around these infected stumps and snags, which are acting as a food base for the fungus, and vary in size from groups of a few trees to patches of tens of acres.

The ability of root disease fungi to kill trees is greatly influenced by host vigor. Root disease fungi are often aggressive in young stands less than 30 years old, especially when large stumps or snags harbor the fungus. Advance of the fungus is much slower in older, rapidly growing trees in which resin secretion and callus formation blocks spread of the disease.

Trees affected by root disease are often predisposed to attack by bark beetles. Researchers have found an association between endemic levels of bark beetles and root disease [3] [4] [5] and with a beetle population increase when combined with a short-term drought [6].

Environmental Consequences

Alternative 1: No Action

The no action alternative would mean a continued elevated risk of injury to people and their property, since root disease infected trees will continue to fail.

Alternative 2: Proposed Action – Reconstruct Existing Campground

The management strategies outlined in the proposed action include activities to reduce the impact of root disease infection and the current level of hazard tree risk within DeMotte Campground. Treatment options include: minimizing the number of root disease infected trees (hazard trees) by removing all spruce and subalpine fir over 12 inches DBH; reducing the food base of the fungus by removing stumps during site reconstruction; reforesting with less susceptible conifers; and maintaining vigorous tree growth. These actions will help reduce the risk of injury to people and their property, damage to site structures, and the level of root disease infection to regeneration.

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[3] Tkacz, B., and Schmitz, R.F. 1986. Association of an endemic mountain pine beetle population with lodgepole pine infected by Armillaria root disease in Utah. USDA For. Serv. Res. Note INT-353.

[4] Hadfield, J.S. 1985. Laminated root rot, a guide for reducing and preventing losses in Oregon and Washington forests. USDA Forest Service Pacific Northwest Region, Portland, Oreg.

[5] Hadfield, J.S.; Goheen, D.J.: Filip, G.M.; [and others]. 1986. Root diseases in Oregon and Washington conifers. R6-FMP-250-86. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Forest Pest Management. 27p.

[6] Cobb, F.W. 1989. Interactions among root disease pathogens and bark beetle conifer forests. *In* Proceedings of the 7th IUFRO Conference on Root and Butt Rots, Vernon and Victoria, B.C. *Edited by* D.J. Morrison. Forestry Canada, Pacific Forestry Centre, Victoria, B.C.

Vegetation

The vegetation conditions that presently exist within the DeMotte Campground Reconstruction analysis area have been primarily created by the preclusion of both natural fire regimes and past (pre-European) burning practices, insect and disease infections, soil compaction, and hazard tree removal. The interplay of these factors has occurred over a period of many decades. The DeMotte Campground Reconstruction Project will begin the process of restoring and maintaining the health, resilience and sustainability of the desired vegetation in the campground. The Vegetation report is in the project record.

Affected Environment

Engelmann spruce/Subalpine fir is the principal forest cover type within the project area. Common juniper, quaking aspen, and true fir saplings and small poles dominate the understory. The average age of the stand within the project area is generally around 180 years, if the understory (which is approximately 20-80 years of age) is not considered. Scattered across the project area are many trees that exceed 250 years of age. Based on a stand examination and field reviews of stand #0031210001 (DeMotte Campground proper), conducted in July 2002, the existing vegetation condition by Vegetative Structural Stages (VSS) and stand averages are displayed in Table 2 and the Silviculture report in the Project Record.

Table 2. Trees Per Acre by VSS Class by Species within the Project Area

Species	VSS 1	VSS 2	VSS 3	VSS 4	VSS 5	VSS 6	Total
	<1"dbh	1-4.9" dbh	5-11.9" dbh	12-17.9" dbh	18-23.9" dbh	24"+ dbh	
Quaking aspen	0	50	48.7	0	0	0	98.7
White fir	0	0	0	0	0	1.1	1.1
Subalpine fir	5	150	0	0	0	0	155
Corkbark fir	0	25	0	5.5	0	0	30.5
Blue spruce	0	0	23.7	10.9	4.7	1.4	40.7
Engelmann spruce	0	0	9.0	8.8	4.0	0	21.8
Ponderosa pine	0	0	0	6.9	3.7	1.2	11.8
Grand Total	5	225	81.4	32.1	12.4	3.7	359.6

The project area can be described as an unhealthy and uneven-aged stand having a variety of horizontal and vertical structures with a number of different age classes and a variety of tree species at different stages of insect and/or disease infection levels. Ground surface cover includes litter and duff (40%), roads, structures, and campsites (30%), and shrubs and small trees (common juniper, spruce, true firs, ponderosa pine, and quaking aspen) (30%).

Environmental Consequences

Alternative 1: No Action

This alternative would not change plant community composition. Stand structure would remain unaltered, except for the removal of trees classified as hazardous to the public

Overstory tree mortality would continue at moderate levels in the short term. A great number of understory trees would continue to survive, although their growth rates would be extremely slow because of competition with the overstory. Insect and disease mortality would continue to take substantial tolls on the trees with low vigor.

In the long-term, overstory and midstory trees would experience substantial competition from the understory trees. This would result in natural overstory thinning. An accumulation of a deep duff layer would reduce natural regeneration in the stand.

This alternative would continue to remove hazard trees as needed. The cumulative effect of DeMotte Campground hazard tree removal added to effects from the adjacent Dry Park Vegetation Management (present) and East Rim Vegetation Management (future) would be inconsequential with respect to stand composition and structure because of the limited number of hazard trees removed from the campground.

Alternative 2: Proposed Action – Reconstruct Existing Campground

This alternative would change stand structure and composition by cutting and removing approximately 400 trees infected with insects and/or diseases. Ninety-nine percent (99%) of these trees would be true fir trees in VSS classes 4 and 5, and 6. No ponderosa pine tree of any diameter class would be removed unless the tree poses a safety hazard or is in the direct path of construction activities. This alternative would also plant 50 ponderosa pine trees per acre on 10 acres to establish a more disease resistant stand in the campground.

The estimated reduction in basal area is expected be about 50 percent, since the vast majority of the trees removed would be ≥ 12" dbh. The average tree size would immediately and slightly increase because the average tree diameters of leave trees would be larger than the average tree size of the existing stand since all large ponderosa pine and healthy true firs would be retained. This is a direct result of cutting trees and not a growth response. The result of the above changes would be stands that are much more open and free of dense understory thickets, ladder fuels, insects and disease, and competing young growth conifers

Long-term effects of fewer trees infected with diseases would cause a corresponding decrease in disease-induced mortality. Since the individual trees would have improved growing conditions, the overall resistance of the timber stand to environmental stress, including insect attack, drought or disease would improve. As a result, mortality levels would decrease.

Vegetation changes from DeMotte Campground would occur on 10 acres (0.004 % of the NKRD timber base). Thus, the effect of removing 400 (various size) trees from 10 acres at DeMotte Campground and changing the stand composition to more disease resistant species, added to effects from adjacent vegetation management projects (Dry Park and East Rim) is very minimal with respect to overall vegetation structure and composition in the surrounding area.

Wildlife:

DeMotte Campground receives high levels of visitor use during the operating season. This human activity creates disturbance for most species, and consequently, the project area provides poor quality habitat for most wildlife and herbaceous plants.

Affected Environment

The following sections provide a discussion of special habitat designations, unique habitat features, and important species of wildlife and plants that might occur within the project area.

Kaibab Squirrel National Natural Landmark

National Natural Landmarks are nationally significant areas that represent the best examples of the ecological and geological features comprising our Nation's natural history. In 1965, the ponderosa pine forest of the Kaibab Plateau that comprises the Kaibab squirrel's habitat was designated as the Kaibab Squirrel National Natural Landmark (see Supplement to the Wildlife Report). Because the project area is not located within the Kaibab Squirrel National Natural Landmark, no further discussion of this will follow.

Grand Canyon Game Preserve

The Grand Canyon Game Preserve was established by President Theodore Roosevelt in 1906 for the protection of game animals and their breeding habitat (see Supplement to the Wildlife Report). The project area is located completely within the boundary of the Grand Canyon National Game Preserve.

Management Indicator Species

Under the National Forest Management Act of 1976, the Forest Service is directed to select and monitor Management Indicator Species (MIS) whose populations are believed to indicate the effects of land management activities on other species. The Kaibab National Forest Land Management Plan identifies MIS for each Ecosystem Management Area (EMA). No MIS were selected for the EMA. The project area, located within EMA 21, is an administrative site. Since no MIS occur within the project area, no further discussion of MIS will follow.

Threatened, Endangered and Sensitive Species

There are currently 19 federally listed species, 1 proposed species, 2 candidate species, and 2 species with Conservation Agreements in Coconino County, Arizona (See Appendix B). Twelve of the listed species might be found on the North Kaibab Ranger District. In addition, there are 15 sensitive wildlife species, 6 proposed sensitive wildlife species, and 12 sensitive plant species from the Southwestern Region US Forest Service Sensitive Species List that might be found on the North Kaibab Ranger District. A complete description of the species' life histories and habitat requirements is provided in "North Kaibab Ranger District Species Descriptions"[7] which is included in the Project Record.

No Threatened, Endangered, or proposed species have been documented within the project area and none have designated or suitable habitat within the project area. No species with Conservation Agreements have been documented within the project area and none have designated or suitable habitat within the project area. Therefore, no further discussion of Threatened species, Endangered species, proposed species, or species with Conservation Agreements will follow.

Three sensitive bat species might have suitable roosting habitat within the project area (see Wildlife Report in the Project Record). Additionally, 2 sensitive plants species have been documented within the project area. These species are discussed in greater detail in the Wildlife Report. Because no other sensitive species have been documented within the project area and none have suitable habitat within the project area, no further discussion of such species will follow.

[7] USDA Forest Service. 2002. North Kaibab species descriptions. Kaibab National Forest, North Kaibab Ranger District. Fredonia, Arizona.

Environmental Consequences

Grand Canyon Game Preserve

Alternative 1: No Action

Under the No Action alternative, there would be no change in existing campground acreage (approximately 10 acres) immediately after treatment or in the long-term. Therefore, no adverse direct, indirect, or cumulative effects are expected to the Grand Canyon Game Preserve from this alternative.

Alternative 2: Proposed Action - Reconstruct Existing Campground

Similarly, under Alternative 2, there would be no change in existing campground acreage (approximately 10 acres) immediately after treatment or in the long-term. Therefore, no adverse direct, indirect, or cumulative effects are expected to the Grand Canyon Game Preserve from the Proposed Action alternative.

Sensitive Bat Species

The number of potential roost sites (snags and live trees) affected was the criterion used to assess effects of management alternatives on the long-eared bat (*Myotis evotis*), the occult bat (*Myotis lucifugus*), and the Western long-legged bat (*Myotis volans*).

Alternative 1: No Action

Under the No Action alternative, a limited number of snags and hazard trees would be removed to improve public safety within the campground.

No adverse effects are expected from the No Action alternative to the long-eared bat, the occult bat, or the Western long-legged bat immediately following treatment or in the long-term because only a very small amount of habitat in a site with high levels of human disturbance would be affected. Direct effects are limited to individuals and should be minimal because only a small number of potential roost sites will be removed. No adverse indirect or cumulative effects to the long-eared bat, the occult bat, or the Western long-legged bat or their habitat are expected from the No Action alternative.

Alternative 2: Proposed Action – Reconstruct Existing Campground

Under this alternative, approximately 400 diseased spruce and fir trees would be removed from the 10-acre project area. The majority of these trees would be in the smaller size classes (smaller than 12 inches diameter at breast height (dbh)). Additionally, as part of routine campground maintenance, snags within the project area that pose a hazard to public safety would be removed. Only a small number of snags would be removed over the 20-year planning period.

No adverse effects are expected from Alternative 2 to the long-eared bat, the occult bat, or the Western long-legged bat immediately following treatment or in the long-term because only a very small amount of habitat in a site with high levels of human disturbance would be affected. Adjacent areas of spruce-fir with lower levels of disturbance provide more suitable habitat for these species. Direct effects of Alternative 2 should be minimal and are limited to individuals. The live trees removed from the project area likely provide roost sites for few individuals, if any (most of the trees removed would be from the smaller size classes. Unlike large trees, small trees typically do not provide loose bark for roosting). Additionally, only a small number of potential

snag roost sites will be removed. No adverse indirect or cumulative effects to the long-eared bat, the occult bat, or the Western long-legged bat or their habitat are expected from Alternative 2 because the proposed action is limited to a minimal amount of habitat and more suitable habitat exists adjacent to the project area.

Sensitive Plant Species

The number of acres of suitable habitat affected was the criterion used to assess effects of management alternatives on the Kaibab bladderpod (*Lesquerella kaibabensis*) and the Kaibab paintbrush (*Castilleja kaibabensis).*

Alternative 1: No Action

Under the No Action alternative, there would be no change in existing campground acreage (approximately 10 acres) immediately after treatment or in the long-term. Less than one acre of suitable habitat currently exists for the Kaibab bladderpod and the Kaibab paintbrush within the project area. Because no change will occur in the small amount of suitable habitat available for these species, no adverse direct, indirect, or cumulative effects are expected to the Kaibab bladderpod or the Kaibab paintbrush from the No Action alternative.

Alternative 2: Proposed Action – Reconstruct Existing Campground

Under Alternative 2, there would be no change in existing campground acreage (approximately 10 acres) immediately after treatment or in the long-term. The removal of trees from the campground would create a more open stand, which would stimulate minor growth of herbaceous understory plants. However, the project area is highly disturbed due to recreational use. Alternative 2 might increase the acreage of suitable habitat (currently less than one acre) for the Kaibab paintbrush since it readily colonizes disturbed sites[8]. Any potential increase in habitat for the Kaibab bladderpod is likely negated by disturbance. Alternatively, Alternative 2 would not reduce the current amount of suitable habitat for these species. Therefore, no adverse direct, indirect, or cumulative effects are expected to the Kaibab bladderpod or the Kaibab paintbrush from Alternative 2 because the proposed action is limited to a minimal amount of habitat and more suitable habitat exists adjacent to the project area.

Neotropical Migratory Birds

ARIZONA PARTNERS IN FLIGHT (APIF) PRIORITY SPECIES OF CONCERN

The effects of management alternatives on the Arizona Partners In Flight (APIF) Priority Species of Concern for spruce-fir habitat were assessed using the following criteria: number of shrubs affected (Swainson's thrush), percent canopy closure from overstory (> 12" dbh) trees (pine grosbeak and golden-crowned kinglet), and number of snags affected (three-toed woodpecker).

[8] Brian, N. J. 2000. A field guide to the special status plants of Grand Canyon National Park. Science Center,Grand Canyon National Park, Grand Canyon, Arizona.

Alternative 1: No Action

Under the No Action alternative, there would be no immediate or long-term change in the number of shrubs within the project area. There would be no immediate change and little long-term change in canopy closure (approximately 60%) from overstory (≥12" dbh) trees. As part of routine campground maintenance, all snags that pose a hazard to the public would be removed from the project area. Only a small number of snags would be removed over the 20-year planning period.

No adverse direct, indirect, or cumulative effects are expected from the No Action alternative to the Swainson's thrush, the pine grosbeak, or the golden-crowned kinglet or their habitat immediately following treatment or in the long-term. (Note: It is likely that Swainson's thrush and pine grosbeak do not occur as breeding residents on the North Kaibab Ranger District[9]) Additionally, no adverse effects are expected to the three-toed woodpecker because only a very small amount of habitat in a site with high levels of human disturbance would be affected. Direct effects are limited to individual birds and should be minimal, since only a small number of snags will be removed. No adverse indirect or cumulative effects to the three-toed woodpecker or its habitat are expected from the No Action alternative.

Alternative 2: Proposed Action – Reconstruct Existing Campground

Under this alternative, the number of shrubs within the project area would not immediately change. In the long-term, the number of shrubs might increase because the removal of trees from the project area would create a more open stand, which would stimulate minor growth of understory plants and shrubs. Canopy closure from overstory (≥12" dbh) trees would decrease from approximately 60% to 22%. As part of routine campground maintenance, all snags that pose a hazard to campers would be removed from the project area. Only a small number of snags would be removed over the 20-year planning period.

As with the No Action Alternative, no adverse direct, indirect, or cumulative effects are expected from Alternative 2 to the Swainson's thrush. No adverse effects are expected to the pine grosbeak, the golden-crowned kinglet, or the three-toed woodpecker because only a very small amount of habitat in a site with high levels of human disturbance would be affected. (Note: It is likely that Swainson's thrush and pine grosbeak do not occur as breeding residents on the North Kaibab Ranger District[10]) Direct effects are limited to individual birds, and include removal of breeding and nesting habitat. These effects should be minimal because adjacent areas of spruce-fir with lower levels of human activity and fewer structures provide more suitable habitat. No adverse indirect or cumulative effects to the pine grosbeak, the golden-crowned kinglet, or the three-toed woodpecker or their habitat are expected from Alternative 2.

Heritage:

There are several known heritage resource sites near the project as well as one site located within the project area. The latter was determined ineligible to the National Register of Historic Places in official consultation between the Kaibab National Forest and the Arizona State Historic Preservation Office, because the site no longer retains physical integrity. Consequently, no special protection or avoidance measures are necessary for this site. All other sites will be

[9] Latta, M.J., C.J. Beardmore, and T.E. Corman. 1999. Arizona Partners in Flight Bird Conservation Plan. Version 1.0. Nongame and Endangered Wildlife Program Technical Report 142. Arizona Game and Fish Department. Phoenix, Arizona. Available: http://www.blm.gov.wildlife/plan_az_10.pdf.

avoided during project activities. Should any unknown heritage resources be discovered during the project, mitigation measures will be implemented to protect the resources from project impacts. Therefore, implementation of any alternative should have no direct, indirect or cumulative effect to eligible heritage resources. The heritage report is in the Demotte Campground Reconstruction Project Record.

Visual and Recreation

Visual Quality Objectives (VQO's) are used by the Forest Service to evaluate scenic aesthetics and to guide the type and extent of change to the visual resources that occurs during management activities. VQO's are a combination of the scenic characteristics and visual diversity of an area and how sensitive an area is to viewers. The resulting visual quality levels: Preservation, Retention, Partial Retention, Modification and Maximum Modification describe different degrees of acceptable change of the natural landscape based on the importance of aesthetics. Retention is the most stringent category outside of preservation in wilderness areas. It designates that human activities are not evident to the casual forest visitor. Partial Retention areas are those where human activities may be evident but must remain subordinate to the characteristic landscape. Modification allows for management activities to visually dominate the original characteristic landscape, but they must borrow from naturally established elements in a way that they appear to be natural occurrences within the surrounding area. Maximum Modification is the least stringent; it allows management activities that visually dominate the original characteristic landscape, but should borrow from naturally established elements in such a way that when seen from a distance, they appear to be natural occurrences within the surrounding area.[10] The Visual and Recreation report is in the Demotte Campground Reconstruction Project Record.

Affected Environment

The project area is in Ecosystem Management Area 21 in the Kaibab National Forest Land Management Plan as amended June 1996 (Forest Plan). All developed recreation sites fall into this area, and are managed for the VQO of Partial Retention in the foreground. Activities may repeat form, line, color or texture common to the characteristic landscape, but changes in their qualities of size, amount, intensity, direction, pattern, etc. remain visually subordinate to the characteristic landscape. Activities may also introduce form, line, color, or texture, which are found infrequently or not at all in the characteristic landscape, but they should remain subordinate to the visual strength of the characteristic landscape. Visual impacts of management activities should be reduced as soon after project completion as possible, or at a minimum within the first year. The Highway 67 corridor is managed as Retention in the foreground.

The landscape approaching Demotte Campground can be characterized as thick coniferous forest in the midground sloping down to extensive, open park-like meadows in the foreground. There is a high degree of contrast in this landscape, and it is considered one of the most scenic areas on the Kaibab Plateau.

[10] USDA Forest Service. 1974. *National Forest Landscape Management Volume 2*., Agriculture Handbook No. 462. April 1974.

This landscape characteristic is one of the primary factors in the designation of Highway 67 as a National Scenic Byway. Figure 6, although not as representative of the contrast as in summer, indicates the strong counterpoint between the forest and meadow. Within the campground, there are dense stands of trees including spruce, fir, aspen and pine. The understory vegetation (grasses, shrubs and forbs) is scarce under tree canopies, and thicker in the openings. See Figure 7 for a typical campground landscape.

Figure 6. Looking from Highway 67 toward the project area. Note the contrast between the meadow and forest.

Figure 7. Typical scene from interior of campground. Some areas are more open; others have dense stands of trees.

The Recreation Opportunity Spectrum (ROS) is used by the Forest Service to provide a framework for defining classes of outdoor recreation environments, activities and experience opportunities. The settings, activities and opportunities for recreation experiences have been divided into six classes: Primitive, Semi-primitive Non-motorized, Semi-primitive Motorized, Rural and Urban. Opportunities for experiences along the spectrum represent a range from very high probability of solitude, self-reliance, challenge and risk, to a very social experience where self-reliance, challenge and risk are relatively unimportant. Not all classes of activity would necessarily occur on every forest. The Kaibab NF has very few urban settings but does have areas representing the other classes.[11]

The ROS for the DeMotte Campground project area is Rural. In Rural settings, a substantially modified landscape may be present, that includes both constructed and natural features. Evidence of the sights and sounds of humans are common. Moderate to high contact with other visitors is expected in developed sites and on roads and trails. Some facilities may be designed for user comfort and convenience.

[11] USDA Forest Service. 1986. Recreation Opportunity Spectrum Book.

The DeMotte Campground-Kaibab Lodge area is one of two small Rural settings on the KNF (the other is at Jacob Lake), both are hubs used by forest users, as they offer overnight accommodations, restaurants, gas stations and stores.

Environmental Consequences

Alternative 1: No Action

There would be slow changes in the landscape as time passes. Changes in the scenery would result mainly from natural disturbances rather than planned activities. The exception to this is removal of hazard trees in the campground on a continuing basis to reduce the threat of windfall in disease-infected trees. The forest would continue to have tree densities many times higher than historic conditions. Natural succession would continue and the landscape would eventually be a climax coniferous forest. Aspen would disappear as a significant species component over time. It is reasonable to assume that some more meadow encroachment would occur, although the natural meadows may not support trees due to soil, moisture or climate conditions. The potential for large-scale natural disturbances such as wildfire would remain high and most likely increase. While these are natural occurrences, stand replacing fires and the resulting erosion processes, or large-scale tree mortality due to insects or disease would generally be considered visually unappealing and possibly catastrophic to visitors and the adjacent Kaibab Lodge.

The current recreation opportunities and the quality of the experiences would remain the same unless a large-scale event (wildfire or tree mortality) occurs. After such an event, the recreation opportunities would change drastically, and most likely in a negative direction for the foreseeable future. There is a good chance that the facility investments at DeMotte Campground as well as the permitted facilities at adjacent Kaibab Lodge would be burned, potentially displacing hundreds of forest users.

For this alternative, facilities within the campground would continue to deteriorate faster than they could be replaced. When they reach the critical health and safety point, they would have to be replaced or the campground would be closed. Soil erosion would continue as a result of camping and visitors walking through the campground (no paths are provided). Soil compaction would also continue since there is little or no delineation of campsites or trails. Spruce and fir trees would continue to be infected with root rot, and there would be continuing susceptibility to wind throw as a result (Figure 8). The District would continue its program of individual tree inspection for root rot and removal, but there would still be a potential for additional trees to fall and injure campers or their property. At the north end of the campground, users would camp in sites that are immediately adjacent to Kaibab Lodge facilities. There would be no universally accessible facilities at the campground. The host site would remain inadequate in size, and in a poor location for visitor contacts.

Figure 8. Wind throw caused by disease-weakened root structure is a continuing problem in the campground. The District inspects and removes hazard trees on a regular basis, but after each winter, there are still trees that have blown over as a result of the root rot.

Alternative 2 – Proposed Action – Reconstruct Existing Campground

The DeMotte Campground Reconstruction Project with the mitigation measures proposed in this text would result in improvements to the scenic resource over time. The spruce-fir forest would appear more open; stands would have more groups of trees with space between them. Overall tree density would be reduced, and would move toward presettlement conditions. Grass, forb and shrub growth would increase due to the creation of openings. Aspen stands would be opened up and competing conifers removed, resulting in more vigorous growth and possibly an increase in the quantity of these species. Treated areas would be less vulnerable to crown fires, and more likely to withstand wildfire in the future. Some campers may express sensitivity to the open feel of the campground, and may feel there is less screening and privacy between sites.

Short-term impacts of tree removal and slash treatment would be apparent during the vegetation treatments. These would temporarily lower the visual quality. These activities will occur next to Kaibab Lodge facilities and within proximity of the scenic byway, and would impact the visual quality from these areas as well. The actions would reduce the immediate fire risk but will lower the visual quality temporarily. Reconstruction of the campground will temporarily lower visual quality as construction activities occur. After tree removal and construction is completed, the area will be stabilized and reseeded. The areas will begin to recover within one year as needles fall and grasses and forbs reappear.

Overall, the scenic effects of the proposal will result in a temporary lowering of visual quality, with some recovery within a year after activities are completed. Further visual quality improvement (over the existing condition) will occur within a decade. It is anticipated the activities will move visual quality into a more stable Partial Retention condition.

The Rural setting has landscapes that are managed for scenic attractiveness and heavily developed recreation sites, although the landscapes may be highly culturally modified. Human disturbance or activity may include cultural, intensively managed wildland resource landscape, or utility corridors. The natural landscape may be largely modified, although efforts are made to maintain attractive scenery and recreation values. High contact with other visitors is expected on roads and in developed sites; moderate to high contact with other visitors is expected on trails. As one moves away from developed sites, visitor contact would be moderate. On-site regimentation and controls are obvious, but in harmony with the natural environment. The site may be heavily modified, some facilities may be provided strictly for the comfort and convenience of users. Facility design may incorporate synthetic materials. Extensive use of paved surfacing may be used. Primary access is usually over paved roads. The project activities would not have any measurable direct, indirect or cumulative effects on the recreation opportunities now or in the future.

Within the campground, recreation facilities would be improved over the existing conditions. Restroom facilities, campsites, the amphitheatre, host site, and circulation patterns would all be reconstructed. Site hardening and delineation, and proper slope stabilization will reduce soil erosion and compaction. The area would be universally accessible for people of all abilities. Campers using recreational vehicles or trailers (all in these categories will be referred to as RVs) would find sites that will better accommodate their vehicles. Tent and RV campers would have the opportunity to be separate, as users choose their campsite locations. The roads would also be reconstructed, with two separate loops instead of contiguous loops. The road reconstruction will also allow for providing space and screening between Kaibab Lodge and the campground.

It is anticipated there would be disruption of use at the campground for at least a year. This will result in displacement of campers into other areas and loss of revenue to the campground concessionaire. The concessionaire permit does indicate closures may take place, and the concessionaire has been notified of the possibility of the closure. It would also reduce the numbers of people using the Kaibab Lodge facilities: having dinner at the restaurant, buying supplies and gasoline at the store. The previous and current lodge permittees have been notified of the potential project, and have provided comments during the scoping process.

Displaced campers would probably move both to dispersed areas as well as to the Jacob Lake Campground and Camper Village RV Park. Many visitors who currently use the DeMotte Campground facilities are overflow from the North Rim of Grand Canyon National Park, or prefer the lesser-developed camping experience. DeMotte Campground's proximity to the National Park boundary is an important factor for many campers who make day trips up to the North Rim and travel in the National Forest. To lessen resource damage from increased dispersed camping, mitigation measures have been developed (see Chapter 2).

A communication plan would be developed if Alternative 2 were selected. One part would help to address the Kaibab Lodge permittee's concerns about reduced business. The District would provide information at the District Office, Visitor Center, through a campground status board, and at other outlets, giving alternatives to camping at DeMotte Campground, and what type and where user facilities are located.

Cumulative Effects

Historic forest management activities, current recreation use and timber management in the area have resulted in changes to the "natural appearing" landscape and scenic integrity (relative intactness of the landscape). The activities proposed (to reconstruct the campground, removal of

trees infected with insects or disease) will not drastically change the scenic condition of the area, and over time will move it toward a more “natural” condition. Use of mitigation measures to reduce short-term negative visual elements will help minimize effects of this project. Therefore, the cumulative effects from Alternative 2 are minimal.

Chapter 4 - Consultation and Coordination

The Forest Service consulted with the following individuals, Federal, state and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

ID Team Members:

Steven E. Martinet, North Kaibab Ranger District Recreation/Lands Specialist (Team Leader)

Gary Holsten, North Kaibab Ranger District Public Service Branch Leader

Jonathan Beck, North Kaibab Ranger District Environmental Coordinator

Heather Reading, North Kaibab Ranger District Wildlife Biologist

Tim Howard, North Kaibab Ranger District Silviculturist

Connie Reid, North Kaibab Ranger District Archeologist

Charlotte Minor, Kaibab National Forest Landscape Architect, Supervisor's Office

Mary Lou Fairweather, Region 3 Zone Pest Management Specialist

Federal, State, and Local Agencies:

William Austin, Biologist, US Fish and Wildlife Service

Tribes:

Carmen Bradley, Tribal Chairperson, Kaibab-Paiute Tribe

Leigh Kuwanwisiwma, Cultural Preservation Office, The Hopi Tribe

Others:

Charles F. Ernst, Kaibab National Forest NEPA Specialist, Supervisor's Office

Bruce H. Higgins, Kaibab National Forest Planner, Supervisor's Office

Appendix A - Summary Comparison of Alternatives		No Action Alternative		Proposed Action Alternative	
Issue	Indicator	Immediate	End of 20-year planning period	Immediate	End of 20-year planning period
Grand Canyon Game Preserve	# acres affected	10	10	10	10
Threatened, Endangered, and proposed species None in project area	N/A	N/A	N/A	N/A	N/A
FS Sensitive species <u>Bats</u> Long-eared bat, Occult bat, Western long-legged bat <u>Plants</u> Kaibab bladderpod, Kaibab paintbrush	 # potential tree roosts affected # potential snag roosts affected # acres affected	 0 few [2] 0	 0 few [2] 0	 400 [1] few [2] <1	 400 [1] few [2] <1
Management Indicator Species (MIS) None in EMA 21	N/A	N/A	N/A	N/A	N/A
Migratory Birds <u>Arizona Partners in Flight Priority Species for spruce-fir habitat</u>: Swainson's thrush Pine grosbeak, Golden-crowned kinglet Three-toed woodpecker	 # shrubs affected % canopy closure # snags ≥12"dbh affected	 0 60% few [2]	 0 60% few [2]	 0 59% few [2]	 0(+) [3] 22% few [2]

[1] This assumes that all trees removed from the project area are potential roost sites. However, most of the trees removed would be from the smaller size classes; unlike large trees, small trees typically do not provide loose bark for roosting. It is likely that far fewer potential tree roosts would be removed from the project area, but the actual number cannot be quantified.

[2] It is not possible to quantify the actual number of snags (hazard trees) that will be removed as routine campground maintenance over the 20-year planning period.

[3] In the long-term, shrubs within the planning area may increase because removal of trees is likely to stimulate minor understory growth.

Appendix B – Listed Threatened and Endangered Species

Listed animal and plant species for the North Kaibab Ranger District and the DeMotte Campground Reconstruction Project area		Federal Listing[1]	State Listing[2]	Regional Forester's List[3]	Documented on NKRD	Suitable Habitat on NKRD	Documented in Project Area	Designated Habitat in Project Area[4]	Suitable Habitat in Project Area
BIRDS									
Bald Eagle	*Haliaeetus leucocephalus*	**T**	**WC**		Yes	Yes	No	No	No
Mexican Spotted Owl	*Strix occidentalis lucida*	**T**	**WC**		No	Yes	No	No	No
Southwestern Willow Flycatcher	*Empidonax trailii extimus*	**E**	**WC**		No	Yes	No	No	No
Yellow-billed Cuckoo	*Coccyzus americanus*	**C**			No	?	No	No	No
California Condor	*Gymnogyps californianus*	**E**			Yes	Yes	No	No	No
Northern Goshawk	*Accipiter gentilis*		**WC**	**S**	Yes	Yes	No	No	No
American Peregrine Falcon	*Falco peregrinus anatum*		**WC**	**S**	Yes	Yes	No	No	No
Sharp-shinned Hawk	*Accipiter striatus*			**S**	Yes	Yes	No	No	No
Swainson's Hawk	*Buteo swainsoni*			**S**	Yes	Yes	No	No	No
Flammulated Owl	*Otus flammeolus*			**S**	Yes	Yes	No	No	No
MAMMALS									
Kaibab Squirrel	*Sciurus aberti kaibabensis*			**S**	Yes	Yes	No	No	No
Spotted Bat	*Euderma maculatum*		**WC**	**S**	Yes	Yes	No	No	No
Townsend's Big-eared Bat	*Corynorhinus townsendii townsendii*			**S**	Yes	Yes	No	No	No
Western Mastiff Bat	*Eumops perotis*			**S**	Yes	Yes	No	No	No
Allen's Lappet-browed Bat	*Idionycteris phyllotis*			**S**	Yes	Yes	No	No	No
Western Red Bat	*Lasiurus borealis*		**WC**	**S**	No	Yes	No	No	No
Small-footed Bat	*Myotis ciliolabrum*			**S**	Yes	Yes	No	No	No
Long-eared Bat	*Myotis evotis*			**cS**	Yes	Yes	No	No	Yes
Occult Bat	*Myotis lucifugus*			**cS**	Yes	Yes	No	No	?
Cave Myotis	*Myotis velifer*			**cS**	Yes	Yes	No	No	No
Western Long-legged Bat	*Myotis volans*			**cS**	Yes	Yes	No	No	Yes
Yuma Myotis	*Myotis yumanensis*			**cS**	Yes	Yes	No	No	No
Fringed Myotis	*Myotis thysanodes*			**cS**	Yes	Yes	No	No	No
REPTILES and AMPHIBIANS									
Northern Leopard Frog	*Rana pipiens*		**WC**	**S**	No	Yes	No	No	No
FISH									
Apache Trout	*Oncorhynchus apache*	**T**	**WC**	**S**	Yes	Yes	No	No	No
INVERTEBRATES									
Kanab Amber Snail	*Oxyloma haydeni kanabensis*	**E**		**S**	No	Yes	No	No	No
PLANTS									
Brady Pincushion Cactus	*Pediocactus bradyi*	**E**	**HS**		No	Yes	No	No	No
Siler Pincushion Cactus	*Pediocactus sileri*	**T**	**HS**		No	Yes	No	No	No
Mt. Dellenbaugh Sandwort	*Arenaria aberrans*			**S**	Yes	Yes	No	No	No
Coppermine Milkvetch	*Astragalus ampullarius*			**S**	No	Yes	No	No	No
Marble Canyon Milkvetch	*Astragalus cremnophylax* var. *hevronii*			**S**	No	Yes	No	No	No
Cliff Milkvetch	*Astragalus cremnophylax* var. *myriorraphis*		**SR**	**S**	Yes	Yes	No	No	No
Rusby Milkvetch	*Astragalus rusbyi*			**S**	No	Yes	No	No	No
Kaibab Paintbrush	*Castilleja kaibabensis*			**S**	Yes	Yes	Yes	No	Yes

Listed animal and plant species for the North Kaibab Ranger District and the DeMotte Campground Reconstruction Project area		Federal Listing[1]	State Listing[2]	Regional Forester's List[3]	Documented on NKRD	Suitable Habitat on NKRD	Documented in Project Area	Designated Habitat in Project Area[4]	Suitable Habitat in Project Area
Arizona Bugbane	*Cimicfuga arizonica*	**CA**	**HS**	**S**	No	Yes	No	No	No
Morton Wild Buckwheat	*Eriogonum mortonianum*			**S**	No	Yes	No	No	No
Atwood Wild Buckwheat	*Eriogonum thompsonae* var. *atwoodii*			**S**	No	Yes	No	No	No
Kaibab Bladderpod	*Lesquerella kaibabensis*			**S**	Yes	Yes	Yes	No	Yes
Kaibab Plains Cactus	*Pediocactus paradinei*	**CA**	**HS**	**S**	Yes	Yes	No	No	No
Fickeisen Pincushion Cactus	*Pediocactus peeblesianus* var. *fickeiseniae*	**C**	**HS**	**S**	Yes	Yes	No	No	No
Mt. Trumbull Beardtongue	*Penstemon distans*			**S**	?	Yes	No	No	No
Grand Canyon Rose	*Rosa stellata* ssp. *Abyssa*		**SR**	**S**	?	Yes	No	No	No

[1]**T**-Threatened, **E**-Endangered, **C**-Candidate, **CA**- Conservation Agreement
[2]**WC**-Wildlife of Special Concern, **HS**-Highly Safeguarded, **SR**-Salvage (collection) Restricted
[3]**S**-Regional Forester's / Forest Sensitive Species, **cS**-Candidate
[4]Mexican Spotted Owl (**PAC**), Northern Goshawk (**PFA**), Arizona Bugbane & Kaibab Plains Cactus (**CA**)

Appendix C. Rural Criteria

Experience or Setting Characteristic	Rural
Naturalness, evidence of human development	Substantially modified landscape having both constructed and natural features. Evidence of human development prevalent.
Social Encounters	Evidence of sights and sounds of humans common. Contact with others expected. Moderate to high contact in developed sites on roads and trails.
Remoteness	Remoteness of little relevance.
Visitor Impacts	Site hardening may be dominant but in harmony.
Managerial Site Controls	Regimentation and controls obvious and numerous, but harmonize. More complex information facilities.
Access	Access and travel facilities are for individualized intensified motorized use.
Vegetation Alterations	Activities are visually subordinate.
Interpretation	More complex wayside exhibits including small, lighted structures. Interpretive facilities like kiosks and portals may be staffed part-time.
Facilities	Some facilities designed primarily for user comfort and convenience. Some synthetic but harmonious materials may be incorporated. Design may be more complex and refined. Moderate to heavy site modification.