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Environmental Assessment

Williams Ranger District
Travel Management Project

Williams Ranger District
Kaibab National Forest
Coconino County, AZ

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Introduction

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA) regulations contained in 40 CFR 1500-1508 and Agency policy in Forest Service Handbook 1909.15. Additional documentation that supports this EA may be found in the project record located at the Williams Ranger District office in Williams, Arizona.

The EA describes the proposed project to improve the management of motorized vehicle use on National Forest System lands on the Williams Ranger District (WRD) of the Kaibab National Forest (KNF) in accordance with the Travel Management Rule (36 CFR 212, 251 and 261). The project will result in the publication of a Motor Vehicle Use Map (MVUM) showing those roads, trails and areas designated for motor vehicle use. After the MVUM has been released, travel off the designated system would be prohibited unless authorized by permit.

Document Structure

The District has prepared this EA in compliance with NEPA and other relevant federal and state laws and regulations. This EA discloses the direct, indirect, and cumulative environmental impacts of the proposed action and alternatives. The document is organized into four parts:

- **Chapter 1 - Purpose and Need:** The chapter includes information on the project area, 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 District informed the public of the proposal and how the public responded.
- **Chapter 2 – Alternatives**: This chapter 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 an interdisciplinary planning effort and issues raised by the public and other agencies during project scoping efforts. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- **Chapter 3 - Affected Environment and Environmental Effects**: This chapter describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area. 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.
- **Chapter 4 - Consultation, Coordination and Literature Cited**: This chapter provides a list of preparers, persons and agencies consulted during the development of the environmental assessment, and literature cited.
- **Appendices**: The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation and analyses of project-area resources are located in the project planning record located at the Kaibab National Forest Williams Ranger District Office and are available pursuant to the Freedom of Information Act.

Chapter 1 – Purpose and Need / Proposed Action

1.1 Background

On November 9, 2005, the Forest Service published final travel management regulations governing off-highway vehicles (OHV) and other motor vehicles on national forests and grasslands. These regulations amended part 212, subpart B of part 251, subpart A of part 261, and removed part 295 of Title 36 of the Code of Federal Regulations (CFR). Together, these regulations are referred to as the Travel Management Rule (Rule). The Rule was developed in response to the substantial increase in use of OHVs on National Forest System lands and related damage to forest resources caused by unmanaged OHV use over the past 30 years. The regulations implement Executive Order (EO) 11644 and EO 11989 regarding off road use of motor vehicles on Federal lands.

The Rule provides for a system of roads, trails and areas that are designated for motor vehicle use. The Rule prohibits the use of motor vehicles off the designated system as well as use of motor vehicles on routes and in areas not consistent with the designations (36 CFR 212.50). Therefore, under the Rule, forests that do not already restrict motorized travel to designated roads, trails, and areas must do so. The restriction on motor vehicle use off the designated system goes into effect once a forest has a designated system of roads, trails and areas open to motor vehicle use and has published a Motor Vehicle Use Map (MVUM). Certain exemptions to the Rule apply and include administrative uses, permitted access, and the possibility for allowing limited off road travel for the purposes of motorized big game retrieval and dispersed recreation (see 36 CFR 212.51).

The Kaibab National Forest (KNF) does not currently restrict off road motorized travel (except in a few areas) and there are no developed motorized trails or areas on the District. To implement the Rule, the Kaibab National Forest Land Management Plan (Plan; 1988 as amended) must be amended to reflect the 2005 final travel management regulations.

This EA presents the results of the analysis of the direct, indirect, and cumulative environmental effects of the proposed action and alternatives to the proposed action.

This EA is not a decision document. It is a document disclosing the environmental effects of implementing the proposed action and alternatives to that action. This analysis is intended to assist the Responsible Official in making an informed decision on how best to implement the Travel Management Rule. That decision will be documented in a Decision Notice signed by KNF Forest Supervisor and will be available to the public upon its completion.

1.2 Project Area Description

The Williams Ranger District (WRD) is one of three Ranger Districts on the Kaibab National Forest, and encompasses 560,305 acres of National Forest in northern Arizona. The district surrounds the town of Williams, approximately 35 miles west of the city of Flagstaff and approximately 60 miles south of Grand Canyon National Park. The district lies predominantly in Coconino County; however, a small section of the district is located in Yavapai County on the west side. The district is bordered by the Coconino National Forest to the east and southeast, State and Private lands on the north and west sides, and the Prescott National Forest on the south and southwest sides. The district is situated in Townships 19, 20, 21, 22, 23, 24 and 25 North, Ranges 1, 2, 3, 4 and 5 East, and Ranges 1 and 2 West (Gila and Salt River

Base Meridian). Figure 1 shows the location of the district within the state as well as its neighboring forests and other ownerships. The Travel Management project analyzed in this assessment applies to the entire Williams Ranger District.

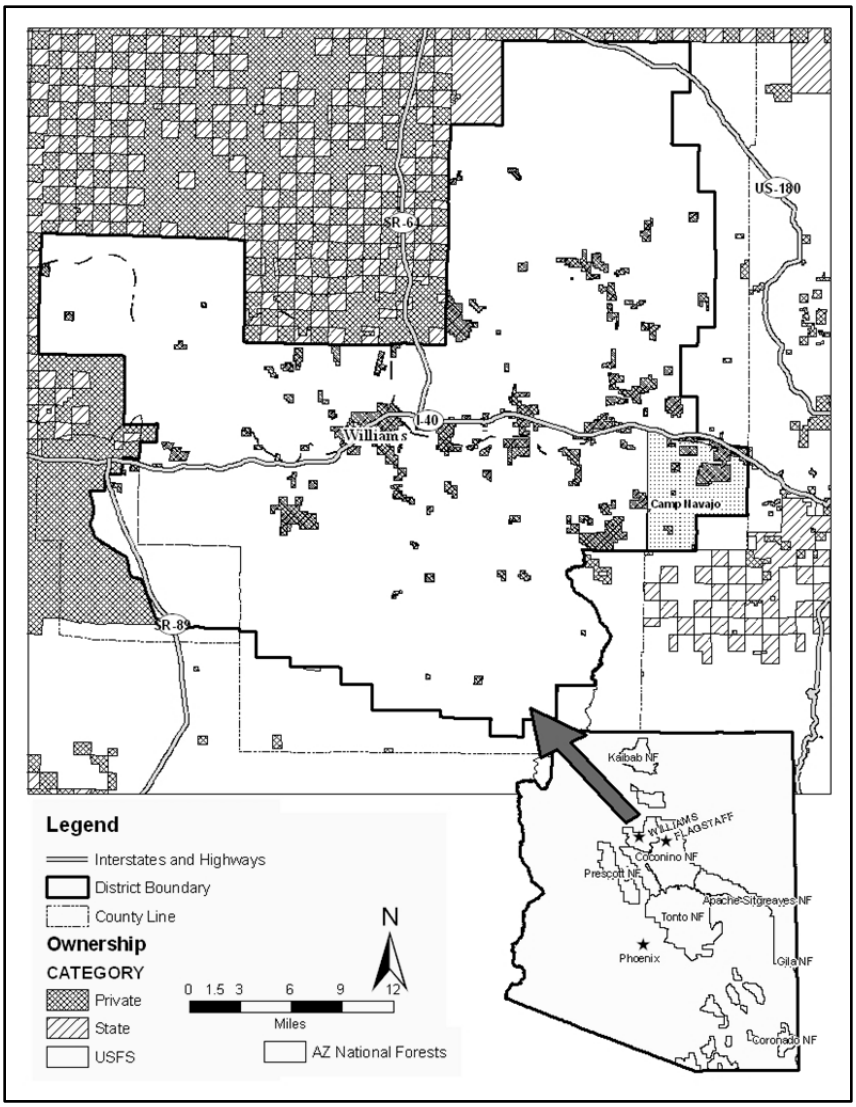

Figure 1: Vicinity Map of the Williams Ranger District

The KNF Plan classifies the forest into distinct Geographic Areas (GAs), and Land Use Zones (LUZs). These designations identify resource objectives and guide management activities by establishing standards and guidelines for each of these areas. Additionally, the Plan includes Special Areas (SAs) that entail special management designations, some of which have been established by Congress or at various executive branch levels (e.g. wilderness areas). The WRD is comprised of Geographic Areas 1, 2 and 3; it contains Land Use Zones 21 and 22 as well as Special Areas 4, 6 and 7. Figure 2 displays the classification of the WRD into these GAs, LUZs and SAs. Brief descriptions of these designations are provided below. For a full description and the management implications of these designations, please refer to the KNF Plan (Forest Service 1988, as amended).

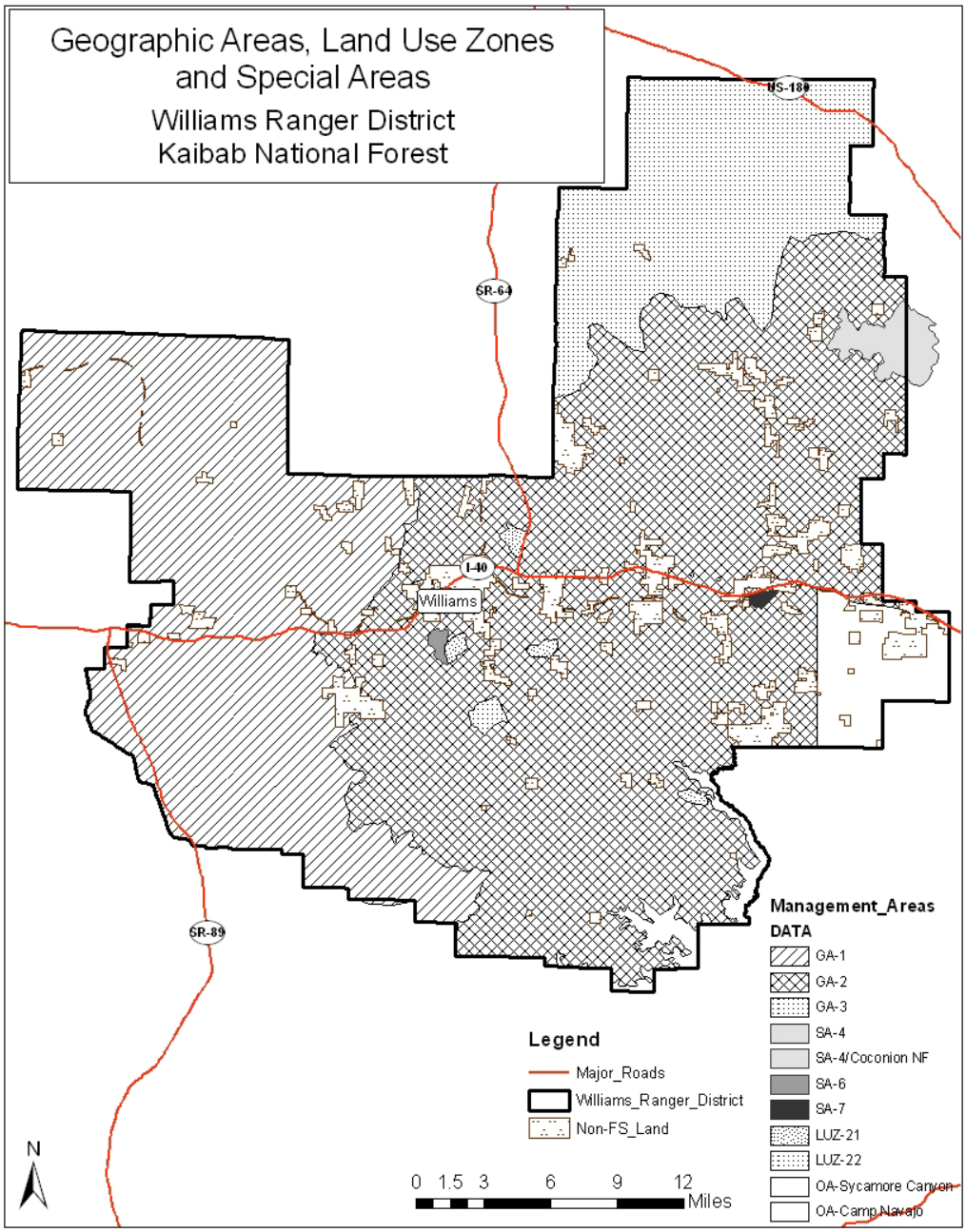

Figure 2: Geographic Areas, Special Areas and Land Use Zones of the WRD

<u>GA – 1</u> Western Williams Woodland: This GA is situated in the western portion of the WRD and includes 169,041 acres of the district. It is described as an elevated plain interspersed with isolated cinder cones and steep scarp slopes. Elevations range from 5,500 to 6,800 feet. The biotic community is dominated by pinyon pine, Utah juniper, one-seed juniper, and on the more moist sites, alligator juniper. There is also some ponderosa pine, which typically includes varying concentrations of woodland species. The understory grasses are dominated by blue grama. The area provides quality winter and summer habitat for elk and deer while the open areas are used by small herds of pronghorn antelope. The pine stringers are important winter habitat for turkey and travel corridors for big game.

GA – 2 Williams Forestland: This GA occupies 308,394 acres and is described as the coniferous forest of the district. The predominant vegetation in this area is ponderosa pine with scattered inclusions of aspen and Gambel oak. Some areas of coniferous woodland, containing ponderosa pine, pinyon pine, alligator juniper and one-seed juniper, are included in this GA. This area is an elevated plain interspersed with isolated cinder hills and volcanic mountains with elevations ranging from 6,500 to 9,400 feet. The city of Williams and several rural subdivisions are located within this management area. The area is habitat for a variety of animals as it offers dispersed pine/oak stands and islands of mixed conifer vegetation (in higher elevations on Bill Williams and Sitgreaves Mountains). Several large seral grass prairies break up the forested area of this GA.

GA – 3 Northern Williams Woodland: This GA consists of the lower elevation woodland at the north end of the district, and covers an area of 65,533 acres. It is an elevated plain with interspersed isolated cinder cones; elevations range from 6,500 feet to 7,700 feet. Most of this area is pinyon-juniper woodland where one-seed juniper and pinyon pine are the dominant tree species. Some coniferous woodland areas are present with ponderosa pine, pinyon pine, alligator juniper and one-seed juniper. The understory grass component is dominated by blue grama with lesser amounts of mutton bluegrass, Indian ricegrass, spike muhly, junegrass, Needle and Thread, winterfat and four-wing saltbush. This area is valuable winter habitat for mule deer, elk, pronghorn antelope and turkey.

LUZ – 21 Existing Developed Recreation Sites: This Land Use Zone contains the existing public and private sector developed recreation sites and smaller sites (trailheads, interpretive sites, etc.) on the district. Ponderosa pine is the dominant vegetation in this zone, while aspen and Gambel oak are present in the understory at some of the sites. Most campgrounds in this zone are adjacent to impoundments (i.e. lakes, reservoirs) that offer water oriented recreation activities.

LUZ – 22 Proposed Developed Recreation Sites: Areas in this zone are reserved for the possibility of expanding developed recreational opportunities in response to increasing demand. Ponderosa pine is the dominant vegetation in most of these proposed sites. The ultimate location of a proposed site is generally based on a combination of desirable attributes of a given area. The landscape setting is one important factor that determines an area's suitability for development.

SA – 4 Kendrick Mountain Wilderness: The Kendrick Mountain Wilderness Area covers 6,651 acres and extends onto the Peaks Ranger District of the Coconino N.F. Elevations range from 7,000 to over 10,000 feet on this steep, volcanic mountain. Vegetation is diverse due to the effect of aspect. North slopes are dominated by mixed conifer species such as Douglas-fir, white fir, ponderosa pine and southwestern white pine. Aspen stands are found scattered throughout the mixed conifer zone. South facing slopes and lower elevations are essentially ponderosa pine forests with a component of alligator juniper. This area provides important habitat for spotted owls and red squirrels.

SA – 6 Arizona Bugbane Botanic Area: This area is a botanical area for the protection of *Cimicifuga arizonica*, Watson, Arizona bugbane. This species is a Forest Service Sensitive species that is covered by a Conservation Agreement between the United States Fish and Wildlife Service and the United States Forest Service. It is located in a canyon bottom on the north face of Bill Williams Mountain and encompasses 490 acres.

SA – 7 Garland Prairie Research Natural Area: This 300 acre area is part of a national network of field ecological research areas established for the purpose of non-manipulative research, observation and study. They are selected and established to preserve a wide spectrum of pristine areas that typify important habitat types and serve to preserve and maintain genetic diversity, maintain baseline or reference areas for the study of ecologic changes, and as a control to other similar habitats being manipulated for research or management purposes.

"Other" Areas (OA) shown in Figure 2: These areas include the Sycamore Canyon Wilderness Area (approx. 7,125 acres) and the Camp Navajo Army Depot (approx. 19,000 acres). The Sycamore Canyon Wilderness is currently managed by the Coconino N.F. Camp Navajo was withdrawn for military purposes by Public Land Order 59 on Nov. 12, 1942.

1.3 Purpose and Need for Action

The purpose of this action is to improve the management of motorized vehicle use on National Forest System lands on the Williams Ranger District (WRD) of the Kaibab National Forest (KNF) in accordance with the Travel Management Rule (36 CFR 212, 251 and 261). The action is needed to:

- **Amend the KNF Plan to prohibit motor vehicle use off the designated system of roads, trails, and areas on the district, except as displayed on the MVUM;** Currently, the KNF Plan allows for motorized travel off of forest roads. Amending the plan will bring travel management policies in compliance with the Rule.

- **Reduce adverse resource impacts caused by roads and motorized cross country travel in order to maintain and restore the health of ecosystems and watersheds;** Some existing system roads are creating unacceptable resource damage while cross country travel has resulted in the creation of unauthorized roads, many of which can damage and/or provide unwanted motorized access to sensitive resources on the WRD.

- **Specify the appropriate uses of motor vehicles on the designated road system and provide opportunities for motorized dispersed camping and motorized retrieval of legally taken big game animals;** These popular activities each present social and environmental implications that need to be addressed in the implementation of the Rule. Road designations and the accommodation of recreation opportunities must meet the social, environmental, and safety criteria outlined in the Rule. Cooperation with State agencies in achieving game and habitat management objectives while protecting other forest resources is directed by the KNF Plan and other regional and national guidance.

1.4 Existing and Desired Conditions

Existing Conditions describe the current management situation and environmental conditions for each topic area. Desired Conditions describe the goals for travel management as defined by Forest Plan guidance, the Travel Management Rule and other regulations, as well as the public's needs. The topic areas below represent broad-scale features associated with a district transportation system. Additional, resource specific existing and desired condition discussions can be found in *Chapter 3 – Environmental Effects.*

Road System

Existing Condition

Motor vehicles are used to access the forest and engage in a wide variety of activities on the Williams Ranger District. Additionally, forest visitors use the existing transportation system to support their lifestyle with activities such as firewood collection and hunting/game retrieval. Currently, motor vehicles may drive on any open road as well as access the forest interior by driving "cross-country" or off of forest roads, except where prohibited by existing off road closure areas. These "motorized travel restricted" areas, totaling approximately 45,000 acres, are closed to cross country travel to protect sensitive soil and vegetation, wetlands, wilderness areas, and Research Natural Areas. These areas have been closed by previous official Forest Orders and/or legislative actions (e.g. congressionally designated wilderness). Refer to Map 2 (Appendix 1) or the Williams Ranger District Travel Analysis Process report (Forest Service, TAP 2010) for details about existing off road closure areas.

The Forest Service uses five maintenance levels (ML) to classify roads, ranging from ML 1 indicating a road closed to all motorized use, to ML 5, indicating a high degree of user comfort and convenience (see Glossary). This report will refer to passenger car roads (ML 3, 4, and 5) that a typical sedan could drive down, and high clearance roads (ML 2) that are maintained and managed for higher clearance vehicles.

Currently, there are approximately 1,500 miles of roads on the Williams Ranger District that are managed under Forest Service jurisdiction. Of these, approximately 20 miles of road are ML 1 (closed) and are officially closed to all motorized use. The remaining ML 2 – 4 roads total approximately 1,460 miles and are available for motorized use by the public. The majority of forest roads were originally established to support logging or ranching operations. In addition, there is approximately 445 miles of roads that cross the WRD that are not under Forest Service jurisdiction, and are managed by state, county or local agencies or private parties. Table 1 below describes the existing road system on the WRD. It should be noted that while roads not under Forest Service jurisdiction will be important for describing the social and environmental impacts of the district road system, they will not be considered for management actions in this analysis.

Table 1: Existing Road System Mileage by Maintenance Level

Road Maint. Level	Mileage	% of Total
Non-FS Jurisdiction	445	XX
Level 1	20	1
Level 2	1340	91
Level 3	110	8
Level 4	10	<1
TOTAL (FS – Jurisdiction)	**1480**	**100**

In addition to the forest roads described above, the WRD has seen the proliferation of unauthorized, or "user created" routes[1]. In most cases, these roads appear as "two track" roads that access popular areas

[1] 36 CFR 212.1 Defines an unauthorized road or trail as: A road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas.

for dispersed recreation (camping, hunting, horseback riding, etc.). These roads are not kept in the Forest Service roads inventory, and do not receive maintenance to ensure environmental impacts are minimized. The most current field survey (completed in 2005), identified approximately 220 miles of these routes. The number of unauthorized routes continues to grow as more and more visitors use the area and travel off road. Map 1 (Appendix 1) shows the existing road system including non-FS and unauthorized routes.

In unusually wet years, when deep snow or saturated soils raise concerns for public safety or road and resource damage from motor vehicles, wet weather travel restrictions (referred to generally as the Wet Weather Roads Policy) are implemented on the District through an official order. Signs are used to inform forest visitors of travel restrictions and open routes. When travel restrictions are in place, motorized travelers are required to stay on those designated routes until soils dry and the order is lifted. These travel restrictions would supersede TMR route designations when implemented.

Desired Condition

The Rule directs the Forest Service to provide for a system of NFS roads, NFS trails, and areas on NFS lands that are designated for motor vehicle use and by class and time of year (if appropriate) (36 CFR 212.50). The District road system is the minimum system necessary to provide safe and efficient travel for the administration, utilization, and protection of NFS lands considering long-term funding expectations while ensuring that the identified system minimizes adverse environmental impacts (36 CFR 212.5 (b)). The Motor Vehicle Use Map (MVUM) greatly enhances visitor understanding and expectations related to motor vehicle uses on the District. The desired condition is a designated system of roads that are managed and sustainable, which accommodates motorized access needs consistent with the KNF Forest Plan and the 2005 Travel Management Rule. The Plan contains the following guidance relevant to the road system:

- Protect and maintain wilderness character and quality by focusing administrative effort in heavily used areas and along wilderness boundaries (p.12).
- Provide and manage a serviceable road transportation system that meets needs for public access, land management, resource protection, and user safety (p.19)
- Identify and obliterate unneeded roads (p.51, 54)[2]

Motorized Trails and Areas

Existing Condition

There are no designated motorized trails on the District. However, there are many ML 2 (high clearance, 1340 miles) and unauthorized routes (220 miles) that provide challenging riding opportunities.

Per Arizona State Law beginning January 1, 2009 (Arizona SB 1167, 2008), forest roads managed at Maintenance Levels 3, 4, and 5 are subject to the Highway Safety Act and are considered maintained roads. These roads are open to travel by passenger cars. The State of Arizona requires that OHVs operating on such roads must be "highway-legal" (registered in the State of Arizona, drivers must be licensed and insured) [3]. Both unlicensed drivers on non-highway legal OHVs, as well as highway-legal

[2] Road obliteration projects are not proposed in this analysis. Identified unneeded roads may be proposed for obliteration in future planning efforts and will be subject to appropriate NEPA regulations.

[3] For more information about the Arizona OHV program, contact local Arizona Game & Fish Dept. or go to http://www.pr.state.az.us/partnerships/ohv/OHVindex.html

vehicles can be operated on high clearance roads (ML 2). This is referred to as Motorized Mixed Use (MMU).

Desired Condition
The OHV transportation system is within the District's ability to manage (operate and maintain) and provides a variety of users with a safe and diverse experience while minimizing resource impacts (36 CFR 212.55 (b)). The Forest Plan also contains the following relevant guidance:

- Maintain a variety of Forest Trails, considering people's needs and desires for horseback and foot travel, winter sports, and motorized and challenge and adventure opportunities for the handicapped (p.17).
- Manage OHV use to provide OHV opportunities while protecting resources and minimizing conflicts with other users (p.18).

Motorized Travel Exemptions

Regulation 36 CFR 212.51 (a) states that the following vehicles and uses are exempted from the travel designations under the Rule: (1) aircraft; (2) watercraft; (3) over-snow vehicles; (4) limited administrative use by the Forest Service; (5) use of any fire, military, emergency, or law enforcement vehicle for emergency purposes; (6) authorized use of any combat or combat support vehicle for national defense purposes; (7) law enforcement response to violations of law, including pursuit; and (8) motor vehicle use specifically authorized under a written authorization issued under Federal law or regulations. Exemption 8 includes uses such as access for range improvements, firewood cutting, gathering other forest products, ceremonial gathering by tribes, outfitter and guide services, maintenance of utility corridors, administrative use by other state or federal agencies, and special use permit events.

Existing Condition
Approximately 95% of the District is currently open to cross country vehicle travel. The uses described under the exemptions (above) currently occur where travel has not been restricted by previous decisions, legislation, and Special Orders (e.g. firewood cutters can travel cross country anywhere travel is not restricted); some uses occur on a limited basis by permit only.

Desired Condition
The District provides access for those vehicles and uses exempt from the designation under 36 CFR 212.51. In general, authorizations under Exemption 8 would emphasize motorized use on existing roads and motorized trails as much as possible. The gathering of forest products is managed by the KNF product permit system (e.g. fuelwood permits). Tribal access is facilitated through free permits or other written authorization. These permits and authorizations are or will be addressed in existing or future NEPA analyses and decisions.

Motor Vehicle Use for Dispersed Camping

The use of motor vehicles off system roads to access campsites is a popular activity on the District. The Rule allows that the Responsible Official "…may include in the designation the limited use of motor vehicles within a specified distance of certain designated routes, and if appropriate within specified time periods, solely for the purposes of dispersed camping…" (36 CFR 212.51 (b)). This allowance is optional and at the discretion of the Responsible Official.

Existing Condition
Motorized dispersed camping occurs throughout the District, particularly during hunting season and summer holiday weekends. A majority of this camping occurs in areas along main NFS roads that have a close proximity to recreation opportunities, views, trails and/or water. Motorized dispersed camping typically occurs in the same areas year after year because they are in desirable locations and are easily accessed. Most motorized dispersed camping sites are within 100 feet of existing roads.

Desired Condition
The District provides motorized dispersed camping opportunities consistent with the Travel Management Rule (and other direction), where safety issues, resource impacts, user conflicts or other management objectives are not of concern. Forest Plan guidance for managing motorized dispersed camping includes:

- Manage a wide spectrum of desired settings that provide opportunities for the public to engage in a variety of developed and dispersed recreational activities, in concert with other resource management and protection needs (p.17).

Motorized Big Game Retrieval

The Rule allows that the Responsible Official may allow the limited use of motor vehicles within a specified distance of certain designated routes, and if appropriate, within specified time periods solely for the purposes of…"retrieval of a downed big game animal by an individual who has legally taken that animal" (36 CFR 212.51 (b)). This allowance is optional and at the discretion of the Responsible Official. It applies only to the **retrieval** of a downed animal; motorized off road travel for other hunting activities such as scouting or accessing a favorite hunting site would be prohibited by the Rule. Any game retrieval that is not specifically allowed in the Decision would require non-motorized methods.

Existing Condition
In areas that are not "motorized travel restricted", motorized vehicles are allowed to travel off-road for the purpose of retrieving any downed game animal. The WRD includes Game Management Units 7W, 8 and 10 and offers a range of hunting opportunities for a variety of game species. Of these, deer and elk hunts are most popular and are closely tracked by game managers. Table 2 summarizes Arizona Game and Fish Department's big game harvest data from 2008. Shown in the table are the total big game animals (by species) harvested from the Game Management Units located on the District and the estimated number of those harvests that used motorized cross country travel for retrieval. Currently, most motorized big game retrievals use 1 trip with a vehicle (typically an ATV), leaving very little or no evidence that it occurred (AZGF personal communication 2009).

Table 2: Summarized total big game harvests from the WRD in 2008 and the estimated number of harvests using motorized means of retrieving game[4].

Big Game Species	Total number of animals harvested in Units 7W, 8, and 10	Estimated number of motorized big game retrievals on Williams District[3]
Elk	1435	695
Mule Deer	426	135
Pronghorn	130	25
Total	1991	855

Desired Condition

The District provides for the limited use of motor vehicles within a specified distance of certain designated system roads for the purposes of retrieval of a downed big game animal by an individual who has legally taken that animal consistent with the Rule, and other state and federal laws and regulations. Forest Plan direction concerning hunting and game retrieval is as follows:

- Provide a wide mix of outdoor recreation opportunities, including hunting and fishing, which range from primitive to urban, and that can respond to local and regional demands for water, forage, wildlife habitats and wood products (p.17).
- Cooperate with Arizona Game and Fish Department to achieve management goals and objectives specified in the Arizona Wildlife and Fisheries Comprehensive Plan. Support the Arizona Game and Fish Department in meeting its objectives for the state (p.18).

1.5 Proposed Action

To meet the Purpose and Need for Action (Section 1.3), the following actions are proposed[5]:

- Amend the KNF Forest Plan to prohibit motorized travel off of designated routes on the Williams Ranger District, except as identified on the Motor Vehicle Use Map (MVUM).
- Close approximately 380 miles of currently open roads. These roads would be moved to Maintenance Level 1 (Map 3).
- Add approximately 16 miles of roads to the designated road system. This includes 8 miles of formerly closed roads and 8 miles of unauthorized user-created routes.
- Authorize motorized travel on designated short spur roads to access dispersed campsites[6]. This includes approximately of 18 miles of roads that have historically served as access to dispersed camping sites (and other activities) on the District (Map 6).

[4] The total estimated number of retrievals assumed that 90% of hunters used motorized cross country travel to retrieve their game and accounted for the proportion of the hunting unit that falls on the Williams Ranger District. For example: 85% of GMU 8 is on the WRD – Total elk harvest from Unit 8 is 419;
419 * .85 *.90 = 321 elk harvests used motorized game retrieval on the Williams Ranger District for that GMU. Source: AZGF 2009.

[5] Updates were made to the road system databases since the release of the PA in 2008. This analysis is consistent with those roads and segments identified in the original PA, but mileage values have been updated to more accurately reflect current conditions.

- Convert 23 miles of existing system roads to motorized trails; construct 2 miles of new trail to form logical loops (Map 4).
- Allow the limited use of motor vehicles within 200 feet of the following designated routes for the purposes of dispersed camping: 4, 6, 11, 12, 13, 14, 41, 42, 44, 48, 56, 57, 71, 74, 76, 90, 100, 105, 108, 109, 110, 115, 122, 124, 129, 138, 139, 140, 141, 142, 171, 194, 354, 714, 720, 730, 736, 747, 749, 786, and 789 (Map 5). These approximately 220 miles of NFS roads are currently receiving this type of use.
- Allow the limited use of motor vehicles within one mile of all designated system roads (except where prohibited) to retrieve a legally hunted and tagged elk during the warmer months of September and October.
    - MBGR is only allowed between 10 am and midnight each day during hunts occurring prior to the fourth Thursday of October.
    - Only one vehicle would be allowed for Motorized Big Game Retrieval (MBGR) per harvested animal.
    - A minimum number of trips are to be used to accomplish the retrieval, and the route taken is to be safe and relatively direct, minimizing negative resource impacts.
    - MBGR would not be allowed in existing off road travel restricted areas, or when conditions are such that travel would cause damage to natural and/or cultural resources.
    - Motorized vehicles would not be permitted to cross riparian areas, streams and rivers except at hardened crossings or crossings with existing culverts.

1.6 Kaibab Forest Plan Direction

In addition to the specific directives listed above, the Kaibab National Forest Land Management Plan (Forest Plan, as amended, 1988) provides general guidance on managing the District transportation system and natural resources:

- Protect and enhance the scenic and aesthetic values of the KNF. (p.12)
- Identify and protect areas that contain threatened, endangered and sensitive species of plants and animals. (p.18)
- Maintain soil productivity and watershed condition. Protect wetlands and floodplains. (p.19,50,53)
- Manage specially designated areas according to the enabling orders and protect their special qualities. (p.23)
- Prevent any new noxious or invasive weed species from becoming established. (p.20)
- Road or trail building in Mexican spotted owl protected activity centers should be avoided. (p.23)
- Provide integration and coordination for transportation in land and resource management planning and with other Federal, State, County and other transportation authorities. (p. 51,54)

[6] Comments received during scoping indicated that this original language was not descriptive enough. The miles of designated short spur roads to be added to the system has since been quantified based on GPS information collected from 2008-2009.

- Establish off road vehicle [ORV] closures as needed to maintain other resource objectives. Manage ORV use to provide ORV opportunities while protecting resources and minimizing conflicts with other users. (p.18)
- Provide and manage a serviceable road transportation system that meets needs for public access, land management, resource protection, and user safety. Provisions are made for the construction and reconstruction, maintenance, seasonal and special closures of Forest roads; and obliteration of unnecessary roads. (p.19)
- Manage road densities at the lowest level possible to minimize disturbance in Goshawk nest areas. (p.31)
- Close project specific areas to off road vehicle traffic; refer to ORV Map for location of closure areas, and ROS Map for location of SPNM [semi-primitive non-motorized] areas. (p.73)
- Monitor off road vehicle (ORV) use during scheduled patrols and revise the ORV plan to prevent resource damage and user conflicts. Provide adequate off road vehicle (ORV) signing to advise the public of motorized restrictions. (p. 69-70)

1.7 Decision Framework

As the Proposed Action includes a Forest Plan Amendment, the Responsible Official for this project is the Forest Supervisor. Based on the purpose and need for action, the findings of this analysis and the consideration of the best available science, the Forest Supervisor will decide:

- Whether to select the proposed action or one of the alternatives;
- Whether to, and to what extent, allow the limited use of motorized vehicles within a specified distance of certain designated routes for the purposes of dispersed camping and/or big game retrieval for elk;
- What mitigation and/or monitoring measures will be required during implementation of the proposed action or any alternative selected;
- The language and content changes to the Kaibab National Forest Plan, or;
- Whether further analysis is needed through the preparation of an Environmental Impact Statement (EIS).

1.8 Public Involvement

Prior to initiating this Environmental Analysis the WRD prepared a Travel Analysis Process report (TAP)[7] to analyze the existing road system and make recommendations for travel management planning. The TAP compiled resource specialist analyses of the risks and values associated with the district transportation system. During the analysis process, the following public meetings were held to solicit public input on transportation planning:

- An Open House held in Williams on September 18, 2006
- An Open House held in Williams on October 11, 2006
- A Joint Forest Open House held in Phoenix on October 17, 2006 (with the Coconino N.F.)
- A Town Hall meeting sponsored by the Williams City Council on January 18, 2007

[7] The WRD TAP is available at: http://fs.usda.gov/goto/kaibab/projects (scroll down to Williams Travel Management project)

- Two interactive work sessions held on March 1, 2007.

Input was gathered from the public, Tribal governments and immediately-affected Tribal communities, and other agencies. Based on the input received, adjustments were made on the preliminary road system, and this became the Proposed Action for the Williams Ranger District (WRD) Travel Management project.

The public involvement efforts in the TAP revealed more than just the recommended changes to the road system needed to be addressed in this environmental analysis. It became evident that many members of the public wanted the District to allow motorized dispersed camping as part of the proposed action. The Forest Service identified areas and roads that historically serve as access to dispersed campsites and incorporated them into the proposed action. It also became evident that many members of the public wanted the District to allow motorized big game retrieval as part of the proposed action. The opinions on this topic were a little more polarizing though. Some people wanted it for all species; some wanted it for only a couple of species, while others felt that motorized big game retrieval should not be allowed at all. In an effort to provide a compromise on the topic, the Responsible Official included the allowance for motorized big game retrieval for elk only in the proposed action. This was based on consideration of the ability to pack an animal out (elk pose the greatest challenge), on the need to reduce the impacts from cross-country travel and on the need to meet management objectives outlined in the Forest Plan.

On January 1, 2008, the Williams Ranger District Travel Management Project was first published in the Forest Service's Schedule of Proposed Actions (SOPA); it has been listed and updated in each quarterly report since then. Public scoping on the EA was initiated with the release of the Proposed Action on April 1, 2008. The proposed action, based on the draft TAP, was mailed to interested public, stakeholder groups, state and local agencies, various user and environmental groups and Native American Tribes. Written (mail/email) and verbal (in person/phone) comments were accepted through June 20, 2008. During this time, public workshops were held on three occasions to provide the public with information about proposed travel management actions and receive comments and address concerns. Public input received through scoping and the previous public input efforts (during TAP) were used to identify issues and concerns with Travel Management Planning.

In February 2010, the Williams Ranger District began the official 30-day comment period for the Williams Ranger District Travel Management Project Environmental Assessment (EA). A legal notice was published in the *Arizona Daily Sun* on February 7, 2010 inviting public comment on the Proposed Action and EA. The comment period provided an opportunity for the public to provide early and meaningful participation on the proposed action prior to a decision being made by the Responsible Official (see Appendix 5).

For a summary of the Tribal consultation and a description of Tribal concerns see Chapter 4 Section 4.1.

1.9 Issues

Issues serve to highlight effects or unintended consequences that may occur from the proposed action and alternatives, giving opportunities during the analysis to reduce adverse effects and compare trade-offs for the decision maker and public to understand (FSH 1909.15, 12.4). An

issue is not an activity in itself; instead, it is the projected effects of the activity that create the issue.

The Forest Service reviewed the 175 comments received in regards to the Proposed Action. Each comment received during scoping was considered and evaluated to determine whether the concern(s) were already resolved through land use designations, implementation of Forest Plan standards and guidelines and Best Management Practices (BMP's), project-specific design criteria or mitigation measures, through processes or analyses routinely conducted by the Interdisciplinary Team (IDT or ID Team), or beyond the scope of the project. All concerns that fell within these categories were considered resolved.

Tribal concerns identified through the consultation process were resolved (Ch. 4 Section 4.1).

On the other hand, concerns that would have to be addressed through spatial location of activities or concerns that would drive (or partially drive) an alternative were considered unresolved. These unresolved concerns were developed into Key Issues. Key Issues are used to develop and compare alternatives, prescribe mitigation measures, and analyze the environmental effects.

Three Key Issues were identified. They are presented below, along with the indicator(s) of each issue. Indicators that are quantifiable, linked to cause-and-effect relationships, and are used to compare the effects among alternatives.

Key Issue 1 *–The proposed action would restrict motorized recreation opportunities because of the prohibition of motorized cross country travel, the extent of road closures and the restrictions placed on Motorized Big Game Retrieval.*

The Environmental Analysis will clearly display the effects of the Proposed Action and Alternatives on motorized recreation opportunities on the District. The No Action alternative will serve as a baseline for comparing the effects of each alternative on all types of recreational activities.

Additionally, Alternative 3 was developed, in part, to respond to this issue. It addresses specific concerns about the seasonal restrictions applied to Motorized Big Game Retrieval in the Proposed Action. It also responds to concerns raised over the environmental impact of too much motorized access allowed for in the Proposed Action. It does not include the development/designation of any motorized trails (open to vehicles 50 inches wide or less) or allowing the limited use of motor vehicles within 200 feet of the following designated routes for the purposes of dispersed camping.

Indicator: a) Miles of road open to motorized vehicle use

Key Issue 2 *– The proposed action allows for motorized dispersed camping and motorized big game retrieval across a large area of the district and is not used sparingly.*

Alternative 4 was partially generated in response to this issue. It does not allow the use of motor vehicles for big game retrieval and limits motor vehicle use for dispersed camping to roadside parking and designated spur routes.

Indicator: a) Provides for big game retrieval opportunities, b) Dispersed camping and recreation access opportunities

***Key Issue 3** – The proposed action does not close enough miles of road to protect wildlife and plant habitats, watersheds, and archaeological resources.*

Key Issue 3 was viewed as the premise for the road closure recommendations by the Center for Biological Diversity (CBD), Grand Canyon Wildlands Council, Grand Canyon Trust, Sierra Club, WildEarth Guardians, and The Wilderness Society in their scoping comment letter submitted June 20, 2008. Alternative 4 was also partially generated in response to this issue. It carries forward the road closure recommendations presented in appendix H of CBD et al. June 2008 scoping letter.

Indicator: a) Average forest-wide open road density

1.10 Changes from the EA for Comment

The EA was updated from the EA for Comment in response to comments received. Changes from the EA for Comment to the final EA include the following:

- Appendix 5 was added to the EA.
    - Appendix 5 contains information regarding the 30-day comment period including the comments received and the Forest Service's response to comments.
- Section 2.7 in Chapter 2 addresses suggestions made during the comment period for additional alternatives.
- Typographical errors regarding the miles of roads have been corrected in the EA. The total miles of roads for each alternative did not change.
- Additional information was added to Section 1.8 regarding the public involvement for this project.
- Additional information was added to Sections 3.1, 3.5, and 3.8 to address comments received during the 30-day comment period.
- The effects analysis in Section 3.7 has been rewritten to clarify the effects to rangeland management from the proposed activities.
- The effects analysis in Section 3.5 was reorganized to address comments received during the 30-day comment period.
- A transportation section has been added to the EA to discuss road maintenance, funding, and access on the WRD (see Section 3.12).
- There were also minor edits and clarifications made throughout the EA and Appendices. None of the changes had a major effect on the comparative evaluation of the alternatives or on the conclusions that can be drawn from the EA.

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Chapter 2 – Description of Alternatives

2.1 Introduction

This chapter describes the alternatives developed to meet the purpose of and need for action and address the Key Issues identified in Chapter 1. The proposed action and alternatives, including the No Action alternative, are described and compared. A total of four alternatives were developed in detail for this analysis. This chapter also provides a summary of the environmental consequences of the alternatives as described in Chapter 3.

2.2 Process Used to Develop the Alternatives

An Interdisciplinary Team (listed in Chapter 4) considered the elements listed below when they developed the Alternatives for this analysis:

- The purpose of and the need for this project identified in Chapter 1.
- Key Issues identified in Chapter 1.
- The goals, objectives, and Desired Conditions for the Analysis Area as described in the Forest Plan for the Kaibab National Forest.
- Comments and suggestions made by the public, the State, and other agencies during the scoping process.
- The laws, regulations, and policies that govern land management on National Forests.
- Site-specific resource information.

2.3 Alternatives Analyzed in Detail

Four alternatives were developed in detail for this environmental analysis process. Each "action alternative" (i.e. 2-4) was designed to be a viable alternative. Additional alternatives were considered but dropped from detailed study. They are presented in Section 2.7 with the reasons for not developing them in detail.

The alternatives presented below and in Section 2.7 (Alternatives Considered but Eliminated from Detail Study) represent a range of reasonable alternatives, given the purpose and need and Key Issues for the proposed action.

The open road system proposed under alternatives 2 and 3 was developed in accordance with the Transportation Analysis Process report (TAP) developed for the Williams Ranger District (Forest Service, TAP 2010). The TAP identified the minimum road system needed for the administration, utilization and protection of the National Forest and incorporated a wide range of public input (see Section 1.8). This identified system was used to form the basis for the road system proposed in Alternatives 2 and 3, though some changes were made based on further resource analysis and public input on the PA. The open road system identified in Alternative 4 reflects that of 2 and 3 however additional road closures are proposed based on comments received during the scoping period.

The road system identified in each of the action alternatives is aimed at meeting the requirements of the Travel Management Rule while providing access to a range of recreational opportunities required by a variety of user groups and protecting sensitive natural and cultural resources.

Alternative 1 – No Action

The "No Action" alternative was developed as a benchmark from which the agency can evaluate the proposed action and alternatives. The "No Action" alternative would continue the current management of the District transportations system. That is, this alternative would **not** implement the TMR; it would not restrict motor vehicle use or make any changes to the transportation system. Motorized cross country travel would continue to be allowed, except in the areas currently closed to off road vehicle travel (see Map 2); existing roads would remain open and unchanged. Motorized dispersed camping and motorized big game retrieval would continue to be allowed across the District. Unauthorized routes would continue to be available for public use, and would likely increase in number. The wet weather road system would continue to be implemented when necessary. A Forest Plan Amendment would not be included under the No Action alternative to prohibit cross country travel; and, Plan language would remain unchanged. Map 1, (Appendix 1) shows the existing road system that would be maintained under the No Action alternative.

The No Action alternative serves as a baseline for comparison of the other alternatives.

Alternative 2 – Proposed Action

To meet the Purpose and Need for Action (Section 1.3), the following actions are proposed under Alternative 2 – the Proposed Action:

- Amend the KNF Forest Plan to prohibit motorized travel off of designated routes on the Williams Ranger District, except as identified on the Motor Vehicle Use Map (MVUM).
- Close approximately 380 miles of currently open roads. These roads would be moved to Maintenance Level 1 (Map 3).
- Add approximately 16 miles of roads to the designated road system. This includes 8 miles of formerly closed roads and 8 miles of unauthorized user-created routes.
- Authorize motorized travel on designated short spur roads to access dispersed campsites[8]. This includes adding approximately of 18 miles of roads that have historically served as access to dispersed camping sites (and other activities) on the District (Map 6).
- Convert 23 miles of existing NFS roads to motorized trails by restricting them to vehicles 50 inches wide or less (Map 4).
- Construct two miles of new motorized trail open to vehicles 50 inches wide or less (Map 4).
- Allow the limited use of motor vehicles within 200 feet of the following designated routes for the purposes of dispersed camping: 4, 6, 11, 12, 13, 14, 41, 42, 44, 48, 56, 57, 71, 74, 76, 90, 100, 105, 108, 109, 110, 115, 122, 124, 129, 138, 139, 140, 141, 142, 171, 194, 354, 714,

[8] Comments received during scoping indicated that this original language was not descriptive enough. The miles of designated short spur roads to be added to the system has since been quantified based on GPS information collected from 2008-2009.

720, 730, 736, 747, 749, 786, and 789 (Map 5). These 220 miles of NFS roads are currently receiving this type of use.

- Allow the limited use of motor vehicles within one mile of all designated system roads (except where prohibited) to retrieve a legally hunted and tagged elk during the warmer months of September and October.
    - MBGR is only allowed between 10 am and midnight each day during hunts occurring prior to the fourth Thursday of October.
    - Only one vehicle would be allowed for Motorized Big Game Retrieval (MBGR) per harvested animal.
    - A minimum number of trips are to be used to accomplish the retrieval, and the route taken is to be safe and relatively direct, minimizing negative resource impacts.
    - MBGR would not be allowed in existing off road travel restricted areas, or when conditions are such that travel would cause damage to natural and/or cultural resources.
    - Motorized vehicles would not be permitted to cross riparian areas, streams and rivers except at hardened crossings or crossings with existing culverts.

Alternative 3

To meet the Purpose and Need for Action (Section 1.3), the following actions are proposed under Alternative 3:

- Amend the KNF Forest Plan to prohibit motorized travel off of designated routes on the Williams Ranger District, except as identified on the Motor Vehicle Use Map (MVUM).
- Close approximately 380 miles of currently open roads. These roads would be moved to Maintenance Level 1 (Map 3).
- Add approximately 16 miles of roads to the designated road system. This includes 8 miles of formerly closed roads and 8 miles of unauthorized user-created routes.
- Add approximately of 18 miles of short spur roads to the designated system. These routes have historically served as access to dispersed camping sites (and other activities) on the District (Map 6).
- Allow the limited use of motor vehicles within one mile of all designated system roads (except where prohibited) to retrieve a legally hunted and tagged elk during **all** elk hunting seasons as designated by the Arizona Game and Fish Department, and for 24 hours following the end of each season.
    - Only one vehicle (one trip in and one trip out) would be allowed for Motorized Big Game Retrieval (MBGR) per harvested animal.
    - Hunters will be required to use the most direct and least ground disturbing route in and out of the area to accomplish the retrieval.
    - MBGR would not be allowed in existing off road travel restricted areas, or when conditions are such that travel would cause damage to natural and/or cultural resources.
    - Motorized vehicles would not be permitted to cross riparian areas, streams and rivers except at hardened crossings or crossings with existing culverts.

Alternative 4

To meet the Purpose and Need for Action (Section 1.3), the following actions are proposed under Alternative 4:

- Amend the KNF Forest Plan to prohibit motorized travel off of designated routes on the Williams Ranger District, except as identified on the Motor Vehicle Use Map (MVUM).
- Close approximately **415 miles** of currently open roads. These roads would be moved to Maintenance Level 1 (Map 7).
- Add approximately 16 miles of roads to the designated road system. This includes 8 miles of formerly closed roads and 8 miles of unauthorized user-created routes.
- Add approximately of 18 miles of short spur roads to the designated system. These routes have historically served as access to dispersed camping sites (and other activities) on the District (Map 6).
- Prohibit the use of motor vehicles off the designated road system for the purposes of big game retrieval.

Common to Alternatives 2, 3, and 4

Fuelwood/Special Forest Products Management Strategy

Scoping efforts revealed that Fuelwood and Special Forest Product (SFP) collection on the Williams Ranger District is a popular and necessary activity for many local users of the National Forest. Each of the three action alternatives includes the prohibition of motorized cross country travel off of the designated road system. The District will continue to offer fuelwood and SFP permits to meet local demands. The District will also continue to accommodate the collection of special forest products and fuelwood by Native Americans for traditional use per the existing MOU and law, regulation, and policy. Fuelwood/SFP gathering will continue to be permitted on the Williams Ranger District, provided that:

1) The permittee does not travel off of designated open system roads (except for roadside parking) and is in compliance with permit stipulations; or,
2) The permittee is in a designated area that authorizes off road travel for fuelwood/SFP collection.

Areas that allow fuelwood/SFP collection off of the designated open roads are approved through subsequent environmental analysis and authorization and are therefore not analyzed or authorized as part of this Travel Management Project.

2.4 Comparison of Alternatives Analyzed in Detail

Alternative 1 – No Action was developed as a benchmark from which the agency can evaluate the proposed action and action alternatives. It would continue the current management of the District transportations system and would not implement the Travel Management Rule. Alternative 2, 3, and 4 differ in the degree to which they designate the limited use of motor vehicles away from the road system.

Table 3 provides a comparison and summary of the features of each alternative analyzed in detail.

Table 3: Comparison of Alternatives – Key Design Features

Feature	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3	Alternative 4
Changes to Designated Road System	No Change	Close approx. 380 miles (move to ML 1) Add approx. 34 miles to system (at ML 2)	Close approx. 380 miles (move to ML 1). Add approx. 34 miles to system (at ML 2)	Close approx. 415 miles (move to ML 1). Add approx. 34 miles to system (at ML 2)
Designated Open Road System Mileage[9] (FS Jurisdiction)	ML2 – 1340 ML3 – 110 ML4 – 10 TOTAL: 1460	ML2 – 994[10] ML3 – 110 ML4 – 10 TOTAL: 1,114	ML2 – 994[10] ML3 – 110 ML4 – 10 TOTAL: 1,114	ML2 – 959[10] ML3 – 110 ML4 – 10 TOTAL: 1,079
Motorized Dispersed Camping	Vehicles can travel anywhere on the District to access recreational opportunities (except current travel restricted areas)	Designates 200 ft. corridor on either side of 220 miles of open system roads Includes 18 miles of short spurs to be added to system	Includes approx. 18 miles of short spurs to be added to the system	Includes approx. 18 miles of short spurs to be added to the system
Motorized Trails	No designated motorized trails	Designate 25 miles of motorized trails (open to vehicles 50 inches wide or less) by converting 23 miles of existing system roads to trail and constructing 2 miles of new trail.	No motorized trails would be designated.	No motorized trails would be designated.
Motorized Big Game Retrieval	Vehicles are allowed to retrieve any downed game animal on the district (except current travel restricted areas)	Allows for MBGR of legally downed Elk: Up to 1 mile off all designated open roads Using minimum number of trips During warm season hunts (see description above)	Allows for MBGR of legally downed Elk: Up to 1 mile off all designated open roads One trip that uses most direct route No time or seasonal restrictions	Does not allow for MBGR; hunters would be required to use non-motorized means of retrieving all game and hunting seasons.

[9] Non-FS Jurisdiction roads total approximately 445 miles on the Williams Ranger District.
[10] This mileage includes the addition of 16 miles of roads (unauthorized and closed) and 18 miles of spurs added at this level in each alternative.

A comparison of the Key Issues addressed by each alternative analyzed in detail is shown in Table 4. Key Issues were previously listed in Chapter 1, Section 1.9.

Table 4: Comparison of Alternatives - Key Issues Addressed

Key Issue	Indicator(s)	ALTERNATIVES			
		1 (No Action)	2 (Proposed Action)	3	4
1. The PA would restrict motorized recreation opportunities.	a) Miles of road open to motorized vehicle use	1,680	1,114	1,114	1,079
2. The PA allows for motorized dispersed camping and MBGR.	c) Provides for big game retrieval d) Dispersed camping and recreation access opportunities	Unlimited Unlimited	Elk - Limited Season Corridors and Spurs	Elk - All Seasons Spurs	Prohibited Spurs
3. The PA does not close enough miles of road.	a) Average forest wide open road density	1.92 mi/mi^2	1.27 mi/mi^2	1.27 mi/mi^2	1.23 mi/mi^2

Table 4 provides a comparison summary of each Alternative's effects on natural resources, described in full in Chapter 3.

Table 5: Comparison of Alternatives - Summary of Effects on Resources

Resource	ALTERNATIVES			
	1 (No Action)	2 (Proposed Action)	3	4
SCENERY	Road density and parallel roads detract from scenery. Unrestricted cross country travel and proliferation of	Overall improvement in scenic integrity, landscape character, sense of place. Decreased scenic integrity along roads	Scenic integrity improvements are similar to Alternative 2, except for lack of detriments caused by camping corridors.	Provides for the greatest improvement in overall scenic integrity.

Resource	ALTERNATIVES			
	1 (No Action)	2 (Proposed Action)	3	4
	dispersed campsites have the greatest negative impacts on scenic quality and integrity.	with camping corridors. Negligible effect to scenic integrity from MBGR and motorized trails.	Minimal effects to scenic integrity from MBGR for all elk hunts.	
RECREATION	Motorized users have ample opportunity for riding. User conflicts increase as unrestricted motorized cross country travel decreases quality of non-motorized opportunities. Lowered quality of recreation settings over time. No change from current hunting and dispersed camping opportunities.	Improvement in quality of semi-primitive motorized, non-motorized ROS and Wilderness areas on the district. Improves the ability to provide high quality recreation opportunities and reduces user conflicts. Improves and provides the greatest mix of motorized recreational opportunities (road and trail riding). Some decrease in hunter satisfaction, though increased outfitting opportunities and decreased hunter conflicts would result.	Improvement in quality of recreation opportunities similar to Alt. 2. However, some OHV rider dissatisfaction may occur from reduced road and trail availability. Reduces user conflicts between motorized and non-motorized users. Some reduction in camping opportunity, but conflicts may also be reduced. Lack of motorized trails may cause dissatisfaction for some. Increased MBGR trips may reduce quality of recreation settings over Alt's 2 and 4.	Decreased motorized recreational opportunities compared to Alts 1, 2, &3 but increase in non-motorized opportunities. Overall recreation quality would be improved compared to other alternatives. Hunter dissatisfaction would be highest though an increase in outfitting opportunities and a decrease in hunter conflicts can be expected.
SOILS AND WATERSHED	Continuation of current management would lead to a continuing decline in soil and watershed stability, condition and productivity. Compared to all other alternatives, it would not provide for the protection of these resources.	Reduces the damage to soil and watershed stability, condition and productivity much more than Alt. 1. It also has the potential to reduce the amount of fugitive dust. However, it would not provide for the protection of these resources as much as Alt. 4.	Reduces damage to soil and watershed resources much more then Alt. 1. It also has the potential to reduce the amount of fugitive dust. Alternative 3 reduces damage to these resources from motorized trails and dispersed camping, compared to Alternative 2. However, it does not reduce the damage from MBGR. Alternative 3 does not provide as much	Highest reduction in the damage to soil and watershed stability, condition and productivity. It also has the potential to reduce the amount of fugitive dust.

Resource	ALTERNATIVES			
	1 (No Action)	2 (Proposed Action)	3	4
			protection as Alt. 4.	
WILDLIFE	No reduction in negative effects associated with open roads and motorized cross-country travel. Negative effects include human disturbance associated with motorized travel, habitat degradation caused by motorized cross-country travel, and animals being hit by vehicle collisions. MBGR would be available for all hunts.	Increased habitat quality and reduced disturbance to wildlife as a result of closing 380 miles of open roads and substantially reducing cross-country motorized travel compared to Alt. 1. Localized disturbance to wildlife in motorized trail areas. No MBGR opportunity for deer and pronghorn hunts or late-season elk hunts.	Increased habitat quality and reduced disturbance to wildlife as a result of closing 380 miles of open roads and substantially reducing cross-country motorized travel compared to Alt. 1. No localized disturbance to wildlife from motorized trail systems. No MBGR opportunity for deer and pronghorn hunts. MBGR opportunity maintained for all elk hunts.	Increased habitat quality and reduced disturbance to wildlife as a result of closing 415 miles of open roads and substantially reducing cross-country motorized travel compared to Alt. 1. No localized disturbance to wildlife from motorized trail systems. No MBGR opportunity.
SENSITIVE PLANTS	Unmanaged off road travel degrades habitat and may damage or destroy rare plants. Individual plants or their habitat may be affected and this could contribute to a loss of viability for these populations or species.	A reduction in off road travel will reduce the chances of physical damage to individuals and/or their habitat. Concentrated use in camping corridors could have detrimental effects. At worst, this alternative may affect some individuals or habitat but it is not likely this would contribute to a loss in viability of any rare plant species.	Extending the MBGR season would increase risk of damage to plants over Alt. 2, but would still be an overall reduction over Alt. 1. Threats posed by concentrated use in corridors would be eliminated. This Alt. may affect some individuals or habitat but it is not likely this would contribute to a loss in viability of any rare plant species.	Effects are similar to those of Alt. 3, except that the prohibition of off road travel would greatly reduce the chances of physical damage to individuals and/or their habitat. This Alt. would have the least affect on individuals or habitat and is not likely to contribute to a loss in viability of any rare plant species.
INVASIVE WEEDS	Unmanaged motorized off road travel and unauthorized user created routes could lead to a large annual increase in the number of weed	Restricting off road travel and closing 380 miles of roads would greatly reduce the rate of introduction and spread of invasive exotic weeds compared to Alt. 1.	Similar to Alt. 2, except the extended season for MBGR (into the wet season) could lead to an increase in the spread of invasive exotic weeds by muddy tires	Prohibiting all off road travel and closing 415 miles of roads would reduce the spread of invasive exotic weeds more than any other

Resource	ALTERNATIVES			
	1 (No Action)	2 (Proposed Action)	3	4
	species found on the District and in the number of acres infested with invasive exotic weeds.	Alt. 2 would not reduce the introduction and spread of invasive exotic weeds as much as Alt. 4.	compared to Alt. 2. Alt. 3 would not reduce the introduction and spread of invasive exotic weeds as much as Alt. 4.	alternative.
CULTURAL	All cultural resources on the District remain at risk to direct and indirect impacts, predominantly from unmanaged off road travel. Impacts to sites would likely increase over time.	Closing roads and prohibiting off road travel will likely lessen but not eliminate effects to cultural resources. MBGR presents some chance of impact to sites. Some effects may occur within camping corridors and motorized trails may cause indirect impacts to sites.	Similar to Alternative 2, however allowing MBGR for all elk hunts may increase the risk of effects to sites. Impacts from motorized trails and camping corridors will be negated.	Provides for the greatest reduction in direct and indirect effects to cultural resources. Effects from MBGR, camping corridors and motorized trails will be negated.
RANGE	Permittees would be free to access range allotments by current routes. Motorized cross country travel and unauthorized routes would negatively affect soil productivity and possibly interfere with permittees activities.	Permittees would be authorized to use closed roads as long as it is authorized in the Operating Instructions and follows guidance from TMR implementation guidelines. Some impacts to range fencing may result.	Operating Instruction would authorize permittees use of closed roads consistent with TMR guidelines. Some impacts to range fencing may result.	Operating Instruction would authorize permittees use of closed roads, consistent with TMR guidelines. Impacts to range fencing would be minimized as all off road travel would be prohibited.
FIRE SUPPRESSION AND FUELS MANAGEMENT	The current road system provides adequate access for fire and fuels management needs. However, human caused fires in remote areas may increase and the desirable spread of management fires can be hindered by the abundance of roads.	Reduction in road density will have little impact on fire and fuels management. Fire patrol and prevention may be improved as motorized dispersed campers would be concentrated. Management fires may also be improved by the reduction in fuel breaks and the re-	Similar to alternative 2, except that dispersed campers would be further concentrated to designated spur roads, making fire prevention and patrol easier.	Similar to Alternative 3. Fires resulting from MBGR have been rare, and therefore effects on fire and fuels are negligible.

Resource	ALTERNATIVES			
	1 (No Action)	2 (Proposed Action)	3	4
		vegetation of closed roads. MBGR has little to no implication for fire and fuels.		
VEGETATION MANAGEMENT	Unmanaged cross country travel may have some slightly negative effects on soil productivity over time.	Each of the Action Alternatives will not have direct effects on the Vegetation Management program on the District, any needed temporary or new road construction would be subject to further environmental analysis and approval. Fuelwood harvest and forest product gathering may be reduced, but ongoing vegetation management activities will provide sufficient opportunities for fuelwood and forest products.		
ECONOMIC	Economic contribution to the community remains, possibly increasing over time. Road maintenance funding requirements total approx. $1.4 million dollars.	Some indirect effects on visitor spending or motorized recreational activities may result from reducing the open road system and limiting game retrieval. However, as the Kaibab NF contributes a relatively small percentage to the overall economy, direct effects are difficult to ascertain. Some localized effects to Williams may result, but quantifying these impacts is speculative. Travel management will have little to no impact on the economy or the sustainability of the economy. Required annual road maintenance funding is reduced by approximately $152,000 or 10%. Needed funds total approximately $1.3 million.		

2.5 Mitigation Measures

This section provides mitigation measures that are applicable to this project and the Alternatives Analyzed in Detail (Section 2.3). These measures are intended to ensure environmental effects remain at acceptable levels during implementation of the project.

- Prohibit the use of motor vehicles for dispersed camping or for the purpose of retrieving a legally taken elk when it results in damage to natural and cultural resources and/or compromises the ability of the Forest Service to meet management objectives.
- Implement the Wet Weather Roads Policy (see glossary) when soil moisture conditions and the potential for road and resource damage exist. Implementation of the policy is at the discretion of the Forest Supervisor or District Ranger.
- Implement Appendix B "Design Features, Best Management Practices, and Mitigation Measures" in the "Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds on the Coconino, Kaibab, and Prescott National Forests within Coconino, Gila, Mojave, and Yavapai Counties, Arizona" (Forest Service 2004).
- Provide operator information and trail ethics guidance for OHV riders at portals located at main access points on the District, on the Motor Vehicle Use Maps, and brochures developed about Travel Management on the Kaibab NF.
- Apply dust abatement treatments, as approprpiate, during motorized trail construction activities to reduce the potential disturbance of particulate matter. Treatments include watering, dust oiling, penetration oiling, magnesium chloride, lignin sulfonate, calcium, chloride, aggregate surfacing,

chip-sealing, or paving (FSH 2509.22 – 41.26). (This mitigation measure is only applicable to Alternative 2.)

2.6 Monitoring

Monitoring entails the gathering of information and observation of management activities to ensure that Forest Plan Standards and Guidelines as well as the objectives of the project are being met. Forest Plan monitoring and evaluation items will be implemented where appropriate. Additional monitoring needs were also compiled for this project to validate assumptions used in this planning process, and to verify that the project is being implemented as intended. This analysis includes the following project specific monitoring:

- Monitor the road system and determine if there are roads that could be decommissioned or obliterated in future planning projects.
- Areas with limited use of motor vehicles for the purposes of dispersed camping and big game retrieval will be monitored to assess for damage to natural and cultural resources and/or frequently occurring actions that compromise the ability of the Forest Service to meet management objectives. This monitoring will occur in conjunction with other project or management activities, including enforcement of the Wet Weather Roads Policy.
    - If soil damage and/or excessive damage to vegetation are discovered, the Forest Service will take the necessary action to move the area into compliance with the Forest Plan. This may include temporarily or permanently closing areas to motorized vehicle use. All permanent closure proposals will follow the required NEPA process.
- Designated roads and motorized trails, as well as closed roads and dispersed camping routes will be monitored periodically for ruts, erosion, or sedimentation of water bodies. This monitoring will occur in conjunction with other project or management activities, including enforcement of the Wet Weather Roads Policy.
    - If damage, erosion, or sedimentation of water bodies is discovered, the Forest Service may repair or upgrade the roads and routes. Temporary or permanent closures of roads and/or forest access spur roads may be necessary. Decommissioning or obliteration of closed roads (i.e. block access rip compaction, re-vegetate) may be necessary. All closure, decommissioning, or obliteration proposals will follow the required NEPA process.
- Staff will continue to do annual invasive exotic weed inventory and monitoring in conjunction with other project or management activities. Areas targeted for weed surveys will include all roads, unauthorized routes, and dispersed camping corridors and spur routes.
    - If weed populations are discovered, the Forest Service may temporarily close specific roads, dispersed camping corridors, dispersed camping routes, or areas that allow motorized vehicle use for big game retrieval, until the weeds are controlled.
- Known rare plant populations will be monitored periodically for impacts. Surveys for new populations of rare plants will be conducted periodically in conjunction with other project and management work in the area.
    - If new rare plant populations are discovered, the Forest Service may close specific roads, road segments, and dispersed camping corridors, or prohibit the use of motorized vehicles for the retrieval of legally taken big game in the area. Road or area closures or road decommissioning may be needed if motorized vehicle travel is harming or has the

potential to harm rare plants. All closure proposals will follow the required NEPA process.

- Monitor motor vehicle use for compliance with the Motorized Vehicle Use Map and forest closures. Adjust management strategies as needed to increase compliance.

2.7 Alternatives Considered but Eliminated from Detailed Study

Four additional alternatives were considered but eliminated from detailed study. They are listed below along with the rationale for not analyzing them in detail:

- An alternative was considered but eliminated from detailed study that would designate the Wet Weather Road System as the open road system. Since the Wet Weather Roads Policy is currently used as a tool to mitigate adverse impacts to resources by enacting emergency travel restrictions when needed, defining what the Wet Weather Roads System is poses a problem. Emergency travel restrictions are often only implemented on specific portions of the District where protection is warranted rather than across the entire District. Therefore under Wet Weather travel restrictions the road system open for public use changes to address site specific conditions. For the purposes of this analysis, the District reviewed this proposal with regards to what changes would need to be made to the existing district-wide designated transportation system so that only the Wet Weather Road System remained (just, as if emergency travel restrictions were implemented across the entire District). This alternative would close approximately 1,220 miles of road or about 83% of the system roads on the District. This alternative would not add any unauthorized or formerly closed roads to the system and would contribute greatly to the deferred maintenance burden on the Forest. Additional analysis of this alternative is documented in a preliminary analysis report available in the project record. The following three reasons are offered as to why this alternative was not considered in detail:
    1) This alternative would unnecessarily restrict motorized public access and would not meet the goals of the 1988 Kaibab Forest Plan, as amended. It was determined based on GIS analysis that this alternative would not meet the desired Recreation Opportunity Spectrum settings prescribed in the Plan. It was also determined that this alternative would not (a) provide a wide mix of outdoor recreation opportunities responsive to the current and future demand (Forest Plan Goal p. 17) and would not (b) manage for a wide spectrum of desired settings that provide opportunities for developed and dispersed recreational activities (Forest Plan Goal p. 17).
    2) The Forest Service incorporated a wide range of public input into the TAP (2010). In the TAP, the Forest Service identified the minimum road system needed for the administration, utilization and protection of the Williams Ranger District per 36 CFR part 212.5(b)(1). This alternative would close approx. 840 *more* miles of road than the minimum system identified by the Forest Service. Alternatives 2, 3, and 4 essentially carry forward the road system recommended in the TAP which is believed to reflect the local public's desired road system, so designating the Wet Weather Roads System as the open roads system would be a drastic change and contrary to the majority of the local public's desire.

3) T his alternative was also not considered because the Wet Weather Roads Policy, which enacts emergency travel restrictions, is incorporated as a mitigation measure to the Alternatives Analyzed in Detail.

- An alternative was proposed that would reflect the desire for adequate resource protection in specific "special areas" (see CBD et al. June 2008 scoping letter). This alternative emphasized closures and motorized travel restrictions within Mexican spotted owl Protected Activity Centers, Northern goshawk nests or Post-Fledging Family Areas, Gunnison's prairie dog active and abandoned colony sites, Pronghorn core habitat, Mule deer core habitat, Black bear core habitat, Mountain lion core habitat, High risk soil erosion areas, Proposed wilderness areas, Proposed wildlife habitat areas, and "Zones of dispersal". The proposal also included permanent closure of current seasonally closed 'quiet areas" and other areas restricted to motorized use. The route closure recommendations were considered on a case-by-case basis (which resulted in Alternative 4) and as a collective alternative. Collectively this alternative would reduce the average route-density on the Williams Ranger District to 1.0 mi/mi^2. This alternative was eliminated from detailed study because it would go beyond the scope of the project which is to *improve the management of motorized vehicle use* on the WRD in accordance with the Travel Management Rule (36 CFR 212, 251 and 261). The concern to close more roads for resource protections is reflected in Key Issue 3; however, the analysis provided in Chapter 3 indicates that the single action which will provide the most benefit to wildlife species and other resources is the prohibition of cross country travel. Additionally, because Alternative 4 took into consideration the road recommendations (and essentially all route closure recommendations, except those listed in the last Table of Appendix H titled 'Additional Route Closure Recommendations Presented in the PA and Supported by the Conservation Coalition,') it was decided not to fully incorporate the coalition's recommendations which, when analyzed, basically created and/or buffered the "special areas" they identified (i.e. collectively, the recommendations were beyond the scope of this project). The protection and existence of the "special areas" presented are important, but the creation and designation of these areas are best addressed at the Forest Plan level.

- It was proposed that the Forest Service decommission all routes not assigned a high value for access in the Draft Transportation Analysis Plan (TAP). This suggestion was not included as part of an alternative because decommissioning roads is also beyond the scope of this project. Decommissioning roads goes beyond the purpose of the project which is "to <u>improve the management of motorized vehicle use</u> on National Forest System lands on the Williams Ranger District (WRD) of the Kaibab National Forest (KNF) in accordance with the Travel Management Rule (36 CFR 212, 251 and 261)"(emphasis added). The Forest recognizes the need to reduce adverse resource impacts caused by roads (see Section 1.3 Purpose and Need for Action), however, decommissioning all routes not assigned a high value for access would be an action far greater than that needed to achieve the purpose and need for action. Rather as a practical approach, the Forest included monitoring measures that emphasize decommissioning or obliteration when it is determined necessary because of resource issues and when decommissioning or obliteration would be more feasible, like in association with future actions and site specific projects where heavy equipment will be used (such as a vegetation management

project). The Williams Ranger District TAP (Forest Service 2010) did not identify or recommend any roads or routes that should be decommissioned.

- It was proposed the Forest Service allow motorized big game retrieval for all big game animals on the Williams Ranger District; the Arizona Game and Fish specifically requested the allowance for both deer and elk, while some members of the public suggested the allowance for antelope as well. The proposed action and Alternative 3 would allow the motorized big game retrieval (MBGR) for elk only while the comments in scoping suggest allowing MBGR for all big game animals (or some combination of elk, deer, antelope, etc.). This suggestion was not included as part of an alternative because the issues raised during scoping revolved around the seasonality restrictions or the simple fact that the proposed action allowed the use of motorized vehicles for game retrieval, rather than the preclusion of additional species for MBGR (see Section 1.9 Key Issues and Appendix 3). Consideration of which species to include in an Alternative Analyzed in Detail took into consideration the estimated weights of mature live big game animals[11] and the Purpose and Need for Action (Section 1.4). When considering the ability to pack an animal out, elk pose the greatest challenge, and could require many trips to walk the animal out. The need to reduce the impacts from cross-country travel was also taken into consideration (see Purpose and Need Section 1.3). While the estimated number of retrievals for deer and antelope was considered an insignificant portion of the existing MBGR use on the District (Table 3 Section 1.4), not including these species would improve the ability of the District to meet the purpose and need for action by slightly reducing the potential for unwanted resource impacts from MBGR.

- An alternative was proposed that would not change the designated road system on the Williams Ranger District, but would prohibit motorized travel off of designated routes. This alternative would not meet the Purpose and Need for Action. There is a need to "**Reduce adverse resource impacts caused by roads and motorized cross country travel in order to maintain and restore the health of ecosystems and watersheds;** Some existing system roads are creating unacceptable resource damage while cross country travel has resulted in the creation of unauthorized roads, many of which can damage and/or provide unwanted motorized access to sensitive resources on the WRD" (Section 1.3). There were 380 miles of system roads identified in the TAP as having resource concerns and in need of closure.

- An alternative to the proposed action was considered that would convert all of the roads proposed for closure to motorized trails (i.e. open to vehicles 50 inches wide or less). There were 380 miles of system roads identified in the TAP as having resource concerns and in need of closure; converting those 380 miles of road to motorized trails would not alleviate resource concerns and would not meet the Purpose and Need for Action (Section 1.3).

[11] http://www.azgfd.gov/h_f/game_elk.shtml, http://www.azgfd.gov/h_f/game_antelope.shtml, http://www.azgfd.gov/h_f/game_mule.shtml

Chapter 3 – Environmental Effects

This chapter summarizes the physical, biological, social and economic environments of the project area (the Williams Ranger District). It discloses the potential effects of implementing the alternatives presented in Chapter 2 and provides the scientific and analytical basis used to compare the alternatives (summarized in Chapter 2 Table 4). The best information available was used to discuss the affected environment and environmental consequences of the alternatives and the "best available science" was considered throughout the discussions presented within this chapter. For some resources, the information presented in this chapter is a summary of the specialists' report located in the project record.

3.1 Recreation and Scenic Resources

Affected Environment

District Users

The Williams Ranger District (District) is one of three ranger districts on the Kaibab National Forest and is used primarily by local and regional visitors as a recreation destination (NVUM 2005; Boussard et al 2002). Recreationists to Williams Ranger District have indicated they come to the area because of its proximity to home, the cool weather, beauty and scenery, and hiking opportunities (Boussard et al 2002). Wildlife and fishing, uncrowded areas, and solitude were also reported as important reasons.

Current Visitor Activities

In the 2000 and 2005 National Visitor Use Monitoring reports the top five recreation activities of the visitors to the Kaibab National Forest (KNF). Note that the top activities users are participating in did not change over the five year period, but there were changes in the percent of users participating in each activity, see Table 6 (NVUM 2000 and 2005).

Table 6: Top 5 recreational activities on the Kaibab National Forest[12]

Activity	Percent participation 2000 Final report*	Percent participation 2005 Final report*
Viewing Natural Features	67.1	54.7
Hiking / Walking	50.4	47.2
Viewing Wildlife	0	44.8
Driving for Pleasure	27.1	44.2
Relaxing	46.2	26.1
Sightseeing	76.3	N/A

[12] Source: NVUM 2000 and 2005 Final Report

In 2005 NVUM surveys motor vehicle use was addressed. The results in Table 7 indicate the percent of forest visitors engaging in motorized activities.

Table 7: Percentage of National Forest visits indicating use of special facilities and Areas on KNF[13]

Facility Type	Percent Of NF Visits Using The Facility [1]
Developed Swimming Site	0.3
Motorized Single Track Trail	5.0
Motorized Dual Track Trails	8.4
Designated ORV Area	2.8
Forest Roads	19.2
Scenic Byway	47.5
Visitor Center or Museum	27.0
Interpretive Displays	16.1
Information Sites	14.7
Developed Fishing Site	0.4
None of these Facilities	33.4

*Selections presented are limited to motorized activities, survey respondents could select multiple activities

Trends

Off-highway vehicle (OHV) use on public lands has increased substantially in the last ten years[14]. The Arizona Statewide Comprehensive Outdoor Recreation Plan (SCORP 2008) estimates that about nine percent of Arizona's residents currently participate in OHV riding. These same residents expect to increase their OHV activities in coming years, self-reporting that they would like to increase their riding by 24 percent. Increased motorized use on the Williams Ranger District is a direct reflection of both the popularity of OHV riding and the increased population growth in the Southwest.

In recent recreation research compiled by the Internet Research Information Series (Cordell et al 2009) there is a nation-wide decrease in hunting and fishing overall, and the greatest increases in recreation activities are in day hiking (210%), backpacking (161%), off-highway vehicle driving (142%) and walking outdoors (111%).

[13] Source: NVUM FY2005 data

[14] The motorized equipment used in these activities will generally be referred to as off-highway vehicles in this document. OHV include four-wheel drive vehicles, motorcycles and motto-cross single wheel vehicles, all-terrain vehicles, and utility terrain vehicles, such as Polaris Ranger, that are a cross between a truck and an ATV.

Recreation Opportunities Provided

The items included below are not a comprehensive list of recreation opportunities provided on the KNF, instead, they are those most directly related to Travel Management Planning.

Motorized Recreation: Forest Roads provide opportunities to access developed and dispersed recreation opportunities. Driving on Forest Roads is a favorite past time for many forest users. Viewing scenery, wildlife, and historic sites along Forest Roads are popular recreation activities. Roads also are used for commercial operations including logging, ranching, mining, outfitting and guiding services, and to access electronic sites, and private land. The District currently has approximately 1,460 miles of NFS roads open to public travel (Maintenance Levels 2-4).

The current trend for the Williams Ranger District has roads distributed throughout the District. In some areas there are parallel roads within one-quarter to one-half of a mile of each other going to roughly the same place. Redundant roads provide little additional benefit and can potentially result in negative impacts to other resources, wildlife, and visitor experiences.

> Wet Weather Road System: In unusually wet years, when deep snow or saturated soils raise concerns for public safety or road and resource damage from motor vehicles, wet weather travel restrictions are implemented on the District by an official Forest Order. Signs are used to inform forest visitors of travel restrictions and open routes. When these travel restrictions are in place, motorized travelers are required to stay on those designated routes until soils dry and the order is lifted. All roads assigned a maintenance level 3 or higher are open year round and seasonal closures are implemented on all maintenance level 2 roads when conditions warrant.
>
> Motorized Cross-Country Travel: At present, motorized vehicle travel is allowed off designated routes. These “motorized travel restricted” areas, totaling about 45,000 acres, are closed to cross country travel to protect sensitive soil and vegetation, wetlands, Designated Wildernesses and Research Natural Areas. Some OHV riders travel cross-country across the District, others create their own motorized trail systems. There are approximately 220 miles of unauthorized or “user-created” motorized routes existing at this time.
>
> On the District, the current trend for the number of unauthorized routes has also increased. Unauthorized routes have not been designed or constructed by the Forest Service and have not gone through the National Environmental Policy Act process. Unauthorized routes can damage forest resources, disturb wildlife, and can negatively impact forest visitors seeking a quiet and secluded recreation experience due to the noise that they make. A 2008 study (Forest Service) found that OHV traffic can adversely affect natural resources regardless of the type and equipment on the individual vehicle. This study looked primarily at the effects of cross country travel and user-created trails. It found vegetation was reduced by a minimum of 40 percent and was often completely eliminated. Soils were compacted, displaced or loosened, making them available for erosion by water. The ability of soil to absorb rainfall was reduced by half, while soil erosion was increased by more than a half. In the dust study, it was found that OHV can cause significant amounts of dust. Low volumes of riders could generate dust loads greater than 150 micrograms per cubic meter. As the volume of riders increases, the dust concentrations could move into the unhealthful range in forested locations where air circulation is inhibited.

Motorized Dispersed Camping: One of the traditional uses of National Forest System lands has been for motorized dispersed or throw-down camping in locations chosen by the forest user. (This is in contrast to camping at a developed campground where amenities such as restrooms, water, and defined camping spurs are provided). Motorized dispersed camping is an important use of the District, and for many people is an inherent part of their recreation expectations and experience. A majority of this camping occurs in areas along main NFS road that have a close proximity to recreation opportunities, view, trails and/or water. Motorized dispersed camping typically occurs in the same areas year after year because they are in desirable locations and are easily accessed. Most motorized dispersed camping sites are within 100 feet of existing roads, and are used during summer, and fall hunting seasons. About 13 percent of Kaibab National Forest users reported participated in dispersed camping activities in 2005 (NVUM).

Many motorized dispersed campers also participated in other recreation activities. One trend is that of motorized recreation activities occurring with dispersed camping. For other users, the natural quiet is desired (Forest Service 2009). Conflicts are increasing between recreationists engaging in motorized recreation activities and non-motorized activities (including hunting).

There are currently ample opportunities to motorized disperse camp on the Williams Ranger District. Special Forest orders close a few limited areas to protect wildlife or other sensitive resources; however, the majority of the District is open to motorized dispersed camping.

Trails: A non-motorized trail system is provided on the District. The non-motorized trail system provides opportunities for hiking, horseback riding, and mountain biking. There is no designated motorized trail system. Approximately 60 miles of the Great Western Trail traverses the District, and provides a motorized backcountry route along the existing road system for a variety of high clearance and 4-wheel drive vehicles.

Non-Motorized Recreation: Non-motorized recreation opportunities are currently provided on Williams Ranger District. These include hiking, scenery and wildlife viewing, dispersed camping and picnicking.

Conflicts have identified between motorized and non-motorized recreation including loss of natural quiet and dust created by motorized vehicles.

Hunting and Motorized Big Game Retrieval: Hunting is a popular activity on the District. The Forest Service works with Arizona Game and Fish to manage habitat for wildlife species. Hunting and trapping activities are facilitated by the existing road system. The roads also facilitate access for sportsmen with disabilities. Roads provide access to much of the District and distribute hunting activities over the area. In contrast, the same benefits of roads for legal activities also help facilitate illegal activities such as poaching.

The Arizona Game and Fish Department estimates that about 90 percent of hunters are in the habit of using their vehicle or OHV to retrieve a legally downed animal during hunting season (Section 1.4). Game retrieval has been facilitated by the open travel status on the District. Other hunters backpack or horse-pack their dressed animal to their parked vehicle.

Designated Wilderness: Two Designated Wildernesses, Kendrick Mountain and Sycamore Canyon are located on the District. No changes to the current management is proposed for these areas in this project.

Forest Plan Direction

Recreation Opportunity Spectrum

National Forest visitors are diverse in their preferences for recreational settings, experiences, and activities, and for the reasons mentioned above, as well as changing demographics. In order to provide a diversity of settings and opportunities the Forest Service uses the Recreation Opportunity Spectrum (ROS) as a management tool to inventory and describe recreation setting objectives for national forest system lands. Table 8 describes the acres and general settings and opportunities provided by ROS classes for the Williams Ranger District in the Kaibab National Forest Management Plan.

Visitors choose specific settings for their activities in order to enjoy desired experiences. These settings vary by Ecosystem Management Area and are further refined by the Recreation Opportunity Spectrum (ROS) classification system that describes different outdoor recreation settings across the Forest using seven standard classes that range from primitive, undeveloped settings to urban, highly developed settings. Attributes typically considered in describing the settings are size, scenic quality, type and degree of access, remoteness, level of development, social encounters, and the amount of on-site management. By describing existing recreation opportunities in each class, ROS helps match visitors with their preferred recreation setting. ROS can also be used to plan how areas should be managed for recreation in the future (Forest Service, ROS Handbook 1986). Changes in a national forest's mix of ROS classes affect the recreation opportunities offered.

Table 8: Acreage by Recreation Opportunity Spectrum classification[15]

ROS Class	Williams District Acres	General Setting Description (Desired Condition)
Rural	50, 759	Landscapes may be highly modified and managed, and managed to maintain general scenic attractiveness. May contain highly developed recreation sites, and use may be high. Generally a natural appearing backdrop.
Roaded Modified	98, 152	Limited developments, low to moderate use levels, variety of non-motorized and motorized recreation opportunities.
Roaded Natural	289, 802	Landscapes are carefully managed to maintain or enhance recreation and scenic values, sites and features, to be natural-appearing, with changes designed to appear in harmony with natural setting. May contain highly developed recreation sites and travel routes.
Semi-primitive Motorized	113, 223	Maintain predominantly undeveloped landscapes and scenic vistas as viewed from travel routes, with limited recreation developments.
Semi-primitive Non-	29, 533	Predominantly undeveloped landscapes and scenic vistas and limited recreation developments.

[15] Source: KNF Plan, 2004.

ROS Class	Williams District Acres	General Setting Description (Desired Condition)
motorized		Recreation uses are non-motorized.
Semi-primitive Non-motorized Wilderness	11, 720	Management according to Wilderness Act and Agency regulations. Use is low. Wilderness-dependent uses are favored. Non-motorized and non-mechanized opportunities.
Primitive	2, 813	Management according to Wilderness Act and Agency regulations. Use is low. Wilderness-dependent uses are favored. Non-motorized and non-mechanized opportunities.

Figure 3 shows the KNF Forest Plan ROS mapping for the Williams Ranger District. Recreation use on Forest Roads, and currently, motorized cross-country travel is supported by the Forest Plan except in travel restricted areas. Motorized access is restricted on approximately 45,000 acres of the District (Kaibab Forest Plan 1988, as amended). All motorized and mechanized recreation is prohibited in Designated Wilderness. In addition, OHV use is restricted within ½ mile of developed campgrounds, this would include the four campgrounds located within the District; Cataract Lake, Dogtown Lake, Kaibab Lake and Whitehorse Lake Campgrounds.

The Project area encompasses seven ROS classes, most predominantly Roaded Natural ROS found in the ponderosa pine vegetation type, with Rural ROS located close to developed recreation sites near the City of Williams, non-federal lands and encompassing the town, and relatively small amounts of Semi-Primitive Motorized and Semi-Primitive Non-Motorized in less roaded areas and on slopes and areas of rough terrain. Designated Wildernesses are mapped as primitive and semi-primitive non-motorized wilderness. There is also a small amount of Roaded Modified ROS along major utility corridors and encompassing the sandstone quarries and historic pinyon-juniper removal areas on the west side of the District. Forest Plan direction states that ROS classes are to be considered in the design of project activities and ROS classes maintained or enhanced.

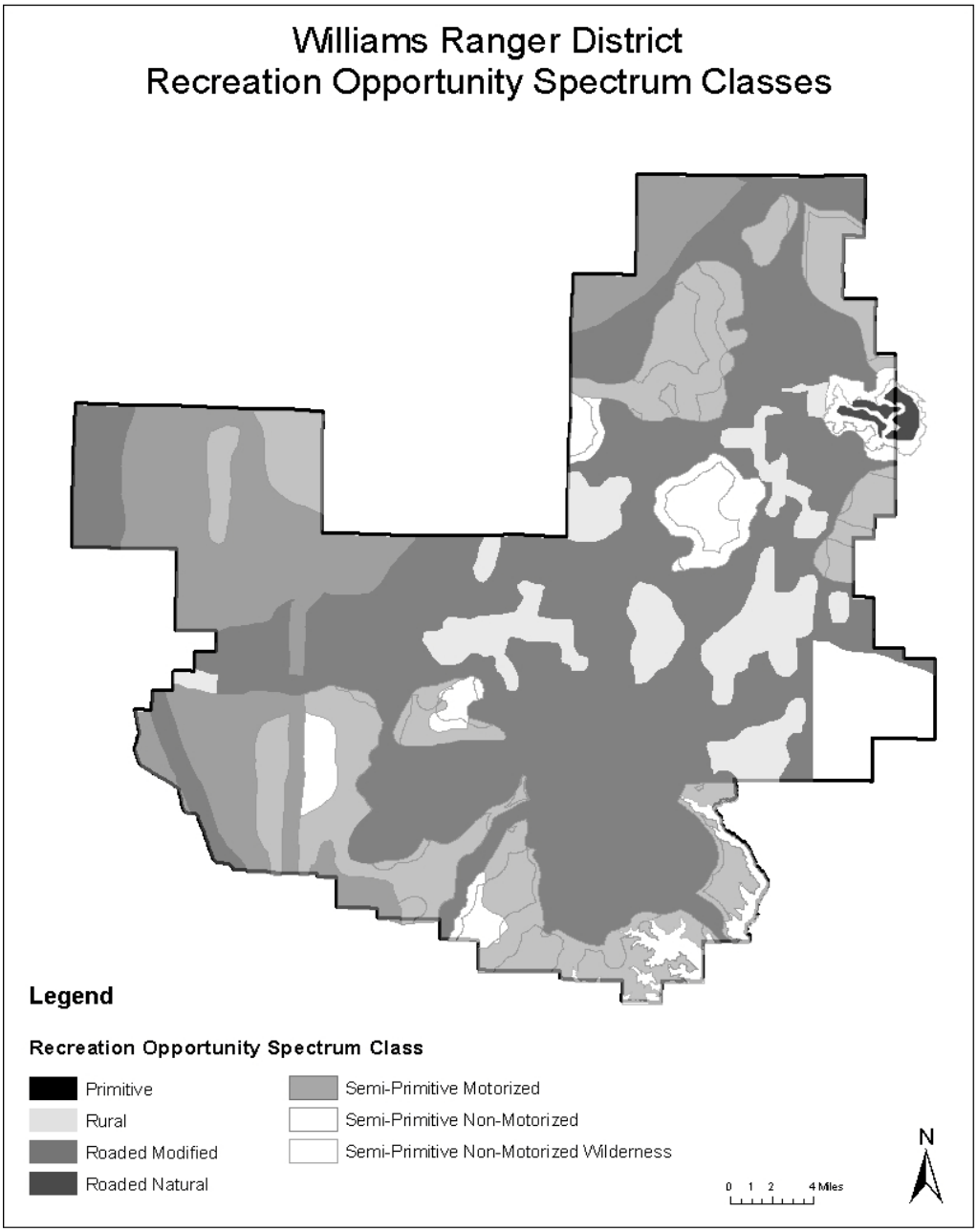

Figure 3: Recreation Opportunity Spectrum classifications on the WRD

Scenery Management

The Williams Ranger District is a recreation destination and important scenic area. It represents a component of the local community's scenic identity and image, contributing to its "sense of place" as well as contributing to the visitor experience associated with tourism in The City of Williams. In addition, private landowners with property within or adjacent to the District view the surrounding landscape and are likely to consider it important to their quality of life.

Scenic Resources: Bill Williams Mountain, Kendrick Mountain, Sitgreaves Mountain, constructed reservoirs and tanks, open grasslands or prairies, and the high elevation ponderosa pine forest are all important scenic resources. Recreationists and local residents alike enjoy the scenic settings found on Williams Ranger District.

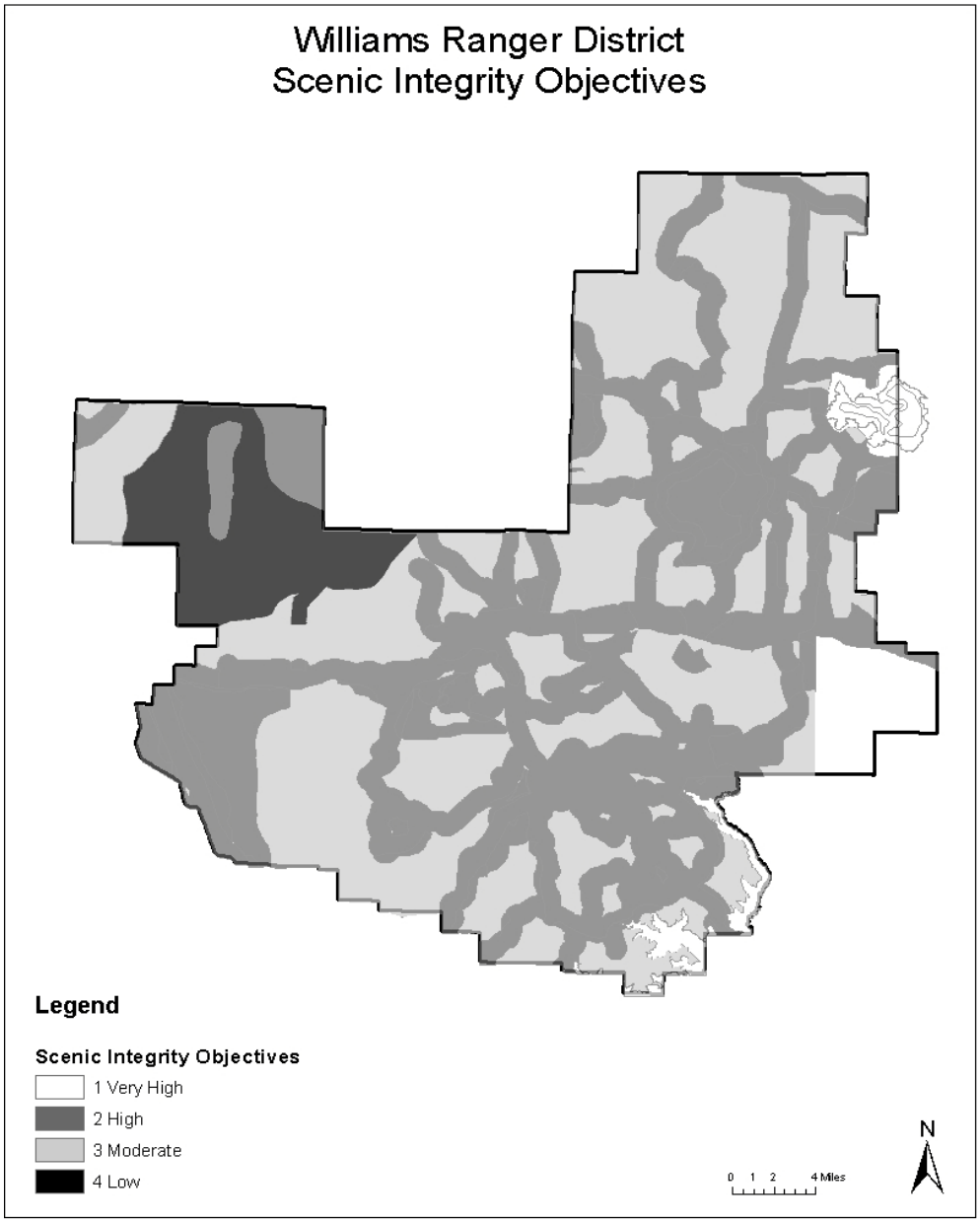

Figure 4: Scenic Integrity Objectives for the WRD

Scenery Management System: Scenery Management is a tool for integrating the benefits, values, desires and preferences regarding scenery into land management planning, and it is an integral part of ecosystem management. The Scenery Management System (SMS) provides a framework for inventory and analysis of scenic values. The old Visual Management System and Visual Quality Objectives were updated and new mapping was adopted in the Forest Plan (1988, as amended). The outcome of the scenery

management analysis is that Scenic Integrity Objectives (similar to Visual Quality Objectives) are assigned to all parts of the District.

Scenic Integrity is a measure of the degree to which a landscape is perceived to be "complete", or to have the characteristics that are appropriate for its distinct physical, biological and cultural attributes. The SIO can be used to describe the existing condition, standard for management, or desired conditions for the future. Figure 4 shows the SIO mapping for the Williams Ranger District.

Much of the District has Moderate SIO indicating that past and present management practices are visible but do not dominate the scenery, and are visible from secondary forest roads. Areas with High SIO are those places most visible from primary road corridors, system trails, and recreation sites, and have high quality scenic values. Very high areas are found in Designated Wilderness; managed for the highest scenic quality. Very few areas have Low SIO. These are typically limited to areas where management activities have altered the natural physical, biological or cultural features. Areas on the Williams Ranger District with these characteristics are designated utility corridors, active mineral claims, and places where woodland areas were converted to grassland areas (juniper pushes).

Related Information

***Accessibility*:** It is necessary to clarify how the Travel Management Rule affects access to National Forests for people with disabilities. Under section 504 of the Rehabilitation Act of 1973, no person with a disability can be denied participation in a federal program that is available to all other people solely because of his or her disability. In conformance with section 504, wheelchairs are welcome on all National Forest System (NFS) lands that are open to foot travel and are specifically exempted from the definition of motor vehicle in §212.1 of the final rule, even if they are battery powered. However, there is no legal requirement to allow people with disabilities to use OHV or other motor vehicles on roads, trails, or areas closed to motor vehicle use because such an exemption could fundamentally alter the nature of the Forest Service's travel management program (7 CFR 15e.103).

Motorized Mixed Use: Use of Forest Roads by both highway-legal and non-highway-legal vehicles is termed "motorized mixed use". Many licensed motorized users enjoy driving and riding roads throughout the District. Mixed-use becomes a safety concern especially when unlicensed minors illegally use higher speed, well-maintained Forest Service roads, such as maintenance level 3 through 5 roads that are maintained for passenger car vehicles. Higher speeds and inexperienced drivers increase the potential for accidents between full sized vehicles and OHV. Per Arizona State law, travel on open National Forest System passenger car roads would be limited to registered vehicles and licensed operators. Open National Forest System high-clearance roads, maintenance level 2 roads, would be open to operators of non-highway-legal OHV as well as other motorized vehicles (*Arizona Off-Highway Vehicle Guide OHV Laws and Places to Ride*; Arizona Game and Fish Department; June 2009).

Enforcement and Education: Implementation of the Travel Management Rule through the Williams Travel Management project is similar to any change in forest recreation management in that it requires the individual forest unit to provide adequate information to the public and in turn for the public to take responsibility for its actions and become knowledgeable about the changes. This partnership has been successful in past changes, and it is anticipated that within a few years the majority of the public would be in compliance. Beyond the information piece of enforcement, Forest Protection Officers and Law

Enforcement would provide enforcement. Also, a new Arizona State Statute, ARS §28-1174A-D, for safe and responsible operation of OHV's went into effect in January, 2009 (*Arizona Off-Highway Vehicle Guide OHV Laws and Places to Ride*; Arizona Game and Fish Department; June 2009). The Forest has cooperative law enforcement agreements with other agencies, Coconino County sheriff department, Williams Police Department, and Arizona Game and Fish Department (AZGFD). AZGFD additionally schedules aerial flights to monitor hunting activities during hunt seasons.

The District (and forest) would provide copies of the District Motor Vehicle Use Map free of charge. Field visits with forest users would be targeted to higher use periods (hunting season, fuel wood gathering in the fall, summer dispersed camping season, etc.). Existing brochures would be made available, and the District has received an Arizona State Off-Highway Vehicle grant to develop additional information stations and information.

LAND AND RESOURCE MANAGEMENT PLAN DIRECTION

Other Recreation Forest Plan Direction:

Direction for recreation management in the Kaibab Forest Plan includes:

Forest Plan Goals, p 11

The existing acreage in each Recreation Opportunity Spectrum class is maintained. Additional areas are closed to off-road vehicles use to protect sensitive soils, vegetation, and important aquatic habitats."

Forest Plan Goals, p 17

Provide a wide mix of outdoor recreation opportunities, including hunting and fishing, which range from primitive to urban, and that can respond to local and regional demands for water, forage, wildlife habitats, wood products and fire protection.

Manage a wide spectrum of desired settings that provide opportunities for the public to engage in a variety of developed and dispersed recreational activities, in concert with other resource management and protection needs.

Protect and enhance the scenic and aesthetic values of the Kaibab NF.

Maintain a variety of Forest trails, considering people's needs and desires for horseback and foot travel, winter sports, and motorized and challenge and adventure opportunities, as well as opportunities for the handicapped.

Forest Plan Goals, p 18

Establish off-road vehicle [ORV] closures as needed to maintain other resource objectives. Manage ORV use to provide ORV opportunities while protecting resources and minimizing conflicts with other users.

Coordinate the management of recreation resources and activities with the Grand Canyon National Park, Coconino County, and the State of Arizona to complement their roles in providing outdoor recreation.

Cooperate with the Arizona Game and Fish Department to achieve management goals and objectives specified in the Arizona Wildlife and Fisheries Comprehensive Plan. Support the Arizona Game and Fish Department in meeting its objectives for the state.

Forest Plan Goals, p 19
Provide and manage a serviceable road transportation system that meets needs for public access, land management, resource protection, and user safety. Provisions are made for the construction and reconstruction, maintenance, seasonal and special closures of Forest roads; and obliteration of unnecessary roads.

Maintain soil productivity and watershed condition. Identify and protect wetlands and floodplains.

Forest Plan Goals, p 23
Road or trail building in Mexican spotted owl protected activity centers should be avoided but maybe permitted on a case-by-case basis for pressing management reasons.

Forest Plan Goals, p 31
Manage road densities at the lowest level possible to minimize disturbance in Goshawk nest areas.

Forest Plan Goals, p 49 & 53
Provide off-road vehicle area closures and manage ORV use that occurs on other areas to maintain recreation, visual, heritage [cultural], soil, water, wildlife, and other resource values.

Forest Plan Goals, p 51 & 54
Identify and obliterate unneeded system roads and facilities in accordance with the Management Direction for Soil and Water Resources.

Provide integration and coordination for transportation in land and resource management planning and with other Federal, State, County, and other local transportation authorities.

Effects on Recreation and Scenic Resources

Alternative 1 – No Action

Direct and Indirect Effects –

Management of motorized recreation would not change from the existing condition in this alternative. The current road system would continue to be available for the public use (Levels 2-4). Current level 1 (closed)/decommissioned roads are not open to public. Unauthorized routes would remain unmanaged, and based on historic occurrences, would increase in number over time. Vehicles can travel and park anywhere on the District to access recreational opportunities, except current travel restricted areas. There would be no designated motorized trails and vehicles are allowed to retrieve any downed game animal on the District, except current travel restricted areas.

Recreation Resources

Recreation Opportunity Spectrum (ROS): In order to provide a diversity of settings and opportunities, the Forest Service uses the ROS as a management tool to inventory and describe recreation management objectives for national forest lands. The forest road system provides both opportunities for motorized recreation and access to the District to engage in motorized and non-motorized recreation activities. The existing condition is an open road system of about 1,500 miles of forest roads as well as about 200 miles of unauthorized routes. Figure 5 illustrates the existing road system and ROS mapping.

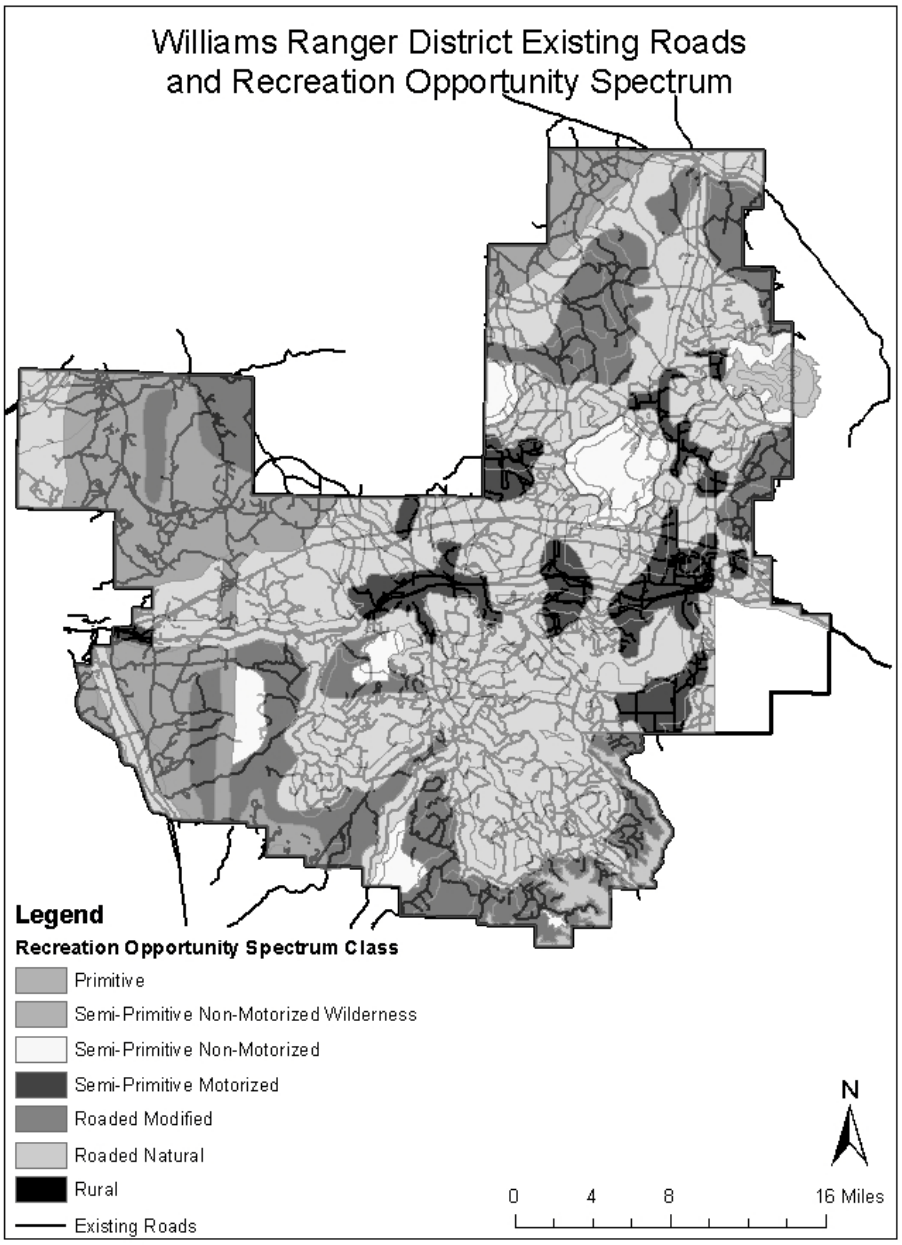

Figure 5: Existing road system and ROS classifications for the WRD

Motorized Recreation: The existing condition offers almost unlimited motorized recreation opportunities. There are approximately 1,700 miles of existing forest roads, open unauthorized routes, and few restrictions on motorized cross country travel. The Forest Roads vary in condition with high clearance roads providing some challenging riding opportunities. There are positive effects for motorized recreationists seeking motorized recreation opportunities.

Conflicts exist between ROS and the existing road system. For example, there are currently roads in areas desired for semi-primitive non-motorized (SPNM) recreation opportunities and the road density is often greater than desired in semi-primitive motorized (SPM) areas. There are long-term negative effects from

existing roads in SPNM areas, and no progress is made toward the desired condition for these areas. Retaining the existing road density in SPM areas does not meet the desired condition for these areas.

Motorized Cross Country Travel: There are positive effects for motorized recreationists seeking motorized cross-country recreation opportunities.

Continuation of motorized cross country travel and development of unauthorized routes is in conflict with Forest Plan direction for the attributes associated with the Recreation Opportunity Spectrum settings, scenic quality, type and degree of access, remoteness, level of development, social encounters, and the amount of on-site management as presented in Table 8. Unrestricted cross country motorized use would have negative effects on almost 95 percent of the District (excludes existing travel restricted areas). Even in places where motorized travel is characteristic of an ROS class, the unrestricted motorized cross-country travel threatens the remaining setting characteristics of those classes. This results in a negative effect to recreation resources as a result of unrestricted motorized cross country travel.

Specific negative effects from increasing motorized cross country travel with its associated dust and noise and creation of new unauthorized routes threatens the quality of recreation settings for all recreationists as vegetation is removed, sedimentation increases and the ability of soil to absorb water is decreased (Forest Service 2008).

Motorized Dispersed Camping: Recreation access points off the Forest Road system provide places where recreation users can engage in dispersed camping and other recreation activities. It is not uncommon to see individuals and groups camping throughout the project area. Many campers use existing unauthorized routes as access points, others develop new areas. The existing condition would not change opportunities for dispersed camping and recreation access.

Alternative 1 does not restrict development of recreation access points. As recreation use increases on the District, it is anticipated more areas would be developed. The District is increasing unable to comply with forest plan direction for the Recreation Opportunity Spectrum desired conditions when the characteristics of the settings, scenic quality, remoteness, level of development and number of social encounters increasingly move toward more developed ROS classes. The trend toward developed ROS classes has a negative effect on recreation resources.

Trails: The existing forest trail system is a non-motorized system. OHV riders can legally operate vehicles on the existing road system or ride cross-country. No opportunities for a developed motorized trail system would be provided but there is no restriction on creation of unauthorized routes. There are no effects on motorized users.

There are existing conflicts among trail users since some motorized users ride on the developed non-motorized trail system in violation of forest orders. The negative effects of illegal riding on the developed non-motorized trail system include creation of a two track trail (versus the constructed single trail tread surface), damage to existing trail construction features, trampling and death of trail side vegetation, reduction of wildlife viewing opportunities, noise from motors, increased dust from motorized vehicles and reduced user experiences due to unwanted (and illegal) motorized intrusions.

Non-Motorized Recreation: There would be no change in provision of non-motorized recreation opportunities under Alternative 1.

It is anticipated that recreation use would increase (Cordell 2009), and that user conflicts between motorized and non-motorized users would increase as well. The 2008 Arizona Statewide Comprehensive Outdoor Recreation Plan indicates that 24 percent motorized riders would like to increase their motorized recreation activities. Many people seeking non-motorized recreation activities complain about noise, dust, and unwanted vehicle intrusions into their activities. Alternative 1 would not restrict motorized activities including cross country travel, and this threatens the ability of the District to provide opportunities for high quality non-motorized recreation. These result in negative effects to the non-motorized recreation resource.

Hunting and Motorized Big Game Retrieval: There would be no change in hunting opportunities or motorized game retrieval.

Conflicts exist between hunters, some of whom find use of motorized vehicles for wildlife scouting or hunting disruptive. These conflicts would continue under Alternative 1.

Designated Wilderness: There are negative effects to recreation settings from a dense road system in Semi-Primitive Motorized areas or roads in Semi-Primitive Non-Motorized areas, and redundant roads near Designated Wilderness.

Scenic Resources

Scenic integrity objectives (SIO) were mapped and adopted in the KNF Management Plan. The predominant SIO on the District are moderate (SIO 3) and high (SIO 2).

Two elements used to produce SIO are landscape character and landscape visibility. The landscape character of an area gives it a visual and cultural identity. The combination of the physical, biological and cultural (human-created) attributes make each landscape unique. The visibility of the landscape helps determine the concerns that forest users may place on visual changes created by management activities and human created features. While virtually all national forest lands may be seen from somewhere, most people view national forest lands from travel ways and developed use areas.

Forest Service Handbook direction (USDA 2000) for moderate and high Scenic Integrity Objectives states:

- Moderate Scenic Integrity: landscapes where the valued physical, biological and cultural features appear slightly altered. Noticeable deviations remain visually subordinate to the landscape character being viewed.
- High Scenic Integrity: landscapes where the valued physical, biological and cultural features appear intact. Deviations may be present, but must repeat the form, line, color, texture and pattern common to the landscape character so completely and at a scale where they are not evident.

Motorized Recreation**:** Existing Forest Roads provide forest access and facilitate driving for pleasure and scenery and wildlife viewing recreation opportunities. Figure 6 compares the SIO to the existing road system. Note there are many redundant roads located adjacent to one another. While access to the forest is important in order to view scenery, it is detrimental to have a road system which detracts from scenery

by virtue of having parallel roads which are visible from one another. In these instances the landscape character cannot be expressed, thus lowering the scenic integrity.

> Motorized Cross Country Travel: Continuation of motorized cross country travel has the greatest negative effects on scenic quality and integrity. Proliferation of unauthorized routes destroys vegetation, creates un-natural contrasts of bare ground to vegetation, and destroys or damages special landscape features such as wildflowers, grasses, shrubs, rocky outcrops, springs and water containments. Concentration of motorized activities causes vegetation trampling or death, compacted soil, reduced water holding capacity and a potential for increased soil erosion (Forest Service 2008). It results in creation of linear tracks and rutting through the forest that do not naturally occur and do not mimic natural openings. As such, creation of unauthorized linear routes conflicts with the desired conditions for scenery management. The characteristic landscape is degraded by repeated motorized cross country travel, and over time, the scenic integrity of the entire District is lowered. Effects of motorized cross country use are increasingly visible and negative.

Motorized Dispersed Camping: Many recreationists enjoy pulling vehicles off of Forest Roads to disperse camp on the District. Many people use existing and unauthorized routes. These recreation access points are often delineated by a short route off a main road and an open, cleared area with an established fire ring. Cole (2004) compiled research about impacts of ecotourism, and found that most campers view a small area of impacts at a campsite as positive whereas a large opening that lacks vegetation as an area that is experiencing abuse, damage and is unhealthy. Similarly, the scenic impact of a small dispersed camp site is more acceptable and has less impact than a large cleared area. The smaller site better resembles the landscape character that includes openings and patchy vegetation. Creation of large group campsites is less acceptable since a larger area is impacted. Uncontrolled proliferation of camp sites as well as user development of large camp sites with growing amounts of bare soil both have a negative effect on the overall scenic integrity on the District.

Trails: There would be no changes in the non-motorized trail system under Alternative 1. User conflicts resulting from illegal operation of motorized vehicles on the non-motorized trail system would continue.

Negative effects on the scenic resource include trail widening (often to two tracks), destruction of trailside vegetation and churning of the trail trend resulting in increased dust production.

Non-Motorized Recreation: There would be no change in provision of non-motorized recreation opportunities under Alternative 1. User conflicts between motorized and non-motorized recreationists resulting in increased noise and production of dust would continue.

Hunting and Motorized Big Game Retrieval: There would be no changes in provision of hunting opportunities under Alternative 1. User conflicts among hunters resulting from increased noise due to operation of motorized vehicles would continue.

The effects of motorized game retrieval generally cause less impact to scenic resources than general motorized cross country travel since this type of travel is limited to hunting seasons (rather than year-round) and typically involves a limited number of trips to pick up a downed animal. It is less likely that

vegetation would be denuded as the result of one or two trips across the forest floor. When wet conditions are present, the effects are the same as with motorized cross country travel.

There are short-term, negative effects to scenery associated with motorized game retrieval. If resource damage occurs during wet conditions, the effects are the same as noted under "Motorized Cross Country Travel" above.

Designated Wilderness: There would be no effects to scenic resources in Designated Wilderness.

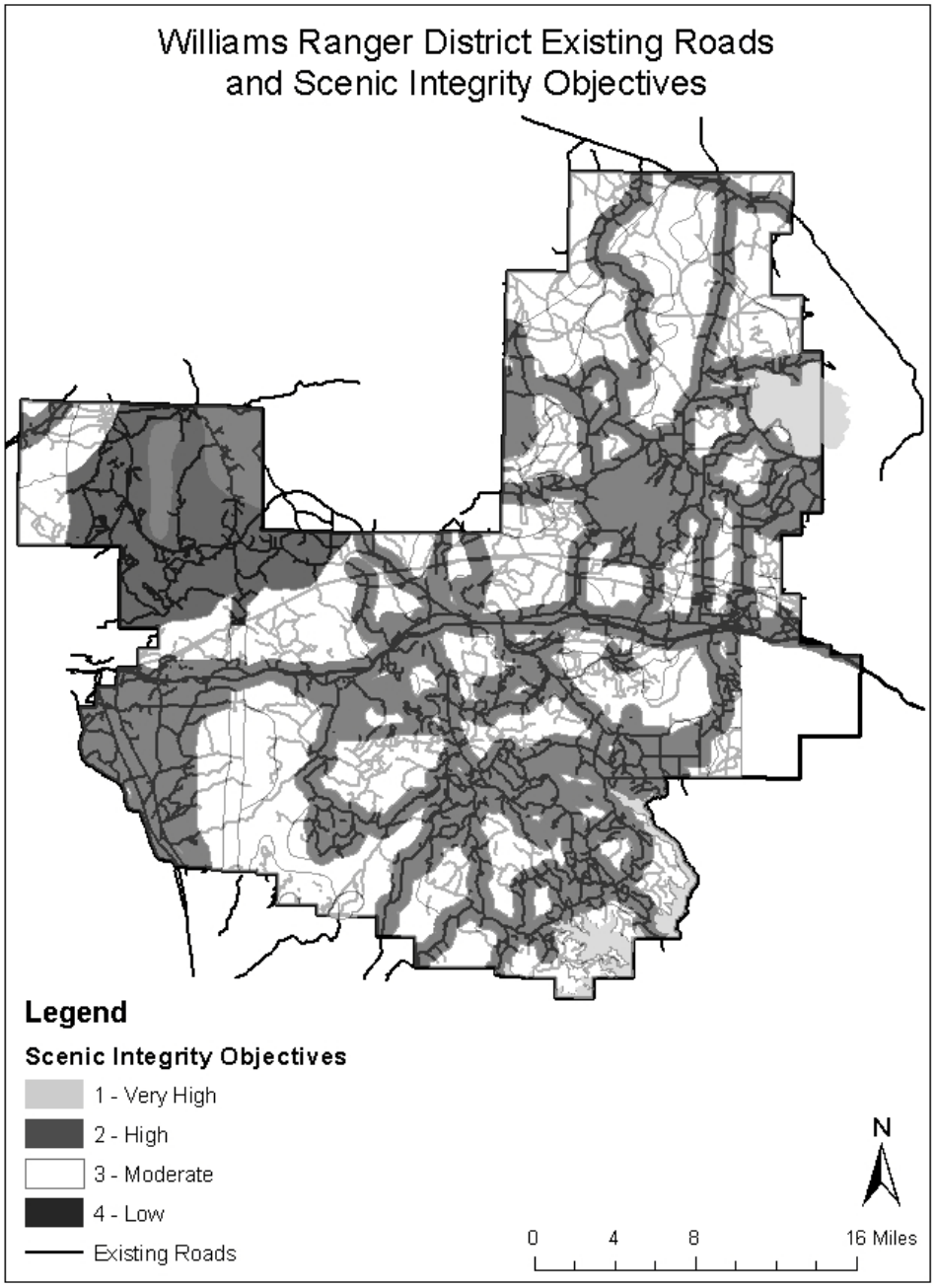

Figure 6: Existing road system and Scenic Integrity Objectives for the WRD

Alternative 2 – Proposed Action

Direct and Indirect Effects –

This alternative would prohibit motorized cross country travel. It would close 380 miles of existing Forest Roads and unauthorized roads, and allow roadside parking off the designated road system. It would provide for a 200 foot wide camping corridor along 220 miles of the designated road system, and also designate 18 miles short spur roads for access to recreation activities. It would provide for a minimum number of trips up to one mile off of the open system of roads for elk game retrieval during warm season elk hunts prior to the fourth Thursday in October. Convert 23 miles of existing National Forest System roads to motorized trails and constructing up to 2 miles of new motorized trails to form logical loops.

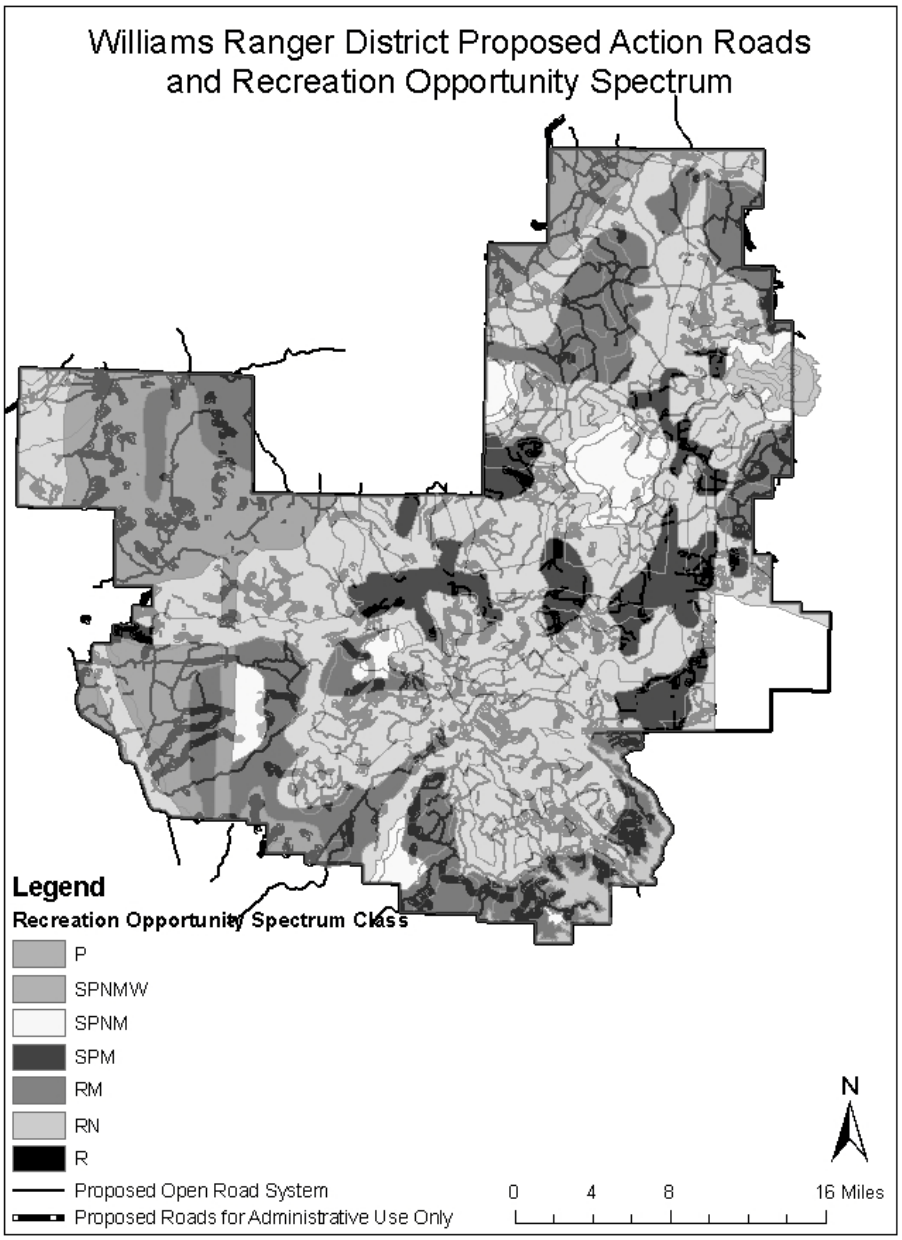

Figure 7: ROS classes under the road system proposed in Alternatives 2 and 3

Recreation Resources

This alternative provides the greatest mix of motorized recreation opportunities since it provides for motorized recreation on the designated road system and a motorized trails system, and improves non-motorized recreation opportunities by prohibiting motorized cross country travel.

Motorized Recreation: The proposed action would designate a system of open roads totaling about 1114 miles. This represents about a 25 percent decrease in the open road system. Figure 7 illustrates the proposed road system, routes closed to public travel, and recreation opportunity spectrum.

There would be fewer forest roads open to motorized recreationists. This would have a slight negative effect on motorized recreation opportunities.

Many redundant roads would be removed from the designated road system, decreasing road density overall. Some roads in ROS classes of semi-primitive motorized and non-motorized have been removed, especially near Designated Wilderness. These changes would improve the ROS in these locations over time and recreation opportunities in these areas would better represent the expected setting opportunities motorized or non-motorized activities. This would have a positive effect on desired conditions for ROS.

> Motorized Cross Country Travel: There would be negative effects to motorists who currently engage in motorized cross country travel since this recreation opportunity would be eliminated. Some effects may be mitigated by provision of a motorized trail system as described below.
>
> Motorized Trail System: Placement of a motorized trail system adjacent to communities on private land would create new user conflicts between the land owners and OHV users. It could potentially increase noise and dust at their homes, as well as, increase potential fire risk and trespassing. The 2008 Forest Service study of motorized cross country travel and user created trails showed that any level OHV disturbance can cause significant amounts of dust, increase erosion, runoff and sedimentation. Implementation of Alternative 2 would concentrate some OHV use and users who desire a motorized trail riding experience onto the proposed motorized trail systems. The proposed motorized trail system “north”, near Dogtown Lake area, is adjacent to private land, the proposed motorized trail system “south”, near Whitehorse Lake, is not.

Motorized Dispersed Camping and Recreation Access: Alternative 2 would restrict dispersed camping corridors to 220 miles of the designated road system. This would impact about 10,670 acres (dispersed camping is already occurring in some of this area). In addition to camping corridors, approximately 18 miles of unauthorized routes would be included in the designated road system for recreation access.

Provision of camping corridors allows recreationists to drive off a designated system road up to 200 feet to establish a camp. It does not restrict driving in the corridor, although the preferred use is to make one trip in to establish a camp, and one trip out. Camping corridors would have negative effects on recreation settings due to the decrease in vegetation cover, increased bare ground adjacent to the designated road system, reduction of scenic quality, and loss of isolation.

Conflicts occur when campers at one site encounter other visitors in or around their campsite. Camping corridors potentially introduce crowded or congested conditions that detract from the quality of dispersed camping opportunities. Farrell and Marion (2000) found that campers consider their campsite a temporary

home. They perceive boundaries around the campsite that offer isolation from other campers. Negative effects may result from designation of camping corridors. This conflict would not be resolved in Alternative 2.

Conflicts may occur when motorized and non-motorized campers are restricted to the same camping corridors. Recreation specialists have noticed an increasing common practice of group camping and associated OHV riding. There are negative effects for campers who do not engage in OHV riding, the noise and dust associated with motorized camps is incompatible. This conflict would not be resolved in Alternative 2.

Providing recreation access points for recreation users would offer higher quality dispersed camping opportunities. Farrell and Marion (2000) found that when campers are able to perceive relative isolation either from campsites separated from one another or from heavy screening, fewer conflicts occur. Alternative 2 would have positive effects for visitors desiring more isolated recreation experiences by driving a short spur road to access recreation opportunities including camping.

Trails: There would be no change to the provision of the non-motorized trail opportunities.

Existing user conflicts created when motorized users illegally ride on the non-motorized trail system may be eliminated by the provision of a motorized trail system as described below. The negative effects from noise, dust and unwanted motorized intrusions from motorized users would be eliminated.

> Motorized Trail System: Alternative 2 provides for a 25 mile designated system of motorized trails for motorized operators of vehicles less than 50 inches wide. Existing roads would be reconstructed for use as motorized trails. This would provide a different riding experience where the risk of encountering conventional motor vehicles is eliminated. The motorized trail system is favorable for inexperienced riders and operators including unlicensed minors. It also provides the minimum distance of 25 miles that riders indicate they ride per day (Arizona State Parks 2009). Two miles of motorized trail construction is included in this alternative. New construction would conform to the specifications for motorized trails. Just over one acre would be impacted by the construction. Alternative 2 would have a positive effect on motorized trail opportunities.

Non-Motorized Recreation: There would be no change in provision of non-motorized recreation opportunities.

The proposed action addresses the existing recreation user conflict between motorized and non-motorized recreationists by eliminating a primary contributing factor: unrestricted motorized cross country travel resulting in noise, dust, and unwanted motorized intrusions. This would have a positive effect to non-motorized recreation.

Hunting and Motorized Big Game Retrieval: There would be no change in provision of hunting opportunities.

Alternative 2 allows for motorized game retrieval. It specifies that one vehicle and the minimum number of trips, and is limited to early hunts. It would require hunters to use other non-motorized methods to retrieve game in the later hunting seasons. Based on the data provided it is estimated that there would be short term negative effects to some recreation settings totally about 350 acres per year from motorized

game retrieval. A limited number of trips through the forest to retrieve an animal would flatten vegetation, but would not cause the vegetation to die or be denuded.

The effects of restricting motorized game retrieval include hunter and outfitter guide dissatisfaction from having to use non-motorized means to retrieve game during later hunting seasons and for animal scouting and location.

There may be some short-term negative effects from illegal motorized use and non-compliance, especially during the first years of TMR implementation.

Outfitter-guides who provide non-motorized game retrieval services may be positively affected because of the potential increase in demand for such services for species other than elk.

Decrease in hunter conflicts during later hunting seasons resulting from motorized vehicle noise from riders traveling cross country scaring away animals. Some hunters complain that motorized cross-country travel whether for scouting or game retrieval scares away wildlife.

Designated Wilderness: There are no changes to recreation opportunities in Designated Wilderness. There are positive effects to recreation settings adjacent to Wilderness, in Semi-Primitive Non-Motorized and Semi-Primitive Motorized settings resulting from reduction of road density.

Scenic Resources

***Motorized Recreation*:** Motorized cross country travel would be prohibited and a designated system of open roads totaling about 1114 miles would be provided. This represents about a 25 percent decrease in the open road system. Figure 8 illustrates the proposed road system, routes closed to public travel, and scenery management objectives.

Many redundant roads are removed from the designated road system, as well as roads adjacent to Designated Wilderness. These are positive effects that would improve the scenic integrity of these locations over time, allowing the landscape character of the areas to be better expressed.

> Motorized Cross Country Travel: This alternative would prohibit motorized cross country travel. The change from 95 percent of the District being open to mostly closed has the greatest positive effects to the landscape character, sense of place, over overall scenic integrity, and would help the District to meet the scenic integrity objectives noted in the Forest Plan.

Motorized Dispersed Camping Corridors: Motorized dispersed camping corridors are proposed along 220 miles of the designated road system and 18 miles of unauthorized roads would be added to the designated road system for recreation access. Providing motorized dispersed camping corridors would impact about 10,670 acres (some of which has existing camping use or is not feasible due to terrain or vegetation). This represents about 4 percent of the total acres on the District.

Negative effects to scenery associated with dispersed camping include the change in landscape character (primarily the contrast created) when a camp site is established. At a motorized dispersed campsite, there is a route to the camp with a core activity area where vegetation is trampled or killed. In addition some vegetation may be impacted at the outside of the core area (Cole et al 2008). Overtime, researchers have found that after the initial impact of camp site creation, there are few additional impacts (Marion 1998).

Camp sites would show increased impacts if the number of users increases substantially, and when the activities in or around the campsite change (Cole 2004) such as establishment of group camps. A related concern is the type and quantity of use that the camping corridors would receive. Cole et al (2008) found that there were fewer new camp sites developed in areas of Grand Canyon National Park in a dispersed camping corridor than in designated camping areas. Cole et al (2008) also determined that the impacts at the sites were fairly stable over time after the initial disturbance occurred.

The scenic integrity would be lowered along the open road system over time as increasing numbers of camp sites in the camping corridors are developed in response to increased recreation use (Cordell 2009). The impact would be on about 4 percent of the District rather than the existing condition where about 95 percent of the District is potentially open to motorized cross country travel for camping and other recreation activities.

Designation of 18 miles of existing unauthorized routes to the proposed Forest Road system for recreation access would result in the addition of less than one percent of total road miles. Since these are existing routes, new effects as a result of being included in the designated road system would be minimal.

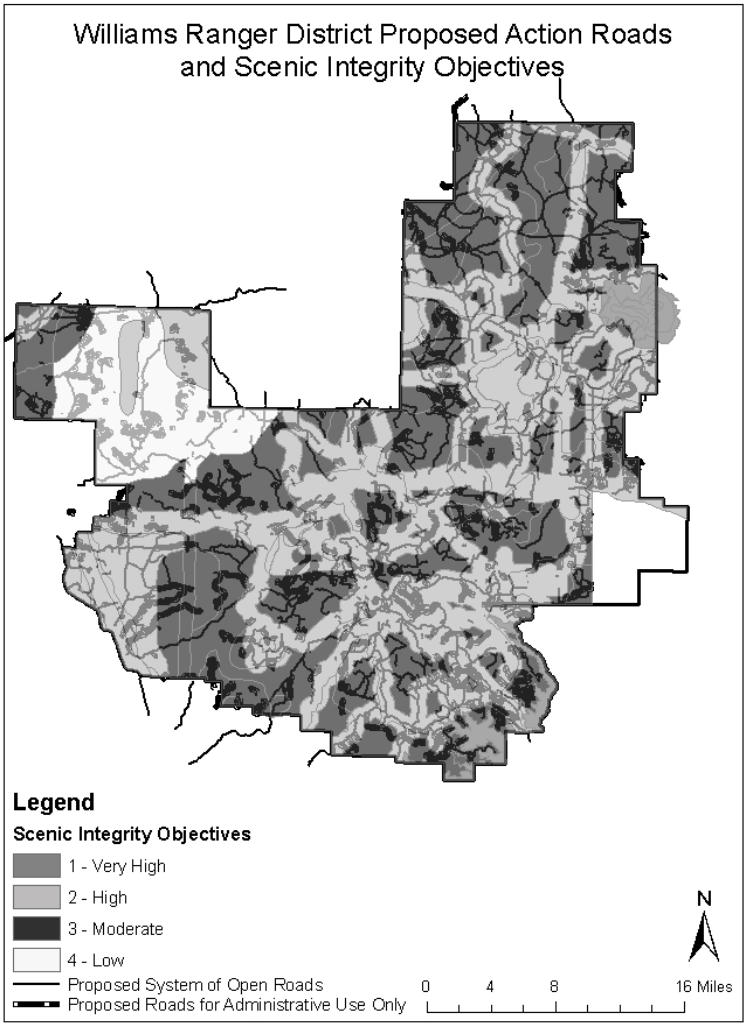

Figure 8: Scenic Integrity Objectives and the Proposed Action road system

Trails: There would be no change in the existing non-motorized trail opportunities as a result of implementation of this alternative.

Existing user conflicts from illegal motorized use of the non-motorized trail system would be reduced as a result of creation of a motorized trail system (analyzed below). This would have a positive effect on the non-motorized trail system since trail widening, trail side vegetation trampling, dust and noise would be reduced improving scenic resources.

> Motorized Trail System: The creation of 25 miles of motorized trail systems is proposed. Since 23 of the miles would convert existing system roads to trails, there would be no new impacts to scenic resources. Two miles of new trail construction to form loops would create a new impact of about 1 acre. The effects to the scenic integrity from the proposed motorized trail system are negligible.

Non-Motorized Recreation: There would be no effect to provision of non-motorized recreation opportunities from this Alternative.

Existing user conflicts between motorized and non-motorized recreation users would be reduced. Prohibition of motorized cross country travel would greatly reduce noise, dust and unwanted motorized intrusions. This would have a positive effect on scenic resources.

The designated road system would be reduced by 33 percent. Conflicts between the designated road system and KNF Forest Plan mapping of semi-primitive non-motorized ROS classes are reduced, although some conflicts remain. This alternative has fewer negative effects compared with Alternative 1.

***Hunting and Motorized Big Game Retrieval*:** There would be no changes in hunting opportunities as a result of this Alternative.

To assess impacts to scenery from motorized game retrieval, hunt data compiled by the Arizona Game and Fish Department (2009) was used, see Section 1.4. The alternative specifies that one vehicle and the minimum number of trips, and is limited to early hunts. Based on the data provided it is estimated that there would be short term negative effects to about 350 acres per year from motorized game retrieval. A limited number of trips through the forest to retrieve an animal would flatten vegetation, but would not cause the vegetation to die or be denuded.

Wet weather conditions are possible during the early elk hunting seasons, but state law prohibits travel off of roads if resource damage could occur (Arizona Game and Fish Department 2009). If motorized game retrieval occurs during wet weather conditions, the effects are similar to those evaluated in Alternative 1 for motorized cross country travel.

***Designated Wilderness*:** There are no changes to scenic resources in Designated Wilderness.

Alternative 3

Direct and Indirect Effects-

This alternative would close 380 miles of existing roads and allow for roadside parking for recreation access along the designated system of forest roads. In addition, recreation access would be provided along 18 miles of unauthorized routes that would be added to the designated road system. It allows for

motorized game retrieval for elk only during all elk seasons. No motorized trail system would be designated.

Recreation Resources

Motorized Recreation: The effects are similar as in Alterative 2. It also has greater positive effects for the desired conditions for ROS settings than Alternative 2.

Motorized Dispersed Camping: Under this alternative recreationists would camp along side of the designated road system or would drive down a short spur road to engage in recreation activities, including camping. This alternative provides for the sense of isolation that most users desire (Farrell and Marion 2000) in selecting a site for recreation activities. It is a first come-first served management approach.

The positive effects of this alternative would be a reduction in conflicts between recreationists, as they self-select their recreation access road.

This alternative would have slight negative effects on recreationists who are disappointed the dispersed campsite they desired is already occupied and they have to move to a different location.

Trails: There is no motorized trail system proposed in this alternative. OHV riders and conventional vehicle drivers are restricted to the designated system of open roads. Many of the high clearance roads offer challenging driving opportunities, and the road system provides access to most areas on the District.

Negative effects of Alternative 3 would include OHV rider dissatisfaction since no motorized trail riding opportunities are proposed.

Hunting and Motorized Big Game Retrieval: Effects are the same as Alternative 2.

Designated Wilderness: There are no changes to recreation opportunities in Designated Wilderness. There are positive effects to recreation settings adjacent to Wilderness, in Semi-Primitive Non-Motorized and Semi-Primitive Motorized settings resulting from reduction of road density.

Scenic Resources

Motorized Recreation: The effects of motorized recreation (including motorized cross country travel) are the same as Alternative 2.

> Motorized Cross Country Travel: Motorized cross country travel is prohibited in Alternative 2. Motorized recreationists would have negative effects from restricting their travel to the designated system of forest roads.
>
> There would be positive effects to ROS class settings resulting to prohibition of motorized cross country travel. Desired conditions would be improved in vegetation cover, natural settings provided adjacent to the designated road system, improved scenic quality, and greater sense of isolation.

Motorized Dispersed Camping: No camping corridors are included in Alternative 3. Motorized dispersed camping opportunities are limited to roadside parking on the designated road system, and use of designated roads for recreation access. Negative effects to dispersed campers may include not being able

to use their favorite dispersed campsite because it is already in use and having to select a different road to camp on.

Providing recreation access points for recreation users may offer higher quality dispersed camping opportunities. Farrell and Marion (2000) found that when campers are able to perceive relative isolation either from campsites separated from one another or from heavy screening, fewer conflicts occur. Alternative 3 would have positive effects for visitors desiring more isolated recreation experiences by driving a short spur road to access recreation opportunities including camping.

Trails: There would be no change in provision of non-motorized trail opportunities. User conflicts from motorized users illegally riding on the non-motorized trail system would not be resolved. No motorized trail system would be designated. There would be negative effects to motorized recreationists who would be limited to riding on the designated road system.

Non-Motorized Recreation: The effects are the same as in Alternative 2.

Hunting and Motorized Big Game Retrieval: There would be no change in provision o f hunting opportunities.

To assess impacts to scenery from motorized game retrieval, hunt data compiled by the Arizona Game and Fish Department (2009) was used (see section 1.4). The alternative specifies that one vehicle and one trip in and out are conditions of motorized game retrieval for elk. It is estimated that 350 acres per year would be impacted as a result of motorized game retrieval in this alternative. One trip through the forest to retrieve an animal would flatten vegetation, but would not cause the vegetation to die or be denuded. There would be short term negative effects from motorized game retrieval on the scenic resource.

Wet weather conditions are possible during the elk hunting seasons, but state law travel off of roads if resource damage could occur (Arizona Game and Fish Department 2009). The effects to scenic integrity of illegal motorized game retrieval during wet weather conditions are the same as for Alternative 2 motorized cross country use.

Designated Wilderness: The effects to Designated Wilderness are the same as in Alternative 2.

Alternative 4

Direct and Indirect Effects-

Alternative 4 closes 415 miles of forest roads (35 more miles than Alternatives 2 and 3) and provides for roadside parking along the designated system of roads. It prohibits motorized cross country travel. Dispersed camping is provided for in the same manner as Alternative 3. No motorized game retrieval is provided.

Recreation Resources

Motorized Recreation: The effects are similar to Alternatives 2 and 3. This alternative would close about 29 percent of the existing FS road system. There would be negative effects to motorized users from reducing miles in the designated FS road system.

Motorized Cross Country Travel: This alternative would prohibit motorized cross country travel. There would be negative effects to motorized cross country riders. The change from 95 percent of the District being open to mostly closed has the greatest positive effects to meeting ROS desired conditions. It would have the greatest positive effects on provision of recreation settings that meet KNF Management Plan direction.

Motorized Dispersed Camping: The effects on motorized dispersed camping are the same as for Alternative 3.

Trails: The effects of Alternative 4 are the same as described above for Alternative 3.

Non-Motorized Recreation: The effects of alternative 4 are similar to those described for Alternative 3. There would be slightly greater improvements in non-motorized recreation opportunities since 35 more miles of FS system roads would be closed.

Hunting and Motorized Big Game Retrieval: The effects of Alternative 4 are the same as described above for Alternative 3.

Alternative 4 prohibits motorized cross country travel of any type. This would make the greatest improvement in ROS class settings.

Many hunters have expressed a desire to use motorized game retrieval, as well as in scouting and locating wildlife and would be dissatisfied with this alternative. It would have negative effects to hunters who have used motorized game retrieval in the past. It also has the most potential for non-compliance during the first few years after implementation.

Some hunters would be pleased with the alternative since they have expressed concern about having their hunting success reduced because of cross-country motor vehicle driving. There would be some positive effects from prohibition of motorized game retrieval.

Alternative 4 provides the most opportunities for outfitters and guides to provide services to pack downed animals out.

Designated Wilderness: There are no changes to recreation opportunities in Designated Wilderness. The greatest positive effects to recreation settings adjacent to Wilderness, in Semi-Primitive Non-Motorized and Semi-Primitive Motorized settings resulting from reduction of road density would result from implementation of Alternative 4.

Scenic Resources

Motorized Recreation: Alternative 4 closes about 28 percent of the existing road system. It would provide about 1079 miles of roads in the designated system.

Many redundant roads are removed from the designated road system, as well as roads adjacent to Designated Wilderness. These are positive effects that would improve the scenic integrity of these locations over time, allowing the landscape character of the areas to be better expressed. This alternative has the most positive effects for scenic resources.

Motorized Cross Country Travel: This alternative would prohibit motorized cross country travel. The change from 95 percent of the District being open to mostly closed has the greatest positive effects to the landscape character, sense of place, over overall scenic integrity, and would help the District to meet the scenic integrity objectives.

Motorized Dispersed Camping: The effects on motorized dispersed camping are the same as for Alternative 3.

Trails: The effects on trails are the same as for Alternative 3.

Non-Motorized Recreation: The effects on non-motorized recreation are similar to Alternative 3. There would be slightly greater positive effects with this alternative.

Hunting and Motorized Big Game Retrieval: There would be no change in hunting opportunities with Alternative 4.

Alternative 4 prohibits motorized cross country travel of any type. This would make the greatest improvement in scenic integrity, and would most likely exceed the scenic integrity objectives in many locations.

Designated Wilderness: There is no change in scenic resources in Designated Wilderness.

Cumulative Effects

The cumulative effects area includes Williams Ranger District over a 20 year period from 2000 to 2020. Potential cumulative actions include management activities associated with past, present and future management activities as designated in Appendix 4.

Alternative 1 (No Action)

Recreation Resources

Recreation user displacement, noise and dust are effects from past, present, and reasonably foreseeable projects that have affected the recreation resources on the District. Past experience has shown that these effects are short in duration and localized to the project area. When combined with the direct and indirect effects of implementing Alternative 1, the cumulative effects on recreation resources are negligible given that activities (such as vegetation management and prescribed burning) do not all occur at the same time and are spatially distributed across the District. However, given that neighboring public lands are likely to restrict cross country travel, the District could experience a slight negative increase in illegal motorized intrusions into restricted and non-motorized recreation settings which would likely impede the attainment of the goals set forth in the Forest Plan.

Scenic Resources

Past experience has shown that implementation of best management practices and careful project design has helped minimize the effect from past activities on scenic resources. These effects (e.g. ground disturbance and dust) have been and are anticipated to continue to be temporary and localized to the project area. For example, over time the establishment of new vegetation and the regeneration of trees help to improve the scenic integrity of a timber stand with ground disturbance. The effects of past,

present, and reasonably foreseeable activities when combined with the direct and indirect effects of implementing Alternative 1 (i.e. creation of linear routes, rutting, etc.) would likely increase the negative effects on scenic resources. However, the cumulative effect is negligible because activities such as vegetation management and prescribed burning do not all occur at the same time and are spatially distributed across the District. This results in a fluctuating trend of effects on scenic resources defined by effects that are short in duration and localized to the project area. In addition, given that neighboring public lands are likely to restrict cross country travel, the District could experience a slight negative increase in illegal motorized intrusions into restricted and non-motorized recreation settings which would likely impede the attainment of Forest Plan scenic integrity objectives.

Alternative 2

Recreation Resources

Recreation user displacement, noise and dust are effects from past, present, and reasonably foreseeable projects that have affected the recreation resources on the District. Past experience has shown that these effects are short in duration and localized to the project area. When combined with the direct and indirect effects of implementing Alternative 2, the cumulative effects on recreation resources are negligible given that activities (such as vegetation management and prescribed burning) do not all occur at the same time and are spatially distributed across the District. Also, given that neighboring public lands are likely to restrict cross country travel, the District will likely experience some negative effects from illegal motorized use due to the allowances for motorized dispersed camping and motorized big game retrieval but because of similar restrictions, the cumulative effects are anticipated to be minimal and are not likely impede the attainment of the goals set forth in the Forest Plan.

Scenic Resources

Past experience has shown that implementation of best management practices and careful project design has helped minimize the effect from past activities on scenic resources. These effects (e.g. ground disturbance and dust) have been and are anticipated to continue to be temporary and localized to the project area. For example, over time the establishment of new vegetation and the regeneration of trees help to improve the scenic integrity of a timber stand with ground disturbance. The effects of past, present, and reasonably foreseeable activities when combined with the direct and indirect effects of implementing Alternative 2 (i.e. creation of linear routes, rutting, etc.) would likely increase the negative effects on scenic resources. However, the cumulative effect is negligible because activities such as vegetation management and prescribed burning do not all occur at the same time and are spatially distributed across the District. This results in a fluctuating trend of effects on scenic resources defined by effects that are short in duration and localized to the project area. In addition, given that neighboring public lands are likely to restrict cross country travel, the District could experience a slight negative impact from illegal motorized use due to the allowances for motorized dispersed camping and motorized big game retrieval but because of similar restrictions, the cumulative effects are anticipated to be minor and are not likely to impede the attainment of Forest Plan scenic integrity objectives.

Alternative 3

The cumulative effects of implementing Alternative 3 would be the same as Alternative 2.

Alternative 4

Recreation Resources

Recreation user displacement, noise and dust are effects from past, present, and reasonably foreseeable projects that have affected the recreation resources on the District. Past experience has shown that these effects are short in duration and localized to the project area. When combined with the direct and indirect effects of implementing Alternative 4, the cumulative effects on recreation resources are negligible given that activities (such as vegetation management and prescribed burning) do not all occur at the same time and are spatially distributed across the District. Also, given that neighboring public lands are likely to restrict cross country travel, the District may experience some negative effects from illegal motorized use but because the impacts would be isolated, the cumulative effects are anticipated to be minimal and are not likely impede the attainment of the goals set forth in the Forest Plan.

Scenic Resources

Past experience has shown that implementation of best management practices and careful project design has helped minimize the effect from past activities on scenic resources. These effects (e.g. ground disturbance and dust) have been and are anticipated to continue to be temporary and localized to the project area. For example, over time the establishment of new vegetation and the regeneration of trees help to improve the scenic integrity of a timber stand with ground disturbance. The effects of past, present, and reasonably foreseeable activities when combined with the direct and indirect effects of implementing Alternative 4 (i.e. creation of linear routes, rutting, etc.) would likely increase the negative effects on scenic resources. However, the cumulative effect is negligible because activities such as vegetation management and prescribed burning do not all occur at the same time and are spatially distributed across the District. This results in a fluctuating trend of effects on scenic resources defined by effects that are short in duration and localized to the project area. In addition, given that neighboring public lands are likely to restrict cross country travel, the District may experience some negative effects from illegal motorized use but because the impacts would be isolated, the cumulative effects are anticipated to be minor and are not likely to impede the attainment of Forest Plan scenic integrity objectives.

3.2 Soils, Watershed and Air Quality

Affected Environment

Soils

The Williams Ranger District is characterized mostly by plains with some hills, cones, mountains, and escarpments. Gentle slopes of less than 15 percent occur on more than three quarters of the District. Slopes of 15 to 40 percent occur on 18 percent of the District, while slopes of greater than 40 percent occur on only 6 percent of the District.

The District is dominated by grassland and savanna soils. Half of the District is covered by the Mollisols soil order (soils that developed under grassland or savanna vegetation and generally contain more clay and less rock). Some are Pachic Argiborolls, the most productive grassland soils in this region. Another one sixth of the District is covered by mollic subgroups (soils that developed under savanna vegetation with a lot of grass) of the Alfisols soil order. The remainder of the District has Alfisols (well developed

soils with more clay that formed mostly under forest cover), Inceptisols soil order (moderately developed soils that formed mostly under woodland or shrub plant communities), Entisols (young soils with very little development), and Vertisols (soils that swell or churn with added moisture and shrink or crack after drying due to the presence of a high amount of montmorillonitic clay minerals). Approximately three percent of the District is covered by rock outcrop instead of soils.

Wetland (aquic) soils cover approximately one percent of the Williams District. These soils are characterized by a high water table that fluctuates with the seasons and the weather. Wetlands are found in basins and along drainages. All the natural wetlands on the District are ephemeral, rather than perennial.

The majority of the soils on the District are moderately deep (20 to 40 inches deep) to deep (greater than 40 inches deep). Approximately one quarter of the District has shallow (less than 20 inches deep) soils and/or rock outcrop.

Most soils on the District have a cover of rock fragments. The range of rock cover is 5 to 70 percent, with an average cover of 40 percent. Soil surface textures are mostly clay loam or loam with some areas of very fine sandy loam, fine sandy loam, or sandy loam. Most soil surface horizons are gravelly or cobbly, but a few areas are stony or have flagstones. Soils without rock fragments are extremely rare on the District.

Subsurface horizons are mostly in the clayey or fine particle size class, but some soils are fine-loamy or loamy. The majority of subsurface horizons have a large amount of gravel and/or cobbles.

Highly erodible soils are found on approximately one quarter of the District. Erosion hazard for the Williams District is as follows: slight (74 percent of the area), moderate (8 percent), and severe (18 percent). Soils with a moderate to severe erosion hazard are generally found on slopes that exceed 15 percent. If a large amount of cover is removed from soils that have a moderate to severe erosion hazard, an unacceptable rate of sheet, rill, and/or gully erosion will occur that will lead to a decline in site productivity.

For soils with a severe erosion hazard, the average minimum plant ground cover (plant basal cover and litter) required to protect the soils from an unacceptable rate of erosion is 50%; for soils with a moderate erosion hazard, it is 25%.

According to the Terrestrial Ecosystem Survey completed in 1979-86, soils in unsatisfactory condition (i.e. an unacceptable rate of erosion is occurring due to inadequate plant and litter ground cover) may already be found on 20% of the area.

Some soil types are more susceptible to compaction, rutting, ponding, and water erosion when they are crossed by vehicles or roads. Most of this risk occurs during periods when moisture is received and roads are wet. Generally November through April and July through September are times when snow or rain is expected and roads and soils may be susceptible to damage. Soils at high risk have low bearing strength when wet.

Approximately 3/4 of the Williams District is covered by soils that have low bearing strength when wet. Ruts are easily created on these soils and on roads that traverse these soils. The driving surface is

damaged and may concentrate water flow that can create gullies on adjoining land. Cross country vehicle use can create gullies and compaction that reduce the productivity of the soil. Compacted soils have reduced infiltration and pore space for air and water. Puddling leads to plugged surface pores in the soil. Plants have reduced survival and productivity when aeration and moisture are scarce.

In a semiarid climate, it is often difficult to re-vegetate the land after a disturbance, such as that caused by off road vehicle travel. The Terrestrial Ecosystem Survey rates the soils according to their re-vegetation potential. On the Williams District, 52 percent of the soils have a low re-vegetation potential, 41 percent have a moderate potential, and only 7 percent have a high potential.

The Terrestrial Ecosystem Survey contains ratings for each soil that describe the limitations for the construction of unsurfaced roads and campgrounds and for the use of off highway vehicles. On the Williams District, 93 percent of the area has a severe limitation for the construction and use of unsurfaced roads. Five percent of the area has a moderate limitation. Fifty-four percent of the area has a severe limitation for the construction and maintenance of campgrounds, while 42 percent has a moderate limitation. These limitations mean that it is extremely difficult to construct and maintain native surface roads and campgrounds. Forty-one percent of the area has a severe limitation for the use of off highway vehicles, while 47 percent has a moderate limitation. This limitation means that the majority of the Williams District is covered by soils that could be damaged by off highway vehicles.

Watershed

The Williams Ranger District is distributed across ten 5th level watersheds. Approximately 34 percent of the District drains into the Lower Colorado River – Lake Mead watershed through the Havasu Canyon and Lower Little Colorado River watersheds from these 5th level watersheds: Spring Valley Wash, Miller Wash, Cataract Creek, and Upper Cedar Wash. Approximately 66 percent of the District drains into the Verde watershed through the Big Chino – Williamson Valley and Upper Verde watersheds from these 5th level watersheds: Ash Fork Draw – Jumbo Tank, Upper Partridge Creek, Lower Partridge Creek, Hell Canyon, Sycamore Creek, and Grindstone Wash – Verde River.

The highest elevations in a watershed are cooler, moister, and of higher productivity than lower elevation arid climates. Higher elevations produce a smaller portion of the overall sediment yield, but produce more water.

No perennial streams exist on the Williams Ranger District; however, ephemeral and intermittent streams are common. They flow only when the snow is melting or during and shortly after heavy rainstorms. The flow regimes are characterized as flashy with rapidly rising peaks in response to rapid snow melt in the spring and in response to high-intensity short-duration rain storms in the summer. Vegetation found along the edges of these channels does not thrive in moist environments and is not considered riparian.

Riparian vegetation is uncommon on the Williams District. It is most often associated with wetlands on the District, but may also be found at springs, ponds, reservoirs, and short reaches of intermittent streams. Riparian plants found include: cottonwood, willow, ash, walnut, sedges, and spikerush.

Streams on the Williams District that have short reaches with perennial pools and/or intermittent water include: Hell Canyon, JD Canyon, MC Canyon, Upper Bear Canyon, and Upper Johnson Canyon. The

riparian segments are associated with springs, groundwater, and/or small natural pools within the drainages.

Springs found on the Williams District include: Big, Buck, East and West Elk, Hitt, Laws, LO, Lower and Upper McDermit, Rosilda, and Willow. Riparian vegetation is found at these springs.

No large natural lakes exist on the District.

The Williams District has many large constructed reservoirs including: Cataract Lake, Dogtown Lake, Kaibab Lake, JD Dam, Perkins Tank, Scholz Lake, and White Horse Lake. Riparian vegetation is found along parts of the shorelines of most of these reservoirs.

There are numerous constructed earthen tanks that provide water to livestock and wildlife. The tanks are ephemeral. In moderate to severe droughts, the tanks may be dry. Most of the earthen tanks do not support aquatic or riparian vegetation due to the semiarid climate, frequent droughts, low runoff potentials, and lack of stable water levels. However, riparian vegetation has developed around the perimeter of a few tanks.

Wetlands cover approximately one percent of the District. Many of the wetlands are called lakes because they hold surface water for a few weeks to months after the snow melts. No wetland on the Williams District has surface water year-round, except during exceptionally wet years. The largest wetlands on the District include: Coleman Lake, Cougar Park, Davenport Lake, Dry Lake, Duck Lake, Holden Lake, Mineral Lake, Moritz Lake, Pine Flat, and Sunflower Flat.

Water Quality

Cataract Lake, Dogtown Lake, Kaibab Lake, JD Dam, Perkins Tank, Scholz Lake, and White Horse Lake are all found on the Williams District. Dogtown and Kaibab Lakes provide part of the water supply for the City of Williams. The City also maintains other reservoirs, such as City and Santa Fe, for the city water supply. All of these large reservoirs are used for recreation, including camping, picnicking, boating, swimming, and fishing. The Arizona Game and Fish Department stocks all reservoirs on the District, except Scholz Lake, with fish.

The largest potential issues facing water quality, related to forest, range, wildlife, and recreation management, are turbidity, siltation, and fecal coliform. Grazing, construction projects, forest thinning, wildfires, prescribed burns, and off road driving can result in decreased vegetative cover and increased erosion, thus contributing to siltation and turbidity. Fecal coliform issues could be caused by livestock waste, wildlife droppings, or human waste.

Ephemeral and intermittent drainages contribute water and sediment to perennial streams, intermittent streams, reservoirs, earthen ponds, and wetlands. In the lower elevation pinyon-juniper woodlands, the combination of geology and relatively dry climate results in naturally higher amounts of bare soil, soil erosion, and sediment yield when compared to higher elevation ecosystems.

Air Quality

The Williams Ranger District is not located next to large population centers, power plants, or industrial facilities. The District is located approximately 100 miles away from two active coal fired power plants.

These plants are located to the northeast in Page, Arizona and to the east in Joseph City, Arizona. The prevailing southwest winds on most days of the year carry pollution from these plants farther away from the District. The District is located approximately 100 miles from Phoenix, Arizona, 125 miles from Las Vegas, Nevada, and 300 miles from Los Angeles, California. Pollution and haze from these and other urban/industrial centers does drift over the District. Visibility is sometimes affected by this haze. Wildfires, prescribed fires, and wood stoves also contribute smoke, particulates, and haze to the District periodically.

The Williams Ranger District is not located within an air quality Non-Attainment Area designated by the Arizona Department of Environmental Quality (ADEQ). The closest Non-Attainment Areas are the Bullhead City Area for PM10 (particulate matter) and the Phoenix Area for PM10 and ozone.

The Regional Haze Rule (40 CFR 51.309(d)(7)) requires states to assess and reduce pollutants that cause haze in order to improve visibility at Class I Areas, including Grand Canyon National Park and Sycamore Canyon Wilderness.

The Regional Haze State Implementation Plan for the State of Arizona from December 23, 2003 states that "road dust is not a measurable contributor on a regional level to visibility impairment in the 16 Class I areas. Due to this finding, no additional road dust control strategies are needed…" The Plan also states that the State of Arizona will "perform further assessments of road dust impacts on visibility. Based on these assessments, if road dust emissions are determined to be a significant contributor to visibility impairment, the State of Arizona commits to implement emissions management strategies…"

The Kaibab National Forest must submit prescribed burn plans to ADEQ for approval in order to minimize smoke, but it is not required to reduce fugitive dust or vehicle emissions.

The majority of roads on the Williams Ranger District are unpaved. These gravel and dirt roads are sources of fugitive dust in dry weather, especially when there is frequent vehicle traffic. Vehicles driving cross country may also create fugitive dust.

Existing Condition

Roads, by design, are compacted soils that are impermeable to infiltration of precipitation; yield large volumes of runoff; and are generally unable to support vegetation.

Some Forest System Roads on the Williams District are located on soils with a moderate to severe erosion hazard. The only way to prevent accelerated erosion on naturally erodible soils is by maintaining at least a minimum amount of vegetative cover. Roads generally do not have vegetative cover at all. Roads on erodible soils present maintenance challenges. Native surface roads created or built without good drainage features are easily damaged by raindrop impact, concentrated runoff, and mechanical disturbance by vehicle tires. The road surface washes off, ruts are created, and ponding occurs. The road itself may become a gully. The erosion and concentrated flow from the road may cause a head cut next to the road, leading to a new gully or drainage.

Sustainable roads may be constructed on erodible soils; but they must have a hard surface, such as gravel or asphalt, and drainage features, such as a raised bed, crowning, water spreading ditches, parallel ditches, and culverts. Construction of sustainable roads is very expensive.

Some roads follow ephemeral drainages, leaving them very vulnerable to water erosion and more maintenance problems. Soil compaction, removal of vegetative cover, and channeling of water by the road all contribute to increased rates of erosion, runoff, and sedimentation of downstream water bodies.

Cross country motorized vehicle travel is especially damaging to soils with a moderate to severe erosion hazard. The vehicle tires compact the soil, create ruts, and remove vegetative cover. These impacts can cause erosion. When slopes are steep, vehicles generally drive straight up the slope instead of across the side of a hill. This practice may increase safety for the operator, but it also may increase damage to the soil due to spinning tires creating compaction, ruts, and holes. These ruts become new drainages for the collection of runoff, leading to more erosion and sedimentation.

Erosion reduces the productivity of the site where it occurs. The loss of topsoil reduces the fertility, permeability, water holding capacity, and stability of soils. Water runs off quickly without benefiting the plants. The soils are then in unsatisfactory condition.

According to the Terrestrial Ecosystem Survey completed in 1979-86, soils in unsatisfactory condition (i.e. an unacceptable rate of erosion is occurring due to inadequate plant and litter ground cover) were found on 20% of the District. Roads and cross country tracks created on these soils increase erosion.

Unauthorized routes occur on all types of soils, including highly erodible soils. Many of these routes should be reclaimed in order to prevent soil erosion, sedimentation of downstream water bodies, and loss of vegetation and soil productivity. However, it is difficult to re-establish vegetation in many areas of the Williams District due to the semi-arid climate and frequently erratic precipitation. In addition, many soils are inherently difficult to re-vegetate. The Terrestrial Ecosystem Survey rates soil types according to their potential for re-vegetation. Over one half of the District has soils with low potential for re-vegetation.

Soils with high potential for re-vegetation may recover naturally in one to two years. Moderate potential soils may recover naturally in two to five years. Low potential soils may not recover for many years or not at all. Soils with low potential for re-vegetation are also difficult to re-seed artificially, especially during periods of drought. If the topsoil has been compacted or removed as a result of motorized cross country travel, it will be even harder to re-vegetate. Consequently, scars from motorized cross country vehicle travel take a long time to heal. These scars could continue to erode over time, especially if they occur on soils with a moderate to severe erosion hazard. More topsoil could be lost, making re-vegetation even more unlikely without a large amount of work, e.g. de-compaction, raking, adding topsoil, adding mycorrhizal fungi, seeding, mulching, etc. Some tracks could continue to be used again and again, so that they could become permanent routes.

Approximately 3/4 of the Williams District is covered by soils that have low bearing strength when wet. Ruts are easily created on these soils and on roads that traverse these soils. The driving surface is damaged and may concentrate water flow that can create gullies on adjoining land. Cross country vehicle use can create gullies and compaction that reduce the productivity of the soil. Compacted soils have reduced infiltration and pore space for air and water. Puddling leads to plugged surface pores in the soil. Plants have reduced survival and productivity when aeration and moisture are scarce.

The prevalence of soils with low bearing strength makes it necessary to avoid driving on low standard and low maintenance roads when they are wet. Safe, sustainable travel is possible on roads on these soils when dry. Vehicle travel on dry soils does not generally cause compaction that lasts for a year or more. Dry soil particles do not bind together as tightly and deep ruts are not generally created. The freeze/thaw cycles of winter and the shrink/swell properties of some soils with montmorillonitic clays tend to break up the compacted layers. Vehicle travel on moist or wet soils, however, will cause long term compaction of many soils. It is possible, however, to travel on roads during wet weather if they have a hard surface and good drainage design.

The Kaibab National Forest enacted a Wet Weather Roads Policy in order to reduce the damage to roads and soils on adjoining lands. Wet weather motorized travel is restricted to improved roads with hard surfaces and adequate drainage features. This policy may be enacted by each District Ranger as needed. It is a temporary restriction that is lifted when the risk for road damage has decreased.

Roads effectively increase the drainage network by facilitating water movement off the impermeable road surfaces into the natural drainage system at road-stream intersections. These relationships between roads and streams can increase stream flow volume and increase the peak flow characteristics of the hydrologic regime during storm events or during spring runoff. Former roads that have been de-compacted and effectively vegetated produce a fraction of the runoff when compared to a compacted road surface. When runoff is reduced, more water is available on site for plant growth.

Two of the largest potential water quality issues on the Williams District are turbidity and siltation. Unmaintained dirt roads and cross country vehicle tracks can result in decreased vegetative cover, rapid runoff, and increased erosion, thus contributing to siltation and turbidity. Sediment is deposited in downstream water bodies or in lower gradient stream channels. Earthen ponds and reservoirs lose capacity, fish eggs and insect eggs and larvae may be killed by the weight of material or the lack of oxygen, and floodplains may be expanded. Roads that follow drainages may contribute the most sediment. These roads may also be damaged by flooding and erosion.

The majority of roads on the Williams District are unpaved. Gravel and dirt roads can be sources of fugitive dust during dry periods, especially if they receive frequent vehicle traffic. Vehicles driving cross country may also create fugitive dust.

Forest Plan Direction

Relevant direction from the Kaibab National Forest Land Management Plan (1988, as amended) sets a goal to:

- Maintain soil productivity and watershed (i.e. soil) condition. Rehabilitate non-productive lands on a planned basis to eliminate unsatisfactory watershed condition by 2020. Maintain a high quality sustained water yield for Forest users and others. Identify and protect wetlands and floodplains.

Effects on Soil, Watershed and Air Quality Resources

Methodology

The soils analysis is largely based on information gathered from the Williams Ranger District GIS database and the Terrestrial Ecosystem Survey of the Kaibab National Forest. The Terrestrial Ecosystem Survey (TES) was consulted for information on many soil and watershed characteristics including: the suitability of soils for native surface roads, erosion hazard ratings, soil condition ratings, and re-vegetation potential. More information on methods is available in the soils, watershed, and air specialist report.

Alternative 1 – No Action

Direct and Indirect Effects

Recreation and other land uses are expected to increase over the years, as the population grows in the Southwest. More people will use the Forest System Roads on the District, leading to a higher need for road maintenance. If funding for roads remains at current levels, most roads may not receive needed maintenance on a regular basis. Many dirt roads, especially those that are located on erodible soils or along drainages, could cause accelerated erosion and sedimentation of water bodies.

Unauthorized cross country routes would continue to be used. More unauthorized cross country routes and dispersed camping areas would be developed by Forest users, especially in areas near scenic views, water, popular hunting areas, developed recreation areas, and private lands. The number of stream crossings and the number of unauthorized routes that follow drainages is likely to increase. Cross country tracks and dispersed camping areas would continue to be created by Forest users on soils with a moderate or severe erosion hazard, on soils in unsatisfactory or impaired condition, and on soils with a low re-vegetation potential. These disturbances could cause more accelerated erosion and runoff, more sedimentation of water bodies, and the loss of soil, watershed, and vegetative health and productivity.

New cross country tracks would continue to be created on soils that have low bearing strength when wet. Many Forest System Roads already exist on this type of soil. Implementation of the Wet Weather Travel Policy when soil moisture conditions warrant will help reduce damage to System Roads and to the soils in the Forest.

Vehicles would continue to create fugitive dust along all Forest roads and cross country tracks. The amount of dust would probably increase as more vehicle tracks are created across the District.

Continuation of current management (Alternative 1) could increase the stress on plants that are already dealing with higher temperatures and a long-term drought. These weather conditions could be caused by global climate change. The plants could become less resilient and more susceptible to mortality. As bare ground increases, there would be an increase in soil erosion and sedimentation of water bodies. There would also be an increase in fugitive dust.

Continuation of current management (Alternative 1) would lead to a continuing decline in soil and watershed stability, condition, and productivity. It would also lead to an increase in fugitive dust. Compared to all other alternatives, Alternative 1 would not improve the protection of soils, watersheds, or air quality at all.

Implementation of Alternative 1 (No Action) would not meet the Kaibab Forest Plan goals of maintaining soil productivity and watershed condition and of protecting wetlands and floodplains.

Alternative 2 – Proposed Action

Direct and Indirect Effects

Recreation and other land uses are expected to increase over the years, as the population grows in the Southwest. More people will use the Forest System Roads on the District, leading to a higher need for road maintenance. The Forest Service could provide better road maintenance, with current funding levels, because there would be 25% fewer miles of road to maintain for public use. It might even be possible to make road improvements to some open roads (i.e. hard surfaces and/or drainage enhancements). The smaller public road system would be in better condition, so there would be less erosion and sedimentation caused by the open Forest Service System Roads.

The closed (ML 1) roads would not be obliterated and re-vegetated at this time. Unless these closed roads are de-compacted, stabilized, and re-vegetated, they may continue to cause erosion, rapid runoff, and sedimentation over time. The roads may also continue to function as artificial drainages, intercepting and diverting water away from the vegetation on the forest. All stream crossings will remain. It is likely that the roads will cause less erosion and sedimentation than unmaintained roads that are used frequently, but it will take many years for these roads to naturally re-vegetate.

There are already approximately 20 miles of closed roads on the Williams District. Some of these roads have been re-vegetated either naturally or artificially by Forest Service seeding activities. Alternative 2 (Proposed Action) would close 380 more miles of road. Soil, vegetation, and watershed recovery would occur much more quickly if the Forest Service could obliterate and re-vegetate many closed roads in the future. If obliteration and re-vegetation is not possible due to budget constraints, the most actively eroding segments of roads could be stabilized to provide better drainage and prevent erosion.

Alternative 2 (Proposed Action) does not propose to close all the Forest System Roads that could be causing erosion and sedimentation. Many roads, that would remain open, follow drainages and/or are located on soils that have a moderate to severe erosion hazard. Some open roads are located on impaired or unsatisfactory condition soils. These roads could be evaluated for possible closure and/or relocation in the future as part of another analysis pursuant to the NEPA. If the roads are important for management or recreation access, then they could be improved with a hard surface and/or enhanced drainage features.

Alternative 2 (Proposed Action) would designate 23 miles of Forest System Roads as motorized trail systems for vehicles that create tracks of 50 inches or less. An additional 2 miles of new road would be constructed in order to create loops. Some of these roads have soil/watershed concerns such as erodible soils, low bearing strength, and proximity to drainages. The trails could be upgraded with some design features, such as water bars, in order to minimize problems. However, it is expected that some accelerated erosion and sedimentation would occur.

Alternative 2 (Proposed Action) would prohibit most cross country motorized vehicle travel. Forest users would not create as many new unauthorized routes at random along drainages, on erodible soils, on soils in poor condition, on soils with low bearing strength when wet, or on soils with low re-vegetation potential. Implementation of Alternative 2 (Proposed Action), with its reduction in cross country vehicle

travel, would cause a reduction in compaction, bare ground, ruts, erosion, runoff, sedimentation, and water diversion.

Current unauthorized cross country routes would not be obliterated and re-vegetated at this time. The effects of leaving these routes on the landscape would be similar to leaving Forest System Roads closed, but not re-vegetated. However, since unauthorized cross country routes are often very poorly located, the effects of leaving them on the landscape will usually be worse in terms of erosion and sedimentation.

Limited cross country motorized travel would be allowed when permitted for the purposes of forest thinning, fuelwood gathering, livestock management, and other forest management activities. Best management practices and mitigation measures are in force during these projects in order to protect the soils and watershed. The purposes of these activities are to provide multiple uses and to improve the health of the forest. The benefits of opening the canopy, restoring understory vegetation, reducing fire hazard, and distributing livestock more evenly across the rangeland exceed the damage caused to the soils and watersheds by this limited vehicle use. In the absence of these management activities, it is possible that a high intensity wildfire and/or overgrazing could damage the vegetation, soils, and watersheds for a long period of time.

To meet State big game harvest and management objectives, Alternative 2 would allow the limited use of motor vehicles within one mile of open roads for the retrieval of legally harvested and properly tagged elk. The purpose of this activity is to make it easier for hunters to keep the population of elk in balance with the habitat. Prevention of overgrazing by elk will benefit vegetative diversity and productivity, soil stability and productivity, and watershed health. It is expected that the benefits of elk population management would exceed the damage to the vegetation, soils, and watersheds by vehicle use. However, it is impossible to avoid some damage to plants and soils when driving vehicles cross country. Soils are not generally saturated for long periods during September and October when cross country motorized elk retrieval would be allowed. If soils are saturated, hunters would be expected to refrain from driving cross country. Hunters would be expected to take the shortest route possible. Hunters would also be expected to refrain from creating unacceptable resource damage at any time. If monitoring shows that unacceptable resource damage is occurring from motorized elk retrieval, the Forest Service could place further restrictions on the activity.

Limited motor vehicle travel would be allowed in order for campers to access dispersed camping sites within designated corridors along approximately 220 miles of Forest Service System Roads. These corridors have not been cleared of resource concerns. It is not known how many areas have erodible soils, unsatisfactory condition soils, nearby drainages, or other soil/watershed concerns. It is likely that cross country motorized vehicle travel within designated camping corridors would cause compaction, erosion, sedimentation, loss of plant cover, and a reduction in soil/watershed stability, condition, and productivity.

Dispersed recreation or camping would also be allowed along newly designated open road segments and other open roads. Forest users would not be able to drive cross country in order to access the Forest from these roads. The approx. 18 miles of short spur roads, that serve to access dispersed campsites road segments, would be added to the system as maintenance level 2 roads. Approximately 16 miles of the 18 miles of short spur roads are not in areas of concern. Approx. 2 miles of the roads are in areas of concern (i.e. review of the roads indicates that portions of the roads have moderate to severe soil erosion hazard, are in an area with the potential for flash flooding, or are potentially near a wetland).

Areas with limited use of motor vehicles for the purposes of dispersed camping and big game retrieval will be monitored to assess for damage to natural and cultural resources and/or frequently occurring actions that compromise the ability of the Forest Service to meet management objectives (Section 2.6). Action (which could be as simple as road maintenance) will be taken as necessary to mitigate resource concerns and ensure the goals and objectives of the Forest Plan will be met.

Properly selected designated road segments would have less risk for resource damage by vehicle parking and camping activities than designated camping corridors. The Forest Service would have a smaller area to monitor for resource damage. If damage does occur, it would be easier to find and address. Areas could be hardened or re-vegetated as necessary. Confining dispersed camping to open roads would also allow the Forest Service to reduce fire risk and improve prevention and control of wildfires. Preventing high intensity wildfires would help protect the vegetation, soils, and watersheds.

Some Forest System Roads would continue to exist on soils with low bearing strength when wet. Continued implementation of the Wet Weather Travel Policy will help reduce damage to System Roads. Campers in designated dispersed camping corridors and elk hunters have to abide by this policy, as well as Forest Service employees, contractors, and permittees.

Alternative 2 (Proposed Action) would reduce the damage to plants from cross country vehicle travel. Plants would have the potential to be healthier and more resilient to climate change. The maintenance of (and possible increase in) plant cover would protect the soil from water erosion and wind erosion (fugitive dust).

Implementation of Alternative 2 (Proposed Action) would reduce the damage to soil and watershed stability, condition, and productivity from motorized vehicle travel much more than Alternative 1 (No Action). It also has the potential to reduce the amount of fugitive dust created on the District. Alternative 2 (Proposed Action) would not reduce the damage to soil/watershed stability, condition, and productivity as much as Alternative 4.

By implementing Alternative 2 (Proposed Action), the Williams District would make progress toward the Kaibab Forest Plan goals of maintaining soil productivity and watershed condition and of protecting wetlands and floodplains.

Alternative 3

Direct and Indirect Effects

The effects of Alternative 3 are the same as Alternative 2 (Proposed Action) except for the following differences.

Alternative 3 would not designate 25 miles of roads as motorized trail systems for vehicles that create tracks of 50 inches or less. Therefore, the expected increase in erosion and sedimentation would not occur at those locations.

Alternative 3 would allow the limited use (one trip in and one trip out) for the retrieval of legally harvested and properly tagged elk during any elk hunting season, including the months of November and December. Extending the allowance for two more months would allow more vehicle tracks to be created on the District. Tracks would probably cause more compaction and ruts because the soils could be wetter in the late fall and early winter. Compaction, erosion, runoff, sedimentation, loss of plant cover, and a

reduction in soil/watershed stability, condition, and productivity could increase compared to Alternative 2 (Proposed Action). However, implementation of the mitigation measures in Section 2.5 should minimize these effects and thus minimize the difference in effects between Alternatives 2 and 3. Hunters would be expected to refrain from cross country travel at those times.

The allowance for motorized elk retrieval at any time of day would not change the effects discussed under Alternative 2 (Proposed Action). Allowing only one vehicle for one trip via the most direct route also would not greatly change the effects discussed under Alternative 2 (Proposed Action). Most areas of the District would already be located within one mile of an existing open road, so the distance traveled to retrieve the elk carcass would not increase greatly.

Alternative 3 would not create dispersed recreation (camping) corridors along any roads. Therefore, the expected increase in compaction, erosion, sedimentation, loss of plant cover, and reduction in soil/watershed stability, condition, and productivity would not occur in these locations.

Implementation of Alternative 3 would reduce the damage to soil and watershed stability, condition, and productivity from motorized vehicle travel much more than Alternative 1 (No Action). It also has the potential to reduce the amount of fugitive dust created on the District. Alternative 3 would reduce the damage to soil/watershed stability, condition, and productivity from motorized trails and dispersed camping more than Alternative 2 (Proposed Action). Alternative 3 would have effects to soil/watershed stability, condition, and productivity from motorized big game retrieval similar to Alternative 2 (Proposed Action), given the mitigation measures (Section 2.5). Overall, Alternative 3 would not reduce the damage to soil/watershed stability, condition, and productivity as much as Alternative 4.

By implementing Alternative 3, the Williams District would make progress toward the Kaibab Forest Plan goals of maintaining soil productivity and watershed condition and of protecting wetlands and floodplains. Alternative 3 would be more effective in meeting the goals than Alternative 2 (Proposed Action).

Alternative 4

Direct and Indirect Effects

The effects of Alternative 4 are the same as Alternative 3 except for the following differences.

Compared to Alternative 3, Alternative 4 would reduce the number of miles of roads open to the public on the Williams District by another 2 percent. Alternative 4 would close 21 roads that extend for 35 miles. Only 4 of those roads were identified as having soils and watershed concerns. Closing these roads to the public would slightly reduce erosion and sedimentation of water bodies compared to Alternative 3, especially on the slopes of Sitgreaves Mountain. However, these roads would still erode over time unless they are obliterated and plant cover is re-established.

The prohibition on cross country motorized elk retrieval would remove all random cross country vehicle travel from the District. All other motorized travel for administrative, contracted, or permitted purposes would be subject to location and seasonal restrictions, as well as other best management practices and mitigation measures.

Compaction, erosion, runoff, sedimentation, and loss of plant cover would be greatly reduced, compared to current management. Soil/watershed stability, condition, and productivity would increase.

Implementation of Alternative 4 would reduce the damage to soil and watershed stability, condition, and productivity from motorized vehicle travel much more than Alternative 1 (No Action). It also has the potential to reduce the amount of fugitive dust created on the District. Alternative 4 would reduce the damage to soil/watershed stability, condition, and productivity more than Alternative 2 (Proposed Action) or Alternative 3.

By implementing Alternative 4, the Williams District would make progress toward the Kaibab Forest Plan goals of maintaining soil productivity and watershed condition and of protecting wetlands and floodplains. Alternative 4 would be more effective in meeting the goals than any other alternative.

Cumulative Effects

The cumulative effects analysis area includes all the HUC 6th level watersheds that occur on the Williams Ranger District. The cumulative effects analysis time period is 2000 to 2020.

Past, ongoing, planned, and foreseeable projects and activities in the cumulative effects analysis area that will have an effect on soils and watersheds include: timber and fuelwood harvesting, forest thinning, grassland restoration tree removal, prescribed burning, livestock grazing, fence construction, water tank construction and maintenance, vehicle driving and horseback riding off road to herd cattle and maintain fences, noxious and invasive exotic weed control, recreational activities (e.g. vehicle and ATV use off road, dispersed camping, horseback riding, hiking, hunting), road use and maintenance, mineral exploration and mining, pipeline and transmission line use and maintenance, and residential/commercial/government developments and activities. Natural conditions, events, and activities that have an effect on soils and watersheds include climate and weather, wildfires, and elk grazing.

Vegetation management projects such as timber harvesting, forest thinning, grassland restoration tree removal, and fuelwood cutting projects reduce overstory cover in the short-term and can stimulate an increase in understory cover in two to five years. These projects will also increase litter cover. The long-term increase in herbaceous cover will protect the soil from raindrop impact and overland flow and will lead to a reduction in sheet, rill, and gully erosion, and deposition. It will also prevent excessive runoff and sedimentation of water bodies. Reduction in tree canopy and heavy fuels will reduce the threat of catastrophic wildfires that could remove most of the plant and litter cover, burn the seed bank, sterilize the soil, and create erosion and flooding. The long-term cumulative effect of vegetation management projects (including best management practices and mitigation measures) is an improvement in soil condition and a reduction in erosion, runoff, and sedimentation.

Broadcast prescribed burns and managed natural fires remove a portion of overstory, understory, and litter cover. In the ponderosa pine and pinyon-juniper region, these burns are conducted in order to maintain or improve forest health by thinning the trees and increasing the herbaceous understory. The burns temporarily remove cover, but they also increase the growing space, light, water, and nutrients available to understory plants. In two to five years, the understory plants can regenerate and expand in cover compared to the pre-burn conditions. The long-term increase in herbaceous cover will protect the soil

from raindrop impact and overland flow and will lead to a reduction in sheet, rill, and gully erosion, and deposition. It will also prevent excessive runoff and sedimentation of water bodies. Reduction in tree cover and heavy fuels will reduce the threat of catastrophic wildfires that could remove most of the plant and litter cover, burn the seed bank, sterilize the soil, and create erosion and flooding. The long-term cumulative effect of broadcast prescribed burns and managed natural fires, including best management practices and mitigation measures, is an improvement in soil condition and a reduction in erosion, runoff, and sedimentation.

Piling of tree thinning slash and prescribed burning of piles will remove excess fuels in the area. These projects will reduce the threat of catastrophic wildfires that could remove most of the plant and litter cover, burn the seed bank, sterilize the soil, and create erosion and flooding. Large piles with heavy fuels can burn at a very high temperature, leading to bare ground and sterilized soil under the piles. Soils will be damaged in small scattered locations. Small areas of soils will be damaged in order to reduce the risk of catastrophic wildfires that can damage soils in broad areas. The long-term cumulative effect of piling and burning slash (including best management practices and mitigation measures) is an improvement in soil condition and a reduction in erosion, runoff, and sedimentation over the broad landscape; with soil damage in small scattered pile burn locations.

Livestock grazing occurs on the Forest Service, state, and private lands within the watersheds. Utilization on the Kaibab National Forest allotments is maintained at a conservative to moderate level that preserves an adequate amount of vegetative and litter cover to protect the soil. Therefore, this activity will not increase erosion and sedimentation within the Kaibab National Forest. The utilization levels on the surrounding state and private lands are unknown. The long-term cumulative effect of livestock grazing (including best management practices) is no effect; or a reduction in soil condition with an increase in erosion, runoff, and sedimentation.

Fence construction, water tank construction and maintenance (including wildlife catchments), vehicle driving and horseback riding off road (to herd cattle and maintain fences) occur within the watersheds. These activities can remove tree cover, remove understory plant cover, and compact the soil in limited areas. Erosion rates may increase in these limited areas, but these effects in small areas are tolerated in order to facilitate livestock, elk, and burro distribution over large areas. Improved livestock, elk, and burro distribution can reduce grazing intensity, improve plant cover, and protect soil condition and stability. The long-term cumulative effect of these range allotment management activities (including best management practices and mitigation measures) is no effect; or an improvement in soil condition and a reduction in erosion, runoff, and sedimentation over the broad landscape; with soil damage in small scattered locations.

Noxious and invasive exotic weed control activities will continue to occur. Weeds will be controlled by manual, chemical, or biological methods. Removal of weeds can create small patches of bare ground in the short-term. Re-treatments will continue to remove the weeds while allowing native plants to cover the area in the long-term. Sites may need to be seeded in order to promote native plant establishment. The long-term cumulative effect of noxious and invasive exotic weed control activities (including best management practices and mitigation measures) is an improvement in soil condition.

Recreational activities (e.g. dispersed camping, horseback riding, hiking, biking, and hunting); road use and maintenance, and pipeline/transmission line use and maintenance will continue to occur. These activities can have effects on soils and watersheds including: removal of tree cover, removal of understory plant cover, channeling of runoff, increased erosion rates, and compaction. Mitigation measures will be used for all projects and permitted uses in order to prevent most resource problems. The long-term cumulative effect of recreational, road, and pipeline/transmission line activities (including best management practices and mitigation measures) is no effect; or a reduction in soil condition with an increase in erosion, runoff, and sedimentation.

Sandstone and cinder mining occurs on the Forest Service, state, and private lands within the watersheds. Mining involves the use of many types of vehicles and equipment on roads and off road for short distances. Mining activities can have effects on soils and watersheds including: removal of plant cover, compaction, channeling of runoff, increased erosion rates, and removal of soil. On Forest Service lands, best management practices are followed during mining activities and the sites are reclaimed with soil and native plants following disturbance. The management practices and mitigation measures on state and private lands are unknown. The cumulative effect of mining (including best management practices and mitigation measures) is a reduction in soil condition in the short-term; and no effect; or a reduction in soil condition with an increase in erosion, runoff, and sedimentation in the long-term.

Residential developments and activities, government housing and offices, city facilities, commercial facilities, and recreation/tourism facilities will be present within the cumulative effects analysis area. Residents and businesses may remove plant cover, compact the soil, and create water flow channels on their properties. These activities could lead to erosion on private property and excessive erosion, runoff, and sedimentation on adjoining Forest Service lands. The long-term cumulative effect of residential, commercial, and government activities is no effect; or a reduction in soil condition with an increase in erosion, runoff, and sedimentation.

Climate and weather will continue to affect the cumulative effects analysis area. Normal, or higher than average, precipitation can lead to an increase in plant and litter cover, which can reduce erosion and sedimentation. Floods and heavy runoff can cause erosion and sedimentation. The region is in a long-term drought. Droughts may become more frequent and average temperatures may continue to increase as a result of climate change. Drought reduces plant cover, kills trees, and makes the forest more susceptible to wildfires. The long-term cumulative effect of climate and weather is an increase in soil condition; no effect; or a reduction in soil condition with an increase in erosion, runoff, and sedimentation.

Wildfires will continue to affect the cumulative effects analysis area. Low to moderate intensity wildfires reduce plant cover in the short term, but can lead to an increase in plant cover in response to higher nutrient levels in the soil. Increased plant cover can reduce erosion and sedimentation. Wildfires can also render soils sterile and hydrophobic, if the fire temperature is very high. Rapid runoff can occur after heavy rains, leading to erosion and sedimentation. The long-term cumulative effect of wildfires is an increase in soil condition or a reduction in soil condition with an increase in erosion, runoff, and sedimentation.

Elk will continue to affect the cumulative effects analysis area. Elk already damage plants in some areas. If the population size remains the same, especially during the drought, elk could continue to graze heavily in some areas and could create patches of bare ground. These areas could be vulnerable to erosion. The long-term cumulative effect of elk grazing is no effect; or a reduction in soil condition with an increase in erosion, runoff, and sedimentation.

Cumulative effect:
The cumulative effect of all human activities and natural events is a general improvement in forest and rangeland health in the District watersheds and an improvement in soil/watershed condition and productivity. It is also expected that there will be a reduction in the amount of fugitive dust created on the District.

Cumulative effects of Alternative 1 (No Action):
Continuation of current management (Alternative 1 - No Action) would reduce the rate of progress being made by vegetation management projects (i.e. thinning, fuels reduction, prescribed burning) to cumulatively improve soil and watershed condition and productivity.

Cumulative effects of Alternative 2 (Proposed Action):
Implementation of Alternative 2 (Proposed Action) would increase the rate of progress being made by vegetation management projects (i.e. thinning, fuels reduction, prescribed burning) to cumulatively improve soil and watershed condition and productivity.

Cumulative effects of Alternative 3:
Implementation of Alternative 3 would increase the rate of progress being made by vegetation management projects (i.e. thinning, fuels reduction, prescribed burning) to cumulatively improve soil and watershed condition and productivity. It would increase the beneficial cumulative effects compared to Alternative 2.

Cumulative effects of Alternative 4:
Implementation of Alternative 4 would increase the rate of progress being made by vegetation management projects (i.e. thinning, fuels reduction, prescribed burning) to cumulatively improve soil and watershed condition and productivity. It would increase the beneficial cumulative effects more than other alternatives.

3.3 Rare and Sensitive Plant Species

Affected Environment

The Williams Ranger District covers approximately 560,305 acres. Elevation ranges from around 5000 feet at Hell Canyon to over 10,000 feet on the top of Kendrick Mountain. The District is dominated by forests and savannas of ponderosa pine and pinyon-juniper. Vegetation types found on the District are: ponderosa pine – Gambel oak (33%), ponderosa pine – Colorado pinyon (10%), pinyon – juniper (36%), grasslands (17%), mixed conifer (2%), sedge/spikerush wetlands (1%), Gambel oak shrublands (<1%), aspen (<1%), and spruce-fir (<1%).

The dominant grasses or grass-like plants on the Williams District include: Arizona fescue, mountain muhly, bottlebrush squirreltail, muttongrass, blue grama, sideoats grama, needle and thread, and western wheatgrass. Dominant herbs include: fleabane, lupine, and yarrow. Dominant shrubs include: rubber rabbitbrush, Apache plume, Stansbury cliffrose, and New Mexico locust. Dominant trees include: ponderosa pine, oneseed juniper, alligator juniper, Utah juniper, Colorado pinyon, and Gambel oak.

Threatened, Endangered, Proposed, Candidate, Conservation Agreement, Forest Service Sensitive, and Kaibab National Forest Management Indicator Species:

A review was conducted to determine if any Threatened, Endangered, Proposed, Candidate, Conservation Agreement, Forest Service Sensitive, or Kaibab National Forest Management Indicator plant species and/or habitats were known to occur in Coconino County and on or near the Williams Ranger District. The following references were used: USFWS Internet list of Threatened, Endangered, Proposed, Candidate, and Conservation Agreement species occurring in Coconino County; Arizona Game and Fish Department Heritage Data Management System; USDA Forest Service Region 3 Sensitive Species List; NatureServe Explorer Internet site; and Arizona Rare Plant Field Guide.

A search was conducted in the Heritage Data Management System maps of plant species occurrences, the Kaibab National Forest GIS rare plant occurrence layers, and in the Kaibab National Forest rare plant files.

No Endangered, Threatened, Proposed, or Candidate plant species have been found on or near the Williams District. No suitable habitat exists for any listed species. One Conservation Agreement species (also Forest Service Sensitive and a Kaibab National Forest Management Indicator Species) and three other Forest Service Sensitive plant species have been found on the Williams District of the Kaibab National Forest.

One Management Indicator Species, Arizona bugbane (*Actaea arizonica*, formerly *Cimicifuga arizonica*), is found on the Williams Ranger District. Arizona bugbane is also a USFWS/FS Conservation Agreement species and a Forest Service Sensitive species.

Table 9: List of Sensitive Plant species found in or near the WRD[16]

Common Name (Scientific Name)	**Elevation, Habitat, and Range**
Arizona bugbane (Actaea *arizonica*)	4700-8800'. Found on Bill Williams Mountain and Oak Creek Canyon. Canyon bottoms and lower slopes, drainages, seeps and springs. Moist, loamy soil, high in humus content. Deep shade, high humidity, north slopes. Between coniferous and riparian habitats with Douglas-fir, white fir, Rocky Mountain maple, and aspen. ***Also a USFWS/FS Conservation Agreement species and Kaibab National Forest Management Indicator Species.***
Mt. Dellenbaugh sandwort (*Arenaria aberrans*)	5500-9000'. Found N of Williams, at the South Rim of Grand Canyon National Park, and in De Motte Park on the N Kaibab RD. Basalt soil or sandy soils. Meadows and meadow edges within oak and pine forests or in pinyon-juniper woodlands.

[16] Source: USDA Forest Service Southwestern Region (Region 3).

Common Name (Scientific Name)	Elevation, Habitat, and Range
Rusby milkvetch (*Astragalus rusbyi*)	5400-9000'. Found on the lower slopes of the San Francisco Peaks, in Oak Creek Canyon, N of Williams, Kendrick Peak, Garland Prairie, and Camp Navajo. Dry or temporarily moist basaltic soils. Openings or meadows in ponderosa pine forest or at the edge of thickets and aspen groves. Also found in mixed conifer and pine-oak forests in openings.
Tusayan rabbitbrush (*Chrysothamnus molestus*)	5000-7000'. Found on north end of the Coconino NF and on portions of the South Zone of the Kaibab NF. Slopes and flats. Kaibab limestone or basalt. Calcareous soils. Openings in pinyon-juniper woodland and shrub-grasslands. Full sun. Pinyon, juniper, blue grama, Douglas rabbitbrush, rubber rabbitbrush, and algerita.
Arizona leatherflower (*Clematis hirsutissima var. hirsutissima*)	6900-8500'. Found along the Rio de Flag, Lower Lake Mary, and upper Volunteer Canyon on the Coconino NF and in the Tusayan area of the Kaibab NF. Rocky hillsides with 12-40% slopes. Kaibab limestone. Rock outcrops and shallow soils. Moist mountain meadows, prairies, and open woods and thickets in ponderosa pine and mixed conifer forests.
rock fleabane (*Erigeron saxatilis*)	4400-8400'. Dacite or Coconino sandstone. Sheer canyon walls. Moist north-facing slopes. Riparian deciduous forest and other habitat types.
Flagstaff pennyroyal (*Hedeoma diffusum*)	4500-7100'. Found near Flagstaff in Walnut Canyon drainages, on the rims of Oak Creek and Sycamore Canyons, Bill Williams Mountain, and north of Tule Canyon. Rock pavement, cliffs and breaks on 0-10% slopes. Kaibab formation dolomitic limestone or sandstone. Outcrops, boulders, rock crevices and pockets, or shallow soils. Ponderosa pine forests.
Flagstaff beardtongue (*Penstemon nudiflorus*)	4500-7000'. Found south of the Grand Canyon and in Sycamore Canyon. Dry slopes in eroded or mountainous terrain. Kaibab limestone or sandstone. Rock outcrops or shallow soils, coarse loamy, neutral pH. Ponderosa pine, Gambel oak, alligator juniper, blue grama.

Four Forest Service Sensitive plant species are known to exist on the Williams District – Arizona bugbane (*Actaea arizonica*), Rusby milkvetch (*Astragalus rusbyi*), Tusayan rabbitbrush (*Chrysothamnus molestus*), and Flagstaff beardtongue (*Penstemon nudiflorus*).

Although plant populations have not been found on the Williams District, suitable habitat may exist for these four Forest Service Sensitive plant species: Mt. Dellenbaugh sandwort (*Arenaria aberrans*), Arizona leatherflower (*Clematis hirsutissima var. hirsutissima*), rock fleabane (*Erigeron saxatilis*), and Flagstaff pennyroyal (*Hedeoma diffusum*).

Conservation status listings from NatureServe are shown in the table below.

Table 10: NatureServe Explorer Species Conservation Status (Sept. 3, 2009)

Species	Global Status	National Status	State Status
Arizona bugbane (Actaea *arizonica*)	G2 Imperiled	N2	S2
Mt. Dellenbaugh sandwort (*Arenaria aberrans*)	G2 Imperiled	N2	S2
Rusby milkvetch (*Astragalus rusbyi*)	G3 Vulnerable	N3	S3
Tusayan rabbitbrush (*Chrysothamnus molestus*)	G3 Vulnerable	N3	S3
Arizona leatherflower (*Clematis hirsutissima var. arizonica)** *Not combined into hirsutissima variety on NatureServe web site.	G4T2?Q Imperiled	N2?	SNR
rock fleabane (*Erigeron saxatilis*)	G3 Vulnerable	N3	S3
Flagstaff pennyroyal (*Hedeoma diffusum*)	G3 Vulnerable	N3	S3
Flagstaff beardtongue (*Penstemon nudiflorus*)	G2G3 Imperiled	N2N3	S2S3

Forest Plan Direction

Relevant direction from the Kaibab National Forest Land Management Plan (1988, as amended):

Goal --

- Identify and protect areas that contain threatened, endangered, and sensitive species of plants and animals. Consult with the U.S. Fish and Wildlife Service when activities have the potential to impact protected species.

Effects on Rare and Sensitive Plant Species

Direct and Indirect Effects Common to All Alternatives

Motorized vehicles may crush, uproot, and kill rare plants. Vehicles may create patches of bare soil and ruts that increase soil erosion and runoff around the plants leading to a loss of topsoil. Vehicles may compact the soil, making it difficult or impossible for the plants to obtain adequate soil water and aeration. Vehicles may introduce noxious and invasive exotic weeds into populations of rare plants; leading to the loss of growing space, soil water, and soil nutrients, and changing the natural fire regime.

Global climate change may lead to higher temperatures, lower precipitation, more frequent and severe droughts, and more wildfires. Drought and high intensity wildfire could kill rare plants and destroy their habitats, leading to the loss of species viability. Noxious and invasive exotic weeds could increase their

range into rare species habitats during droughts and after fires. Motorized vehicle impacts during a time of climate change may reduce the ability of some rare plant populations to adapt and survive.

Surveys are conducted periodically by the Forest Service to look for rare plants in various project areas. At this time, only a few populations of rare plants (Rusby milkvetch, Tusayan rabbitbrush, and Flagstaff beardtongue) have been found growing right next to or near open Forest System Roads on the Williams District. The populations are monitored periodically. If a road is causing detrimental effects to the plants, the Forest Service can close the road, relocate the road, or use mitigation methods along the road. Alternatives 2, 3, and 4 do not propose to close these roads because there are no known detrimental effects on rare plants at this time.

Motorized vehicle use by Forest Service employees, Forest Service contractors, and Forest permittees will continue in project areas (e.g. forest thinning projects), but the agency must check survey maps first for known rare plant populations or habitats and avoid and/or mitigate the impacts. The Forest Service, contractors, and permittees must also avoid driving through large weed populations until the weeds are controlled.

Implementation of Alternatives 2, 3, and 4 would reduce the damage and death of rare plants, the soil compaction, the creation of ruts and bare soil patches, and the spread of noxious and invasive exotic weeds into rare plant habitat.

Alternative 1 – No Action

Direct and Indirect Effects

Threatened, Endangered, Proposed, or Candidate Plant Species --

No populations of Threatened, Endangered, Proposed, or Candidate plant species have been found and no suitable habitat is known to exist on the Williams Ranger District.

Continuation of current management (Alternative 1 – No Action) would have No Effect on US Fish and Wildlife Service (USFWS) listed species.

Forest Service Sensitive Plants --

Alternative 1 (No Action) would impede the Williams District's ability to meet the Kaibab Forest Plan goal of protecting areas that contain sensitive plant species.

More detailed information on each species may be found in the rare plants specialist report.

<u>Arizona bugbane (*Actaea arizonica*, formerly *Cimicifuga arizonica*)</u>

Arizona bugbane is also a USFWS/FS Conservation Agreement species and a Kaibab National Forest Management Indicator Species.

Threats to Arizona bugbane include trampling and the spread of invasive exotic weeds. There are very few roads within Arizona bugbane habitat. Cross country motorized travel does not usually occur in or near suitable habitat due to the steep, rocky slopes.

Continuation of current management (Alternative 1 – No Action) could lead to damage to Arizona bugbane populations and/or habitats from invasive exotic weeds introduced by vehicles traveling on nearby open roads. The spread of exotic weeds would not be rapid, due to the thick canopy of trees and abundant understory cover. Forest staff would control the weeds before they could invade affect the Arizona bugbane populations.

Continuation of current management (Alternative 1 – No Action) May Affect Arizona bugbane Individuals or Habitat, but is Not Likely to Contribute to a Trend toward Federal Listing or Loss of Viability to Populations or the Species.

Mt. Dellenbaugh sandwort (*Arenaria aberrans*)

Threats to Mt. Dellenbaugh sandwort include off road vehicle travel, road maintenance, dispersed camping, trampling, and the spread of invasive exotic weeds. Roads could exist and motorized cross country travel could occur in suitable habitat due to the gentle slopes. Individual plants and populations could be physically damaged by off road vehicle travel and camping. Habitats could be damaged by the introduction of invasive exotic weeds by vehicles.

Continuation of current management (Alternative 1 – No Action) could lead to damage to Mt. Dellenbaugh sandwort populations and/or habitats. This alternative poses the greatest risk to the plants, if they are found to exist on the District, due to unmanaged cross country motorized vehicle travel.

Continuation of current management (Alternative 1 – No Action) May Affect Mt. Dellenbaugh Individuals or Habitat, but is Not Likely to Contribute to a Trend toward Federal Listing or Loss of Viability to Populations or the Species, because the plants are not known to exist on the District.

Rusby milkvetch (*Astragalus rusbyi*)

Threats to Rusby milkvetch include off road vehicle travel, road maintenance, dispersed camping, trampling, and the spread of invasive exotic weeds. Roads do exist and motorized cross country travel could occur in suitable habitat due to the gentle slopes. Individual plants and populations could be physically damaged by off road vehicle travel and camping. Habitats could be damaged by the introduction of invasive exotic weeds by vehicles.

Continuation of current management (Alternative 1 – No Action) could lead to damage to Rusby milkvetch populations and/or habitats. This alternative poses the greatest risk to the plants due to unmanaged cross country motorized vehicle travel. However, it is unlikely that all populations across the District would be damaged by vehicles or camping.

Continuation of current management (Alternative 1 – No Action) May Affect Rusby milkvetch Individuals or Habitat, but is Not Likely to Contribute to a Trend toward Federal Listing or Loss of Viability to Populations or the Species.

Tusayan rabbitbrush (*Chrysothamnus molestus*)

Threats to Tusayan rabbitbrush include off road vehicle travel, road maintenance, and the spread of invasive exotic weeds. Some disturbance due to recreation, fuelwood gathering, and savanna/grassland restoration is not harmful to the plants. In some cases, light to moderate mechanical disturbance can

actually stimulate shoot and flower production. (Galeano-Popp 1987) Severe disturbance of plants and soils, however, could kill the plants. Roads do exist and motorized cross country travel could occur in suitable habitat due to the gentle slopes. Off road vehicle travel could damage individual plants and/or habitat, if vehicles drive repeatedly over the same plants, especially when soils are wet. Habitats could be damaged by the introduction of invasive exotic weeds by vehicles.

Continuation of current management (Alternative 1 – No Action) could lead to damage to Tusayan rabbitbrush populations and/or habitats. This alternative poses the greatest risk to the plants, due to unmanaged cross country motorized vehicle travel. However, it is unlikely that all populations across the District would be damaged by vehicles.

Continuation of current management (Alternative 1 – No Action) May Affect Tusayan rabbitbrush Individuals or Habitat, and Could Contribute to a Trend toward Federal Listing or Loss of Viability to Populations or the Species.

Arizona leatherflower (*Clematis hirsutissima var. hirsutissima*)

Threats to Arizona leatherflower include off road vehicle travel, road maintenance, dispersed camping, trampling, and the spread of invasive exotic weeds. Roads could exist and motorized cross country travel could occur in some areas of suitable habitat where the slopes are gentle and the surface is not too rocky, especially at scenic views. Off road vehicle travel and camping could damage individual plants and/or habitat. Habitats could be damaged by the introduction of invasive exotic weeds by vehicles.

Continuation of current management (Alternative 1 – No Action) could lead to damage to Arizona leatherflower populations and/or habitats. This alternative poses the greatest risk to the plants, if they are found to exist on the District, due to unmanaged cross country vehicle travel.

Continuation of current management (Alternative 1 – No Action) May Affect Arizona leatherflower Individuals or Habitat, and Could Contribute to a Trend toward Federal Listing or Loss of Viability to Populations or the Species, because the plants are not known to exist on the District.

Rock fleabane (*Erigeron saxatilis*)

Threats to rock fleabane include rock climbing and trampling. Roads do not generally exist and motorized cross country travel could not occur within suitable habitat due to the steep cliffs.

Continuation of current management (Alternative 1 – No Action) would have No Effect on rock fleabane individuals, populations, or habitats.

Flagstaff pennyroyal (*Hedeoma diffusa*)

Threats to Flagstaff pennyroyal include off road vehicle travel, dispersed camping, and the spread of invasive exotic weeds. The plants can survive light to moderate disturbance from trampling and forest restoration activities. (Goodwin 1983) Roads are not likely to exist and motorized cross country travel is not likely in most suitable habitat due to the rock cover and cliffs, but could occur in limited areas with access to scenic views. Off road vehicle travel could damage individual plants and/or habitat. Habitats could be damaged by the introduction of invasive exotic weeds by vehicles.

Continuation of current management (Alternative 1 – No Action) could lead to damage to Flagstaff pennyroyal populations and/or habitats. This alternative poses the greatest risk to the plants, if they are found to exist on the District, due to unmanaged cross country motorized vehicle travel.

Continuation of current management (Alternative 1 – No Action) May Affect Flagstaff pennyroyal Individuals or Habitat, but is Not Likely to Contribute to a Trend toward Federal Listing or Loss of Viability to Populations or the Species, because the plants are not known to occur on the District.

Flagstaff beardtongue (*Penstemon nudiflorus*)

Threats to Flagstaff beardtongue include off road vehicle travel, road maintenance, dispersed camping, trampling, and the spread of invasive exotic weeds. Roads could exist and motorized cross country travel could occur in suitable habitat due to the gentle slopes. Off road vehicle travel and camping could damage individual plants and/or habitat. Habitats could be damaged by the introduction of invasive exotic weeds by vehicles.

Continuation of current management (Alternative 1 – No Action) could lead to damage to Flagstaff beardtongue populations and/or habitats. This alternative poses the greatest risk to the plants, due to unmanaged cross country motorized vehicle travel. However, it is unlikely that all populations across the District would be damaged by vehicles.

Continuation of current management (Alternative 1) May Affect Flagstaff beardtongue Individuals or Habitat, but is Not Likely to Contribute to a Trend toward Federal Listing or Loss of Viability to Populations or the Species.

All other Forest Service Sensitive Plants:

There are no known populations and no suitable habitat on the Williams District for these Forest Service Sensitive plant species: gumbo milkvetch (*Astragalus ampullarius*), Marble Canyon milkvetch (*Astragalus cremnophylax var. hevronii*), cliff milkvetch (*Astragalus cremnophylax var. myriorrhaphis*), Kaibab paintbrush (*Castilleja kaibabensis*), Morton wild buckwheat (*Eriogonum mortonianum*), Atwood wild buckwheat (*Eriogonum thompsonae var. atwoodii*), Kaibab bladderpod (*Lesquerella kaibabensis*), Kaibab pincushion cactus (*Pediocactus paradinei*), Fickeisen pincushion cactus (*Pediocactus peeblesianus var. fickeiseniae*), Mt. Trumbull beardtongue (*Penstemon distans*), and Grand Canyon rose (*Rosa stellata ssp. abyssa*).

Continuation of current management (Alternative 1 – No Action) would have No Effect on these Forest Service Sensitive plant species.

Alternative 2 – Proposed Action

Direct and Indirect Effects

Threatened, Endangered, Proposed, or Candidate Plant Species --

No populations of Threatened, Endangered, Proposed, or Candidate plant species have been found and no suitable habitat is known to exist on the Williams Ranger District.

Implementation of Alternative 2 (Proposed Action) would have No Effect.

Forest Service Sensitive Plants –

By implementing Alternative 2 (Proposed Action), the Williams District would be able to protect many areas that contain sensitive plant species. This would meet the goals and objectives of the Kaibab Forest Plan.

Alternative 2 (Proposed Action) proposes to close approximately 25% of the miles of open road on the District. The lack of road maintenance activities would reduce the amount of disturbance to any rare plants that may be growing next to these roads. The lack of vehicle use, road maintenance, and dispersed camping/parking would reduce the opportunities for trampling and the introduction and spread of exotic weeds into rare plant populations and habitats.

Alternative 2 (Proposed Action) proposes to create motorized trail systems for off highway vehicles, using 23 miles of existing open System Roads and 2 miles of newly constructed trails. Rare plant species are not known to exist within these areas. Motorized vehicles already use the open roads, so the potential rate of introduction and spread of exotic weeds would not change much. The proposed locations of new trails would be surveyed for rare plants before construction could begin. If any populations were found, they would be flagged and avoided, or the proposed trail would be completely moved to a different location. Motorized trail systems in these areas would not increase the detrimental effects to rare plants compared to Alternative 1 (No Action).

This action would greatly improve the ability of rare plants to grow, survive, and reproduce. The plants would be much less likely to be physically damaged or killed by vehicle tires. The rate of introduction and spread of exotic weeds into rare plant populations and habitats would be greatly reduced.

Limited motor vehicle travel would be allowed in order for campers to access dispersed camping sites within designated corridors along 220 miles of open roads. These corridors have not been surveyed for rare plants. The corridors would be monitored over time in conjunction with other project and management activities. If a population of rare plants is found in a section of a corridor, then that section could be closed to cross country motorized travel and camping in order to protect the plants.

Alternative 2 (Proposed Action) proposes to designate at least 7 miles of open road segments for Forest access and dispersed camping. These proposed open road segments would be surveyed for rare plants. If any populations of rare plants are found, the road segment would not be designated as open. This protocol would prevent any detrimental effects to rare plant populations.

Alternative 2 would allow the limited use of motor vehicles within one mile of open roads for the retrieval of legally harvested and properly tagged elk during September and October. Motorized elk retrieval has the potential to damage rare plant populations and habitats by the physical impact of tires on the plants and by the introduction of exotic weeds.

See Alternative 1 Direct and Indirect Effects for general information about each plant species.

<u>Arizona bugbane (*Actaea arizonica*, formerly *Cimicifuga arizonica*)</u>

Alternative 2 (Proposed Action) does not propose to close the roads that are located in or near Arizona bugbane habitat on Bill Williams Mountain. Therefore, compared to Alternative 1 (No Action), Alternative 2 (Proposed Action) does not reduce the risk of damage to Arizona bugbane populations

and/or habitats from invasive exotic weeds, introduced by vehicles traveling on nearby open roads. The effects of the two alternatives are identical. The spread of exotic weeds would not be rapid, due to the thick canopy of trees and abundant understory cover. Forest staff would control the weeds before they could invade affect the Arizona bugbane populations.

Implementation of Alternative 2 (Proposed Action) May Affect Arizona bugbane Individuals or Habitat, but is Not Likely to Contribute to a Trend toward Federal Listing or Loss of Viability to Populations or the Species.

Mt. Dellenbaugh sandwort (*Arenaria aberrans*)

Implementation of Alternative 2 (Proposed Action) would reduce the potential damage to Mt. Dellenbaugh sandwort populations and their habitats compared to Alternative 1 (No Action). Alternative 2 (Proposed Action) would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 2 (Proposed Action) May Affect Mt. Dellenbaugh sandwort individuals or habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or the Loss of Viability of the Species.

Rusby milkvetch (*Astragalus rusbyi*)

Implementation of Alternative 2 (Proposed Action) would reduce the potential damage to Rusby milkvetch populations and their habitats compared to Alternative 1 (No Action). Alternative 2 (Proposed Action) would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 2 (Proposed Action) May Affect Rusby milkvetch individuals or habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or the Loss of Viability of the Species.

Tusayan rabbitbrush (*Chrysothamnus molestus*)

Implementation of Alternative 2 (Proposed Action) would reduce the potential damage to Tusayan rabbitbrush populations and their habitats compared to Alternative 1 (No Action). Many roads would be closed, but the roads next to some of the known populations would remain open. Alternative 2 (Proposed Action) would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 2 (Proposed Action) May Affect Tusayan rabbitbrush individuals or habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or the Loss of Viability of the Species.

Arizona leatherflower (*Clematis hirsutissima var. hirsutissima*)

Implementation of Alternative 2 (Proposed Action) would reduce the potential damage to Arizona leatherflower populations and their habitats compared to Alternative 1 (No Action). Alternative 2 (Proposed Action) would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 2 (Proposed Action) May Affect Arizona leatherflower individuals or habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or the Loss of Viability of the Species.

Rock fleabane (*Erigeron saxatilis*)

Implementation of Alternative 2 (Proposed Action) would have No Effect on rock fleabane individuals, populations, or habitats.

Flagstaff pennyroyal (*Hedeoma diffusa*)

Implementation of Alternative 2 (Proposed Action) would reduce the potential damage to Flagstaff pennyroyal populations and their habitats compared to Alternative 1 (No Action). Alternative 2 (Proposed Action) would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 2 (Proposed Action) May Affect Flagstaff pennyroyal individuals or habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or the Loss of Viability of the Species.

Flagstaff beardtongue (*Penstemon nudiflorus*)

Implementation of Alternative 2 (Proposed Action) would reduce the potential damage to Flagstaff beardtongue populations and their habitats compared to Alternative 1 (No Action). Many roads would be closed, but the roads next to some of the known populations would remain open. Alternative 2 (Proposed Action) would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 2 (Proposed Action) May Affect Flagstaff beardtongue individuals or habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or the Loss of Viability of the Species.

All other Forest Service Sensitive Plants:

There are no known populations and no suitable habitat on the Williams District for these Forest Service Sensitive plant species: gumbo milkvetch (*Astragalus ampullarius*), Marble Canyon milkvetch (*Astragalus cremnophylax var. hevronii*), cliff milkvetch (*Astragalus cremnophylax var. myriorrhaphis*), Kaibab paintbrush (*Castilleja kaibabensis*), Morton wild buckwheat (*Eriogonum mortonianum*), Atwood wild buckwheat (*Eriogonum thompsonae var. atwoodii*), Kaibab bladderpod (*Lesquerella kaibabensis*), Kaibab pincushion cactus (*Pediocactus paradinei*), Fickeisen pincushion cactus (*Pediocactus peeblesianus var. fickeiseniae*), Mt. Trumbull beardtongue (*Penstemon distans*), and Grand Canyon rose (*Rosa stellata ssp. abyssa*).

Implementation of Alternative 2 (Proposed Action) would have No Effect on these Forest Service Sensitive plant species.

Alternative 3

Direct and Indirect Effects

Threatened, Endangered, Proposed, or Candidate Plant Species --

No populations of Threatened, Endangered, Proposed, or Candidate plant species have been found and no suitable habitat is known to exist on the Williams Ranger District.

Implementation of Alternative 3 would have No Effect.

Forest Service Sensitive Plants --

By implementing Alternative 3, the Williams District would be able to protect many areas that contain sensitive plant species. Alternative 3 would meet the goals and objectives of the Kaibab Forest Plan better than Alternative 2.

The effects of Alternative 3 are the same as Alternative 2 (Proposed Action), except for the following differences. Please see the Direct and Indirect Effects of Alternative 2 (Proposed Action) for more information.

Alternative 3 does not propose to create any motorized trail systems for off highway vehicles. The 23 miles of existing open System Roads would continue to be used by all types of vehicles. Rare plant populations are not known to occur in these areas. The effects to rare plant habitat along these roads would not change compared to Alternative 1 (No Action).

Alternative 3 does not proposed to designate 220 miles of dispersed camping corridors. Motorized vehicle travel would no longer occur in these areas. This change could greatly benefit rare plants, if any populations exist there. Plants would have a lower risk of being damaged or killed by vehicle tires, camping, or trampling. Invasive exotic weeds would be introduced and spread at a lower rate.

Forest users would be allowed to park within a safe distance of most open roads, under Alternative 3. As long as people interpret “a safe distance” to not mean more than about 30 feet from the road, then the effects would not change greatly compared to Alternative 2 (Proposed Action). A few populations of rare plants located near roads would be more vulnerable to damage from vehicle tires, camping, and trampling. The rate of introduction and spread of exotic weeds would not change much.

Alternative 3 would allow the limited use (one trip in and one trip out) for the retrieval of legally harvested and properly tagged elk during any elk hunting season. Motor vehicle use for the purposes of elk retrieval has the potential to damage rare plant populations and habitats by the physical impact of tires on the plants and by the introduction of exotic weeds. The extended season would increase the risk of damage to rare plant populations and habitats by random cross country vehicle travel compared to Alternative 2. Cross country vehicle use during November and December, when soils are often moist, could lead to an increase in the spread of exotic weeds by muddy tires compared to Alternative 2. The allowance for motorized elk carcass retrieval at any hour of the day would not change the effects compared to Alternative 2. The restriction of using only one vehicle for the shortest round trip distance also would not greatly change the effects compared to Alternative 2 (Proposed Action).

See Alternative 1 Direct and Indirect Effects for general information about each plant species.

Arizona bugbane (*Actaea arizonica*, formerly *Cimicifuga arizonica*)

Alternative 3 does not propose to close the roads that are located in or near Arizona bugbane habitat on Bill Williams Mountain. Therefore, compared to Alternative 1 (No Action) and Alternative 2 (Proposed Action), Alternative 3 does not reduce the risk of damage to Arizona bugbane populations and/or habitats from invasive exotic weeds introduced by vehicles traveling on nearby open roads. The effects of the three alternatives are identical. The spread of exotic weeds would not be rapid, due to the thick canopy of trees and abundant understory cover. Forest staff would control the weeds before they could invade affect the Arizona bugbane populations.

Implementation of Alternative 3 May Affect Arizona bugbane Individuals or Habitat, but is Not Likely to Contribute to a Trend toward Federal Listing or Loss of Viability to Populations or the Species.

Mt. Dellenbaugh sandwort (*Arenaria aberrans*)

Implementation of Alternative 3 would reduce the potential damage to Mt. Dellenbaugh sandwort populations and their habitats compared to Alternative 1 (No Action). Alternative 3 would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 3 May Affect Mt. Dellenbaugh sandwort individuals or habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or the Loss of Viability of the Species.

Rusby milkvetch (*Astragalus rusbyi*)

Implementation of Alternative 3 would reduce the potential damage to Rusby milkvetch populations and their habitats compared to Alternative 1 (No Action). Alternative 3 would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 3 May Affect Rusby milkvetch individuals or habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or the Loss of Viability of the Species.

Tusayan rabbitbrush (*Chrysothamnus molestus*)

Implementation of Alternative 3 would reduce the potential damage to Tusayan rabbitbrush populations and their habitats compared to Alternative 1 (No Action). Many roads would be closed, but the roads next to some of the known populations would remain open. Alternative 3 would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 3 May Affect Tusayan rabbitbrush individuals or habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or the Loss of Viability of the Species.

Arizona leatherflower (*Clematis hirsutissima var. hirsutissima*)

Implementation of Alternative 3 would reduce the potential damage to Arizona leatherflower populations and their habitats compared to Alternative 1 (No Action). Alternative 3 would reduce the risk of physical

damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 3 May Affect Arizona leatherflower individuals or habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or the Loss of Viability of the Species.

Rock fleabane (*Erigeron saxatilis*)

Implementation of Alternative 3 would have No Effect on rock fleabane individuals, populations, or habitats.

Flagstaff pennyroyal (*Hedeoma diffusa*)

Implementation of Alternative 3 would reduce the potential damage to Flagstaff pennyroyal populations and their habitats compared to Alternative 1 (No Action). Alternative 3 would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 3 May Affect Flagstaff pennyroyal individuals or habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or the Loss of Viability of the Species.

Flagstaff beardtongue (*Penstemon nudiflorus*)

Implementation of Alternative 3 would reduce the potential damage to Flagstaff beardtongue populations and their habitats compared to Alternative 1 (No Action). Many roads would be closed, but the roads next to some of the known populations would remain open. Alternative 3 would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 3 May Affect Flagstaff beardtongue individuals or habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or the Loss of Viability of the Species.

All other Forest Service Sensitive Plants:

There are no known populations and no suitable habitat on the Williams District for these Forest Service Sensitive plant species: gumbo milkvetch (*Astragalus ampullarius*), Marble Canyon milkvetch (*Astragalus cremnophylax var. hevronii*), cliff milkvetch (*Astragalus cremnophylax var. myriorrhaphis*), Kaibab paintbrush (*Castilleja kaibabensis*), Morton wild buckwheat (*Eriogonum mortonianum*), Atwood wild buckwheat (*Eriogonum thompsonae var. atwoodii*), Kaibab bladderpod (*Lesquerella kaibabensis*), Kaibab pincushion cactus (*Pediocactus paradinei*), Fickeisen pincushion cactus (*Pediocactus peeblesianus var. fickeiseniae*), Mt. Trumbull beardtongue (*Penstemon distans*), and Grand Canyon rose (*Rosa stellata ssp. abyssa*).

Implementation of Alternative 3 would have No Effect on these Forest Service Sensitive plant species.

Alternative 4

Direct and Indirect Effects

Threatened, Endangered, Proposed, or Candidate Plant Species --

No populations of Threatened, Endangered, Proposed, or Candidate plant species have been found and no suitable habitat is known to exist on the Williams Ranger District. Implementation of Alternative 4 would have No Effect.

Forest Service Sensitive Plants --

By implementing Alternative 4, the Williams District would be able to protect many areas that contain sensitive plant species. Alternative 4 would meet the goals and objectives of the Kaibab Forest Plan better than any other alternative.

The effects of Alternative 4 are the same as Alternative 3, except for the following differences. Please see the Direct and Indirect Effects of Alternative 3 for more information.

Compared to Alternative 3, Alternative 4 would reduce the number of miles of roads open to the public on the Williams District by another 2 percent. Alternative 4 would close 21 roads that extend for 35 miles. Closing all 21 roads to the public would slightly reduce the rate of introduction and spread of invasive exotic weeds into sensitive plant habitat compared to Alternative 3. The lack of road maintenance activities, dispersed camping, and parking along these 21 roads would also reduce the opportunities for trampling or disturbance of any sensitive plants that are growing near roads.

Under Alternative 4, hunters would be prohibited from driving motorized vehicles cross country for any purpose. The motorized retrieval of the carcasses of elk or any other hunted animal would not be allowed. The limitations on cross country motorized vehicle travel would greatly benefit any sensitive plants and their habitats that exist on the District. Implementation of Alternative 4 would reduce the damage and death of sensitive plants, the soil compaction, the creation of ruts and bare soil patches, and the spread of exotic weeds into sensitive plant habitat.

See Alternative 1 Direct and Indirect Effects for general information about each plant species.

<u>Arizona bugbane (*Actaea arizonica*, formerly *Cimicifuga arizonica*)</u>

Alternative 4 does not propose to close the roads that are located in or near Arizona bugbane habitat on Bill Williams Mountain. Therefore, compared to Alternative 1 (No Action), Alternative 4 does not reduce the risk of damage to Arizona bugbane populations and/or habitats from invasive exotic weeds introduced by vehicles traveling on nearby open roads. The effects of the two alternatives are identical. The spread of exotic weeds would not be rapid, due to the thick canopy of trees and abundant understory cover. Forest staff would control the weeds before they could invade affect the Arizona bugbane populations.

Implementation of Alternative 4 May Affect Arizona bugbane Individuals or Habitat, but is Not Likely to Contribute to a Trend toward Federal Listing or Loss of Viability to Populations or the Species.

Mt. Dellenbaugh sandwort (*Arenaria aberrans*)

Implementation of Alternative 4 would reduce the potential damage to Mt. Dellenbaugh sandwort populations and their habitats compared to Alternatives 1, 2 and 3. Alternative 4 would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 4 May Affect Mt. Dellenbaugh sandwort Individuals or Habitat, but Will Not Likely Contribute to a Trend toward Federal Listing or the Loss of Viability of the Species.

Rusby milkvetch (*Astragalus rusbyi*)

Implementation of Alternative 4 would reduce the potential damage to Rusby milkvetch populations and their habitats compared to Alternatives 1, 2, and 3. Alternative 4 would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 4 May Affect Rusby milkvetch Individuals or Habitat, but Will Not Likely Contribute to a Trend toward Federal Listing or the Loss of Viability of the Species.

Tusayan rabbitbrush (*Chrysothamnus molestus*)

Implementation of Alternative 4 would reduce the potential damage to Tusayan rabbitbrush populations and their habitats compared to Alternatives 1, 2, and 3. Many roads would be closed, but the roads next to some of the known populations would remain open. Alternative 4 would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 4 May Affect Tusayan rabbitbrush Individuals or Habitat, but Will Not Likely Contribute to a Trend toward Federal Listing or the Loss of Viability of the Species.

Arizona leatherflower (*Clematis hirsutissima var. hirsutissima*)

Implementation of Alternative 4 would reduce the potential damage to Arizona leatherflower populations and their habitats compared to Alternatives 1, 2, and 3. Alternative 4 would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 4 May Affect Arizona leatherflower Individuals or Habitat, but Will Not Likely Contribute to a Trend toward Federal Listing or the Loss of Viability of the Species.

Rock fleabane (*Erigeron saxatilis*)

Implementation of Alternative 4 would have No Effect on rock fleabane individuals, populations, or habitats.

Flagstaff pennyroyal (*Hedeoma diffusa*)

Implementation of Alternative 4 would reduce the potential damage to Flagstaff pennyroyal populations and their habitats compared to Alternatives 1, 2, and 3. Alternative 4 would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 4 May Affect Flagstaff pennyroyal Individuals or Habitat, but Will Not Likely Contribute to a Trend toward Federal Listing or the Loss of Viability of the Species.

Flagstaff beardtongue (*Penstemon nudiflorus*)

Implementation of Alternative 4 would reduce the potential damage to Flagstaff beardtongue populations and their habitats compared to Alternatives 1, 2, or 3. Many roads would be closed, but the roads next to some of the known populations would remain open. Alternative 4 would reduce the risk of physical damage to the plants and their habitats. It would also reduce the opportunities for exotic weeds to be spread into plant populations or habitats.

Implementation of Alternative 4 May Affect Flagstaff beardtongue Individuals or Habitat, but Will Not Likely Contribute to a Trend toward Federal Listing or the Loss of Viability of the Species.

All other Forest Service Sensitive Plants:

There are no known populations and no suitable habitat on the Williams District for these Forest Service Sensitive plant species: gumbo milkvetch (*Astragalus ampullarius*), Marble Canyon milkvetch (*Astragalus cremnophylax var. hevronii*), cliff milkvetch (*Astragalus cremnophylax var. myriorrhaphis*), Kaibab paintbrush (*Castilleja kaibabensis*), Morton wild buckwheat (*Eriogonum mortonianum*), Atwood wild buckwheat (*Eriogonum thompsonae var. atwoodii*), Kaibab bladderpod (*Lesquerella kaibabensis*), Kaibab pincushion cactus (*Pediocactus paradinei*), Fickeisen pincushion cactus (*Pediocactus peeblesianus var. fickeiseniae*), Mt. Trumbull beardtongue (*Penstemon distans*), and Grand Canyon rose (*Rosa stellata ssp. abyssa*).

Implementation of Alternative 4 would have No Effect on these Forest Service Sensitive plant species.

Cumulative Effects

The cumulative effects analysis area consists of the Williams Ranger District surrounded by a one mile buffer. The cumulative effects analysis time period is 2000 to 2020.

Past, ongoing, and planned projects and activities in the cumulative effects analysis area that will have an effect on rare plants include: timber harvesting, forest thinning, grassland restoration tree removal, prescribed burning, livestock grazing, fence construction, water tank construction and maintenance, vehicle driving and horseback riding off road to herd cattle and maintain fences, noxious and invasive exotic weed control, recreational activities (e.g. dispersed camping, horseback riding, hiking, hunting), road use and maintenance, mineral exploration and mining, pipeline and transmission line use and maintenance, and residential/commercial/government developments and activities. Natural conditions, events, and activities that have an effect on rare plants include climate, wildfires, and elk grazing.

Timber harvesting, forest thinning, and grassland restoration tree removal projects reduce overstory cover in the short-term and can stimulate an increase in understory cover in two to five years. The vigor and cover of the native understory (including rare plants) can improve. Reduction in tree canopy and heavy fuels will reduce the threat of catastrophic wildfires that could remove most of the plant and litter cover (including rare plants), burn the native seed bank, sterilize the soils, and provide areas for noxious and invasive exotic weeds to invade. Weeds could dominate rare plant habitat after a catastrophic fire. Weeds could be spread by heavy equipment, vehicles, and personnel working in the project areas. However, best management practices and mitigation measures are in place on every project in order to reduce the introduction and spread of weeds. Existing weed populations should be controlled before work begins. All equipment must be cleaned before it is moved to the site. Project areas are monitored and weed populations are controlled over time after a project is completed. Known populations of rare plants are flagged and damage is avoided. Elk and livestock may be attracted to the area due to the increase in quantity and quality of forage. Rare plant populations need to be monitored to avoid damage. The long-term cumulative effect of vegetation management projects (with the incorporation of best management practices and mitigation measures) on rare plants is no effect, or an improvement in plant vigor and/or habitat conditions.

Broadcast prescribed burns remove a portion of overstory, understory, and litter cover. In the ponderosa pine region, these burns are conducted in order to maintain or improve forest health by thinning the trees and increasing the herbaceous understory. The burns temporarily remove cover, but they also increase the growing space, light, moisture, and nutrients available to understory plants, including rare plants. In two to five years, the understory plants can regenerate and expand in cover compared to the pre-burn conditions. Reduction in tree cover and heavy fuels will reduce the threat of catastrophic wildfires that could remove most of the plant and litter cover (including rare plants), burn the seed bank, sterilize the soil, and provide sites for noxious and invasive exotic weed invasion. Project areas are surveyed and weeds should be controlled before projects begin. Fire managers distribute the fuels, so that broadcast prescribed fires do not burn at a very hot temperature. This action protects the soil and some of the litter and residual plants. Soils are generally more fertile after a low to moderate intensity broadcast burn, so that native plants can easily regenerate. Noxious and invasive exotic weeds may still invade, but they must compete with a healthy and vigorous native plant community. After the burn, the area is monitored and weeds are controlled over time. Known rare plant populations are flagged and avoided, unless they are well adapted to fire. Weeds found in or near rare plant populations will be controlled. Elk and livestock may be attracted to the area due to the increase in quantity and quality of forage. Rare plant populations need to be monitored to avoid damage. The cumulative effect of broadcast prescribed burns (with the incorporation of best management practices and mitigation measures) on rare plants is no effect, or damage to plants and/or habitat in the short-term; and no effect, or an improvement in plant vigor and/or habitat conditions in the long term.

Piling of tree thinning slash and prescribed burning of piles will remove excess fuels in the area. These projects will reduce the threat of catastrophic wildfires that could remove most of the plant and litter cover (including rare plants), burn the native seed bank, sterilize the soil, and provide large areas for the invasion of noxious and invasive exotic weeds. Large piles with heavy fuels can burn at a very high temperature, leading to bare ground and sterilized soil under the piles. Native plants usually do not regenerate very quickly on these spots, so the ground can remain barren or can fill in with invasive exotic weeds. Weeds may occur in small scattered locations, but can spread to other areas. Weeds should be

monitored and controlled before and after the project is completed. No piling or burning will take place on or near rare plant populations. The long-term cumulative effect of piling and burning slash (with the incorporation of best management practices and mitigation measures) on rare plant populations is no effect.

Livestock grazing occurs on the District and on nearby private and state lands. Forage utilization on the Forest is maintained at a conservative level that protects the vigor of rare plants and their ability to set seed. Forage utilization levels on the nearby private and state lands are unknown. Native plant communities on the Forest would remain healthy with a minimal amount of bare ground for noxious and exotic weed invasion. However, livestock can spread the seeds of some weeds that become attached to their hair and feet. A few weed populations could become established and spread. The long-term cumulative effect of livestock grazing (with the incorporation of best management practices and mitigation measures) on rare plants is no effect, or damage to plants and/or habitat.

Fence construction, water tank construction and maintenance, vehicle driving and horseback riding off road to herd cattle and maintain fences occur on the District. These activities can remove understory plant cover in limited areas. These effects are tolerated in order to facilitate livestock, burro, and elk distribution. Improved livestock, burro, and elk distribution can reduce grazing intensity, improve plant vigor and ability to set seed, and improve plant cover. However, the bare areas along fences and water tanks could become sites for the invasion of noxious and exotic weeds. The vehicles and horses could spread weed seeds. These weeds could spread into populations of rare plants. The project areas will be surveyed for rare plants before work begins. Populations will be flagged and avoided. Weeds found in or near rare plant populations will be controlled. The long-term cumulative effect of these livestock and elk management activities (with the incorporation of best management practices and mitigation measures) on rare plants is no effect.

Noxious and invasive exotic weed control activities began on the Williams Ranger District in 2001 and will continue to occur. Manual control began in 2001, chemical and biological control in 2006. Weeds will be controlled by manual, chemical, or biological methods. If rare plants are present, a control method will be chosen that has a low risk of damaging those plants. Removal of weeds can create small patches of bare ground in the short-term. Re-treatments will continue to remove the weeds while allowing native plants to cover the area in the long-term. The long-term cumulative effect of noxious and invasive exotic weed control activities (with the incorporation of best management practices and mitigation measures) on rare plants is an improvement in plant vigor and habitat condition.

Sandstone and cinder mining activities are currently occurring on the District. Mining involves the use of many types of vehicles and equipment on Forest Service System Roads and off road for short distances. The projects have the potential to damage or kill rare plants. However, all project areas are surveyed before work begins. If rare plants are found, the project is moved to avoid them or mitigation measures are enforced to protect them. Mining vehicles have the potential to introduce and/or spread noxious and invasive exotic weeds into rare plant populations by creating patches of bare ground and dispersing seeds. The miners must follow best management practices (e.g. wash equipment) and take mitigation measures in order to: prevent the introduction of weeds, and re-vegetate all disturbed areas with native plants. The long-term cumulative effect of mining (with the incorporation of best management practices and mitigation measures) on rare plants is no effect.

Recreational activities (e.g. dispersed camping, horseback riding, hiking, biking, and hunting), and pipeline/transmission line use and maintenance will occur on the District. These activities can remove or trample rare plants and introduce and spread noxious and invasive exotic weeds. The Forest Service will continue to monitor and control populations of weeds as they invade. Mitigation measures will be used along utility corridors to minimize damage to rare plants. The long-term cumulative effect of recreation and pipeline/transmission line activities (with the incorporation of best management practices and mitigation measures) on rare plants is no effect, or damage to plants and/or habitat.

Residential, commercial, and government developments and activities will still occur and may increase on private in-holdings within the cumulative effects analysis area. Residents, businesses, and government agencies may introduce noxious and invasive exotic weeds to their properties. The weeds could spread to adjoining Forest Service land. The Forest Service will continue to monitor and control weeds as they invade, especially in known rare plant populations. The long-term cumulative effect of residential activities on rare plants is no effect, or damage to plants and/or habitat.

Climate and weather will continue to affect the cumulative effects analysis area. Floods, heavy runoff, and high winds can spread noxious and invasive exotic weed seeds. The region has experienced a recent long-term drought. Droughts may become more frequent and average temperatures may continue to increase as a result of climate change. Drought reduces plant cover (including rare plants), kills trees, and makes the forest more susceptible to wildfires. Noxious and invasive exotic weeds have a competitive advantage during droughts and could expand their ranges at the expense of rare plants. The long-term cumulative effect of climate and weather on rare plants is no effect, or an improvement in plant vigor and habitat; or damage to plants and/or habitat.

Wildfires will continue to affect the cumulative effects analysis area. Noxious and invasive exotic weeds often colonize areas burned by a wildfire, especially if the fire was hot enough to burn the native seed bank and sterilize the soil. The long-term cumulative effect of wildfires on rare plants is no effect, or an improvement in plant vigor and habitat; or damage to plants and/or habitat.

Elk will continue to affect the cumulative effects analysis area. Elk already damage plants in some areas. If the population size remains the same, especially during the drought, elk could continue to heavily graze in some areas and create patches of bare ground that could be susceptible to weed invasion. Elk could also spread the seeds of some weeds that attach to their hair and feet. Elk may browse or trample rare plants. The long-term cumulative effect of elk grazing on rare plants is no effect, or damage to plants and/or habitat.

Cumulative effects on all rare plants:

The cumulative effect of all human activities and natural events will be a general improvement in forest and rangeland health on the District, including rare plant habitat. However, noxious and invasive exotic weeds will continue to be introduced and spread by vehicles, animals, people, water, and wind. Use of the Forest by the public will continue to increase. Any patch of bare ground on the District is vulnerable to weed invasion through vectors (e.g. recreationists, hunters, local property owners, animals, wind, and water) that the Forest Service cannot control. Invasive exotic weeds could become a threat to the survival of some rare plant populations.

Cumulative effects of Alternative 1 (No Action):

Continuation of current management (Alternative 1 - No Action) would maintain or increase the detrimental cumulative effects to rare plant individuals or habitats.

Cumulative effects of Alternative 2 (Proposed Action):

Implementation of Alternative 2 (Proposed Action) would reduce the detrimental cumulative effects to rare plant individuals or habitats compared to Alternative 1 (No Action).

Cumulative effects of Alternative 3:

Implementation of Alternative 3 would reduce the detrimental cumulative effects to rare plant individuals or habitats more than Alternatives 1 or 2.

Cumulative effects of Alternative 4:

Implementation of Alternative 4 would reduce the detrimental cumulative effects to rare plant individuals or habitats more than any other alternative.

3.4 Noxious and Invasive Exotic Weeds

Affected Environment and Existing Condition

Noxious and invasive exotic weeds found on the Williams Ranger District include: cheatgrass (*Bromus tectorum*), jointed goatgrass (*Aegilops cylindrica*), Dalmatian toadflax (*Linaria dalmatica*), diffuse knapweed (*Centaurea diffusa*), Russian knapweed (*Acroptilon repens*), bull thistle (*Cirsium vulgare*), and Scotch thistle (*Onopordum acanthium*). Other invasive exotic weeds commonly found on the District include: common mullein (*Verbascum thapsus*) and yellow sweetclover (*Melilotus officinalis*).

Cheatgrass occurs in mostly small patches throughout the District, especially along roads or in burned areas. It is common within the Pumpkin Fire area on Kendrick Mountain. Dalmatian toadflax is common in small patches across the District, especially along roads and in burned areas. Large patches are found within the Pumpkin Fire area. Jointed goatgrass, diffuse knapweed, and Russian knapweed have only been found in a few locations on the District, along roads and in developed areas. Bull thistle is another common weed found throughout the District, especially in wet areas and burned areas. Thick patches are found within the Pumpkin Fire area in places where the fire burned at a high intensity, killing all the trees and sterilizing the soil. Scotch thistle is found along Interstate 40 and along other roads and developed areas. Common mullein is found all over the District, mostly in areas that have burned at a high intensity (i.e. wildfires and slash pile burns). Yellow sweetclover is found throughout the District, especially in disturbed areas and roadsides. It is a pasture forb that was frequently used in seed mixes in the past.

Many of these populations have been treated using manual, chemical, or biological control methods. Invasive exotic weed inventory, monitoring, new treatments and re-treatments occur annually on the District.

Most new invasive exotic weed infestations have been found next to or near roads. Vehicles are the most common cause of weed introduction and spread. Road density, road locations, and the location of new

ground disturbances can be used to predict the location and rate of spread of many invasive exotic weeds. Many exotic invasive weed seeds and plant parts are spread by muddy vehicle tires. A dense road network increases the risk that existing weeds will be spread further and that new weeds will be introduced. Noxious and invasive weeds may also be spread by hikers, bicyclists, horses, livestock, and wildlife. Seeds and other plant parts are spread after sticking to muddy feet, tires, clothing, fur, or hair. Weeds may also be spread by wind and water.

Forest Plan Direction

Relevant direction from the Kaibab National Forest Land Management Plan (1988, as amended):

Goal --

- Prevent any new noxious or invasive weed species from becoming established, contain or control the spread of known weed species, and eradicate species that are the most invasive and pose the greatest threat to biological diversity and watershed condition.

Forest-wide Standards –

- Incorporate measures to control invasive species into project planning, implementation, and monitoring.

Forest-wide Guidelines –

- Use the Appendix B "Design Features, Best Management Practices, and Mitigation Measures" in the "Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds on the Coconino, Kaibab, and Prescott National Forests within Coconino, Gila, Mojave, and Yavapai Counties, Arizona" (2004) for specific mitigation measures.

Effects on Noxious and Invasive Exotic Weeds

Direct and Indirect Effects Common to All Alternatives

The following information is from the Environmental Impact Statement for Cross Country Travel by Off Highway Vehicles (Forest Service 2004, pages 16 and 30). It lists the general effects that invasive exotic weeds can have on the environment. It also describes the various ways that weeds may be introduced or spread, including by motorized vehicles.

> Invasive, weedy plants have a highly significant effect on native plant communities, wildlife populations and habitats and natural ecosystem processes (Duncan 1997). Exotics frequently displace native plants and out-compete native plants. Within 3 years of establishment, spotted knapweed in Glacier National Park caused six native species to be considered rare (Williams 1997). Other species such as Russian knapweed and salt cedar are allelopathic (Roche 1989, Asher and Spurrier 1998), producing chemicals that make soil unfit for other plants. Weeds are also known to overrun riparian areas and sites with deep, rich soils, the most productive habitats (Asher and Spurrier 1998). These changes in the structure of native plant communities lead to changes in wildlife habitat.
>
> Noxious weeds are also capable of changing the natural functions of ecosystems. Examples include altering soil microclimates (Evans and Young 1984) and disrupting nutrient and water cycles (Vitousek 1990). The invasion of the Sonoran desert by

buffelgrass promotes wildfire in an environment that is not adapted to such events (Esque and Schwalbe 2000). Cheatgrass, Russian thistle (tumbleweed) and salt cedar are other weedy species known to increase the frequency and/or intensity of fires (DeLoach et al.1998, Asher and Spurrier 1998, Holland et al. 2001).

Some weed species contain compounds that are toxic to wildlife. Yellow star thistle and Russian knapweed trigger chewing disease in horses, causing the animals to lose control of facial muscles. Leafy spurge is poisonous to cows, and can cause intense eye irritation or even blindness in humans (Asher and Spurrier 1998).

Economic losses often stem from reduction in livestock grazing capacity, reduction in soil productivity and reduction in property values (Parker 1972). The Forest Service spends time and money mapping, monitoring, and treating weeds as well.

Other states have felt more serious repercussions from the invasion of noxious plants. Currently, Arizona's noxious weed problems are not equal in magnitude to those of many other states; however, looking at their circumstances reinforces the importance of control and eradication of known infestations, as well as detecting and preventing the establishment of new ones.

These weeds spread in a variety of ways, including animals (wildlife, pets and livestock), hikers, bikers, wind, water and motorized equipment. Each weed has unique characteristics that make seed transport by some methods more significant than others. OHVs (Off Highway Vehicles) have a huge potential for weed spread. Vehicles driving through populations of invasive plants often get seed entrapped in tire tread or undercarriages, move to another area and then drop seeds into a previously uninfested area. A study performed by Trunkle and Fay (1991) determined that an average of 1,644 knapweed seeds became attached to a pickup truck after backing 40 feet through an infested area and then pulling back out. After driving one mile, 14 percent of seeds were still attached, and after 10 miles, only 8 percent remained attached. This type of seed attachment and dispersal is likely common for any number of weed species and shows the havoc that motorized vehicle users can have unknowingly on the landscape. In addition, continued OHV use in an area often reduces vegetation and exposes soil, creating favorable conditions for germination of weed seeds (Burke and Grime 1996, Hobbs and Heunneke 1992).

It is common knowledge that invasive weeds are strongly associated with travel corridors such as roads and trails (USFS 1998b, ODA 2001, Penner 1997, Penfold 2000, Brothers 1992). People, vehicles and animals function as vectors in seed transport by the common use of such thoroughfares. Often roads and trails serve as the initial invasion corridors for weeds, which then spread outward from these locations. The perpetual disturbance in these areas creates a perfect environment for weeds to launch new populations. The random nature of motorized wheeled cross-country travel, as well as the movements of people and animals, makes detection of newly established infestations difficult.

Noxious and invasive exotic weeds can affect the forest and rangeland in other ways as well. Weeds can aggressively out-compete most native plants for growing space, sunlight, soil moisture, and soil nutrients. They can displace many species of native plants, leading to a reduction in biodiversity. Weeds may also reduce the scenic and natural beauty of the area.

Alternative 1 – No Action

Direct and Indirect Effects

The current rate of spread of existing noxious and invasive exotic weeds and the current rate of introduction of new weeds would continue. As recreation use of the District increases in the future, the rate of spread of weeds would probably increase as well.

The increased populations of weeds may increase soil erosion, reduce forage for wildlife and livestock, reduce wildlife habitat, displace native plants, reduce biodiversity, increase the risk of fire, and reduce scenic and natural beauty.

Unmanaged cross country motorized vehicle travel is a major threat to the Forest. Vehicles can crush and kill native vegetation, drive through existing populations of noxious and invasive exotic weeds, open up ruts and bare patches of soil, cause soil erosion, and spread weed seed onto the newly created seedbeds. The most vulnerable areas include gentle slopes, areas with an open canopy of trees and shrubs, areas near water, and scenic views.

Global climate change may lead to higher temperatures, lower precipitation, more frequent and severe droughts, and more wildfires. Many noxious and invasive exotic weeds have a competitive advantage during droughts and after fires and could expand their ranges at the expense of native plants. The continuation of current travel management could lead to an even greater rate of weed introduction and spread if global climate change predictions are correct.

Continuation of current management (Alternative 1 – No Action) could lead to a large annual increase in the number of weed species found on the District and in the number of acres infested with invasive exotic weeds.

Implementation of Alternative 1 (No Action) would not meet the Kaibab Forest Plan goals of preventing the establishment of new noxious or invasive weed species or of controlling the spread of weeds.

Alternative 2 – Proposed Action

Direct and Indirect Effects

The Travel Management Process provides an opportunity to reduce the density of the open road network and to reduce the number of open roads and new unauthorized routes near vulnerable areas such as wilderness, scenic areas, mountains, watersheds, important wildlife habitat, areas with rare plant populations, and other points of interest. Alternative 2 (Proposed Action) reduces the miles of open Forest Service System Roads by 25%. It also closes many, but not all, roads that are in or near vulnerable areas. These road closures, and the limitation on most motorized cross country travel, would help prevent the introduction and spread of invasive exotic weeds into some of the most vulnerable and important areas of the District. More road closures, in or near vulnerable areas, could occur in the future, if necessary, as part of later iterations of the Travel Management Process.

The closure of 25% of the Forest Service System Roads on the District; the closure of most unauthorized routes; and the ban on most cross country motorized vehicle travel, would greatly reduce the spread of existing noxious and invasive exotic weeds and the introduction of new weeds across the District. Fewer disturbances of soil and native vegetation would occur and fewer weed seeds would be spread by

motorized vehicles. The reduced incidence of weeds would help conserve: soil, forage for wildlife and livestock, wildlife habitat, native plant communities, biodiversity, and scenic/natural beauty.

Alternative 2 (Proposed Action) proposes the creation of off-highway vehicle trail systems, using 23 miles of existing System Roads and adding 2 miles of constructed roads. Most of these roads already exist and are currently used by vehicles, including off highway vehicles. Converting the roads to off highway vehicle tracks and adding 2 more miles of track in those same areas would not greatly change the current rate of weed introduction and spread.

Some motorized cross country travel, in support of land management projects, would still be allowed by Forest Service employees, Forest Service contractors, and permittees. However, best management practices and mitigation measures are currently implemented on all projects conducted by Forest Service employees, contractors, and some permittees, in order to reduce the spread of noxious and invasive exotic weeds. For example, loggers, miners, and utility crews are required to wash their heavy equipment before entering the Forest. Also, vehicles and heavy equipment are not allowed to be used when soils are wet enough to cause soil and road damage. This policy can also reduce the amount of weed seed that is transported around the District on muddy tires. Current best management practices reduce the introduction and spread of exotic weeds, but they do not eliminate it.

Alternative 2 (Proposed Action) would designate dispersed camping corridors along 220 miles of open System Roads. Forest users and campers could drive cross country at random in these areas to access the Forest. These corridors have not been reviewed for resource concerns. Many weed populations could already exist within the corridors. These weeds could be spread and more weed species could be introduced by cross country motorized vehicle travel. The current rate of weed introduction and spread near these roads from unmanaged motorized vehicle travel (Alternative 1 – No Action) would not change with the implementation of Alternative 2 (Proposed Action).

Under Alternative 2 (Proposed Action), the District would designate at least 7 miles of short road segments as open for dispersed camping and general forest access. These roads would be evaluated for resource concerns, including weed populations. Restricting dispersed camping to these road segments and other roads would provide the Forest Service with a way to track and control new populations of noxious and invasive exotic weeds. Designated open roads would be periodically surveyed for weeds, so that the weeds could be controlled. Disturbed areas could be re-vegetated as needed. Designating open road segments for dispersed camping and other forest access would reduce the spread of exotic weeds in comparison to Alternative 1 (No Action), which allows random cross country vehicle use.

Alternative 2 (Proposed Action) would allow cross country motorized vehicle use by hunters to retrieve legally tagged elk carcasses. Vehicles could travel almost anywhere on the District, within one mile of an open road, during elk hunting seasons within the months of August, September, and October. Cross country vehicle use has the potential to introduce and spread invasive exotic weeds. However, Alternative 2 (Proposed Action) greatly reduces the amount of cross country vehicle use associated with hunting. Currently, Alternative 1 (No Action) allows hunters to drive cross country almost anywhere on the District, at any time of year, for any type of game, and for any purpose (scouting, hunting, or retrieving carcasses). Alternative 2 (Proposed Action) would reduce the introduction and spread of exotic weeds by hunters.

Continued implementation of the Wet Weather Travel Policy will help reduce the spread of noxious and invasive exotic weed seeds that cling to muddy tires and vehicles.

Implementation of Alternative 2 (Proposed Action), with its reduction in open roads and cross country motorized vehicle use, would improve the ability of native plants to grow and survive. The reduction in bare ground would improve the ability of the forest and rangeland to better resist invasion by weeds, especially during a period of global climate change.

Noxious and invasive exotic weeds will continue to be spread by hikers, bicyclists, horses, livestock, wildlife, wind, and water. But implementation of Alternative 2 (Proposed Action) would reduce the introduction and spread of weeds by vehicles, which are the most common vectors of weed dissemination.

Implementation of Alternative 2 (Proposed Action) would greatly reduce the introduction and spread of noxious and invasive exotic weeds compared to Alternative 1 (No Action). Alternative 2 (Proposed Action) would not reduce the introduction and spread of exotic weeds as much as Alternative 4.

By implementing Alternative 2 (Proposed Action), the Williams District would make progress toward the Kaibab Forest Plan goals of preventing the establishment of new noxious or invasive weed species and of controlling the spread of weeds.

Alternative 3

Direct and Indirect Effects

The effects of Alternative 3 are the same as for Alternative 2 (Proposed Action), except for the following differences.

Alternative 3 does <u>not</u> propose to create any off-highway vehicle trail systems. Most of the roads, proposed for use by the trail system under Alternative 2 (Proposed Action), already exist and are currently used by vehicles, including off highway vehicles. Therefore, under Alternative 3, exotic weeds could continue to be introduced and spread along those roads at the same rate as they are now under Alternative 1 (No Action). However, under Alternative 3, the District would <u>not</u> construct 2 new miles of trail. Therefore, exotic weeds would not be introduced and spread by vehicles along 2 new miles of trail.

Alternative 3 would <u>not</u> designate dispersed camping corridors along 220 miles of open System Roads. Prohibiting motorized cross country travel for dispersed camping along these roads would greatly reduce the rate of exotic weed introduction and spread compared to Alternative 1 (No Action) and Alternative 2 (Proposed Action).

Alternative 3 would allow Forest users and dispersed campers to park within “a safe distance” of any open road unless the road section is posted with a no camping, no parking, or no travel sign. “A safe distance” would often be greater than one car length, but it should not be much more than 30 feet. Vehicles could introduce or spread exotic weeds whether they are parked within “a safe distance” or within one car length of a road, so the effects are generally the same as for Alternative 2 (Proposed Action).

Alternative 3 would allow cross country motorized vehicle use by hunters to retrieve legally tagged elk carcasses. Vehicles could travel almost anywhere on the District, using one vehicle for one round trip of the shortest distance. Motorized elk retrieval could occur during any time of the day and during any time during the legal elk hunting seasons, including November and December. Since most areas of the District

would be located within one mile of an open road, hunters probably would not travel much further than they would under Alternative 2 (Proposed Action). Therefore, the effects would be the same as for Alternative 2 (Proposed Action). The allowance for motorized elk retrieval at any time of the day would not change the effects either. The allowance for motorized elk retrieval in November and December is a large change. Hunters' vehicles could introduce and spread invasive exotic weeds for two more months per year across the District, at a time when the soils are often moist. Exotic weed seeds could stick to vehicle tires and could be spread around the District. Alternative 3 would greatly reduce the introduction and spread of exotic weeds by hunters compared to Alternative 1 (No Action), but less than Alternative 2 (Proposed Action) and Alternative 4.

Implementation of Alternative 3 would greatly reduce the introduction and spread of noxious and invasive exotic weeds compared to Alternative 1 (No Action). It would also improve the ability of the Forest to inventory, monitor, and control weeds. Alternative 3 would not reduce the introduction and spread of exotic weeds as much as Alternative 4.

By implementing Alternative 3, the Williams District would make progress toward the Kaibab Forest Plan goals of preventing the establishment of new noxious or invasive weed species and of controlling the spread of weeds. Alternative 3 would be more effective in meeting the goals than Alternative 2.

Alternative 4

Direct and Indirect Effects

The effects of Alternative 4 are the same as Alternative 3, except for the following differences.

Compared to Alternative 3, Alternative 4 would reduce the number of miles of roads open to the public on the Williams District by another 2 percent. Alternative 4 would close 21 roads that extend for 35 miles. Closing all 21 roads to the public would slightly reduce the rate of introduction and spread of invasive exotic weeds compared to Alternative 3. Closing 2 of the roads would really help reduce the threat of weed invasion and spread on Sitgreaves Mountain.

The prohibition on cross country motorized elk retrieval would remove all unregulated random cross country vehicle travel from the District. All other motorized cross country travel for administrative, contracted, or some permitted purposes would be subject to location and seasonal restrictions, as well as other best management practices and mitigation measures.

Random cross country motorized vehicle travel would no longer occur on the District. As a result, the rate of introduction and spread of noxious and invasive exotic weeds would be greatly reduced.

Implementation of Alternative 4 would greatly reduce the introduction and spread of noxious and invasive exotic weeds compared to Alternative 1 (No Action). Alternative 4 would also reduce the introduction and spread of exotic weeds more than Alternative 2 (Proposed Action) and Alternative 3.

By implementing Alternative 4, the Williams District would make progress toward the Kaibab Forest Plan goals of preventing the establishment of new noxious or invasive weed species and of controlling the spread of weeds. Alternative 4 would be more effective in meeting the goals than any other alternative.

Cumulative Effects

The cumulative effects analysis area consists of the Williams Ranger District surrounded by a one mile buffer. The cumulative effects analysis time period is 2000 to 2020.

Past, ongoing, and planned projects and activities in the cumulative effects analysis area that will have an effect on noxious and invasive exotic weeds include: timber and fuelwood harvesting, forest thinning, grassland restoration tree removal, prescribed burning, livestock grazing, fence construction, water tank construction and maintenance, vehicle driving and horseback riding off road to herd cattle and maintain fences, noxious and invasive exotic weed control, recreational activities (e.g. dispersed camping, horseback riding, hiking, hunting), mineral exploration and mining, pipeline and transmission line use and maintenance, and residential developments and activities. Natural conditions, events, and activities that have an effect on noxious and invasive exotic weeds include climate and weather, wildfires, and elk grazing.

Timber and fuelwood harvesting, forest thinning, and grassland restoration tree removal projects reduce overstory cover in the short-term and can stimulate an increase in understory cover in two to five years. The improved health and cover of the native understory and soils can reduce the ability of noxious and invasive exotic weeds to invade and spread. Reduction in tree canopy and heavy fuels will reduce the threat of catastrophic wildfires that could remove most of the plant and litter cover, burn the native seed bank, sterilize the soils, and provide sites for noxious and invasive exotic weeds to invade. Weeds could be spread by heavy equipment, vehicles, and personnel working in the project areas. However, best management practices and mitigation measures are in place on every project in order to reduce the introduction and spread of weeds. Existing populations should be controlled before work begins. All off road equipment must be cleaned before it is moved to the site. Project areas are monitored and weed populations are controlled over time after a project is completed. The cumulative effect of vegetation management projects (with the incorporation of best management practices and mitigation measures) is no effect, or an increase in weed populations in the short-term; and a decrease in weed populations in the long term.

Broadcast prescribed burns remove a portion of overstory, understory, and litter cover. These burns are conducted in order to maintain or improve forest health by thinning the trees and increasing the herbaceous understory. The burns temporarily remove cover, but they also increase the growing space, light, moisture, and nutrients available to understory plants. In two to five years, the understory plants can regenerate and expand in cover compared to the pre-burn conditions. Reduction in tree cover and heavy fuels will reduce the threat of catastrophic wildfires that could remove most of the plant and litter cover, burn the seed bank, sterilize the soil, and provide sites for noxious and invasive exotic weed invasion. Project areas are surveyed and weeds should be controlled before projects begin. Fire managers distribute the fuels, so that broadcast prescribed fires do not burn at a very hot temperature. This action protects the soil and some of the litter and residual plants. Soils are generally more fertile after a broadcast burn, so that native plants can easily regenerate. Weeds may still invade, but they must compete with a healthy and vigorous native plant community. After the burn, the area is monitored and weeds are controlled over time. The cumulative effect of broadcast prescribed burns (with the incorporation of best management practices and mitigation measures) is no effect, or an increase in weed populations in the short-term; and a decrease in weed populations in the long-term.

Piling of tree thinning slash and prescribed burning of piles will remove excess fuels in the area. These projects will reduce the threat of catastrophic wildfires that could remove most of the plant and litter cover, burn the native seed bank, sterilize the soil, and provide large areas for the invasion of noxious and invasive exotic weeds. Large piles with heavy fuels can burn at a very high temperature, leading to bare

ground and sterilized soil under the piles. Native plants may not regenerate very quickly on these spots, so the ground can remain barren or can fill in with invasive exotic weeds. Weeds may occur in small scattered locations, but can spread to other areas. Weeds will be monitored. Weeds should be controlled before the project is started and will be controlled over time after a project is completed. The long-term cumulative effect of piling and burning slash (with the incorporation of best management practices and mitigation measures) is an increase in weed populations in small scattered locations and a decrease in weed populations over the broad landscape.

Crushing or mulching of slash can help reduce the fuel load by breaking up the large pieces and speeding up the decomposition and incorporation of organic material into the soil. This process will provide litter cover to areas of bare soil, helping to prevent the creation of habitat for invasive exotic weeds. Best management practices will be in place, so that heavy equipment does not drive through and spread any existing populations of invasive exotic weeds. The long-term cumulative effect of crushing and mulching of slash (with the incorporation of best management practices and mitigation measures) is a decrease in weed populations.

Livestock grazing occurs in most areas of the District and on private and state land. Forage utilization on the Forest is maintained at a conservative level that protects plant vigor and ability to set seed. Forage utilization levels on the nearby state and private lands are unknown. With conservative utilization, native plant communities across most of the Forest will remain healthy with a minimal amount of bare ground for noxious and exotic weed invasion. However, bare ground is created around water tanks and gates, where livestock tend to concentrate. These small areas can provide sites for exotic weed invasion. Livestock may trample the cryptogamic crusts that exist in a few areas, particularly on sandy soils. The crusts provide cover to the soil that prevents the invasion of many weeds. Livestock can spread the seeds of some weeds that become attached to their hair and feet. Weed populations could invade and spread. The long-term cumulative effect of livestock grazing (with the incorporation of best management practices and mitigation measures) is an increase in weed populations.

Fence construction, water tank construction and maintenance, vehicle use and horseback riding to herd cattle and maintain fences, all occur on the District. These activities can remove tree cover and remove understory plant cover in limited areas. These effects are tolerated in order to facilitate livestock, burro, and elk distribution. Improved livestock, burro, and elk distribution can reduce grazing intensity, improve plant vigor and ability to set seed, and improve plant cover. However, the bare areas along fences and at water tanks could become sites for the invasion of noxious and exotic weeds. The vehicles and horses could spread the seeds of weeds. The long-term cumulative effect of these livestock and elk management activities (with the incorporation of best management practices and mitigation measures) is an increase in weed populations in small scattered locations and a decrease in weed populations over the broad landscape.

Noxious and invasive exotic weed control activities began on the Williams Ranger District in 2001 and will continue to occur. Manual control began in 2001; chemical and biological control in 2006. Removal of weeds can create small patches of bare ground in the short-term. Re-treatments will continue to remove the weeds while allowing native plants to cover the area in the long-term. Sometimes seeding of native plants is necessary. The long-term cumulative effect of weed control activities (with the incorporation of best management practices and mitigation measures) is a decrease in weed populations.

Sandstone and cinder mining activities are currently occurring on the District. Mining involves the use of many types of vehicles and equipment on Forest Service System Roads and off road for short distances. These vehicles have the potential to introduce and/or spread noxious and invasive exotic weeds by creating patches of bare ground and dispersing seeds. The miners must follow best management practices (e.g. wash equipment before bringing it on site) to prevent the introduction of weeds. They must also implement mitigation measures in order to re-vegetate all disturbed areas with native plants. The long-term cumulative effect of mining (with the incorporation of best management practices and mitigation measures) is no effect, or an increase in weed populations.

Recreational activities (e.g. dispersed camping, horseback riding, hiking, biking, and hunting) and pipeline/transmission line use and maintenance will continue to occur on the District. These activities can remove understory native plant cover, trample plants, and introduce and spread noxious and invasive exotic weeds. The Forest Service will continue to monitor and control populations of weeds as they invade. Best management practices will be required on all projects, when possible. The long-term cumulative effect of recreation and pipeline/transmission line activities (with the incorporation of best management practices and mitigation measures) is an increase in weed populations.

Residential developments and activities, government housing and offices, city facilities, commercial facilities, and recreation/tourism facilities will be present within the cumulative effects analysis area. Residents, businesses, and government agencies may introduce noxious and invasive exotic weeds to their properties. The weeds could spread to adjoining Forest Service land. The Forest Service will continue to monitor and control weeds as they invade. The long-term cumulative effect of residential activities is an increase in weed populations.

Climate and weather will continue to affect the cumulative effects analysis area. Floods, heavy runoff, and high winds can spread noxious and invasive exotic weed seeds. The region is experiencing a long-term drought. Droughts may become more frequent and average temperatures may continue to increase as a result of climate change. Drought reduces plant cover (including native forbs and perennial grasses), kills trees, and makes the forest more susceptible to wildfires. Many noxious and invasive exotic weeds have a competitive advantage during droughts and could expand their ranges at the expense of native plants. The long-term cumulative effect of climate and weather is no effect, or an increase in weed populations.

Wildfires will continue to affect the cumulative effects analysis area. Noxious and invasive exotic weeds often colonize areas burned by a wildfire, especially if the fire was hot enough to burn the native seed bank and sterilize the soil. The long-term cumulative effect of wildfires is no effect, or an increase in weed populations.

Elk will continue to affect the cumulative effects analysis area. Elk can impact plants in many areas. If the population size remains the same, especially during the drought, elk over-graze in some areas, creating patches of bare ground that could be susceptible to weed invasion. Elk can also spread the seeds of some weeds that attach to their hair and feet. The long-term cumulative effect of elk grazing is no effect, or an increase in weed populations.

Cumulative effects for noxious and invasive weeds:

The cumulative effect of all human activities and natural events will be an improvement in forest and rangeland health on the District, but noxious and invasive exotic weeds will continue to be introduced and spread by vehicles, animals, people, water, and wind. Best management practices and mitigation measures implemented on District projects will reduce the rate of introduction and spread of weeds by Forest Service activities. However, use of the Forest by the public will continue to increase.

Any patch of bare ground on the District is vulnerable to weed invasion through vectors (e.g. recreationists, hunters, local property owners, animals, wind, and water) that the Forest Service cannot control.

Cumulative effects of Alternative 1 (No Action):

Continuation of current management (Alternative 1 - No Action) would allow the introduction and spread of weeds to increase. It would increase the detrimental cumulative effects to weed management.

Cumulative effects of Alternative 2 (Proposed Action):

Implementation of Alternative 2 (Proposed Action) would reduce the detrimental cumulative effects to weed management compared to Alternative 1 (No Action).

Cumulative effects of Alternative 3:

Implementation of Alternative 3 would reduce the detrimental cumulative effects to weed management more than Alternatives 1 or 2.

Cumulative effects of Alternative 4:

Implementation of Alternative 4 would reduce the detrimental cumulative effects to weed management more than any other alternative.

3.5 Wildlife

Analysis focused on effects of Alternatives 1, 2, 3, and 4 on Threatened and Endangered species (animal species listed, candidate, or proposed for listing under the Endangered Species Act), Forest Service Sensitive species, Kaibab National Forest Management Indicator Species (MIS), migratory birds, and other species potentially affected by changes in travel management.

The scientific literature documents a variety of negative effects of roads and motorized travel on wildlife (e.g., see literature reviews in Boyle and Samson 1985, Forman and Alexander 1998, Trombulak and Frissell 2000, Wisdom et al. 2000, Brown et al. 2001). Potential direct and indirect effects of roads and motorized travel on wildlife include habitat loss, fragmentation, and degradation caused by roads and cross-country motorized travel; roads can create barriers to movements of certain species; animals can be killed or injured as a result of being hit or run over by motor vehicles; human disturbance or harassment of animals caused by or facilitated by motorized travel; shooting or harvest of animals facilitated by motor vehicle access to wildlife habitats.

In addition to effects related to closing open roads that are discussed below for individual species, there would be differences between Alternatives 2, 3, and 4 in effects due to motorized dispersed camping, motorized trails, and motorized big game retrieval. Sites where people already commonly dispersed camp have been identified and evaluated for resource concerns. Spur roads into the sites where there are not resource concerns are proposed for addition to the designated road system under Alternatives 2, 3, and 4. In addition, vehicles could park within 30 feet of roads to access motorized dispersed camping under Alternatives 2, 3, and 4, and vehicles could access dispersed camping sites within 200 feet of approximately 220 miles of designated Forest Service roads under Alternative 2.

Alternative 2 includes a proposed motorized trail system of 25 total miles in two areas (Map 4). Motorized travel would be restricted to vehicles 50 inches wide or less along 23 miles of existing Forest Service roads, and up to 2 miles of motorized trail would be constructed to connect existing routes. There would likely be increased motor vehicle use on these two trail systems and thus increased potential human disturbance effects to wildlife in addition to the habitat impacts associated with 2 miles of trail construction. The two motorized trail systems proposed under Alternative 2 would be located in the ponderosa pine forest cover type in GA 2.

Motorized big game retrieval opportunities would be restricted under Alternatives 2, 3, and 4 compared to Alternative 1. Because motorized cross-country travel is currently allowed everywhere on the district outside of travel-restricted areas, motorized big game retrieval is allowed for all game species under Alternative 1 (Table 11). Motorized big game retrieval would not be allowed for any hunts under Alternative 4, but would be allowed for legally harvested elk during elk hunts before the 4th Thursday of October under Alternative 2, and for all elk hunts under Alternative 3. Thus, between the three action alternatives (Alternatives 2, 3, and 4), the number of motorized big game retrievals allowed would be greatest under Alternative 3, least under Alternative 4, and intermediate under Alternative 2. In 2008 there were an estimated 700 motorized big game retrievals for legally harvested elk across the Williams District (Table 11). Motorized big game retrievals would be widely dispersed spatially across the district and occur between September and October under Alternative 2 and between September and December under Alternative 3. Potential disturbance and other impacts to wildlife would thus occur outside of the spring and summer breeding/nesting season. The proposed action would result in a substantial reduction in overall motorized cross-country travel because most of the motorized cross-country travel that occurs on the district currently is for purposes other than big game retrieval (e.g., general recreational OHV riding, hunting activities other than big game retrieval such as scouting, and collection of shed elk and deer antlers).

Table 11. Estimated numbers of motorized big game retrievals on the Williams Ranger District. Estimates are based on 2008 big game harvest data published by Arizona Game and Fish Department.

Big Game Species	Total number of animals harvested in Units 7W, 8, and 10	Estimated number of motorized big game retrievals on Williams District
Elk	1435	695
Mule Deer	426	135
Pronghorn	130	25
Total	1991	855

Threatened and Endangered Species

The following animal species identified by the U.S. Fish and Wildlife Service for Coconino and Yavapai Counties (http://www.fws.gov/arizonaes/) would not be affected by travel management alternatives because the Williams Ranger District is either outside of the species' range or the district lacks suitable habitat: Kanab ambersnail, Page springsnail, Apache trout, humpback chub, razorback sucker, roundtail chub, Gila chub, headwater chub, Colorado pikeminnow, Little Colorado spinedace, desert pupfish, Gila topminnow, spikedace, Chiricahua leopard frog, northern Mexican gartersnake, southwestern willow flycatcher, yellow-billed cuckoo. The following animal species or their habitat may be affected by travel management alternatives and are discussed below: Mexican spotted owl, California condor, Sonoran Desert Area bald eagle, and black-footed ferret.

Mexican Spotted Owl

Affected Environment

The Mexican spotted owl was listed as threatened under the Endangered Species Act in 1993. Mexican spotted owls typically nest and roost in forests with relatively dense canopies or in rocky canyons. They prey on a variety of small mammals such as woodrats, mice, and voles. Forests selected for nesting typically contain mature or old-growth stands with complex structure characterized by high canopy cover, a multi-storied canopy, large-diameter trees and snags, and large logs and other woody material on the forest floor. Sites with cool microclimates are typically selected for nesting and roosting. Spotted owls use a wider variety of habitats for foraging. The biology of the Mexican spotted owl was summarized in the 1995 Recovery Plan (Fish and Wildlife Service 1995). Habitat characteristics of stands used for roosting and foraging were summarized in Ganey et al. (2003). The Williams District is located at the western end of the Upper Gila Mountains Recovery Unit. Within the Upper Gila Mountains Recovery Unit, spotted owls are most common in mixed conifer forest dominated by Douglas-fir and/or white fir and canyons and in pine-oak forest (Fish and Wildlife Service 1995, Ganey et al. 2003).

Three levels of habitat management are described in the Mexican spotted owl recovery plan (Fish and Wildlife Service 1995): protected areas, restricted areas, and other forest and woodland types. Protected areas receive the highest level of protection, other forest and woodland types the lowest. Protected areas include PACs and mixed conifer and pine-oak forests located on steep slopes (>40%) where timber harvest has not occurred in the past 20 years. All other mixed conifer and pine-oak forests on the Williams District are considered restricted areas. Each of the known areas occupied by spotted owls on the district is located in mixed conifer forest. Although pine-oak forest is widely distributed on the district, extensive surveys during the past 20 years have failed to find evidence of spotted owls occupying this habitat type on the Williams Ranger District.

There are six areas on the district where spotted owls are known to occur and breed, or have bred in the past, and a Protected Activity Center (PAC) has been established at each of these areas. Two PACs are located within the Williams District portion of the Kendrick Mountain Wilderness Area, one PAC is located on Sitgreaves Mountain, one is located on Bill Williams Mountain, and two are located within the Williams District portion of the Sycamore Canyon Wilderness Area. There are three PACs on the east side of Kendrick Mountain on the Coconino National Forest, a portion of one of these overlaps the

boundary between the two national forests. Another PAC that is located in lower Volunteer Canyon and Sycamore Canyon overlaps the two national forests, and the Geronimo PAC is located within the Coconino National Forest in Sycamore Canyon Wilderness Area adjacent to the boundary between the two forests.

Designation of Mexican spotted owl critical habitat was finalized in 2004. Three critical habitat units overlap the district: one encompassing Kendrick Mountain (UGM-15), one encompassing Sitgreaves Mountain (UGM-17), and a larger unit that includes Bill Williams Mountain, Sycamore Canyon, and the pine-oak forests south of Interstate 40 (UGM-13). Critical habitat includes protected and restricted habitats within critical habitat units, so mixed conifer and pine-oak forests located within these critical habitat units are considered designated critical habitat. Primary constituent elements of critical habitat include 1) a range of tree species composed of different tree sizes reflecting different ages of trees, 30-45% of which are large with a dbh of 12 inches or greater; 2) a shade canopy of 40% or greater; 3) large dead trees (snags) with a dbh of 12 inches or greater; 4) high volumes of fallen trees and other woody debris; 5) a wide range of tree and plant species, including hardwoods; and 6) adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration.

Direct and Indirect Effects of Alternative 1

Roads and motorized cross-country travel facilitate access and thus potential human disturbance of spotted owls. Potential effects of current travel management on individual spotted owls and occupied habitat (i.e., PACs) are limited though because only 1.8 miles of open road are located within PAC boundaries, and motorized cross-country travel is prohibited within all or nearly all of each of the PACs. Steep and rugged terrain also limits motor vehicle opportunities within each of the PACs. There is a total of 221 miles of open Forest Service jurisdiction roads that intersect spotted owl restricted habitat that is mapped on the district. 188 of these miles are located within Mexican spotted owl Critical Habitat units on the district.

The primary effect of current travel management on spotted owl habitat and designated Critical Habitat is potential degradation of habitat of spotted owl small mammal prey species as a result of motorized cross-country travel. Motorized cross-country travel sometimes results in impacts to plant and soil resources and localized decreases in plant cover. Herbaceous plants provide forage and cover for small mammal prey species of spotted owls such as woodrats, mice, and voles.

Potential human disturbance effects and localized impacts to spotted owl habitat would continue and not be reduced under Alternative 1.

Direct and Indirect Effects of Alternatives 2, 3, and 4

There would be a small reduction in potential effects due to human disturbance associated with motorized travel under Alternatives 2, 3, and 4 because 1.0 of the 1.8 miles of open roads that intersect PACs on the district would be closed (Table 12). No non-system road segments located within PACs would be added to the designated road system under any of the action alternatives. The Bixler Saddle Road (Forest Road 45), which crosses the western portion of the Bill Williams PAC, would be closed, as would a shorter segment of a road that intersects the northern edge of the Bill Williams PAC and a short road segment that intersects the southern edge of one of the PACs on Kendrick Mountain. These road closures would result in decreased road access to PACs and thus decreased risk of human disturbance to individual spotted owls.

Under Alternatives 2, 3, and 4, 67 miles that intersect restricted spotted owl habitat would be closed, 45 of which are located in spotted owl Critical Habitat units outside of PACs (Table 12). Five miles of existing non-system routes would be added to the open road system under Alternatives 2, 3, and 4 (Table 12). There may be an increase over time in use and human disturbance on the 5 miles of non-system roads that would be added to the designated road system. These are existing routes, but they may receive increased use over time as a result of adding them to the designated road system. There would still be a net decrease in the designated road system and human disturbance associated with motorized travel under Alternatives 2, 3, and 4.

Each of the two motorized trail systems proposed under Alternative 2 overlaps pine-oak restricted habitat and thus designated Critical Habitat. Most of the proposed trail system would be on existing Forest Service roads, but up to 2 miles of trail would be constructed. There would likely be increased motor vehicle use on these two trail systems and thus increased potential human disturbance in addition to the vegetation and soil disturbance that would result from trail construction. Under each of the action alternatives, motorized cross-country travel would be substantially restricted, with the greatest restriction under Alternative 4. Restricting motorized cross-country travel under Alternatives 2, 3, and 4 would result in fewer impacts to habitat of spotted owl small mammal prey and thus result in some level of increased quality of spotted owl foraging habitat within designated Critical Habitat.

Overall, Alternatives 2, 3, and 4 would result in some level of increased habitat quality for Mexican spotted owl compared to Alternative 1, with Alternative 4 resulting in a greater increase in habitat quality compared to Alternatives 2 and 3. There would be more motorized big game retrievals allowed under Alternative 3 than under Alternative 2, but Alternative 3 would lack potential human and habitat disturbance effects associated with Alternative 2's motorized trail systems.

Effects of Alternative 2, 3, or 4 on Mexican spotted owl would be primarily beneficial. Alternative 2, 3, or 4 may affect but would not adversely affect Mexican spotted owl or Mexican spotted owl designated Critical Habitat.

Table 12. Miles of existing open roads in the Forest Service designated road system (Alt 1), miles of open system roads that would be closed to public travel under Alternatives 2 and 3 and Alternative 4 (Miles Closed), and miles of unauthorized (non-system) routes that would be added as open roads to the designated road system (Miles Added). Some habitat areas overlap and are not mutually exclusive.

Habitat Area	Acres	Alt 1 - Miles Open Road	Miles Closed		Miles Added
			Alts 2 & 3	Alt 4	Alts 2, 3, 4
GA 1	177,896	372	135	148	5
GA 2	324,578	971	235	253	28
GA 3	79,027	196	25	25	0
Yavapai County	25,622	47	18	27	0.2
Garland Prairie	15,041	18	8	8	0
Government Prairie	10,079	26	4	8	0
Sycamore Rim	21,671	84	33	33	0.7
MSO PACs	4,485	1.8	1.0	1.0	0
MSO Critical Habitat outside of PACs	50,075	188	45	45	5
Gosahawk Nest Areas and PFAs	24,767	88	20	23	6

Ponderosa Pine	216,495	711	168	180	26
Pinyon-juniper	214,582	420	130	137	3
Grassland	83,897	291	68	76	4
Mixed Conifer	6,794	4	1.0	1.2	0.1
Aspen	1,568	3	0.8	0.8	0
Spruce-fir	286	0	0	0	0

California Condor

Affected Environment

Condors are opportunistic scavengers that feed primarily on large dead mammals such as deer, elk, bighorn sheep, and domestic livestock. Condors nest in caves on cliff walls, on rock ledges, and in tree cavities.

The California condor is classified as endangered under the Endangered Species Act. In 1996 a nonessential experimental population of California condors was designated in northern Arizona and southern Utah under section 10(j) of the Endangered Species Act. Captive-bred condors began to be released at the Vermillion Cliffs in 1997. The nonessential experimental population area in northern Arizona includes lands north of Interstate 40 and Highway 93 and west of Highway 191. The portion of the Williams District north of Interstate 40 is thus located within the experimental population area. Although the northern part of the district is located within the designated experimental population area, condors primarily occur around the Grand Canyon, Kaibab Plateau, Marble Canyon, Vermillion Cliffs, and southern Utah. Condors have not been coming as far south as the Williams District to forage (condors with GPS transmitters have not been tracked on the Williams District, and there have been no condor detections on the district reported since the reintroduction program began). In the last two years, condors have been increasingly foraging and using habitat to the north of the Grand Canyon in southern Utah.

Direct and Indirect Effects of Alternative 1

Condors have not been foraging as far south as the Williams District, so travel management on the district is not currently affecting condors. It is possible that if the condor population grows, individual condors may forage on parts of the district in the future. The primary potential effect of travel management on condors would be human disturbance of condors that are scavenging on carrion. There would be no reduction in these long-term potential disturbance effects under Alternative 1.

Direct and Indirect Effects of Alternatives 2, 3, and 4

Under Alternatives 2, 3, and 4, there would be decreased risk of human disturbance of scavenging condors as a result of a reduced open road system and substantially restricted motorized cross-country travel. Potential long-term benefits to condors would be slightly greater under Alternative 4 than under Alternatives 2 or 3 because Alternative 4 would result in a greater reduction in miles of open roads and a slightly greater restriction in motorized cross-country travel. The two motorized trail systems proposed under Alternative 2 are located outside of the nonessential experimental population area designated for the California condor.

Condors scavenge on large mammal carrion and potentially on roadkill elk and deer. Alternatives 2, 3, and 4 would have no measurable effects on the frequency of roadkill of large mammals such as elk, deer,

and pronghorn. These large mammals are frequently killed by vehicle collisions along Interstate 40 and State Highway 64 but are rarely killed by vehicle traffic on Forest Service Maintenance Level 2 and 3 roads on the district because of the relatively low vehicle speeds and traffic volumes on these roads.

Lead poisoning caused by ingestion of lead bullet fragments in gut piles and carcass parts of hunter-killed ungulates and other mammals is known to affect bald and golden eagles, California condors, and other scavengers such as ravens (Hunt et al. 2006, Bedrosian and Craighead 2009, Green et al. 2009). Lead bullet fragments consumed by avian scavengers are typically concentrated in the gut pile that is left behind in the field after field dressing. Changes in motorized big game retrieval policy may affect hunter behavior and influence the amount of game carcass parts left in the field. Currently, nearly all hunters field dress their harvested animal and leave the gut piles in the field. Because lead poisoning is such a problem for California condors in northern Arizona and southern Utah (Sieg et al. 2009), Arizona Game and Fish Department recommends that hunters in game management units that overlap condor range use non-lead ammunition or if they use traditional lead ammunition, that they remove the entire game carcass including the gut pile from the field (Arizona Game and Fish Department 2009:58). The list of game management units that Arizona Game and Fish Department considers to overlap condor country includes unit 9, which is located north of the Williams District and unit 10, which overlaps the northwest quadrant of the Williams District. Game management units 7W and 8 are not included in the list of units overlapping condor range. Arizona Game and Fish Department personnel conducted a survey in 2006 and found that only about one percent of the hunters in units 9 and 10 who used traditional lead ammunition actually removed the entire game carcass and gut pile from the field (Kathy Sullivan, Condor Program Coordinator, Arizona Game and Fish Department, personal communication).

On the Kaibab Plateau north of the Grand Canyon, Arizona Game and Fish Department and The Peregrine Fund initiated a gut pile raffle in 2007, offering financial incentives to big game hunters using traditional lead ammunition to remove the gut pile from the field. This program is considered very successful because many of the mule deer hunters have participated and disposed of the deer gut piles, substantially reducing the number of gut piles left in the field available to condors and other scavengers (Sieg et al. 2009).

Even if condors do begin to forage on the Williams District in the future, there would likely be no measurable increase in the risk of condors and other avian scavengers contracting lead poisoning as a result of restricting motorized big game retrieval. Because nearly all big game hunters currently leave gut piles in the field, restricting motorized big game retrieval would not result in additional gut piles being left in the field.

Alternative 2, 3, or 4 would not jeopardize the continued existence of the California condor.

Bald Eagle

Affected Environment

The bald eagle was taken off the Endangered Species List in 2007. However, threatened status was reinstated for the population of nesting bald eagles in central Arizona. This population is referred to as the Sonoran Desert Area population of bald eagles. The Fish and Wildlife Service recently determined that listing of the Sonoran Desert population of bald eagle under the Endangered Species Act is not

warranted because the population does not meet the definition of a distinct population segment. The Fish and Wildlife Service plans to publish a separate notice to remove the Sonoran Desert bald eagle from the List of Threatened and Endangered Wildlife, but until then, it remains protected by the Endangered Species Act. The range of the Sonoran Desert bald eagle population includes Yavapai County. A small portion on the western end of the Williams District is located in Yavapai County and thus is within the range of the Sonoran Desert bald eagle. The dominant vegetation type in this area is pinyon-juniper woodland. Although a small portion of the Williams District overlaps Yavapai County, there are no historic records of bald eagle nests in this area, or anywhere else on the Williams District.

Arizona supports a substantial population of wintering bald eagles. Bald eagles that winter in northern Arizona are primarily migratory individuals that breed in the northern U.S. and Canada (Grubb 2003). Migratory bald eagles typically arrive in northern Arizona in October and leave in April with adults more common in fall and immature birds more abundant in January through April (Grubb 2003). During winter, eagle diet in northern Arizona is comprised mostly of carrion of large ungulates and small mammals (Grubb and Kennedy 1982). Bald eagles in the northern Arizona Flagstaff area typically roost in large ponderosa pine trees during winter (Joshi 2009).

Direct and Indirect Effects of Alternative 1

The primary effects of current travel management are potential human disturbance of foraging, perching, or roosting bald eagles, and localized degradation of habitat of small mammal prey species caused by motorized cross-country travel. Risk of human disturbance and impacts to small mammal prey habitat would continue and not be reduced under Alternative 1. However, Alternative 1 would not result in take of bald eagles under the Bald and Golden Eagle Act or Migratory Bird Treaty Act and is consistent with National Bald Eagle Management Guidelines.

Direct and Indirect Effects of Alternatives 2, 3, and 4

Under Alternatives 2, 3, and 4, there would be decreased risk of human disturbance of bald eagles as a result of a reduced open road system and restricted motorized cross-country travel. 18 of 47 miles of open roads within the Yavapai County portion of the Williams District would be closed under Alternatives 2 and 3, and 27 miles would be closed under Alternative 4 (Table 12). Only 0.2 mile of non-system road within the Yavapai County portion of the district would be added to the system under Alternatives 2, 3, and 4.

Decreased open road density may result in a small decrease in potential carrion food availability due to reduced vehicle traffic and thus reduced potential roadkill of jackrabbits, cottontails, ground squirrels and other small mammals. However, bald eagles prey on live small mammals also, so reduced roadkill mortality may result in slight increases in small mammal prey availability compared to current management.

In addition to reduced risk of disturbance to individual eagles, restrictions on motorized cross-country travel would result in reduced impacts to habitat of small mammal prey species and thus a small increase in the quality of bald eagle foraging habitat. Long-term benefits to bald eagles would be slightly greater under Alternative 4 than under Alternatives 2 or 3 because Alternative 4 would result in a greater reduction in miles of open roads and a slightly greater restriction in motorized cross-country travel. The

two motorized trail systems proposed under Alternative 2 are located outside of the Yavapai County portion of the Williams District.

Lead poisoning caused by ingestion of lead bullet fragments in gut piles and carcass parts of hunter-killed ungulates and other mammals is known to affect bald and golden eagles, California condors, and other scavengers such as ravens (see discussion above under California condors). Because nearly all big game hunters on the Williams District leave gut piles of harvested animals in the field currently, restricting motorized big game retrieval opportunity under Alternative 2, 3, or 4 would not result in increased numbers of gut piles being left afield.

Alternative 2, 3, or 4 may affect but would not likely adversely affect the Sonoran Desert bald eagle. Alternative 2, 3, or 4 would not result in take of bald eagles under the Bald and Golden Eagle Act or Migratory Bird Treaty Act and are consistent with National Bald Eagle Management Guidelines.

Black-footed Ferret

Affected Environment

There are no known wild populations of black-footed ferrets in Arizona, but there are two populations of reintroduced ferrets that are classified as nonessential experimental populations under the Endangered Species Act. One is the Aubrey Valley population located west of Seligman and approximately 25 to 35 miles from the nearest part of the Williams District. The other is the Espee Ranch population north of Seligman and approximately 20 to 30 miles from the nearest part of the Williams District. Outside of the experimental population areas, the black-footed ferret is classified as endangered under the Endangered Species Act. Prairie dogs are the primary prey of black-footed ferrets, and large prairie dog towns or complexes of prairie dog towns provide necessary habitat for ferrets. The primary threat to black-footed ferrets has been loss of prairie dog colonies and complexes due to grassland conversion, poisoning of prairie dogs, disease, and lack of active management. Gunnison's prairie dog is the species of prairie dog that occurs on the Williams District and in northern Arizona. Gunnison's prairie dog populations, like those of other prairie dog species, have declined substantially throughout their range. Large-scale poisoning campaigns during the 1900s decimated many populations. Gunnison's prairie dog populations have also declined more recently, primarily due to outbreaks of slyvatic plague (Wagner et al. 2006).

Large prairie dog complexes are required to support a black-footed ferret population. Survey criteria outlined in the Fish and Wildlife Service's black-footed ferret survey guidelines allow for a white-tailed prairie dog (comparable to Gunnison's prairie dog) town or complex less than 200 acres and having no neighboring prairie dog towns to be cleared without a ferret survey (Fish and Wildlife Service 1989). Gunnison's prairie dog colonies occur in grassland habitats across the Williams District. There are no known colonies greater than 200 acres in size on the district, but many of the colonies have not been mapped to know how large they are.

Direct and Indirect Effects of Alternative 1

Although black-footed ferrets are not known to occur on the Williams District, ferret surveys have not been conducted and travel management may affect Gunnison's prairie dog populations and thus may affect the long-term potential for black-footed ferret habitat to develop on the district. The action area includes grassland habitats across the district.

Prairie dog populations can be impacted by recreational shooting, and open roads and motorized cross-country travel provide hunters access to shoot prairie dogs. Arizona Game and Fish Department is responsible for managing Gunnison's prairie dog populations in Arizona. Gunnison's prairie dog can be hunted throughout the year except during the spring months of April and May. Motorized cross-country travel through prairie dog towns also may result in degradation of prairie dog habitat due to vehicles causing collapse of prairie dog burrow entrances. In addition, prairie dogs and ferrets could be killed or injured as a result of collisions with vehicles along roads.

Grasslands provide suitable habitat for Gunnison's prairie dogs and potential habitat for black-footed ferrets. Under Alternative 1, there would be no reduction in miles of open roads that intersect grassland habitats and no restriction of motorized cross-country travel in grassland habitats.

Direct and Indirect Effects of Alternatives 2, 3, and 4

Reducing the open road system and restricting motorized cross-country travel under Alternatives 2, 3, or 4 may result in reduced mortality of Gunnison's prairie dogs as a result of reduced motorized access for prairie dog hunters. Reduced open road density also would result in a small decrease in probability of prairie dogs or ferrets being killed or injured by vehicle collisions. Restricted motorized cross-country travel would result in reduced potential for vehicles running over and collapsing prairie dog burrows.

Reduced Gunnison's prairie dog mortality may result in increased long-term probability of black-footed ferret habitat developing on the Williams District. Potential benefits would be slightly greater under Alternative 4 than under Alternatives 2 and 3. 68 of the 291 miles of open roads that intersect grassland habitats would be closed under Alternatives 2 and 3, and 76 miles would be closed under Alternative 4 (Table 12). 4 miles of existing non-system routes located within grassland habitats would be added to the designated road system under Alternatives 2, 3, and 4 (Table 12). The two motorized trail systems proposed under Alternative 2 are not located in potential grassland habitat.

Effects of Alternative 2, 3, or 4 on black-footed ferret would be primarily beneficial. Alternative 2, 3, or 4 may affect but would not likely adversely affect black-footed ferret.

Effects to Forest Service Sensitive Species

The Williams Ranger District contains suitable habitat and is located within the geographic range of the following animal species classified as Sensitive by the Southwestern Region of the Forest Service: northern leopard frog, bald eagle, northern goshawk, American peregrine falcon, burrowing owl, Merriam's shrew, spotted bat, Allen's lappet-browed bat, Townsend's big-eared bat, and Mogollon vole. Other animal species classified as Sensitive by the Southwestern Region of the Forest Service would not be affected by travel management alternatives because the Williams Ranger District is either outside of the species' range or the district lacks suitable habitat.

There are no records of western red bats on the Williams District. This species is considered to be associated with low-elevation deciduous riparian habitats. There is a limited amount of this habitat in portions of Sycamore Canyon that overlap the Williams District, but this area is located within the Sycamore Canyon Wilderness Area and would not be affected by travel management alternatives. The

four-spotted skipperling is classified as sensitive by the Southwestern Region of the Forest Service. Little is known about this species of butterfly. It has not been recorded on the Williams District. It's believed to be associated with wet meadows and streamside riparian habitat. Meadows and stream channels are ephemeral and dry much of the year on the Williams District.

Northern Leopard Frog

Affected Environment

Northern leopard frogs breed in a variety of aquatic habitats that include slow-moving or still water along streams and rivers, wetlands, permanent or temporary pools, beaver ponds, and human-constructed habitats such as earthen-dam stock tanks. Breeding habitats typically do not contain predaceous fish or other predators such as bullfrogs. Emergent vegetation such as sedges and rushes are thought to be important features of breeding and tadpole habitats. Northern leopard frogs occurred on the Williams District historically and in the recent past, but there are no known populations on the district currently. A number of water bodies on the Williams District that may have provided suitable breeding habitat in the past now have resident non-native bullfrog populations and likely no longer provide suitable breeding habitat (e.g., Sholz Lake, JD Dam Lake, Perkins Lake, Pomeroy Springs).

Direct and Indirect Effects of Alternative 1

Open roads and motorized cross-country travel provide access for people to collect leopard frog tadpoles and adults. Leopard frogs also may be run over as a result of motorized cross-country travel in meadows surrounding aquatic habitats, as well as being run over by vehicles on roads adjacent to aquatic habitats. Alternative 1 would result in no reductions in the levels of these potential risks to northern leopard frogs and northern leopard frog habitat.

Direct and Indirect Effects of Alternatives 2, 3, and 4

Risks associated with open roads and motorized cross-country travel would be reduced under Alternatives 2, 3, and 4 compared to Alternative 1 because of reductions in the open road system and restrictions on motorized cross-country travel. Thus, each of the action alternatives would result in some level of decreased risks of northern leopard frogs being killed or injured by vehicle collisions and decreased risk of habitat impacts. Long-term benefits to northern leopard frog habitat would be slightly greater under Alternative 4 than under Alternatives 2 or 3 because Alternative 4 would result in a greater reduction in miles of open roads and a slightly greater restriction in motorized cross-country travel.

Effects of Alternative 2, 3, or 4 on northern leopard frog would be primarily beneficial. Alternative 2, 3, or 4 may result in impacts to individual leopard frogs or its habitat, but none of these alternatives would cause a trend toward federal listing or loss of northern leopard frog population viability.

Bald Eagle

Affected Environment

Outside of Yavapai County on the Williams District, bald eagles are not listed under the Endangered Species Act but are classified as a Forest Service Sensitive species. Bald eagles are protected under the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act. Arizona supports a substantial population of wintering bald eagles. Bald eagles that winter in northern Arizona are primarily migratory

individuals that breed in the northern U.S. and Canada (Grubb 2003). Migratory bald eagles typically arrive in northern Arizona in October and leave in April with adults more common in fall and immature birds more abundant in January through April (Grubb 2003). During winter, eagle diet in northern Arizona is comprised mostly of carrion of large ungulates and small mammals (Grubb and Kennedy 1982). Bald eagles typically roost in large ponderosa pine trees during winter (Joshi 2009). Wintering bald eagles are habitat generalists and can be seen anywhere on the district. They are often seen scavenging on or perched near a dead elk or deer or other source of carrion. They are also commonly seen around some of the larger lakes on the district where waterfowl and fish occur such as Kaibab Lake, White Horse Lake, Sholz Lake, and Dogtown Reservoir.

Direct and Indirect Effects of Alternative 1

The primary potential effects of current travel management are human disturbance of foraging, perching, or roosting bald eagles, and localized degradation of habitat of small mammal prey species caused by motorized cross-country travel. Alternative 1 would result in no reductions in risk of human disturbance and impacts to small mammal prey habitat. However, Alternative 1 would not result in take of bald eagles under the Bald and Golden Eagle Act or Migratory Bird Treaty Act and is consistent with National Bald Eagle Management Guidelines.

Direct and Indirect Effects of Alternatives 2, 3, and 4

Under Alternatives 2, 3, and 4, there would be decreased risk of human disturbance of bald eagles as a result of a reduced open road system and restricted motorized cross-country travel. In addition to reduced potential disturbance of individual eagles, restrictions on motorized cross-country travel would result in reduced impacts to habitat of small mammal prey species and thus a small increase in the quality of bald eagle foraging habitat. Long-term benefits to bald eagles would be slightly greater under Alternative 4 than under Alternatives 2 or 3 because Alternative 4 would result in a greater reduction in miles of open roads and a slightly greater restriction in motorized cross-country travel.

There would likely be increased use and thus potential human disturbance of bald eagles associated with the two motorized trail systems proposed under Alternative 2 and the 34 miles of existing non-system routes that would be added to the designated road system under Alternatives 2, 3, and 4. However, most of the recreational use of these proposed trail systems and non-system routes would occur in summer, outside of the winter season when bald eagles occur on the Williams District.

Decreased open road density may result in a small decrease in potential carrion food availability due to reduced vehicle traffic and thus reduced potential roadkill of jackrabbits, cottontails, ground squirrels and other small mammals. However, bald eagles prey on live small mammals also, so reduced roadkill mortality may result in slight increases in small mammal prey availability compared to current management.

Lead poisoning caused by ingestion of lead bullet fragments in gut piles and carcass parts of hunter-killed ungulates and other mammals is known to affect bald and golden eagles, California condors, and other scavengers such as ravens (see discussion above under California condors). Because nearly all big game hunters on the Williams District leave gut piles of harvested animals in the field currently, restricting

motorized big game retrieval opportunity under Alternative 2, 3, or 4 would not result in increased numbers of gut piles being left afield.

Alternative 2, 3, or 4 may result in impacts to individual bald eagles or its habitat, but none of these alternatives would cause a trend toward federal listing or loss of bald eagle population viability. Alternative 2, 3, or 4 would not result in take of bald eagles under the Bald and Golden Eagle Act or Migratory Bird Treaty Act and are consistent with National Bald Eagle Management Guidelines.

Northern Goshawk

Affected Environment

Northern goshawks typically nest in large ponderosa pine trees in relatively dense forested areas on the Williams District. Goshawks prey on a wide variety of small mammal and bird species. Approximately 40 goshawk territories have been documented on the Williams District during the past 20-30 years. For each of these territories, stands have been delineated as Nest Area stands and Post-Fledgling Family Area (PFA) stands.

Direct and Indirect Effects of Alternative 1

The primary potential effects of current travel management are human disturbance associated with motorized travel to individual goshawks, and localized decreases in the quality of goshawk foraging habitat as a result of motorized cross-country travel impacts to vegetation and soil resources important to goshawk small mammal prey species. Alternative 1 would result in no reductions in the levels of these risks to goshawks and goshawk habitat.

Direct and Indirect Effects of Alternatives 2, 3, and 4

Under Alternatives 2, 3, and 4, there would be decreased risks of human disturbance to individual goshawks as a result of reducing open road density and restricting motorized cross-country travel, and there would be decreased impacts to goshawk foraging habitat as a result of restricting motorized cross-country travel. 20 of the 88 miles of open roads that intersect goshawk Nest Areas and PFAs would be closed under Alternatives 2 and 3, and 23 miles would be closed under Alternative 4 (Table 12). There may be an increase in human disturbance on the 6 miles of non-system routes that intersect Nest Areas and PFAs that would be added to the open road system under Alternatives 2, 3, and 4 (Table 12), but there would still be net decreases in open road density under each action alternative. Long-term benefits to goshawks would be slightly greater under Alternative 4 than under Alternatives 2 or 3 because Alternative 4 would result in a greater reduction in miles of open roads and a slightly greater restriction in motorized cross country travel. One of the two motorized trail systems proposed under Alternative 2 overlaps stands designated as goshawk Nest Area and PFA. Most of the proposed trail system would be on existing Forest Service roads, but up to 2 miles of trail would be constructed. There would likely be increased motor vehicle use on the two trail systems and thus increased potential human disturbance in addition to the vegetation and soil disturbance that would result from trail construction. There would be more motorized big game retrievals allowed under Alternative 3 than under Alternative 2, but Alternative 3 would lack human and habitat disturbance effects associated with the proposed motorized trail systems.

Effects of Alternative 2, 3, or 4 on northern goshawk would be primarily beneficial. Alternative 2, 3, or 4 may result in impacts to individual goshawks or its habitat, but none of these alternatives would cause a trend toward federal listing or loss of goshawk population viability.

Peregrine Falcon

Affected Environment

Peregrine falcons nest on cliffs or rock outcrops and hunt avian prey in relatively open habitats. Peregrine falcon nests have been found on Bill Williams Mountain, Sitgreaves Mountain, and Kendrick Mountain. Each of these nest sites is in steep, rugged terrain inaccessible to motorized vehicles. The Kendrick Mountain nest site is located within the Kendrick Mountain Wilderness Area where motorized vehicles are prohibited, and the Bill Williams nest site is located within the Bill Williams Mountain travel restriction area where motor vehicles are restricted to open roads.

Direct and Indirect Effects of Alternative 1

The primary effect of current travel management is risk of human disturbance to nesting peregrine falcons. Alternative 1 would result in no reductions in risk of human disturbance associated with motorized travel.

Direct and Indirect Effects of Alternatives 2, 3, and 4

Under Alternatives 2, 3, and 4, there would be decreased risks of human disturbance to nesting peregrine falcons as a result of reducing open road density and restricting motorized cross-country travel. The non-system route segments that would be added to the designated road system under Alternatives 2, 3, or 4 are each located at least 2 miles from any known historic peregrine falcon nest sites. The two motorized trail systems proposed under Alternative 2 are located at least 3 miles from any known historic nest sites. Alternative 4 would result in greater decreases in risk of human disturbance than Alternatives 2 or 3 because of Alternative 4's greater reduction in open road density and motorized cross-country travel.

Effects of Alternative 2, 3, or 4 on peregrine falcon would be primarily beneficial. Alternative 2, 3, or 4 may result in impacts to individual peregrine falcons or its habitat, but none of these alternatives would cause a trend toward federal listing or loss of peregrine falcon population viability.

Burrowing Owl

Affected Environment

Burrowing owls occur in a wide variety of open habitats and typically nest in burrows of prairie dogs or ground squirrels. Gunnison's prairie dog colonies likely provide the most important potential habitat for burrowing owls on the Williams District. Gunnison's prairie dog populations, like those of other prairie dog species, have declined substantially throughout their range. Large-scale poisoning campaigns during the 1900s decimated many populations. Gunnison's prairie dog populations have also declined more recently in northern Arizona, primarily due to outbreaks of slyvatic plague (Wagner et al. 2006).

Direct and Indirect Effects of Alternative 1

Travel management under Alternative 1 may affect Gunnison's prairie dog populations and thus may affect habitat suitability for burrowing owls. Prairie dog populations can be impacted by recreational

shooting, and open roads and motorized cross-country travel provide hunters access to shoot prairie dogs. Arizona Game and Fish Department is responsible for managing Gunnison's prairie dog populations in Arizona. Gunnison's prairie dog can be hunted throughout the year except during the spring months of April and May. Motorized cross-country travel through prairie dog towns also may result in degradation of burrowing owl and prairie dog habitat due to vehicles causing collapse of burrowing owl and prairie dog burrow entrances. Alternative 1 would result in no reductions in the levels of these risks to individual burrowing owls and its habitat.

Direct and Indirect Effects of Alternatives 2, 3, and 4

Reducing the open road system and restricting motorized cross-country travel under Alternatives 2, 3, or 4 may result in reduced mortality of Gunnison's prairie dogs as a result of reduced motorized access for people to shoot prairie dogs. Reduced Gunnison's prairie dog mortality may result in increased habitat quantity and/or quality for burrowing owls. Restricted motorized cross-country travel also may result in a slight reduction in potential habitat impacts to prairie dog and burrowing owl burrow entrances.

Potential benefits to prairie dogs and burrowing owls would be slightly greater under Alternative 4 than under Alternatives 2 and 3. 68 of the 291 miles of existing open roads that intersect grassland habitats would be closed under Alternatives 2 and 3, and 76 miles would be closed under Alternative 4 (Table 12). 4 miles of existing non-system routes would be added to the designated road system under each of the action alternatives (Table 12). The two motorized trail systems proposed under Alternative 2 are not located in potential grassland habitat.

Effects of Alternative 2, 3, or 4 on burrowing owl would be primarily beneficial. Alternative 2, 3, or 4 may result in impacts to individual burrowing owls or its habitat, but none of these alternatives would cause a trend toward federal listing or a loss of burrowing owl population viability.

Merriam's Shrew and Mogollon Vole

Affected Environment

Merriam's shrew is known to occur in ponderosa pine forests and pinyon-juniper woodlands on the Williams District. They are associated with grassy areas in conifer forests. This species eats a variety of insects and other arthropods. Mogollon voles also are known to occur on the Williams District. They inhabit grassy areas and meadows within or adjacent to various forest and woodland types including ponderosa pine, mixed conifer, spruce-fir, and aspen forest types and pinyon-juniper woodland. They are also known to occur in larger grassland areas on the district such as Garland Prairie and Government Prairie.

Direct and Indirect Effects of Alternative 1

The primary potential effects of current travel management on Merriam's shrew and Mogollon vole are mortality of individuals run over by vehicles on roads or vehicles driving cross-country, and habitat degradation that may result from motorized cross-country travel (e.g., localized reductions in herbaceous vegetation cover). Alternative 1 would result in no reductions in the levels of these risks to individual Merriam's shrews and Mogollon voles and their habitat.

Direct and Indirect Effects of Alternatives 2, 3, and 4

Reducing the open road system and restricting motorized cross-country travel under Alternatives 2, 3, and 4 would result in decreased risk of individual shrews and voles being run over by motor vehicles and reduced potential for localized habitat degradation caused by motorized cross-county travel. Risks to Merriam's shrews and Mogollon voles would be reduced more under Alternative 4 than under Alternative 2 or 3 because the open road system and cross-country travel would be reduced by a greater amount under Alternative 4.

Substantial proportions of existing open roads within ponderosa pine forest, pinyon-juniper woodland, and grassland cover types would be closed under Alternatives 2, 3, and 4 (Table 12). There would be more motorized big game retrievals allowed under Alternative 3 than under Alternative 2, but Alternative 3 would lack the habitat disturbance effects associated with the proposed motorized trail systems.

Effects of Alternative 2, 3, or 4 on shrews and voles would be primarily beneficial. Alternative 2, 3, or 4 may result in impacts to individual Merriam's shrews and Mogollon voles or their habitat, but none of these alternatives would cause a trend toward federal listing or a loss of population viability for either species.

Spotted Bat, Allen's Lappet-browed Bat, and Townsend's Big-eared Bat

Affected Environment

Each of these three bat species forages on flying insects, often across over water bodies and wetlands where flying insects are abundant. Spotted bats are known to roost in crevices and cracks in cliff faces and rock outcrops and forage in a wide variety of habitat types. Allen's lappet-browed bats are known to roost behind pieces of loose bark in large conifer snags and trees on the Williams District. Townsend's big-eared bats typically roost in caves and old mines and forage in a wide variety of habitat types. There are no known caves or old mines on the Williams District where Townsend's big-eared bats are known to roost.

Direct and Indirect Effects of Alternative 1

A potential effect of travel management on these and other bat species is human disturbance of roosting bats. The existing open road system and current motorized cross-country travel policy allow for widespread motorized access of different habitats across the district. Alternative 1 would result in no reductions in risks of human disturbance associated with motorized travel.

Direct and Indirect Effects of Alternatives 2, 3, and 4

Under Alternatives 2, 3, and 4, there would be decreased risks of human disturbance to roosting bats as a result of reducing open road density and restricting motorized cross-country travel. Long-term benefits to spotted bats, Allen's lappet-browed bats, and Townsend's big-eared bats would be slightly greater under Alternative 4 than under Alternatives 2 or 3 because Alternative 4 would result in a greater reduction in miles of open roads and a slightly greater restriction in motorized cross country travel.

Effects of Alternative 2, 3, or 4 on bat species would be primarily beneficial. Alternative 2, 3, or 4 may result in impacts to individual spotted bats, Allen's lappet-browed bat, or Townsend's big-eared bats or

their habitat, but none of these alternatives would cause a trend toward federal listing or a loss of population viability for any of these three species.

Management Indicator Species

Management Indicator Species and the habitats they represent are listed in the most recent Kaibab National Forest Management Indicator Species (MIS) report (Forest Service 2010). Information on species biology, management effects, population trends, and habitat trends are presented in the MIS report. Management Indicator Species that may be affected by travel management alternatives are Mexican spotted owl, northern goshawk, cinnamon teal, wild turkey, elk, mule deer, American pronghorn, and Abert's squirrel.

Travel management alternatives would not affect indicator habitat and would not result in changes to Forest-wide population or habitat trend for the following species: aquatic macroinvertebrates, Lincoln's sparrow, Lucy's warbler, yellow-breasted chat, hairy woodpecker, juniper titmouse, pygmy nuthatch, red-naped sapsucker, and red squirrel. Aquatic macroinvertebrates are not analyzed in detail below because they were selected as an indicator of stream quality in North Canyon Creek on the North Kaibab District (Forest Service 2010:pages 18-21). There are no known breeding populations of Lincoln's sparrow on the Williams District, and travel management alternatives would not affect habitat features important to this species (high-elevation meadows and willow-dominated riparian habitat; Forest Service 2010:pages 39-43). There are no known Lucy's warbler populations on the Williams District, and travel management alternatives would not affect habitat features important to this species (snags and low-elevation riparian habitat; Forest Service 2010:pages 43-47). There are no known breeding populations of yellow-breasted chats on the Williams District, and travel management alternatives would not affect habitat features important to this species (dense shrub-layer vegetation and low-elevation riparian habitat; Forest Service 2010:pages 69-74).

Hairy woodpeckers are common on the Williams District, but travel management alternatives would not affect habitat features important to this species (snags and live trees, biomass of insect prey on snags and trees; Forest Service 2010:pages 33-39). Juniper titmice are common in pinyon-juniper woodlands on the Williams District, but travel management alternatives would not affect habitat features important to this species (snags and live pinyon pine and juniper trees, biomass of insect prey on snags and trees; Forest Service 2010:pages 47-52). Pygmy nuthatches are common in ponderosa pine forests on the Williams District, but travel management alternatives would not affect habitat features important to this species (snags and live ponderosa pine trees, biomass of insect prey on snags and trees; Forest Service 2010:pages 52-56). Red-naped sapsuckers occur on the Williams District, but travel management alternatives would not affect habitat features important to this species (snags and live aspen trees, biomass of insect prey on snags and trees; Forest Service 2010:pages 64-69). Red squirrels are common in mixed conifer forest on the Williams District, but travel management alternatives would not affect habitat features important to this species (conifer trees and abundance of conifer cones and fruiting bodies of fungi; Forest Service 2010:pages 85-87).

Mexican Spotted Owl

Effects of Alternatives 1, 2, 3, and 4 on Mexican spotted owl were analyzed above in the Threatened and Endangered Species section, as well as in the Biological Assessment (project record). It was concluded that the primary effects of Alternatives 2, 3, or 4 would be reduced risk of human disturbance of individual spotted owls and reduced risk of decreases in the quality of spotted owl foraging habitat. Mexican spotted owl was selected as an indicator species for late-seral mixed conifer and spruce fir forest (Forest Service 2010:pages 56-62). There is only one small area on the top of Kendrick Mountain where spruce fir forest is located, and there are no roads within the Kendrick Mountain Wilderness Area. Mixed conifer forest mapped on the Williams District represents approximately 20% of the total amount of mixed conifer forest mapped on the Kaibab National Forest. Alternatives 2, 3, or 4 may result in impacts to individual spotted owls or their habitat, but none of these alternatives would result in a change in the Forest-wide population or habitat trend for Mexican spotted owl.

Northern Goshawk

Effects of Alternatives 1, 2, 3, and 4 on northern goshawk were analyzed above in the Forest Service Sensitive Species section. It was concluded that the primary effects of Alternatives 2, 3, or 4 would be reduced risk of human disturbance of individual goshawks and reduced risk of decreases in the quality of goshawk foraging habitat. Northern goshawk was selected as indicator species for late-seral ponderosa pine forest (Forest Service 2010:pages 26-33). Ponderosa pine forest mapped on the Williams District represents approximately 45% of the total amount of ponderosa pine forest mapped on the Kaibab National Forest. Alternatives 2, 3, or 4 may result in impacts to individual goshawks or their habitat, but none of these alternatives would result in a change in the Forest-wide population or habitat trend for northern goshawk.

Cinnamon Teal

Affected Environment

Cinnamon teal was selected as an indicator for late-seral wetlands (Forest Service 2010:pages 21 to 26). This species uses a wide variety of wetlands but prefers larger wetlands with well developed emergent vegetation for nesting. The number of cinnamon teal nesting on the district varies from year to year depending on water levels at wetlands during the spring. Potential nesting habitat on the district includes Coleman Lake, Sholz Lake, JD Dam Lake, Perkins Lake, White Horse Lake, and in wet years, Sunflower Flat. During fall migration, cinnamon teal use the larger water bodies as well as smaller stock tanks. Cinnamon teal can be hunted on the district during waterfowl season.

Direct and Indirect Effects of Alternative 1

Cinnamon teal may be affected by current travel management because open roads and motorized cross-country travel provide access for hunters to shoot teal, and nesting teal may be disturbed by motorized travel. Several of the wetlands with potential nesting habitat are located within motorized travel restricted areas where motorized cross-country travel is already prohibited (Coleman Lake, Sholz Lake, JD Dam Lake, Perkins Lake, Sunflower Flat). There would be no reductions in risks to cinnamon teal and cinnamon teal habitat under Alternative 1.

Direct and Indirect Effects of Alternatives 2, 3, and 4

Potential effects of a reduced open road system and restricted motorized cross-country travel under Alternatives 2, 3, and 4 would be reduced risk of mortality from waterfowl hunters and reduced risk of human disturbance of nesting cinnamon teal. These potential effects would be beneficial but limited, especially because motorized cross-country travel is already prohibited around the most suitable nesting habitats on the district. Effects of Alternative 2, 3, or 4 on cinnamon teal are primarily beneficial. Alternative 2, 3, or 4 may result in impacts to individual cinnamon teal or their habitat, but none of these alternatives would cause effects sufficient to alter the Forest-wide population or habitat trend for this species.

Wild Turkey

Affected Environment

Wild turkey was selected as an indicator for late-seral ponderosa pine forest (Forest Service 2010:pages 62 to 64). Turkeys nest on the ground and forage on a wide variety of plants and insects on the forest floor and typically roost in the canopies of large pines. Wild turkeys are a popular game species on the Williams District.

Direct and Indirect Effects of Alternative 1

Turkeys may be affected by current travel management because open roads and motorized cross-country travel provide access for hunters to shoot turkeys, and turkeys are ground-nesters so their nests may be impacted by vehicles driving cross country. Frequency of turkey nests being destroyed by vehicles driving cross country is probably low because turkeys typically nest next to trees or logs in ponderosa pine forest. Motorized cross-country travel may result in localized reductions in herbaceous plant cover in places and thus localized impacts to turkey habitat. There would be no reductions in risks to wild turkey and wild turkey habitat under Alternative 1.

Direct and Indirect Effects of Alternatives 2, 3, and 4

Reducing the open road system and restricting motorized cross-country travel under Alternatives 2, 3, and 4 may result in reduced mortality of turkeys as a result of reduced motorized access for turkey hunters. 168 of the 711 miles of existing open roads that intersect the ponderosa pine forest cover type on the district would be closed under Alternatives 2 and 3, and 180 miles would be closed under Alternative 4 (Table 12). 26 miles of existing non-system routes within the ponderosa pine cover type would be added to the designated road system under each of the action alternatives (Table 12). Alternative 3 would lack the human disturbance and habitat disturbance effects associated with the motorized trail systems proposed under Alternative 2. Restricted motorized cross-country travel would result in fewer localized reductions in herbaceous plant cover, which would result in a slight increase in turkey habitat quality. Reduced motorized access for turkey hunters would be beneficial for turkeys, and Alternative 4 would benefit turkeys slightly more than Alternatives 2 or 3.

The motorized cross-country travel that would be allowed under Alternative 2 or 3 would not result in risk of wild turkey ground nests being run over and destroyed because motorized big game retrievals would only be allowed during the fall elk hunts, which are outside of the spring wild turkey nesting season.

Ponderosa pine forest mapped on the Williams District represents approximately 45% of the total amount of ponderosa pine forest mapped on the Kaibab National Forest. Effects of Alternative 2, 3, or 4 on wild turkey would be primarily beneficial. Alternative 2, 3, or 4 may result in impacts to individual wild turkeys or their habitat, but none of these alternatives would cause effects sufficient to alter the Forest-wide population or habitat trend for this species.

Elk

Affected Environment

Elk was selected as an indicator species for early-seral ponderosa pine, mixed conifer, and spruce-fir (Forest Service 2010:pages 74 to 76). Elk is the most important big game species on the Williams District. Hunters come from all over Arizona and other parts of the country to hunt elk on the Williams District in Game Management Units 7W, 8, and 10. Much of the elk calving habitat on the district is located in GA 2, whereas much of the winter and transitional range is located in GAs 1 and 3. The Sycamore Rim area above Sycamore Canyon is an important habitat area for elk and deer (mule deer and white-tailed deer). This area has a lot of key elk and deer browse plants such as cliffrose and mountain mahogany and provides important transitional range between higher-elevation summer range and winter range below in Sycamore Canyon.

Elk are known to be affected by human disturbance associated with motorized travel. Several studies have documented elk shifting their distribution away from open roads (e.g., Lyon 1979, Rost and Bailey 1979, Rowland et al. 2000). An experimental study also showed various off road recreational activities (OHVs, mountain biking, horse riding, and hiking) caused flight responses in elk (Wisdom et al. 2004).

Direct and Indirect Effects of Alternative 1

Elk may be affected by current travel management because open roads and motorized cross-country travel provide access for hunters to shoot elk, and elk may be negatively affected by human disturbance associated with motorized travel. The existing open road system allows widespread motorized access across the district for big game hunters. Current motorized cross-country travel policy also facilitates widespread access for hunters. There would be no reductions in motorized access for elk hunters and no reductions in risk of human disturbance under Alternative 1.

Direct and Indirect Effects of Alternatives 2, 3, and 4

168 of the 711 miles of existing open roads that intersect the ponderosa pine forest cover type on the district would be closed under Alternatives 2 and 3, and 180 miles would be closed under Alternative 4 (Table 12). 26 miles of existing non-system routes within the ponderosa pine cover type would be added to the designated road system under each of the action alternatives (Table 12). There are only 4 miles of existing open roads that intersect the mixed conifer cover type and no roads that intersect the spruce-fir cover type (Table 12). There also would be substantial reductions in miles of open roads across GA 2 where much of the elk calving habitat is located, and in GAs 1 and 3 where much of the district's winter and transitional range occur (Table 12). In the important big game habitat area along Sycamore Rim, 33 of the 84 miles of existing open roads would be closed under Alternatives 2, 3, and 4 (Table 12). (The Sycamore Rim area was defined in GIS as the buffer area within 1 mile of the rim of Sycamore Canyon.) Alternative 3 would lack the human disturbance effects associated with the motorized trail systems proposed under Alternative 2.

Primary effects of a reduced open road system and restricted motorized cross-country travel under Alternatives 2, 3, or 4 would be reduced motorized access to the district for hunters to shoot elk and reduced levels of human disturbance associated with motorized travel. These effects would result in increased habitat quality for elk, and Alternative 4 would result in a slightly greater increase in habitat quality than Alternatives 2 or 3. The risk of disturbance to elk associated with motorized big game retrieval under Alternative 2 or 3 would occur during the fall, outside of the spring elk calving season. The total area of ponderosa pine and mixed conifer forest mapped on the Williams District represents approximately 43% of the total area of ponderosa pine and mixed conifer forest mapped on the Kaibab National Forest. Effects of Alternative 2, 3, or 4 on elk would be primarily beneficial. Alternative 2, 3, or 4 may result in impacts to individual elk or their habitat, but none of these alternatives would cause effects sufficient to alter the Forest-wide population or habitat trend for elk.

Effects of Alternatives 2, 3, and 4 on hunting are analyzed in the Recreation section of Chapter 3. Executive Order 13443, Facilitation of Hunting Heritage and Wildlife Conservation, which was issued in 2007, directs federal agencies to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat. This executive order directs federal agencies to evaluate effects of agency actions on trends in hunting participation and to work collaboratively with state governments to manage and conserve game species and their habitats in a manner that respects private property rights and state management authority over wildlife resources.

Motorized big game retrieval opportunity would be allowed for elk hunts in September and October under Alternative 2, allowed for all elk hunts under Alternative 3, and prohibited completely under Alternative 4. Elk are large, heavy animals, and the majority of elk hunters currently retrieve their harvested animal using a motor vehicle. Arizona Game and Fish Department is the state agency responsible for managing wildlife populations in Arizona. Management of elk populations on the Williams District is important because elk are large ungulates that affect cover and density of forage and browse plant species, as well as other resources such as water developments. Arizona Game and Fish Department manages elk densities through its management of antlerless (cow) hunts. Changes in motorized big game retrieval policy may affect how Arizona Game and Fish Department manages antlerless and bull elk hunts. Substantial reduction or elimination of motorized big game retrieval for elk may impact Arizona Game and Fish Department's ability to manage antlerless elk hunts and achieve elk population objectives.

Mule Deer

Affected Environment

Mule deer was selected as an indicator species for early-seral aspen and pinyon-juniper (Forest Service 2010:pages 76 to 80). Similar to elk, mule deer is a popular big game species on the Williams District. Much of the district's mule deer fawning habitat is located in GA 2, and much of the district's mule deer winter and transitional range is located within GA 1 and GA 3. Mule deer are known to be affected by human disturbance associated with motorized travel. Mule deer have been shown to shift their habitat use and movement patterns away from open roads (Rost and Bailey 1979, Sawyer et al. 2006).

Direct and Indirect Effects of Alternative 1

Mule deer may be affected by current travel management because open roads and motorized cross-country travel provide access for hunters to shoot mule deer, and mule deer may be negatively affected by human disturbance associated with motorized travel. The current open road system allows widespread motorized access across the district for hunters to shoot mule deer. Current motorized cross-country travel policy also facilitates widespread access for hunters. There would be no reductions in motorized access for mule deer hunters and no reductions in human disturbance associated with motorized travel under Alternative 1.

Direct and Indirect Effects of Alternatives 2, 3, and 4

130 of the 420 miles of existing open roads that intersect the pinyon-juniper woodland cover type on the district would be closed under Alternatives 2 and 3, and 137 miles would be closed under Alternative 4 (Table 12). 3 miles of existing non-system routes within the pinyon-juniper cover type would be added to the designated road system under each of the action alternatives (Table 12). In the important big game transitional range area along Sycamore Rim, 33 of the 84 miles of existing open roads would be closed under Alternatives 2, 3, and 4 (Table 12). Alternative 3 would lack the human disturbance effects associated with the motorized trail systems proposed under Alternative 2.

Primary effects of a reduced open road system and restricted motorized cross-country travel under Alternatives 2, 3, and 4 would be reduced motorized access to the district for mule deer hunters and reduced levels of human disturbance associated with motorized travel. These effects would result in increased habitat quality for mule deer, and Alternative 4 would result in a slightly greater increase in habitat quality than Alternatives 2 or 3. The risk of disturbance to mule deer associated with motorized big game retrieval under Alternative 2 or 3 would occur during the fall, outside of the spring mule deer fawning season. The area of aspen forest and pinyon-juniper woodland mapped on the Williams District represents approximately 32% of the total area of aspen forest and pinyon-juniper woodland mapped on the Kaibab National Forest. Effects of Alternative 2, 3, or 4 on mule deer are primarily beneficial. Alternative 2, 3, or 4 may result in impacts to individual mule deer or their habitat, but none of these alternatives would cause effects sufficient to alter the Forest-wide population or habitat trend for this species.

Although mule deer are not nearly as large as elk, the majority of mule deer hunters on the district currently retrieve harvested deer using a motor vehicle. Motorized cross-country travel would not be allowed for the purpose of retrieving harvested mule deer under Alternative 2, 3, or 4.

American Pronghorn

Affected Environment

Pronghorn was selected as an indicator species for early- and late-seral grassland (Forest Service 2010:pages 81 to 84). Pronghorn populations in Arizona have declined substantially from historic times. They are common in the larger grassland areas of Garland Prairie and Government Prairie, but also occur in smaller grassland areas and travel through ponderosa pine forest on the district. Pronghorn are a big game species and are hunted in Game Management Units 7W, 8, and 10 on the district. Similar to elk and mule deer, pronghorn are known to be affected by human disturbance associated with motorized travel.

One study showed that pronghorns had increased vigilance and decreased foraging times along roads, especially roads with higher traffic volumes (Gavin and Komers 2006).

Direct and Indirect Effects of Alternative 1

Similar to elk and mule deer, pronghorn may be affected by current travel management because open roads and motorized cross-country travel provide access for hunters to shoot pronghorn, and pronghorn may be negatively affected by human disturbance associated with motorized travel. The current open road system allows widespread motorized access across the district for pronghorn hunters. Current motorized cross-country travel policy also facilitates widespread access for hunters. There would be no reductions in motorized access for pronghorn hunters and no reductions in human disturbance associated with motorized travel under Alternative 1.

Direct and Indirect Effects of Alternatives 2, 3, and 4

There would be substantial reductions in miles of open roads within grassland cover types and the key pronghorn habitat areas of Garland Prairie and Government Prairie under Alternatives 2, 3, and 4 (Table 12). Primary effects of a reduced open road system and restricted motorized cross-country travel under Alternatives 2, 3, and 4 would be reduced motorized access to the district for pronghorn hunters and reduced levels of human disturbance associated with motorized travel. These effects would result in increased habitat quality for pronghorn, and Alternative 4 would result in a slightly greater increase in habitat quality compared to Alternatives 2 or 3. The proposed motorized trail systems under Alternative 2 are not located in grassland habitats. The risk of disturbance to pronghorn associated with motorized big game retrieval under Alternative 2 or 3 would occur during the fall, outside of the spring pronghorn fawning season. The area of grassland habitat mapped on the Williams District represents approximately 36% of the total area of grassland habitat mapped on the Kaibab National Forest. Effects of Alternative 2, 3, or 4 on pronghorn would be primarily beneficial. Alternative 2, 3, or 4 may result in impacts to individual pronghorn or their habitat, but none of these alternatives would cause effects sufficient to alter the Forest-wide population or habitat trend for pronghorn.

Although pronghorn are much smaller than elk, many pronghorn hunters on the district currently retrieve harvested pronghorn using a motor vehicle. Motorized cross-country travel would not be allowed for the purpose of retrieving harvested pronghorn under Alternative 2, 3, or 4.

Abert's Squirrel

Affected Environment

Abert's squirrel was selected as an indicator of early-seral ponderosa pine forest (Forest Service 2010:pages 87 to 91). This is the most common tree squirrel on the Williams District. Abert's squirrel can be hunted and is classified as a small game species in Arizona.

Direct and Indirect Effects of Alternative 1

Abert's squirrels may be affected by current travel management because open roads and motorized cross-country travel provide access for hunters to shoot squirrels, and squirrels are killed when hit by motor vehicles travelling on open roads. The current open road system allows widespread motorized access across the district for hunters to shoot squirrels, and this would not change under Alternative 1. Numbers of Abert's squirrels killed by vehicles on open roads also would not be reduced under Alternative 1.

Direct and Indirect Effects of Alternatives 2, 3, and 4
Reducing the open road system under Alternatives 2, 3, and 4 would result in reduced mortality of Abert's squirrels due to reduced potential for squirrels to be hit by vehicles along open roads and reduced motorized access for hunters to shoot squirrels. 168 of the 711 miles of existing open roads that intersect the ponderosa pine forest cover type on the district would be closed under Alternatives 2 and 3, and 180 miles would be closed under Alternative 4 (Table 12). 26 miles of existing non-system routes within the ponderosa pine cover type would be added to the designated road system under each of the action alternatives (Table 12). In addition to habitat impacts associated with construction of up to 2 miles of motorized trail under Alternative 2, increased motor vehicle use on the two motorized trail systems may result in a slightly greater risk of Abert's squirrels being run over by vehicles.

The area of ponderosa pine forest mapped on the Williams District represents approximately 45% of the total area of ponderosa pine forest mapped on the Kaibab National Forest. Effects of Alternative 2, 3, or 4 on Abert's squirrel would be primarily beneficial. Alternative 2, 3, or 4 may result in impacts to individual Abert's squirrels or their habitat, but none of these alternatives would cause effects sufficient to alter the Forest-wide population or habitat trend for Abert's squirrels..

Migratory Birds

Numerous migratory bird species occur on the Williams District. Some species classified as migratory birds were analyzed in sections above (Mexican spotted owl, California condor, bald eagle, northern goshawk, burrowing owl, cinnamon teal). In addition to these species, potential effects of travel management were considered for Arizona Partners in Flight (PIF) Priority Species (Latta et al. 1999) and U.S. Fish and Wildlife Service (FWS) Birds of Conservation Concern (Fish and Wildlife Service 2008). There are no designated Important Bird Areas on the Williams District. Bird species most likely to be affected by travel management alternatives in this EA are raptors and ground-nesting bird species. Many raptor species are known to be sensitive to human disturbance during nesting, so human disturbance associated with motorized travel is a potential effect of travel management alternatives. Ground-nesting bird species may be affected because motor vehicles driven cross-country may run over and destroy nests.

Affected Environment
Raptor species from the PIF Priority Species list and FWS Birds of Conservation Concern list that are known to occur or potentially occur on the Williams District are golden eagle, ferruginous hawk, and prairie falcon. Golden eagles nest in large trees or on cliffs or rock outcrops. Ferruginous hawks nest in a wide variety of sites including trees, cliffs and rock outcrops, utility structures, and even on the ground. Prairie falcons nest on cliffs and rock outcrops. Each of these species nests in open habitats such as pinyon-juniper woodlands and grasslands. GA 1 and GA 3 provide the greatest amount of potential nesting habitat for each of these species.

None of the PIF Priority Species or FWS Birds of Conservation Concern known to occur or that potentially occur on the district are ground nesters. Ground-nesting bird species known to occur on the Williams District include wild turkey, killdeer, common poorwill, whip-poor-will, vesper sparrow, lark sparrow, dark-eyed junco, and western meadowlark.

Direct and Indirect Effects of Alternative 1

Known golden eagle nests are located in steep, rugged terrain that is inaccessible by vehicles. Eagle nests, however, are large and located in relatively open habitats so they are visible from a long distance. The current open road system allows widespread motorized access across the district, which increases the risk of human disturbance or harassment of nesting eagles and other raptors.

Under Alternative 1, some level of unintentional take of migratory birds likely occurs as a result of vehicles driving cross-country and running over nests. There would be no reduction in potential disturbance of nesting golden eagles, ferruginous hawks, or prairie falcons, and there would be no reduction in the risk of nests of ground-nesting birds being run over by motor vehicles under Alternative 1. However, Alternative 1 would not result in take of golden eagles under the Bald and Golden Eagle Act or Migratory Bird Treaty Act. Although motorized cross-country travel under Alternative 1 likely results in destruction of some ground-nesting bird nests (unintentional take), occurrence is likely not frequent enough to cause a loss of population viability for any of the migratory bird species that occur on the district.

Direct and Indirect Effects of Alternatives 2, 3, and 4

One effect of a reduced open road system and restricted motorized cross-country travel under Alternatives 2, 3, or 4 would be reduced motorized access and thus reduced risk of human disturbance of nesting raptors such as golden eagles, ferruginous hawks, and prairie falcons. In GA 1, 135 of 372 miles of open roads would be closed under Alternatives 2 and 3, and 148 miles would be closed under Alternative 4 (Table 12). In GA 3, 25 of 196 miles of open roads would be closed under Alternatives 2, 3, and 4. Of the 420 miles that intersect pinyon-juniper woodlands, 130 miles would be closed under Alternatives 2 and 3, and 137 miles would be closed under Alternative 4. Only 3 miles of existing non-system roads that intersect pinyon-juniper woodlands would be added to the designated road system under Alternatives 2, 3, and 4.

The limited amount of motorized cross-country travel that would be allowed under Alternative 2 or 3 would occur during the fall hunting season, outside of the spring nesting season for migratory bird species on the Williams District. Thus, each of the action alternatives would result in a substantial decrease in the risk of nests of ground-nesting bird species being run over and destroyed by motor vehicles.

Reducing the open road system and restricting motorized cross-country travel under Alternatives 2, 3, or 4 would result in reduced risks of disturbance of nesting raptors and other bird species and reduced risk of motor vehicles running over and destroying nests of ground-nesting bird species. Each of the action alternatives would have beneficial effects on migratory birds. None of the action alternatives would result in take of golden eagles under the Bald and Golden Eagle Act or Migratory Bird Treaty Act or cause a measurable negative effect on any migratory bird population as a result of unintentional take.

Other Species

Other wildlife species that are potentially affected by travel management alternatives include various species of reptiles and small mammals, black bear, and mountain lion. Gunnison's prairie dog is one of the small mammal species potentially affected by travel management. Effects to Gunnison's prairie dog

are discussed in the black-footed ferret and burrowing owl sections. Reptiles (lizards and snakes) and small mammals may be affected by travel management because they are small, diurnal, terrestrial species that are vulnerable to being run over by vehicles, and their habitat may be impacted by vehicles driven off-road. Black bears and mountain lions may be affected by travel management because open roads and motorized cross-country travel provide access for hunters to shoot them, and they may be negatively affected by human disturbance associated with motorized travel. Movement patterns of black bears and mountain lions have been shown to be influenced by roads or road traffic (e.g., Van Dyke et al. 1986, Brody and Pelton 1989).

Affected Environment

Many species of lizards, snakes, and small mammals occur on the Williams District. Black bears and mountain lions occur on the district, but at relatively low densities. Black bears and mountain lions are classified as big game species by Arizona Game and Fish Department.

Direct and Indirect Effects of Alternative 1

Road-kill animals most commonly observed along Forest Service roads on the Williams District are snakes and diurnal small mammals such as chipmunks, ground squirrels, and tree squirrels (Abert's squirrel). Reptiles and diurnal small mammals are also likely killed occasionally as a result of impacts with vehicles being driven cross-country. Motorized cross-country travel also results in localized reductions in herbaceous plant cover and thus impacts habitat of reptiles and small mammals. Under Alternative 1 there would be no reductions in mortalities of reptiles and diurnal small mammals killed as a result of being hit by vehicles along open roads and off roads, and there would be no reductions in impacts to reptile and small mammal habitat caused by motorized cross-country travel. There would also be no reductions in motorized access for black bear and mountain lion hunters and levels of human disturbance of these species.

Direct and Indirect Effects of Alternatives 2, 3, and 4

A reduced open road system and restricted motorized cross-country travel under Alternatives 2, 3, and 4 would result in reduced frequencies of certain reptile and diurnal small mammal species killed by impacts with motor vehicles. Restrictions in motorized cross-country travel under Alternatives 2, 3, and 4 also would result in reduced impacts to reptile and small mammal habitat. Reductions in mortalities due to vehicle impacts and habitat impacts would be slightly greater under Alternative 4 compared to Alternatives 2 and 3. For black bears and mountain lions, primary effects of a reduced open road system and restricted motorized cross-country travel under Alternatives 2, 3, and 4 would be reduced opportunities for hunters to shoot black bears and mountain lions and reduced levels of human disturbance associated with motorized travel. Sycamore Canyon provides important habitat for black bears and mountain lions. 33 of the 84 miles of open roads that intersect the Sycamore Rim area would be closed under Alternative 2, 3, and 4 (Table 12). These effects would result in increased habitat quality for black bears and mountain lions, and Alternative 4 would result in a slightly greater increase in habitat quality than Alternatives 2 or 3. Alternative 3 would lack the human disturbance and habitat disturbance effects associated with the motorized trail systems proposed under Alternative 2.

Cumulative Effects

Past, present, and reasonably foreseeable actions on and surrounding the Williams Ranger District are described in Section 3.13 of the EA. Large vegetation management projects approved during the past 20 years are identified. The primary land use practices and actions on the Williams District and surrounding private, state, and federal lands during the past 20 years and foreseeable future that affect wildlife habitat are livestock grazing, different types of tree thinning projects, and fire management. Most of the Williams District and much of the surrounding private, state, and federal lands are grazed by livestock. Livestock grazing generally results in decreases of habitat quality for many wildlife species because grazing reduces forage and cover resources for many species. These are long-term ongoing effects because lands on and surrounding the Williams District have been grazed by livestock for approximately 130 years. Numbers of livestock grazed on the district now are substantially less than numbers grazed in the late 1800s and early 1900s.

Thinning and prescribed burning of forests and woodlands have substantial effects on vegetation structure and composition and thus on wildlife habitat. Much of the forests and woodlands on the district have become denser than they were prior to the late 1800s because of decreased wildfire frequency (Swetnam et al. 1999, Covington and Moore 1994, Covington 2003). Thinning and burning treatments are likely moving habitat structure and composition back to conditions more similar to conditions that occurred during the recent evolutionary past for all native species in the area.

Most of the roads on the Williams District were constructed decades ago prior to the 1980s. Many of the roads were constructed for historic logging and ranching operations. Many of the more recent vegetation management projects listed in Appendix 4 involved closures of open, system roads (e.g., Branigan, Government, Beacon, Elk-Lee, Spring Valley, Frenchy, Pineaire). Temporary roads were established for some of these projects (Dogtown, City, and Twin), but temporary roads have been or will be decommissioned.

Direct and indirect effects of actions authorized under Alternatives 1, 2, 3, and 4 of this EA are described above for Threatened and Endangered species, Forest Service Sensitive species, Management Indicator Species, migratory bird species, and other wildlife species. Direct and indirect effects of action alternatives described above are primarily beneficial for each of the species analyzed because most effects of open roads and motorized travel on wildlife are negative, and the open road system would be reduced and motorized cross-country travel would be restricted under Alternatives 2, 3, and 4. Under Alternative 1, no new roads would be constructed, and no new areas would be opened for motorized cross-country travel. For species analyzed above, beneficial direct and indirect effects of action alternatives include reduced risk of human disturbance associated with motorized travel, reduced risk of mortality from shooting as a result of reduced motorized access for hunters, reduced risk of injury or mortality from vehicle collisions, reduced impacts to habitat as a result of restricted motorized cross-country travel. For each species analyzed, beneficial effects would be slightly greater under Alternative 4 compared to Alternatives 2 and 3 because more miles of open roads would be closed under Alternative 4, and motorized cross-country travel would not be allowed for retrieval of legally harvested elk.

The beneficial effects of actions authorized under Alternative 2, 3, or 4, even when added to the effects of past, present, and reasonably foreseeable future actions, would not result in adverse effects to any of the

species analyzed above. Actions would not 1) adversely affect or threaten the continued existence of any Threatened or Endangered species, 2) cause a loss of population viability or trend toward listing under the Endangered Species Act for any Forest Service Sensitive species, 3) cause a decline in Forest-wide population or habitat trend for any of the Management Indicator Species, 4) cause a measurable negative effect on any migratory bird population as a result of unintentional take, or 5) cause a loss of population viability for any native or desired nonnative animal species.

3.6 Cultural Resources

Affected Environment

During the past 30 years, KNF Cultural Resource specialists in compliance with Sections 106 and 110 of the National Historic Preservation Act of 1966, as amended, have intensively inventoried 238,232 of the District's 560,305 acres (42%). Archaeologists have identified 4,634 cultural resources, listed 11 of them on the National Register of Historic Places, and determined 766 eligible for inclusion on the National Register of Historic Places. The majority of the sites have not been evaluated for their eligibility for listing on the National Register at this time. However they will be treated as eligible for the purposes of this proposed action. The cultural resources on the District include prehistoric artifacts scatters, ancestral puebloan sites with masonry structures, prehistoric agricultural areas, cultural sensitive sites such as Traditional Cultural Places (TCPs), historic cabins, logging railroad grades and camps, Civilian Conservation Corp camps and other associated historic features, historic Forest Service administration buildings, and a variety of other historic properties. Cultural resource inventories over the past 30 years have shown that the resources occur in moderate to the high densities throughout the District. The current condition of unmanaged cross country travel has been shown to have to have adverse effects on cultural resources.

Williams Ranger District History

The earliest occupants of the Williams Ranger District were Archaic Indians who hunted and gathered between 7000 BC and AD 1. Very little evidence remains of these nomadic people. Lithic scatters without ceramics may be Archaic assemblages, but without further testing little more can be said about these sites. The transitional period between Archaic populations and Cohoninas is poorly understood in across the District. Few sites from the Basketmaker time period have ever been found. By far, the majority of sites are artifact scatters and small masonry habitation sites affiliated with the Cohonina who occupied the project area from AD 700-1100; ceramics indicate that most sites date from AD 900-1050. Most habitation structures are either one or two rooms indicating limited seasonal use of the project area. While there are several scattered multiple room pueblos, the archaeological record suggests that the prehistoric occupants were highly mobile and scattered themselves across the entire landscape. There is scant evidence of cultures occupying the project area after the Cohonina migrated from their territory around AD 1100, although it is likely that ancestors of Hualapais, Havasupais and Yavapais hunted and gathered in the project area much like the Archaic Indians mentioned above. These people also led a nomadic existence and left few items behind that would preserve in the archaeological record.

Historic Anglo use of the District commenced when Congress passed the Pacific Railroad Survey Bill in 1853. They commissioned Lieutenant Amiel Weeks Whipple to survey for a railroad along the 35th

Parallel. Although the railroad was years away, in 1857, Congress next commissioned Lieutenant Edward Beale to construct a wagon road from Fort Smith, Arkansas to the Colorado River. Beale constructed the route in 1859. When miners discovered gold near the headwaters of the Hassayampa River 1863, the United States Government commissioned the Overland Trail to access the "fortunes". A route was soon blazed between Flagstaff and Fort Whipple, crossing the District. The trail, however, was extremely rough and claims of gold strikes fizzled. Finally, the 1882 completion of the Atlantic and Pacific Railroad, opened immigration to the region by settlers, ranchers, loggers, tourists and later, the Forest Service. In 1922, the construction of the "Old Trails Highway" (by 1926, known as Route 66) paralleled the railroad and made the west accessible to even more immigrants and tourists.

USDA Forest Service Cultural Resource Policies Regarding Travel Management

In a policy statement drafted by the Forest Service in consultation with the Advisory Council on Historic Preservation, it was stated that any restriction of motorized travel on designated routes, and the prohibition of unmanaged cross country travel will serve to protect historic properties across a broad landscape and that such a clearly designated system will "(p)rotect natural and cultural resources." (Forest Service 2005)

The Kaibab has been meeting its Section 106 responsibilities under a Region-wide Programmatic Agreement signed by the FS, SHPOs, and the Advisory Council in lieu of the procedures set forth in 36 CFR 800. The agreement, the *R3 First Amended Programmatic Agreement (PA) Regarding Historic Property Protection and Responsibilities,* allows for the development of protocols for certain classes of undertakings where effects on historic properties and resulting protection and treatment measures are similar and repetitive, or for certain classes of undertakings where effects on historic properties are similar and repetitive. A protocol for Travel Management Route Designation was developed in 2006 in consultation with the tribes, SHPOs and Advisory Council as Appendix I: Standard Consultation Protocol For Travel Management Route Designation (Forest Service 2006) under the programmatic agreement.

In the protocol, the Advisory Council, the Region 3 of the Forest Service Region and the State Historic Preservation Officers of New Mexico, Texas, Oklahoma and Arizona, agreed that the designation of an existing system of roads and trails, already open for motor vehicle use, will have little or no potential to affect historic properties (Forest Service 2006). The protocol provides a process for compliance with Section 106, and eliminates some areas from 100% survey. All new roads, trails, and corridors will be subject to Section 106 compliance.

Methodology for Applying Protocols for Section 106 Compliance

To apply the aforementioned protocols for the Travel Management Rule, Kaibab archaeologists have worked closely with the Interdisciplinary (ID) Team to designate an open road system that will help protect and preserve cultural resources in their natural environment. In this manner, they were able to identify areas of cultural sensitivity that require exclusion from possible dispersed camping corridors, unsuitable spur, previously closed or unauthorized user created roads. During this process archaeologists recommended that several roads passing near or through significant cultural resources do not appear on the MVUM. Overall, the ID Team proposed to remove 380 miles from the existing system.

Archaeologists evaluated all of the proposed alternatives in relationship to the Appendix I of the Programmatic Agreement. According to Section II.A of the Appendix, existing system roads and trails

and their associated constructed features that are already open for motor vehicle use will have little or no potential to affect historic properties. Therefore, the proposed designated existing system of roads did not require further evaluation. The potential effects from designated dispersed camping corridors, adding newly designated spur roads, unauthorized user created roads, previously closed roads, newly proposed trails, and/or allowing for motorized big game retrieval may, however, lead to undesirable effects on cultural resources and they are evaluated in depth below.

To comply with Section 106, archaeologists will apply the protocols by conducting additional surveys and monitoring if the selected alternatives include designating spur roads, previously closed and unauthorized user created roads, newly proposed trails or camping corridors (see mitigation measures below).

Dispersed Camping Corridors

Within the 220 miles of proposed corridors, archaeologists have inventoried 78% of the area. 214 sites are located within these corridors. Should an alternative be chosen allowing these corridors, prior to the release of the MVUM, archaeologists will monitor all sites within the corridors to determine their current condition. In subsequent years, Archaeologists will monitor 20% of the sites within the corridors each year to determine if undesirable effects occur. If they do, corridors will be removed from the maps.

Designated Spur, Previously Closed and Unauthorized User Created Roads

Archaeologists will survey all proposed designated spur roads, previously closed roads (if they have not been inventoried) and any unauthorized user created roads to ensure they do not affect cultural resources. If they do, they will not be designated on the MVUM.

Motorized Big Game Retrieval

No additional surveys will be required for the decision to allow motorized big game retrieval. Given that there are only an estimated 695 motorized big game harvests (Table II, Section 1.4) potentially impacting approximately 350 acres (695 times 12” wide wheels X 2 wheels X 2 miles) per year (0.0625% of the District), and that hunters may only travel off road when conditions are suitable (see discussion of Wet Weather Roads in Section 2.6), archaeologists expect that there will be no adverse effects from such a decision.

Effects on Cultural Resources

Direct and Indirect Effects

The following paragraphs discuss the direct and indirect effects that are common to most alternatives. Further below, the unique proposal of each alternative is evaluated and do not recant these common effects.

While the potential direct and indirect effects are discussed below, by applying the aforementioned protocols, archaeologists do not expect any adverse effects to cultural resources. Any of the alternatives provided below, other than Alternative 1 the No Action Alternative, greatly reduces the risk of damages to cultural resources from off road vehicles.

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Motorized Big Game Retrieval (Common to all Alternatives, except Alternative 4)

Direct impacts of motorized big game retrieval and off road travel involves the physical contact of tires or an undercarriage traveling over or through archaeological sites or traditional use areas altering the ground surface and any archeological materials on the site. OHV use in areas with sensitive or moist soils can create tracks, ruts and new user routes that may crush, displace, and/or destroy cultural materials (i.e. artifacts, features, traditionally used plants), and damage significant information that may contribute to our understanding of history. These ruts may then lead to rill and gully formations, which could further damage sites. As a result, an eligible or listed property may become ineligible for listing on the National Register. For example, during a 2003 archaeological site inventory survey in the Coconino National Forest near the Timberline subdivision, archaeologists observed numerous OHV tracks and routes that passed through and over important features and artifacts on prehistoric sites, often noting irreparable damage (Lyndon 2003). However, given that there are only an estimated 695 motorized big game harvests (Table II, Section 1.4) potentially impacting only 350 acres per year (0.0625% of the District), and that hunters may only travel off road when conditions are suitable (see discussion of Wet Weather Roads in Section 2.6), archaeologists expect that there will be no adverse effects from such a decision.

Figure 9: Kaibab NF Archaeologist Neil Weintraub inspects a site impacted by campers on the WRD. In fall 2008, archaeologists successfully removed a campfire ring (lower right) from within the site, thus discouraging camping near the large structure (wall rubble in background). The access road to this site would be closed under Alternatives 2, 3 and 4.

Designation of Spur Roads, Formerly Closed and Unauthorized User Created Roads (Common to Alternatives 2, 3, and 4)

The designation of spur roads is common to all alternatives, except Alternative 1 – the No Action Alternative. Many of these spur roads (most less than ¼ mile long) lead to multiple dispersed camping sites. The designation of these spur roads may lead to an increase in effects to cultural resources adjacent to designated spur roads (see Figure 9). Their use may also create ruts and erosion problems that can displace and damage archaeological materials and deposits. However, since mitigation measures below will only allow spur roads that have been surveyed and have no sites, there will be no effects to cultural resources from this allowance. Archaeologists will also survey all potentially designated unauthorized

user created roads and previously closed roads that may not have been surveyed. If any of these roads affect cultural resources, they will not be designated as open to motorized travel.

Roadside Parking (Common to all)

Under all alternatives roadside parking is allowed. Roadside parking is exempted under the protocol. This has been the traditional way that forest users have camped on less traveled roads of the Williams Ranger District. Because this activity takes place in heavily disturbed areas along the edge of existing roads, there are few new threats to cultural resources. If areas are found where roadside parking is damaging cultural resources then those areas will be designated as closed to parking.

Alternative 1 - No Action

Of the No Action Alternative's open trails and roads, archaeologists have inventoried 69.8% of the open road system (24551 of 35196 acres). On the Kaibab, archaeologists normally survey roads 100 ft. on both sides of a road's centerline. Many of these roads also fall within areas surveyed for large timber sales.

Direct and Indirect Effects

Because Alternative 1 leaves all roads open for use and off road driving would be allowed, all cultural resources (both known and unknown) on the Williams Ranger District remain at risk to direct and indirect effects (see earlier discussion) from off road travel. Virtually all of the 4634 cultural resources on the Williams Ranger District (except for 41 sites located in the Sycamore Canyon and Kendrick Mountain Wilderness areas), are at risk to damages from off road vehicles.

Table 13 (below) illustrates the proximity of cultural resources to Alternative 1's open roads system. Almost 72% (n=3335/4634) of the Williams Ranger District's known cultural resources are less than ¼ mile from any open road.

Table 13: Percentage of known cultural resource sites within a specified distance of existing forest roads

Distance from Open Road	Number of sites	Percentage of Williams Ranger District Sites (n=4634)
Sites within 10 ft	481	0.10
Sites within 25 ft	549	0.12
Sites within 50ft	672	0.15
Sites within 100ft	918	0.20
Sites within 200 ft	1293	0.28
Sites within 500ft	2046	0.44
Sites within 1/4 mile	3335	0.72
Sites within 1/2 mile	4232	0.91
Sites within 1 mile	4517	0.97

Alternative 2 – Proposed Action

Direct and Indirect effects

This alternative greatly reduces the direct and indirect effects to cultural resources. When compared to Alternative 1, Alternative 2's allowance for off road travel for only seasonal big game retrieval will likely lessen but not eliminate the direct and indirect effects to cultural resources.

Because Alternative 2 also proposes designating a 200 ft. dispersed camping corridor along appropriate open system roads, archaeologists expect increased impacts within these areas (see discussion above).

This alternative also adds 25 miles of motorized trails to the system. The creation of these motorized trails can lead to negative direct effects by displacing and crushing artifacts and disturbing archaeological deposits. These trails may also cause erosion that may indirectly affect sites by displacing archaeological artifacts and deposits.

Mitigation Measures

Under this alternative, designated dispersed camping corridors, spurs, user created roads, previously closed roads and motorized trails proposed for designation in the MVUM, are undertakings subject to compliance with Section 106 of the National Historic Preservation Act of 1966.

By reducing the opportunities for dispersed camping across the District, archaeologists expect increased impacts within designated 200 ft. corridors. Within the 220 miles of proposed corridors, archaeologists have inventoried 78% of the area. 214 sites are located within these corridors. Should an alternative be chosen allowing these corridors, prior to the release of the MVUM, archaeologists will monitor all sites within the corridors to determine their current condition. In subsequent years, Archaeologists will monitor 20% of the sites within the corridors each year to determine if undesirable effects occur. If they do, corridors will be removed from the maps.

Archaeologists will conduct a 100% Section 106 compliance survey of all roads proposed for designation including spur roads, user created and previously closed roads, and any proposed motorized trails prior to their publication in the MVUM. Any such roads or trails that affect cultural resources will not appear on the MVUM and thus will not be open to the public.

Given that there are only an estimated 695 motorized big game harvests (Table II, Section 1.4) potentially impacting only 350 acres per year (0.0625% of the District), and that hunters may only travel off road when conditions are suitable (see discussion of Wet Weather Roads in Section 2.6), archaeologists expect that there will be no adverse effects from such a decision.

Alternative 3

Direct and Indirect Effects

The major differences between Alternative 2 and Alternative 3 are that under this alternative, there are no designated dispersed camping corridors or motorized trails that are designated. This alternative greatly reduces the direct and indirect effects to cultural resources. This alternative only designates appropriate spur roads, previously closed roads and unauthorized user created roads that do not affect cultural resources. When compared to Alternative 2, removal of dispersed camping corridors eliminates all direct and indirect effects from motorized vehicles driving within areas adjacent to the open road system.

Alternative 3's allowance for mechanized big game retrieval will likely lessen but not eliminate the direct and indirect effects to cultural resources.

Mitigation Measures

Under this alternative, any spurs roads, user created roads and previously closed roads proposed for designation in the MVUM are undertakings subject to compliance with Section 106 of the National Historic Preservation Act of 1966. Archaeologists will conduct a 100% Section 106 compliance survey of all roads proposed for designation including spur roads, user created and previously closed roads prior to their publication on the MVUM. Any such roads or trails that affect cultural resources will not appear on the MVUM and thus will not be open to the public.

Given that there are only an estimated 695 motorized big game harvests (Table II, Section 1.4) potentially impacting only 350 acres per year (0.0625% of the District), and that hunters may only travel off road when conditions are suitable (see discussion of Wet Weather Roads in Section 2.6), archaeologists expect that there will be no adverse effects from such a decision.

Alternative 4

Direct and Indirect Effects

This alternative provides for the greatest reduction in direct and indirect effects to cultural resources. Because there will be 35 fewer miles of designated roads, no motorized big game retrieval, and no dispersed camping corridors, direct or indirect effects to cultural resources will be greatly reduced to only those areas immediately adjacent to the open road system (roadside parking). This alternative (like Alternative 3) only designates appropriate spur roads that have no effect on cultural resources.

Mitigation Measures

Under this alternative, any spur roads, user created roads and previously closed roads proposed for designation in the MVUM are undertakings subject to compliance with Section 106 of the National Historic Preservation Act of 1966. Archaeologists will conduct a 100% Section 106 compliance survey of all roads proposed for designation including spur roads, user created and previously closed roads prior to their publication on the MVUM. Any such roads or trails that affect cultural resources will not appear on the MVUM and thus will not be open to the public.

Cumulative Effects

The table of past, present and future projects in Appendix IV lists decisions that have actions that include off road travel and the construction of temporary roads to accomplish the project's goals. The vast majority of these large landscape projects are intended to restore the forest to a healthy ecosystem. To comply with Section 106 of the National Historic Preservation Act of 1966 as amended, Kaibab National Forest archaeologists ensure that any activities associated with these projects, such as temporary road construction, mechanical thinning of timber, or even construction of fire control lines, have no adverse effects on cultural resources. In applying the protocols to protect cultural resources under the Travel Management Rule, archaeologists do not expect adverse effects to occur to cultural resources. Because none of the past, present and future actions adversely affect cultural resources, nor will the Travel

Management Rule adversely affect cultural resources, there will be no cumulative effects to cultural resources as a result of this decision.

3.7 Range Management

Affected Environment

Livestock grazing has occurred on the Williams District since late-1800. At times the area was grazed concurrently by both sheep and cattle; actual numbers were not recorded. Once allotments were formally established and grazing permits were issued, livestock numbers began to be reduced.

There are twenty-eight grazing allotments in the project area:

Table 14: Grazing allotments on the WRD

Summer Cattle Allotments (14)				
Bellemont	Chalender	Corva	Davenport Lake	Elk Springs
Government Mountain	Government Prairie	Homestead	Moritz Lake	Pine Creek
Seven C Bar	Sitgreaves	Spitz Hill	Tule	
Summer Sheep Allotments (7)				
Big Springs	Cowboy Tank	Garland Prairie	Hat	Pomeroy
Squaw Mountain	Twin Tanks			
Winter Cattle Allotments (5)				
Dog Knobs	Double A	Ebert	Partridge Creek	Smoot Lake
Yearlong Cattle Allotments (2)				
Irishman Dam	Juan Tank			

All of the cattle allotments have interior fences (pastures) as well as exterior, allotment boundary fences. There are hundreds of miles of fence, numerous water sources, waterlots, and Parker 3-Step range transects within these allotments.

The sheep allotments are managed by herders who move the sheep around from grazing area to grazing area with the help of their dogs. As a result most sheep allotments don't have pasture fences, and some don't have allotment boundary fences unless they abut a cattle allotment. For example, there are no allotment boundary fences between the Garland Prairie, Pomeroy, and Big Springs sheep allotments. However, there are allotment boundary fences between each of those and their cattle allotment neighbors. The sheep allotments have numerous water sources, waterlots, and Parker 3-Step range transects within them.

Most of the water sources on the allotments are earthen tanks. They were built in the early 1900's in basins or drainages to catch snow melt or run-off. In recent years many tanks were built adjacent to roads, in order to catch road run-off.

Relevant Laws, Regulations, and Policy

The Kaibab National Forest Plan (page 5) states: "This plan balances permitted grazing use with grazing capacity and improves management. More intensive management, coupled with the retreatment of range non-structural improvements and the maintenance of structural improvements generates a modest increase in grazing capacity across the planning horizon."

This is further clarified in the Forest Plan on page 51: "D06 Range Improvement Maintenance - Permittees maintain improvements as specified in the grazing permit." Term Grazing Permits were signed with the understanding that the permittee would have access to the improvements they have maintenance responsibility for. Any road restrictions would violate the intent of the permit and could cause economic hardship if equipment and materials would have to be hauled to the work site in some manner other than by a motor vehicle.

36 CFR Part 212, Section 212.51(8) and Sec. 261.13(h) specifically exempt motor vehicle use, that is authorized under a written authorization issued under Federal law or regulations, from the prohibition on off road travel established under 36 CFR 212.51. This exemption includes Term Grazing Permits.

The following information comes from the TMR Implementation Guidelines – Revision 3 (Forest Service 2007):

> "Implementation of the TMR will require active management of all motorized use, including that related to permitted grazing activities. Motorized travel off the designated road system by grazing permit holders must be based on need related to carrying out required management practices, and compliance with the terms and conditions of Term Grazing Permits. Legitimate motorized use, including cross-country access, needed for conducting activities required under Term Grazing Permits will be authorized unless compelling natural and/or heritage resource issues such as those identified below require postponement or modification of the activity.
>
> Changes from historic patterns of travel should not impair management of the allotment or substantially impact the operator's economic viability. Permittee access to manage allotments would be provided through a combination of the designated Forest system roads and other access needs identified in their Term Grazing Permit. If not currently described in a Term Grazing Permit, access needs other than the designated system, will be spelled out as a special provision in Part 3 of the Term Grazing Permit (either in the Allotment Management Plan (AMP), or directly as a special provision of the permit in Part 3) as presently being practiced.
>
> Annual Operating Instructions (AOI's) specify those annual actions that are needed to implement the management direction set forth in the Term Grazing Permit including the AMP. With regard to travel management needs, this will annually include a brief discussion of the use of vehicles and ATV's within the designated road system, any single purpose use roads or trails, and a description of the annually anticipated level of cross-country travel and access consistent with the Part 3 of the Term Grazing Permit and/or AMP. Any unplanned or emergency type travel not previously contemplated in the Term Grazing Permit would also be discussed with appropriate authorization and guidance established in the AOI.

> All authorizations for cross-country motorized travel are subject to other existing regulations intended to protect natural and/or heritage resources. This includes compliance with regulations addressing use of vehicles off roads (36CFR 261.15), National Forest Wilderness (36CFR 261.18), and National Forest Primitive Areas (36 CFR 261.21), as well as other applicable laws and regulations. Cross-country motorized travel should not be allowed when conditions are such that cross-country travel would cause unacceptable natural and/or heritage resource damage, and existing resource protection regulations should be enforced when conditions warrant."

The Kaibab National Forest has a long history of permitted domestic grazing use. Domestic livestock grazing is an important and valued use on National Forests in the Southwest and those activities are an integral part of the tradition, culture, and social fabric of communities throughout the Southwest.

Effects on Range Operations

Alternative 1 – No Action

Alternative 1, the no action alternative, would leave approximately 1,890 miles of roads open to the public; no roads will be closed; motorized cross-country travel would continue, as would motorized cross-country travel for game retrieval for any species; dispersed camping would not be restricted in any way.

The creation and use of new user-created routes could interfere with a grazing permittee's operation.

There would be no need to address motorized use by grazing permittee's in their AMP's or AOI's. Permittees would be free to access their livestock and improvements by any route (cross-country, Forest roads or user-created roads). Forest Service range personnel could do the same in order to administer the permit.

Alternative 2 – Proposed Action

With Alternative 2, approximately 380 miles of roads would be closed. This action would have minimal to no effect on range permit administration and permitted grazing activities.

Motorized retrieval for elk would be allowed in September and October for up to one mile cross-country. An estimated 90% of hunters use motorized cross country travel to retrieve their elk (see Table 2, Section 1.4). The effects of this limited travel to the range resources should be minimal. One effect could be hunters encountering a fence and rather than searching for a gate to drive through, just cutting the fence and leaving it. Another scenario would be hunters encountering a closed gate but leaving it open, rather than leaving it as they find it (or vice-a-versa). Either scenario would pose a problem for the rancher who then has to find and move stray livestock, constantly monitor gates, and/or constantly repair fences that have been cut.

Dispersed camping is restricted to designated corridors or on designated routes to those campsites for a total of approximately 5,280 acres. Keeping use confined to these areas will prevent new "sacrifice zones" from being created that replace grasses with bare, compacted soil.

Grazing permittees would be authorized to travel cross country as long as it is specified in their Annual Operating Instructions (AOI) and follows the guidance from the TMR Implementation Guidelines. Range personnel could also do the same when needed to efficiently administer the grazing permits. Regular cross country travel or use on any closed road by either permittee or Range personnel will be discouraged

in favor of utilizing the open road system. However, there will be times when such use may be needed without prior approval or clearance (ex: a sick cow needs to be retrieved, or a road is found to be closed that accesses an historic range study site). Legitimate motorized use may continue in these situations unless compelling natural and/or heritage resource issues require postponement or modification of the activity.

Alternative 3

The effects of Alternative 3 will be the same as for Alternative 2.

Alternative 4

In Alternative 4, approximately 415 miles of roads would be closed. This action would have minimal to no effect on range permit administration and permitted grazing activities.

Alternative 4 eliminates cross-country travel for big game retrieval. With motorized retrieval for big game prohibited, hunters would be restricted to open roads and therefore required to go through gates instead of cutting a fence to get through. The possibility for hunters encountering a closed gate but leaving it open, rather than leaving it as they find it (or vice-a-versa) would still remain.

Grazing permittees would be authorized to travel cross country as long as it is specified in their Annual Operating Instructions (AOI) and follows the guidance from the TMR Implementation Guidelines. Range personnel could also do the same when needed to efficiently administer the grazing permits. Regular cross country travel or use on any closed road by either permittee or Range personnel will be discouraged in favor of utilizing the open road system. However, there will be times when use of a closed road may be needed without prior approval or clearance (ex: a sick cow needs to be retrieved, or a road is found to be closed that accesses an historic range study site). Legitimate motorized use may continue in these situations unless compelling natural and/or heritage resource issues require postponement or modification of the activity.

Effects to ranching operations could be positive because limiting access to the general public may make for a more pleasant ranching operation. It may be quieter with less harassment of animals, especially during calving. There may be fewer gates left open and/or fences being vandalized, which means less work for the rancher.

Cumulative Effects

The geographical extent of this analysis is confined to the Williams Ranger District. Past and ongoing uses and actions within the analysis area that could affect range resources include tree thinning, prescribed burning, wildlife habitat management, and developed and dispersed recreation. All of these uses are expected to continue indefinitely into the future.

The level of motorized cross-county use by permittees is not expected to be high under any alternative. Most of the range improvements are accessible by roads. Each permittee's Annual Operating Instructions (AOI) will include a brief discussion of the use of vehicles and a description of annually anticipated level of cross-country use if an action alternative is selected.

Some activities may affect permittee access to an area, for example before, during or following a prescribed burn, but this restriction is usually temporary to provide for permittee safety as well as

allowing the landscape an opportunity to recover. Additionally, these activities are coordinated with permittees so that there is minimal conflict between permittees and the intended activities. Therefore, the cumulative effect of implementing any of the action alternatives on rangeland management is expected to be minor.

3.8 Fire Suppression and Fuels Management

Affected Environment

Currently, there is 110 miles of maintenance level (ML) 3 roads traversing the district. Maintenance level 1 and 2 roads provide further access to areas between the Level 3 roads. The present density of roads is such that very few areas of the district are more than one mile from a road. At this density, there is wide-spread dispersal of forest visitors which may contribute to a higher number of human-caused wildfires. Additionally, desirable management fires for resource benefit (low to moderate intensity) can be checked prematurely due to a break in fuels at the road edge.

Effects on Fire Suppression and Fuels Management

Alternative 1- No Action

The current density of roads adequately facilitates patrolling, initial attack response and movement of suppression resources. The spread of desirable management fires for resource benefit is often hampered by the break in fuel continuity at the edge of roads. All ML 2 and 3 roads are used extensively by the visiting public and OHV use is expected to increase. Human-caused fires in dispersed areas may increase, especially given the expected increase in off road driving. As dispersed visitation increases, the ability to make adequate fire prevention contacts will diminish without additional personnel, vehicles and related funding. Damage to patrol vehicles will likely increase as well, from driving rough roads in the effort to make adequate contacts over a wider area.

Alternative 2 – Proposed Action

Closing 380 miles of existing ML 2 district roads and adding 25 miles of motorized trails will have very little impact on the ability to move suppression resources, adequately patrol, and provide initial attack response, particularly since they are ML 2 roads and often are in need of maintenance and located within a few miles of roads that are not being considered for closure. While it may be several years before sufficient vegetation covers the closed road to provide a continuous fuel bed for the spread of desirable management fires for resource benefit, the reduction will be a favorable step in that direction. Visitor use, especially within the 200 foot camping corridors, will be less dispersed, making it easier to patrol and provide prevention contacts. Given the anticipated increase of use associated with the 25 miles of motorized trails (see Section 3.2), there is a moderate potential for the increase of human caused wildland fires within and adjacent to the motorized trail areas. Limited road maintenance funds will not be spread as thin as they are currently. This should result in better road conditions overall and less damage to patrol vehicles.

Alternative 3

From the perspective of fire management, the effects of Alternative 3 are similar to Alternative 2. Closing 380 miles of existing ML 2 district roads will have very little impact on the ability to move

suppression resources, to adequately patrol, and to provide initial attack response. While it may be several years before sufficient vegetation covers the closed road to provide a continuous fuel bed for the spread of desirable management fires for resource benefit, the reduction will be a favorable step in that direction. Visitor use will be less dispersed, making it easier to patrol and provide prevention contacts. The different strategy to allow motor vehicle use for Big Game (ELK) retrieval will have little impact on fire and fuel management because wildland fires being started during Big Game retrieval incidents have been rare.

Alternative 4

From the perspective of fire management, the effects of Alternative 4 are similar to Alternatives 2 and 3. Closing 415 miles of existing ML 2 district roads will have very little impact on the ability to move suppression resources, to adequately patrol, and to provide initial attack response. While it may be several years before sufficient vegetation covers the closed road to provide a continuous fuel bed for the spread of desirable management fires for resource benefit, the slightly greater reduction in road miles with Alt. 4 will be a favorable step in that direction. Motorized visitor use will be slightly less dispersed than Alternatives 2 &3, making it easier to patrol and provide prevention contacts. The main difference in Alternatives is to prohibit cross country travel for any reason on the Williams Ranger District which will have little if any noticeable impact on fire and fuel management.

Cumulative Effects

It can be reasonably expected that the cumulative effects of Alternative 1 - No Action will provide increased dispersed access to most areas of the Williams Ranger District for Forest Service employees, permittees and contractors, as well as the visiting public. All will continue to push deeper in to the Forest and cause very few areas on the district to not be near some level of roads. In terms of patrolling, initial attack response and movement of suppression resources, this is desirable. However, downward funding trends and a growing road maintenance back-log equate to continued degradation of road conditions and the resulting increase in maintenance and repair costs for patrol and fire response vehicles. An increase in dispersed camping and associated human caused fires in remote areas may also be expected. As visitation and OHV use increases, the current level of prevention patrolling will likely be inadequate to meet the needs for forest protection. Increased staffing will require increased funding for personnel and equipment. This may be difficult to secure given past and current budget trends.

Human caused fires (during High to Extreme Fire Danger time frames) in remote areas require longer response times and are more likely to result in larger, more costly, dangerous and difficult to manage wildfires. An increase in user-developed roads can be expected as OHV use proliferates. These roads invariably cause ecological damage and tend to accelerate erosion and soil degradation. This often results in plant mortality, gullies and removal of soils. An increase in roads of any type will further limit the opportunities for desirable (low to moderate intensity) wildland fire to move across the landscape unimpeded by human caused breaks in surface fuels.

The reduction in roads throughout the Williams Ranger District, as in Alternatives 2-4, will increase opportunities for the spread of desirable management fires for resource benefit as user-created routes and closed roads re-vegetate over time. Road maintenance funds will not be stretched as thin; system roads may be kept in better condition. However, initial attack response and the movement of fire suppression resources may be constricted and resulting in larger, more costly, and difficult to manage wildfires

(during High to Extreme Fire Danger time frames). Historically at Williams Ranger District, the majority of lightning-caused fires do not immediately become explosive and unmanageable by local resources. Closed roads will be available for initial attack response, although road conditions will deteriorate without maintenance over time.

Currently, fuel reduction goals are partially met by permitting the gathering of fuelwood for both commercial and personal use. It is expected that this process will continue into the foreseeable future. A significant reduction in roads will result in fewer areas being accessed for fuelwood gathering and will shift the burden of fuel reduction back to prescribed burning and management fires for resource benefit. This may result in less fuelwood removed from the Ranger District and more dead-down fuel to be consumed by wildland and prescribed fire. A higher fuel load will contribute to hotter wildfires and an increase in smoke volume. In addition to a likely increase in the number and duration of smoke impacts to local residents and visitors, this situation may also lengthen the time and effort necessary to meet long-term resource objectives such as restoring the historic low intensity - high frequency fire regime that is desirable for ponderosa pine forests.

Fuel reduction goals are primarily addressed through prescribed fire (broadcast and pile burns) and management fires for resource benefit implemented on the Kaibab National Forest. These activities coupled with the implementation of Alternatives 1-4 would continue to provide protection to the private lands within the Williams Ranger District and minimize any risk associated with change in use.

In summary, the cumulative effect for Alternative 1 is generally positive for fire suppression and prevention. Roads provide opportunities to stop an undesirable wildfire, provide access for suppression resources and prevention patrols. The cumulative effect for management fires for resource benefit with Alternative 1 is negative due to the abundance of roads that may cause a desirable fire to stop prematurely. Because user-created routes and closed roads are anticipated to re-vegetate over time, Alternatives 2 – 4 are expected to result in neutral to positive cumulative effects for the fire and fuel management.

3.9 Vegetation Management

Affected Environment

Vegetation management occurs on many parts of the District. This work is not expected to be effected by TMR. The primary concern for vegetation management is provision of an adequate transportation system in order to provide access for vegetation management projects. Roads are needed in order for contractors to access work areas in order to load and haul timber as well as small diameter wood. Roads are also needed for fuel wood and Special Forest Product (SFP) collecting (i.e. Christmas Trees, cones, pine boughs) which are popular uses of the Williams Ranger District.

Desired Condition

An adequate number of open roads are provided in order to carry out vegetation management activities. Closed roads are reopened and temporary roads augment the open road system to facilitate this work, and are reclosed or decommissioned after work is completed (subject to project specific analysis and approval). Fuel wood, Christmas tree and forest product gathering are conducted as permitted, however

allowing motorized cross country travel for these activities will be used sparingly, but will be permitted if it is necessary to meet vegetation management objectives (consistent with 36 CFR 212.51 (b)).

Effects on Vegetation Management Activities

Effects Common to All Alternatives

Vegetation management will continue with any temporary road construction, obliteration or use of closed roads covered under the environmental planning and contract preparation each specific project. Fuel wood, Christmas tree cutting and forest product collection will continue to be permitted as needed to meet vegetation management goals and local demand for fuelwood and SFPs.

Alternative 1 – No Action

Direct and Indirect Effects

There are no direct effects on vegetation management with the existing condition. There may be indirect effects related to unmanaged cross country use, if soil erosion and soil productivity are decreased. These are expected to be slightly negative over time.

All Action Alternatives

Direct and Indirect Effects

These alternatives will not have direct effects on the Vegetation Management program. Closed roads and temporary roads would still be used for Vegetation Management projects as needed and approved under project specific planning. There would be no effect on vegetation management activities from dispersed camping or motorized big game retrieval for elk seasons. Fuelwood/SFP collection might be negatively affected since the open road system would be reduced by about 24 percent, making it more difficult to access certain areas of the District. Further, the prohibition of motorized cross country travel would require that individuals use non-motorized methods of gathering fuelwood from within the forest interior. Though roadside parking along open roads would be allowed, fuelwood cutters would not be able to drive motorized vehicles off of open roads to search for, locate or remove fuelwood. SFP collection would continue to meet local demands, though the prohibition of motorized cross country travel would have similar impacts on the accessibility of these products unless off road travel exemptions were granted in the terms of the permit.

Cumulative Effects

There are no cumulative effects on the Vegetation Management Program. However, individuals will continue to be affected by the prohibition of motorized cross country travel as it pertains to fuelwood and SFP collection. Past vegetation management projects, such as the Irishman Dam project, have been approved for fuelwood harvest (including off road travel) and would be available for public use (with permit) as soon as the demand warrants. Other past projects, such as the City project, also have fuelwood available for public use and include both the free use of pine slash and permitted collection of juniper. Future projects, including the McCracken vegetation management project, will likely include the provision of fuelwood cutting areas accessible by vehicle (free and permitted). Public demand for fuelwood is expected to be met through an active vegetation management program on the District and the only change would be the manner in which fuelwood gathering takes place. Special Forest Product gathering will continue to be handled on a case by case basis and approved after subsequent analysis.

3.10 Lands and Minerals

Affected Environment

There are approximately (to be determined) acres of private property located within the (to be determined) acres of the Williams Ranger District. There are existing roads leading to or through most of the private property parcels. The general public, including private property owners, are allowed to use open Forest roads to access their property.

By law, the Forest Service is required to provide access to private lands surrounded by National Forest System Lands. Usually, the provided access is by an existing road. A written authorization is required to upgrade an existing road by a private property owner. There have been several FLPMA easements and permits granted for ingress and egress to private property on the District over the years.

There are approximately 270 special use permits issued for commercial uses on the District including, but not limited to electrical powerlines, natural gas pipelines, water transmission pipelines, Federal, State and County roads, driveways, bee hives, research studies, communication sites, and railroads. Many of these permits also allow for cross country travel as part of their operating plans or as a condition of their special use authorization.

There are approximately 25 contracts for saleable mineral materials located on the District that are already using certain roads authorized under road use permits. These permits allow the contractors to maintain and improve the roads associated with their operations. There are 5 locatable Plans of Operation for the removal of sandstone on the District. By law, locatable mining operations have a reasonable right to ingress and egress to their mining claims. These rights are also exercised under road use permits.

Desired Condition

With regard to lands and mineral resources, the desired future condition is that the travel management rule will not make a difference under any alternative. We will still allow access to existing commercial uses and mining activities. Any new special use permits that would require cross country travel could be authorized for that use.

Effects on Lands and Minerals

Effects Common to All Alternatives

From the No Action alternative to Alternative 4, there will be no direct or indirect effects with implementation of the Travel Management Rule. Commercial users will still be allowed to access their permit areas either from open roads or under written authorization. By law, we are required to provide ingress and egress to private property owners and this will be accomplished with written authorization.

Mineral material contractors and mining claimants will still have written authorization to use certain Forest roads for access to contract areas or claims.

Cumulative Effects

Since there are no direct or indirect effects under any alternative, there are no cumulative effects.

3.11 Economics

Travel Management planning necessarily focuses on vehicular travel; it is not a non-motorized travel planning process. The Information provided below about economic contributions from recreation provide an overall framework from which to view the portion contributed by motorized recreation and related recreation activities. Little primary research has focused solely on the economics of motorized recreation. Some secondary sources provide indicators about contributions to state and Coconino County economic impacts.

Travel and Tourism

Travel and tourism is the second largest industry in the state, and tourism is one of the largest employers (Arizona Office of Tourism 2007). On National Forest lands, recreation is the second largest producer of direct revenue to the economy. Whereas communities near National Forests used to be dependent upon extractive industries, their economies are shifting to attracting tourists (Forest Service 2008). Table 15 provides information about the contribution of tourism to Arizona's economy.

Table 15: Tourism Contribution to Arizona Economy

Measure	Quantity
Number of Domestic/International Overnight Visitors	31 million (2005)
Visitor Expenditures	$17.5 billion/year
Local Tax contribution	$456 million/year
State Tax contribution	$583 million/year
Jobs generated	313,000 jobs; $9.3 billion in earnings

Source: 2005 Arizona Office of Tourism.

Closer to the project area, Northern Arizona is part of the Northern tourism segment of Arizona. Information gathered for this segment shows most visitors come for general vacations, as opposed to weekend get-aways or special events. Two-thirds of the visitation occurs during the late spring through early fall. Almost 50 percent of visitors come to Grand Canyon National Park. Seventy-eight percent of visitor spending is attributed to international visitors and out of state visitors (Arizona Office of Tourism 2007). Revenue from travel related spending is exhibited in Table 16.

Table 16: Travel related spending in Coconino, Yavapai, and Mojave counties

Factor	Coconino County	Yavapai County	Mojave County	Arizona
Travel Related Spending				
Total Spending ($ Million)	836.5	638.1	434.3	17,460.90
Earnings ($ Million)	222.4	165.8	98.6	4,523
Related Travel Generated Impacts				
Employment (Number of Jobs)	10,740	8,780	5,110	168,130
Local Taxes ($ Million)	24.1	14	9.2	456.4
State Taxes ($ Million)	31	20.7	17.4	582.8

Source: 2005 Arizona Office of Tourism.

Kaibab National Forest contributions to the overall economy are small, as shown in Tables 17 and 18 (Forest Service 2008). These display the total estimated direct, indirect, and induced or net labor income and employment contributions of current activities on the Kaibab National Forest.

Table 17: KNF contributions to labor income by resource program, 2006

Resource	Thousands of 2006 Dollars		
	Total Program	Estimated Impact of the Recreation Activities of Local Residents *	Program Net of Local Resident Recreation
Recreation	$3,445	$564	$2,881
Wildlife and Fish	$863	$167	$695
Grazing	$311	$0	$311
Timber	$2,046	$0	$2,046
Minerals	$18,600	$0	$18,600
Payments to	$2,068	$0	$2,068
Forest Service Expenditures	$15,445	$0	$15,445
Total Forest Management	$42,778	$731	$42,047
Percent of Total Labor	100%	2%	98%

Table 18: KNF contribution to employment by resource program, 2006

Resource	Number of Jobs Contributed		
	Total Program	Estimated Impact of the Recreation Activities of Local Residents [1]	Program Net of Local Resident Recreation
Recreation	127	19	108
Wildlife and Fish	31	6	25
Grazing	21	0	21
Timber	81	0	82
Minerals	536	0	536
Payments to States/Counties	67	0	67
Forest Service Expenditures	314	0	314
Total Forest Management	1,177	25	1,152
Percent of Total Employment	100 %	2%	98%

Trends

Travel and tourism are dependent upon overall economic conditions, a 2009 report prepared for the Arizona Office of Tourism indicates that travel and tourism were down three percent from 2007 to 2008 and are expected to decrease more in 2009 due to the global economic slowdown. Forecast trends include:

1. Shorter Trips
2. Closer to Home
3. Trading down (or up), but not out
4. Looking for value and deals
5. Less expensive activities/destinations
6. Driving instead of flying
7. Sharing costs with friends/family
8. Using credit card rewards and frequent flyer miles

Economic Contribution of Individual Recreation Activities

Some state-wide information is available about the economic contribution of individual recreation activities. These have been quantified for hunting, non-consumptive wildlife related activities, and OHV recreation in Table 19.

Table 19: Selected State-wide economic contributions

Item	Statewide Yearly Economic Contribution
Hunting	$126.5 million in retail sales
Non-consumptive Wildlife-related Recreation	$1.5 billion
OHV	$4 billion

Spending Profiles of National Forest Visitors

Some local economic information can be evaluated from the National Visitor Use Monitoring report, although this focuses on spending profiles of National Forest visitors. The data was compiled at a national level, and applies to all Forests, not just the KNF (Stynes and White, 2005). Survey data from 2000 to 2003 was included in the analysis.

National Forest visitors reported spending in ten categories including lodging, food/drink, gasoline, groceries, transportation, fees, souvenirs, recreation related activities, and equipment rentals, and their trips were classified into day, and overnight (on National Forest and off National Forest). Spending profiles were based on a seven day trip and reported per each party participating in the trip. The report also took into account the difference between local forest users and those traveling from out of town to the forest. Table 20 summarizes the report information displaying spending category and type of trip.

Table 20: Spending profiles by category and type of trip for National Forest visitors (2003)

Trip Info	Spending Categories								
Non-local Visitors	Lodging	Food	Groceries	Gas	Other Transpor-tation	Recreation Activities	Fees	Souvenirs	Total All
Day Trip	$0	$13.60	$7.61	$15.99	$0.98	$3.87	$5.24	$4.31	$51.60
Over-night on NF	25.30	25.26	36.55	37.28	3.00	8.04	10.23	15.59	161.25
Over-night off NF	64.85	58.91	31.28	35.79	7.54	15.49	9.02	22.37	245.25

The NVUM report also looked at spending by recreation activity. There are significant differences in costs and spending by activity. This information is also divided between local and non-local visitors to National Forests and is the cost per individual in a party or group. Table 21 displays a variety of recreation activities and associated costs.

Table 21: Spending averages by recreation activity for National Forest visitors (2003)

Recreation Activity*	Non-local Day Trip	Non-local Overnight on NF	Non-local Overnight off NF	Local Day Trip	Local Overnight on NF	Local Overnight off NF
Biking			$343	$20		
Boating		158	288	52	100	
Cross-Country Ski			346			
Developed Camping		140	146		128	127
Alpine Ski	80		331	53		129
Driving	40		166	24		
General or Relaxing	46	158	245	33	125	148
Hiking	37	147	276	20	79	83
Hunting	44	201	250	51	174	130
OHV	62	147	182	38	114	
Picnic	59			38		
Camp or Backpack		105	104		93	99

Direct and Indirect Effects

All of the alternatives evaluated provide for motorized recreation, hunting and dispersed camping activities. Alternatives 1, 2 and 3 provide for motorized game retrieval, while Alternative 4 does not. The Kaibab NF as a whole contributes a relatively small percentage of the overall economy. While there may be some indirect effects of travel management on visitor spending or motorized recreation activities, it is difficult to show any direct effects. There may be some localized effects in towns such as Williams, but it is speculative to try to quantify these or make projections. Travel management may cause some changes in activities and these may be positive or negative, but the overall actions proposed related to travel management would have little to no impact on the economy or sustainability of the economy.

Cumulative Effects

There are no cumulative effects of travel management for economics or economic sustainability from travel management planning. The Arizona State Trails Plan reports that economic downturns and gas prices influence participation in OHV riding (Arizona State Parks 2009). Global, national, and state economic changes would have a far greater impact on local economic conditions since these have greater influence on tourism and travel.

3.12 Transportation

Affected Environment

There are over 1680 miles of existing roads and unauthorized routes on the WRD (a complete list of the roads is found in the Williams Ranger District Travel Analysis Process report (2010)). The Forest Service has jurisdiction and maintenance responsibility for the National Forest road system. In addition to the existing National Forest System Roads (NFSR), there are unauthorized routes on the National Forest that are not part of the forest road system and are not maintained by the agency. See the glossary at the end of the document for definitions.

Roads evaluated in this analysis are the existing National Forest System passenger car and high clearance roads, and any unauthorized routes added to the proposed road system. Forest roads are maintained at five different maintenance levels. The Maintenance Levels (ML) used to classify roads range from ML 1 to ML 5. ML 1 indicates a closed road, ML 2 are high clearance roads, ML 3, 4 and 5 are roads suitable for passenger cars.

There are about 120 miles of passenger car roads on WRD and 1340 miles of high clearance roads. The passenger car roads provide the primary access points to the District. These roads typically have a crushed aggregate surface composed of limestone or volcanic material. Some roads have culverts at drainages or watercourse crossings, but due to the xeric environment, most crossings do not have culverts. Most of the remaining forest roads are classified as high clearance roads; these are unpaved and are constructed, native-surface roads.

Costs of Road Maintenance

Road maintenance is currently performed on passenger car roads more frequently than on high clearance roads. The passenger car roads have higher standards that must be met and are more expensive to maintain. Maintenance on high clearance roads is less costly because they are only maintained for passage by high clearance vehicles and are not subject to the Highway Safety Act. About 250 miles of maintenance is completed on the District each year. Since only a limited number of roads can be maintained due to available funds, emphasis is placed on keeping the passenger roads to standard. Very little road maintenance can be achieved on high clearance roads because of limited funds. The costs to maintain roads vary by maintenance level requirements, fuel prices, haul distances and other variables. Table 22 summarizes the costs of maintenance for the different alternatives based on average road maintenance costs across Region 3 in 2005.

Table 22: Road maintenance costs by alternative.

Maintenance Level	Cost per Mile	Alternative 1		Alternatives 2 and 3		Alternative 4	
		Miles	*Cost*	*Miles*	*Cost*	*Miles*	*Cost*
1	**$107**	20	$2,140	400	$42,800	435	$46,545
2	**$420**	1340	$562,800	994	$417,480	959	$402,780
3	**$6,751**	110	$742,610	110	$742,610	110	$742,610
4	**$9,851**	10	$98,510	10	$98,510	10	$98,510
Total Maintenance Cost		**$1,406,060**		**$1,301,400**		**$1,290,445**	

Approximately 40% of all roads on the Kaibab National Forest are located on the Williams Ranger District. The Forest usually receives approximately $920,000 per year for road maintenance. Therefore, if the District receives 40% of this funding, or $368,000, it would be 23% of the funding needed for annual road maintenance.

When needed or scheduled road maintenance cannot be performed due to budget or other limitations, the work that is delayed is referred to as "deferred maintenance," (See Glossary). Given the budget constraints discussed above, deferred maintenance needs increase every year on the Williams Ranger District. Eventually, maintenance needs may make a particular road impassable, then a decision would be made to restore the road, reduce the maintenance level (from Passenger Car to high clearance road) or to close or decommission the road.

Minimum Road System

The minimum road system was identified in the Williams TAP (Forest Service 2010). It is the road system needed for safe and efficient travel and for the administration, utilization, and protection of National Forest System lands (36 CFR 212.5(b)). The minimum road system is that which is needed to meet resource and other management objectives adopted in the relevant land and resource management plan (36 CFR part 219), laws and regulations, long-term funding expectations, and minimizes adverse environmental impacts. The desired minimum road system attempts to balance these elements and make progress toward a sustainable road system.

Unauthorized Routes

Currently the Williams Ranger District is open to motorized cross-country travel, except in areas currently closed to motorized travel. Approximately 45,000 acres of the Williams District is administratively closed to motorized cross country travel. These closed areas include formally designated wilderness areas and administratively closed meadows and wetlands.

A field survey in 2005 found approximately 220 miles of unauthorized routes that are not part of the National Forest road system and are not maintained by the forest. Many of the routes were created by users traveling cross-country along the same pathways. Forest Service employees have noted a substantial increase in the number of people who are using OHV's and portable geographic positioning

system devices to facilitate the collection of deer and elk antler sheds in the late winter and early spring. District personnel have reported antler hunters crisscrossing the District in a grid system collecting antlers.

Wet Weather Travel Policy

In unusually wet years, when deep snow or saturated soils raise concerns for public safety and/or road and resource damage from motorized vehicles, wet weather travel restrictions are implemented. Based on site-specific ground conditions, an official order implementing the wet weather road system is signed by the District Ranger authorizing the restrictions. As soon as conditions allow, the restrictions are lifted by the District Ranger. When travel restrictions are in place, motorized travelers are required to stay on those designated routes until the soils dry out and until the restrictions are lifted. Cross-country travel is prohibited in all cases when these restrictions are in place.

The wet weather travel policy is implemented on an as-needed basis in order to be responsive to conditions in the Forest. Wet weather travel policy will continue to be used by District Rangers when soil moisture conditions and the potential for road and resource damage exist. Implementation of the policy has been included as a mitigation measure for all alternatives.

Climate Change

The Southwestern Regional Office planning program has summarized some ecological and socioeconomic effects of climate change (Periman 2008). The following is an excerpt of the information.

> The state of knowledge needed to address climate change at the forest scale is still evolving. Most global climate models are not yet suitable to apply to land management at the forest scale. This limits regional analysis of potential effects especially for a specific project. At a more local scale, paleoenvironmental studies of changing southwestern climate may provide limited historical ecological context for ecosystem variability and climate change. These can provide limited knowledge about past climate change, patterns of precipitation, drought severity and changes in vegetation patterns.
>
> Climate modelers generally agree that the Southwestern United States is experiencing a drying trend that will continue into the latter part of 21st century. In the recent past, two droughts occurred, one in the 1930's Dustbowl and one in the 1950's Southwestern Drought. Climate model scenarios suggest the warming trend observed in the last 100 years may continue into the next century with the greatest warming occurring during the winter. Some climate models predict 2-3 degree temperature changes in the next 20 years. Such temperature changes could result in limited water supplies and altered fire regimes, as well as influence the distribution and abundance of animal and plant species.

Some potential ecological implications of climate change trends include:

- More extreme disturbance events such as wildfires, intense rain and wind events.
- Greater vulnerability to invasive species.
- Long term shifts in vegetative patterns, such as cold-tolerant vegetation moving upslope or disappearing in some areas.
- Changes in wildlife populations, diversity, viability and migration patterns.

Some potential socioeconomic effects of climate change trends include:

- Water shortages.
- Impact on amenities, goods and services from forests.

Direct and Indirect Effects of Alternatives

Alternative 1 – No Action

The no action alternative represents the existing condition. It provides almost 1480 miles of open National Forest System roads at different maintenance levels (see Table 3 or Table 22 above). Of the four alternatives analyzed in detail, Alternative 1 is the most costly for road maintenance (See Table 22). Only approximately 23% percent of the road system can be maintained annually; the remainder of the roads will not be maintained annually, and this alternative contributes the most to deferred maintenance on the District. Maintenance priorities are placed on the passenger car roads as these must meet higher standards for health and safety. When these higher standard roads cannot be sufficiently maintained, the road surface breaks down, and the roads become impassable to passenger cars. It takes more resources to bring a road back to standard that has been neglected because of a lack of maintenance. This alternative would not make progress toward the minimum road system, does not minimize environmental impacts, does not reduce road maintenance costs, and does not implement the Travel Management Rule.

The existing unauthorized routes would remain, and additional routes would likely be created as off-road travel and antler shed collection continues, dispersed campers create routes to new campsites, and fuel wood gatherers drive farther back from the edge of roads as the available dead trees are removed. Resource damage and road maintenance needs continue to increase.

Dispersed camping and motorized game retrieval would continue per the existing condition. State projections indicate there will be some increase in the amount of OHV riders, camping, hiking and other activities (see Section 1.4). The District will continue to see cross country driving for antler shed collection and hunters driving cross-country to scout for animals and retrieve game during hunting seasons. Motorized cross-country travel can contribute to resource damage, especially when soils are wet and the vehicles cause rutting which results in the loss of vegetation and increased erosion.

This alternative has the greatest potential for negative impacts to resources. It retains the greatest number of roads and allows motorized cross-country use and unauthorized routes created from this use. Damage to resources from motorized cross-country use would be exacerbated by climate change, especially drought, if lower precipitation prevented or reduced re-establishment of vegetation. Repeated traffic along unauthorized routes results in loss of plant cover and the potential for soil erosion. If predictions for increasing OHV use and dispersed camping occur (see Section 3.1), there could be increased areas of bare ground that are vulnerable to soil movement. Bare soil is also more vulnerable to spread of invasive exotic plants.

Alternative 2 – Proposed Action

The proposed action provides 1114 miles of open national forest system roads at different maintenance levels (See Table 3 and Table 22). It would close about 380 miles of existing roads and add approximately 34 miles of maintenance level 2 roads. Changing roads from maintenance level 2 to maintenance level 1would result in lowered maintenance costs for the District's transportation system (by approximately $330 per mile). Road maintenance costs would be less than those for Alternative 1 and

about 28% of the proposed roads could be maintained annually. Alternative 2 would reduce the deferred maintenance burden compared with Alternative 1, but not as much as Alternative 4. This alternative reduces the number of roads while providing adequate access for resource management, recreation activities, and reducing annual road maintenance costs.

The 25 miles of motorized trails proposed under this alternative would likely result in higher traffic levels on the surrounding roads as OHV users access the two trail areas. Monitoring and maintenance activities will help ensure the motorized trails are kept in an acceptable condition.

This alternative would add approximately 16 miles of roads to the designated road system. This includes 8 miles of formerly closed roads and 8 miles of unauthorized user-created routes. These roads would be added to the designated system as maintenance level 2 roads (Table 22), and likely meet or exceed Forest Service standards for maintenance level 2 roads. These roads would be constructed and maintained as maintenance level 2 roads to provide the intended visitor experience and reduce resource impacts.

This alternative would add approximately of 18 miles of short spur roads to the designated system that have historically served as access to dispersed camping sites (and other activities) on the District. Adding the 18 miles of road, which is equates to over 70 short spur roads scattered throughout the District, is expected to reasonably accommodate existing motorized dispersed camping needs with little change from the current use. These roads would also be added to the designated system as maintenance level 2 roads (Table 22), and likely meet or exceed Forest Service standards for maintenance level 2 roads. These roads would be constructed and maintained as maintenance level 2 roads to provide the intended visitor experience and reduce resource impacts.

Mitigation and monitoring measures are in place to ensure impacts from motorized use within dispersed camping corridors and for motorized big game retrieval are minimized and prohibited when necessary. Implementation of the wet weather roads policy has helped reduce resource damage and minimize rutting of national forest system roads.

This alternative reduces the potential for negative impacts to resources from climate change. It proposes to close approximately 25% of the existing road system (i.e. retains 25% fewer roads than Alt. 1) and prohibits motorized cross-country use and travel on 220 miles of known unauthorized routes. Although damage to resources from motorized cross-country use would be exacerbated by climate change especially drought, this alternative limits motor vehicle use to designated roads and camping corridors and limited use by hunters to retrieve legally downed elk during warm season elk hunts only. If predictions for increasing OHV use and dispersed camping occur (see Section 3.1), there would be decreased areas of bare ground that are vulnerable to soil movement. Fewer areas of bare soil created by motorized cross-country travel would be created that are vulnerable to spread of invasive exotic plants.

Alternative 3

The proposed action provides 1114 miles of open national forest system roads at different maintenance levels (See Table 3 and Table 22). It would close about 380 miles of existing roads and add approximately 34 miles of maintenance level 2 roads. Changing roads from maintenance level 2 to maintenance level 1would result in lowered maintenance costs for the District's transportation system (by approximately $330 per mile). Road maintenance costs would be less than those for Alternative 1 and about 28% of the proposed roads could be maintained annually. Alternative 3 would reduce the deferred

maintenance burden compared with Alternative 1, but not as much as Alternative 4. This alternative reduces the number of roads while providing adequate access for resource management, recreation activities, and reducing annual road maintenance costs.

This alternative would add approximately 16 miles of roads to the designated road system. This includes 8 miles of formerly closed roads and 8 miles of unauthorized user-created routes. These roads would be added to the designated system as maintenance level 2 roads (Table 22), and likely meet or exceed Forest Service standards for maintenance level 2 roads. These roads would be constructed and maintained as maintenance level 2 roads to provide the intended visitor experience and reduce resource impacts.

This alternative would add approximately of 18 miles of short spur roads to the designated system that have historically served as access to dispersed camping sites (and other activities) on the District. Adding the 18 miles of road, which is equates to over 70 short spur roads scattered throughout the District, to the road system is expected to reasonably accommodate existing motorized dispersed camping needs with little change from the current use. These roads would also be added to the designated system as maintenance level 2 roads (Table 22), and likely meet or exceed Forest Service standards for maintenance level 2 roads. These roads would be constructed and maintained as maintenance level 2 roads to provide the intended visitor experience and reduce resource impacts.

Mitigation and monitoring measures are in place to ensure impacts from motorized big game retrieval are minimized and prohibited when necessary. Implementation of the wet weather roads policy has helped reduce resource damage and minimize rutting of national forest system roads.

This alternative reduces the potential for negative impacts to resources from climate change. It proposes to close approximately 25% of the existing road system (i.e. retains 25% fewer roads than Alt. 1) and prohibits motorized cross-country use and travel on 220 miles of known unauthorized routes. Although damage to resources from motorized cross-country use would be exacerbated by climate change especially drought, this alternative limits motor vehicle use to designated roads and camping corridors and limited use by hunters to retrieve legally downed elk during warm season elk hunts only. If predictions for increasing OHV use and dispersed camping occur (see Section 3.1), there would be decreased areas of bare ground that are vulnerable to soil movement. Fewer areas of bare soil created by motorized cross-country travel would be created that are vulnerable to spread of invasive exotic plants.

Alternative 4

This alternative provides approximately 1079 miles of open National Forest System roads at different maintenance levels. It would remove approximately 415 miles from the open road system. Road maintenance costs are less than Alternative 1, 2 or 3. Approximately 29 % of the forest roads could be maintained annually. This alternative would further reduce the increase of deferred maintenance costs, though it only differs by approximately $11,000 per year over Alternatives 2 and 3.

This alternative would add approximately 16 miles of roads to the designated road system. This includes 8 miles of formerly closed roads and 8 miles of unauthorized user-created routes. These roads would be added to the designated system as maintenance level 2 roads (Table 22), and likely meet or exceed Forest Service standards for maintenance level 2 roads. These roads would be constructed and maintained as maintenance level 2 roads to provide the intended visitor experience and reduce resource impacts.

This alternative would add approximately of 18 miles of short spur roads to the designated system that have historically served as access to dispersed camping sites (and other activities) on the District. Adding the 18 miles of road, which is equates to over 70 short spur roads scattered throughout the District, to the road system is expected to reasonably accommodate existing motorized dispersed camping needs with little change from the current use. These roads would also be added to the designated system as maintenance level 2 roads (Table 22), and likely meet or exceed Forest Service standards for maintenance level 2 roads. These roads would be constructed and maintained as maintenance level 2 roads to provide the intended visitor experience and reduce resource impacts.

Overall, the effects of implementing Alternative 4 would be less than those associated with implementing Alternatives 1, 2 & 3 because of the reduction in miles of open roads and by not allowing motor vehicle use for dispersed camping or retrieval of a big game animal.

This alternative reduces the potential for negative impacts to resources from climate change. It proposes to close approximately 28% of the existing road system (i.e. 28% fewer roads than Alternative 1), and prohibits motorized cross-country use and travel on 220 miles of unauthorized routes.

Cumulative Effects

The cumulative effects analysis area consists of the Williams Ranger District, and the time period is 2000 to 2020.

Past, ongoing, planned, and foreseeable projects and activities in the cumulative effects analysis area that affect transportation include: availability of funding, timber and fuel wood harvesting, forest thinning, grassland restoration tree removal, sagebrush restoration, prescribed burning, livestock grazing, fence construction, water tank construction and maintenance, invasive weed control, trail construction, maintenance, mineral exploration and possible mining, pipeline and possible transmission line construction and maintenance (see Appendix 4).

Implementation of Alternative 1 would have increasingly negative cumulative effects. Fewer miles of existing national forest system roads would be maintained and more miles of road would become impassable. These would be compounded by permitted uses, mineral exploration, pipeline and transmission line use and maintenance. This alternative has the most potential to have effects magnified by climate change. The overall cumulative effects of not implementing TMR would result in fewer miles of useful road over time.

Implementation of Alternatives 2, 3, & 4 will have an increasingly positive cumulative effect on the transportation system as the miles of roads needing maintenance decreases and the trend in road closures continues. There would be an adequate system of roads to provide for forest management activities. Continued effects from permitted uses, mineral exploration, pipeline and transmission line use and maintenance would continue to be addressed through project implementation and not be compounded as much as in Alternative 1. The net cumulative effect of implementing TMR and other natural events will result in a positive trend.

Implementation of Alternatives 2, 3, & 4 will have an increasingly positive cumulative effect on the transportation system as the miles of roads needing maintenance decreases and the trend in road closures

continues. There would be an adequate system of roads to provide for forest management activities. Resource damage would decrease from existing roads on sensitive soils resulting in decreased erosion and sedimentation as future projects would continue to address areas of concern and as motorized cross-country use would be prohibited. Continued effects from permitted uses, mineral exploration, pipeline and transmission line use and maintenance would continue to be addressed through project implementation and not be compounded as much as in Alterantive 1. The net cumulative effect of implementing TMR and other natural events will result in a positive trend.

3.13 Other Disclosures

Environmental Justice

On February 11, 1994, President Clinton issued Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." This Executive Order was designed to focus the attention of federal agencies on the human health and environmental conditions in minority and low-income communities. It requires federal agencies to adopt strategies to address environmental justice concerns within the context of existing laws, including NEPA.

The goal of Environmental Justice Analysis is not to shift risks among populations, but to identify potential disproportionately high and adverse effects, and to identify alternatives that may mitigate these impacts. One way that this is achieved is by providing an opportunity for minority and low-income populations to participate in planning, analysis, and decision making. Individual tribal members may use the project area for the personal collection of traditional or medicinal plants. Low-income groups may use the area for the collection of fuel wood. None of the alternatives would have adverse effects on these uses or to low income and minority populations in the area. No concerns or issues related to Environmental Justice were raised during project scoping or the Notice and Comment period. Additionally, the American Indian Tribes listed in Chapter 4 were consulted regarding this proposal and potential effects were analyzed.

There are no adverse effects expected to public health or safety under any of the Alternatives. The actions proposed in Alternatives of the EA would have no effect on park lands or prime farmlands, rangeland, and forest land as defined in FSH 1909.15 section 65.2. These kinds of allocations or land capability either do not exist on the Williams Ranger District or would be unaffected by the proposed activities of the Alternatives.

There are no adverse effects expected on inventoried roadless areas under any of the Alternatives (i.e. there is no road construction or reconstruction proposed under any Alternatives that would alter the roadless characteristics) because there are no inventoried roadless areas on the Williams Ranger District.

3.14 Cumulative Effects Summary

The Council for Environmental Quality (CEQ) defines cumulative impacts as, “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” In other words, cumulative effects are simply the

sum of past, present, and reasonably foreseeable environmental, social, and economic effects of land management activities which, when taken in context of this specific project, affect the conditions and trends of resources and values within the project area and adjacent areas of influence.

Each resource specialist discussed the affected environment, the existing conditions, and the anticipated effects of each alternative within their section in Chapter 3. The analysis of cumulative effects begins with consideration of the direct and indirect effects on the environment that are expected or likely to result from the alternative proposals; the effects discussed in the previous sections (Sections 3.1 – 3.13) are expected to be minor and short in duration.

Past vegetation management projects, temporary road building, prescribed burning, and other activities (grazing, camping, hunting...) have helped shape the Williams Ranger District into the present condition. Additionally, approx. 1460 miles of open and maintained Forest Service roads provide extensive access to the entire District and motor vehicles may currently be driven "cross-country" or off of forest roads, except where prohibited by existing off road closure areas.

Past, present and reasonably foreseeable activities within and adjacent to the District are described in Appendix 4 and were considered in the cumulative effects analyses of this environmental assessment. Activities such as vegetation management, fuels management, livestock grazing, recreational activities, and other management activities (e.g. noxious weeds treatments) have occurred in the past, are occurring, and are reasonably foreseeable actions on the District over the next ten to twenty years. Road realignment, reconstruction, and/or decommissioning may occur as part of these activities.

As part of some fuel management projects, the construction and decommissioning of dozer lines may also occur. Past experience has shown that the effects from dozer line construction are minor and short in duration, as dozer lines are not open for motor vehicle travel and are rehabilitated as soon as the control line is no longer necessary.

Past experience and analysis has also shown that by implementing project specific mitigation measures and design criteria that follow best management practices effects to cultural and natural resources can be minimized. For example, fuels management projects surrounding the city of Williams have been successfully implemented to meet vegetation management objectives while effectively protecting culturally sensitive areas identified through consultation. Seasonal restrictions are another example of how effects have been minimized.

Scoping provides the agency the opportunity to focus in on those cumulative effects that may be significant. Below, the cumulative effects by alternative are summarized in relation to the Key Issues.

Alternative 1 – No Action

Key Issue 1: The cumulative effect of implementing Alternative 1 on motorized recreation opportunities is negligible. Motorized recreation opportunities have and will likely continue to be restricted during the implementation of vegetation and fuel management projects for public safety reasons; however, the effect is usually temporary and localized to the project area. Implementing Alternative 1 (which affords the greatest miles of roads open for all vehicles and allows for cross country travel), in combination with past, present and reasonably foreseeable activities (a few of which include or propose road closures; see

Appendix 4), would likely continue to provide ample motorized recreation opportunities because the trend has been to close very few miles of roads.

Key Issue 2: The cumulative effect of implementing Alternative 1 on motorized dispersed camping and motorized big game retrieval activities is negligible. Opportunities for motorized dispersed camping and motorized big game retrieval have and will likely continue to be restricted during the implementation of vegetation and fuel management projects for public safety reasons; however, the effect is usually temporary and localized to the project area. Implementing Alternative 1, in combination with past, present and reasonably foreseeable activities (a few of which include or propose road closures; see Appendix 4), would likely continue to provide ample opportunities for motorized dispersed camping and motorized big game retrieval because very few projects or activities on the district restrict the access or opportunity for these activities and this alternative would apply minimal restrictions on motorized dispersed camping and motorized big game retrieval activities.

Key Issue 3: Past experience has shown that implementation of best management practices (BMP's) and careful project design has helped minimize the effect from past activities on wildlife and plant habitats, watersheds, and archaeological resources. The effects to wildlife and plant habitats have been and are anticipated to continue to be temporary and localized to the project area. For example, some wildlife species may not utilize areas where projects are being implemented. The effects to watersheds from past vegetation management and prescribed burning projects have often resulted in improved watershed health due to a reduction in fuel loading and implementation of BMP's that minimize direct effects such as sedimentation and soil compaction. There have been minimal impacts to archaeological resources due to mitigation measures from past projects. The effects of past, present, and reasonably foreseeable activities when combined with the direct and indirect effects of implementing Alternative 1 would likely increase the negative effects on wildlife and plant habitats, watersheds, and archaeological resources. However, the cumulative effect is negligible because management activities such as vegetation management and prescribed burning often incorporate mitigation measures and monitoring for project activities to protect and/or avoid areas altogether when there is the potential for impacts. The cumulative effects of implementing Alternative 1 are anticipated to be minor and are not likely to impede the attainment of Forest Plan goals and objectives.

Alternative 2 – Proposed Action

Key Issue 1: Motorized recreation opportunities have and will likely continue to be restricted during the implementation of vegetation and fuel management projects for public safety reasons; however, the effect is usually temporary and localized to the project area. When combined with the direct and indirect effects of implementing Alternative 2, the cumulative effects on recreation opportunities are negligible given that activities (such as vegetation management and prescribed burning) do not all occur at the same time and are spatially distributed across the District. Implementing Alternative 2 (which designates 25 miles of motorized trail and reduces many redundant roads), in combination with the trend from past, present and reasonably foreseeable activities to close very few miles of roads, would likely continue to provide ample motorized recreation opportunities to meet the demands of Forest visitors (see Section 3.1).

Key Issue 2: The cumulative effect of implementing Alternative 2 on motorized dispersed camping and motorized big game retrieval activities is negligible. Opportunities for motorized dispersed camping and motorized big game retrieval have and will likely continue to be restricted during the implementation of

vegetation and fuel management projects for public safety reasons; however, the effect is usually temporary and localized to the project area. Implementing Alternative 2, in combination with past, present and reasonably foreseeable activities (a few of which include or propose road closures; see Appendix 4), would likely continue to provide ample opportunities for motorized dispersed camping because very few projects or activities on the district restrict the access or opportunity for these activities. Motorized big game retrieval opportunities would be limited with this Alternative, but the allowance of motor vehicle use for elk retrieval would help meet management objectives (such as the foreseeable aspen restoration project on the WRD) which are affected by over- browsing from elk populations.

Key Issue 3: Past experience has shown that implementation of best management practices (BMP's) and careful project design has helped minimize the effect from past activities on wildlife and plant habitats, watersheds, and archaeological resources. The effects to wildlife and plant habitats have been and are anticipated to continue to be temporary and localized to the project area. For example, some wildlife species may not utilize areas where projects are being implemented. The effects to watersheds from past vegetation management and prescribed burning projects have often resulted in improved watershed health due to a reduction in fuel loading and implementation of BMP's that minimize direct effects such as sedimentation and soil compaction. There have been minimal impacts to archaeological resources due to mitigation measures from past projects. The effects of past, present, and reasonably foreseeable activities when combined with the direct and indirect effects of implementing Alternative 2 are not likely to increase the negative effects on wildlife and plant habitats, watersheds, and archaeological resources. The cumulative effect is negligible because management activities such as vegetation management and prescribed burning often incorporate mitigation measures and monitoring for project activities to protect and/or avoid areas altogether when there is the potential for impacts. The cumulative effects of implementing Alternative 2 are anticipated to be minor and are not likely to impede the attainment of Forest Plan goals and objectives.

Alternative 3

Key Issue 1: Motorized recreation opportunities have and will likely continue to be restricted during the implementation of vegetation and fuel management projects for public safety reasons; however, the effect is usually temporary and localized to the project area. When combined with the direct and indirect effects of implementing Alternative 3, the cumulative effects on recreation opportunities are negligible given that activities (such as vegetation management and prescribed burning) do not all occur at the same time and are spatially distributed across the District. Implementing Alternative 3 (which reduces many redundant roads), in combination with the trend from past, present and reasonably foreseeable activities to close very few miles of roads, would likely continue to provide ample motorized recreation opportunities to meet the demands of Forest visitors (see Section 3.1).

Key Issue 2: The cumulative effect of implementing Alternative 3 on motorized dispersed camping and motorized big game retrieval activities is negligible. Opportunities for motorized dispersed camping and motorized big game retrieval have and will likely continue to be restricted during the implementation of vegetation and fuel management projects for public safety reasons; however, the effect is usually temporary and localized to the project area. Implementing Alternative 3, in combination with past, present and reasonably foreseeable activities (a few of which include or propose road closures; see Appendix 4), would likely continue to provide ample opportunities for motorized dispersed camping because very few projects or activities on the district restrict the access or opportunity for these activities. Motorized big

game retrieval opportunities would be less limited with this Alternative than with Alternative 2, but the allowance of motor vehicle use for elk retrieval would help meet management objectives (such as the foreseeable aspen restoration project on the WRD) which are affected by over- browsing from elk populations.

Key Issue 3: Past experience has shown that implementation of best management practices (BMP's) and careful project design has helped minimize the effect from past activities on wildlife and plant habitats, watersheds, and archaeological resources. The effects to wildlife and plant habitats have been and are anticipated to continue to be temporary and localized to the project area. For example, some wildlife species may not utilize areas where projects are being implemented. The effects to watersheds from past vegetation management and prescribed burning projects have often resulted in improved watershed health due to a reduction in fuel loading and implementation of BMP's that minimize direct effects such as sedimentation and soil compaction. There have been minimal impacts to archaeological resources due to mitigation measures from past projects. The effects of past, present, and reasonably foreseeable activities when combined with the direct and indirect effects of implementing Alternative 3 are not likely to increase the negative effects on wildlife and plant habitats, watersheds, and archaeological resources. The cumulative effect is negligible because management activities such as vegetation management and prescribed burning often incorporate mitigation measures and monitoring for project activities to protect and/or avoid areas altogether when there is the potential for impacts. The cumulative effects of implementing Alternative 3 are anticipated to be minor and are not likely to impede the attainment of Forest Plan goals and objectives.

Alternative 4

Key Issue 1: Motorized recreation opportunities have and will likely continue to be restricted during the implementation of vegetation and fuel management projects for public safety reasons; however, the effect is usually temporary and localized to the project area. When combined with the direct and indirect effects of implementing Alternative 4, the cumulative effects on recreation opportunities are negligible given that activities (such as vegetation management and prescribed burning) do not all occur at the same time and are spatially distributed across the District. Implementing Alternative 4 (which proposes to close the most roads), in combination with the trend from past, present and reasonably foreseeable activities to close very few miles of roads, would likely continue to provide ample motorized recreation opportunities, although slightly less than those provided by Alt. 2 &3, to meet the demands of Forest visitors (see Section 3.1).

Key Issue 2: The cumulative effect of implementing Alternative 4 on motorized dispersed camping and on motorized big game retrieval activities is negligible. Opportunities for motorized dispersed camping and motorized big game retrieval have been restricted during the implementation of vegetation and fuel management projects for public safety reasons; however, the effect is usually temporary and localized to the project area. Implementing Alternative 4, in combination with past, present and reasonably foreseeable activities (a few of which include or propose road closures; see Appendix 4), would likely continue to provide ample opportunities for motorized dispersed camping because very few projects or activities on the district restrict the access or opportunity for these activities. While, motorized big game retrieval activities would no longer be affected by such activities as it would not be allowed with under this Alternative.

Key Issue 3: Past experience has shown that implementation of best management practices (BMP's) and careful project design has helped minimize the effect from past activities on wildlife and plant habitats, watersheds, and archaeological resources. The effects to wildlife and plant habitats have been and are anticipated to continue to be temporary and localized to the project area. For example, some wildlife species may not utilize areas where projects are being implemented. The effects to watersheds from past vegetation management and prescribed burning projects have often resulted in improved watershed health due to a reduction in fuel loading and implementation of BMP's that minimize direct effects such as sedimentation and soil compaction. There have been minimal impacts to archaeological resources due to mitigation measures from past projects. The effects of past, present, and reasonably foreseeable activities when combined with the direct and indirect effects of implementing Alternative 4 are not likely to increase the negative effects on wildlife and plant habitats, watersheds, and archaeological resources. The cumulative effect is negligible because management activities such as vegetation management and prescribed burning often incorporate mitigation measures and monitoring for project activities to protect and/or avoid areas altogether when there is the potential for impacts. The cumulative effects of implementing Alternative 4 are anticipated to be minor and are not likely to impede the attainment of Forest Plan goals and objectives.

Chapter 4 – Consultation and Coordination

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

ID Team:

Micah Grondin	Team Leader, NEPA Specialist
Clare Hydock	Range Management Specialist
Karlynn Huling	Soils and Watershed Specialist/Plant Ecologist
Jeff Waters	Wildlife Biologist
Neil Weintraub	Archeologist
Christa Roughan	Recreation Specialist
Deidre McLaughlin	Recreation Forester
John O'Brien	Assistant Forest Engineer
Tom Mutz	Lands/Minerals Specialist
Martie Schramm	District Ranger

Support:

Andy Espinoza	GIS Specialist
Mike Lyndon	Tribal Liaison
Mae Franklin	Navajo Tribal Liaison
Jackie Banks	Public Affairs Officer
Liz Schuppert	Recreation, Lands and Minerals Staff Officer
Ariel Leonard	Assistant Forest Planner
Paul Hancock	NEPA Coordinator

Federal, State, and Local Agencies:
US Fish & Wildlife Service
Arizona Game and Fish Department
City of Williams

American Indian Tribes:
Hopi Tribe
Navajo Nation
Hualapai Tribe
Havasupai Tribe
Yavapai-Prescott Indian Tribe

4.1 Tribal Consultation Summary

Government-to-government consultation with tribes is guided by existing law, regulation, and policy, including the National Environmental Policy Act (NEPA), the National Forest Management Act (NFMA), the Archaeological Resources Protection Act (ARPA), the National Historic Preservation Act (NHPA), the American Indian Religious Freedom Act (AIRFA), the Native American Graves Protection and Repatriation Act (NAGPRA), the Religious Freedom Restoration Act (RFRA), Executive Order 13007-Indian Sacred Sites, Executive Order 13175-Consultation and Coordination with Indian Tribal Governments, and Executive Order 12898- Environmental Justice. The Kaibab National Forest has

entered into Memoranda of Understanding with the Havasupai Tribe, the Hualapai Tribe, the Hopi Tribe, and the Kaibab Band of Paiute Indians to establish a standard process for consultation with each tribe.

The Kaibab National Forest recognizes that area tribes have cultural ties and knowledge about the lands now managed by the Forest Service. Many tribal members regularly visit the Kaibab National Forest to gather traditional resources and to visit traditional cultural properties and sacred sites. Therefore, tribes share an interest in protecting important natural and cultural resources from damage, including damage caused by uncontrolled cross-country motor vehicle traffic.

Due to the level of use of the forest by tribal members and the unique interests of area tribes, the Kaibab National Forest has conducted extensive tribal consultation and scoping of tribal communities throughout the Travel Management process. This consultation process reflects a long-standing commitment by the Kaibab National Forest to share the stewardship of public lands with area tribes. For the current project, tribal consultation was conducted at the government-to-government level with concerned tribes according to established Memoranda of Understandings with the tribes and pertinent laws and regulations. Additionally, the forest scoped tribal communities and individual tribal members that utilize the forest. Such scoping assures that affected publics are given the opportunity to participate in the planning process as required by the National Environmental Policy Act and other laws and regulations.

The Kaibab National Forest has heard comments and concerns from area tribes about the management of forest roads and off road travel for many years. Prior to 2005, specific issues with road access, obliteration, and maintenance had been addressed on a case-by-case basis. By 2005, the Kaibab National Forest initiated broader discussions with tribes regarding the management of the forest-wide road system as initial analysis for the Five Forest OHV EIS and the Tusayan Roads Analysis project. These discussions included government-to-government meetings with the Hopi Tribe in Kykotsmovi, AZ on 2/24/2005 and 1/18/2006, and the Havasupai Tribe on 4/6/2006 in Supai, Arizona. On 11/12/2006, forest representatives attended a meeting of the Cameron Chapter of the Western Navajo Agency to identify local concerns with Navajo tribal members.

By 2006, the Forest began to focus on analysis of the Tusayan District specifically. However, consultation with tribes on general issues and concerns regarding Travel Management continued. On 4/1/2006, the Tusayan Travel Management Project was added to the Kaibab National Forest Fiscal Year 2006 Third Quarter Schedule of Proposed Actions. A copy of the SOPA was sent to the Havasupai Tribe, the Hualapai Tribe, the Hopi Tribe, the Yavapai-Prescott Indian Tribe, the Navajo Nation, and the Bodaway/Gap, Cameron, Coalmine Canyon, Leupp, and To'Nanees'Dizi Chapter Houses of the Western Agency of the Navajo Nation. On February 1, 2008, Williams Travel Management project was added to the Kaibab National Forest Fiscal Year 2008 Second Quarter Schedule of Proposed Actions. A copy of the SOPA was sent to the Havasupai Tribe, the Hualapai Tribe, the Hopi Tribe, the Yavapai-Prescott Indian Tribe, the Navajo Nation, and the Bodaway/Gap, Cameron, Coalmine Canyon, Leupp, and To'Nanees'Dizi Chapter Houses of the Western Agency of the Navajo Nation. Copies of the SOPA have been mailed to the parties above on a quarterly basis since that time, including updated information about the project.

Over the last three years, forest representatives have updated the tribes on the Travel Management process during regularly scheduled government to government consultation meetings with the Hopi Tribe on 2/21/2007, 6/21/2007, 2/20/2008, 12/22/2008, and 5/20/2009, the Havasupai Tribe on 4/6/2006, 2/6/2007,

3/18/2008 and 1/8/2009, the Hualapai Tribe on 3/4/2008, the Navajo Nation on 1/31/2007, 11/19/2007, 2/14/2008, the Yavapai-Prescott Indian Tribe on 2/19/2008, and the Pueblo of Zuni on 10/7/2008 and 06/18/2009, and Intertribal meetings held in Williams AZ on 8/7/2007 and 8/3/2008. Additionally, The Kaibab Navajo Liaison has regularly updated the Western Navajo Agency Chapters about Travel Management at regularly scheduled Chapter Meetings. The project was specifically discussed at the Cameron Chapter on 3/21/2007, 8/12/2007 and 1/25/2009 and the Bodaway/Gap Chapter on 7/12/2007.

Table 23: Summary of tribal consultation on Travel Management issues.

Date	Tribe	Location	
2/24/05	Hopi Tribe	Kykotsmovi, AZ	Kaibab N.F. representatives met with Hopi Tribe.
1/18/06	Hopi Tribe	Kykotsmovi, AZ	Kaibab N.F. representatives met with Hopi Tribe.
4/1/06	Havasupai Tribe, Hualapai Tribe, Hopi Tribe, Yavapai-Prescott Indian Tribe, Navajo Nation, and Bodaway/Gap, Cameron, Coalmine, Leupp, To'Nanees' Dizi Chapters of Western Navajo Agency	N/A	Tusayan Travel Management added to SOPA. SOPA mailed to tribes quarterly.
4/6/06	Havasupai Tribe	Supai, AZ	Kaibab representatives met with the Havasupai Tribal Chair.
11/12/06	Cameron Chapter, Western Navajo Agency	Cameron, AZ	KNF representatives attended a Chapter meeting.
1/31/07	Navajo Nation	Window Rock, AZ	The Forest Supervisor and other KNF representatives met with Navajo Nation.
2/6/07	Havasupai Tribe	Tusayan, AZ	Tusayan District Ranger and other KNF representatives met with Havasupai Tribal council.
2/21/07	Hopi Tribe	Kykotsmovi, AZ	Tusayan District Ranger and other KNF representatives met with Hopi Tribe. Hopi Tribe identified one ceremonial access issue on Williams District.
3/21/07	Cameron Chapter of Western Navajo Agency	Cameron AZ	KNF representatives attended a Chapter meeting.
6/21/07	Hopi Tribe	Kykotsmovi, AZ	Kaibab representative met with Hopi Tribe and developed mitigation for tribal access issue on Williams District.
7/12/07	Bodaway/Gap Chapter of Western Navajo Agency	Gap, AZ	KNF representatives attended a Chapter meeting.
8/7/07	Havasupai Tribe, Hopi Tribe, Hualapai Tribe, Kaibab Band of Paiute Indians, Navajo Nation, Tonto Apache Tribe, Yavapai-Prescott Indian	Williams, AZ	Forest Supervisor, District Rangers, and staff met with representatives of the Havasupai Tribe, Hopi Tribe, Hualapai Tribe, Kaibab Band of Paiute Indians, Navajo Nation, Tonto Apache Tribe, Yavapai-Prescott Indian Tribe, and Yavapai-Apache Nation at the Kaibab

	Tribe, and Yavapai-Apache Nation		Intertribal Meeting.
8/12/07	Cameron Chapter of Western Navajo Agency	Cameron, AZ	KNF representatives attended a Chapter meeting.
11/19/07	Navajo Nation	Window Rock, AZ	Williams District Ranger and other KNF staff met with Navajo Nation.
2/1/2008	Havasupai Tribe, Hualapai Tribe, Hopi Tribe, Kaibab Band of Paiute Indians, Yavapai-Prescott Indian Tribe, Navajo Nation, and Bodaway/Gap, Cameron, Coalmine, Leupp, Lechee, To'Nanees'Dizi Chapters of Western Navajo Agency	N/A	Williams Travel Management added to SOPA. SOPA mailed to tribes quarterly.
2/14/08	Navajo Nation	Flagstaff, AZ	Tusayan District Ranger and other Kaibab staff met with Navajo Nation.
2/19/08	Yavapai-Prescott Indian Tribe	Williams, AZ	The Acting Forest Supervisor and other Kaibab staff met with the Yavapai-Prescott Indian Tribe.
2/20/08	Hopi Tribe	Kykotsmovi, AZ	The Acting Forest Supervisor and other Kaibab representatives met with the Hopi Tribe.
3/4/08	Hualapai Tribe	Peach Springs, AZ	Kaibab staff met with Hualapai Tribal Chair and staff
3/18/08	Havasupai Tribe	Tusayan, AZ	Tusayan District Ranger and other KNF representatives met with Havasupai Tribal council.
8/3/08	Hopi Tribe, Kaibab Band of Paiute Indian, Hualapai Tribe, Navajo Nation	Williams, AZ	Forest Supervisor, District Rangers, and staff met with representatives of the Hopi Tribe, Kaibab Band of Paiute Indian, Hualapai Tribe, and Navajo Nation at the Kaibab Intertribal Meeting.
10/7/08	Pueblo of Zuni	Zuni, NM	Kaibab staff met with Pueblo of Zuni.
12/22/08	Hopi Tribe	Flagstaff, AZ	Kaibab representatives met with the Hopi Tribe.
1/8/09	Havasupai Tribe	Supai, AZ	Kaibab representatives met with the Havasupai Tribal Council.
1/25/09	Cameron Chapter of Western Navajo Agency	Cameron, AZ	KNF representatives attended a Chapter meeting.
5/20/09	Hopi Tribe	Kykotsmovi, AZ	Kaibab representatives met with the Hopi Tribe.
6/18/09	Pueblo of Zuni	Zuni, NM	Tusayan District Ranger and Kaibab staff met with Pueblo of Zuni.

Tribal Concerns with the Williams Travel Management Project

The majority of tribal concerns submitted during the consultation and scoping process involve access to special areas on the forest or maintenance and management of the forest road system. In general, tribes have voiced concerns over increased off road travel and user created roads, and have stated support for restricting such travel. While tribes have made numerous comments about Travel Management issues over the last several years, most of these comments have centered on the Tusayan Ranger District, which borders both Navajo and Havasupai tribal lands. On the Williams District, the Hopi Tribe identified one road that tribal members must use to access a ceremonial site. A separate written instrument will be used to ensure Hopi tribal members have access to this area.

The Forest Service would like to thank all of the individuals and organizations that participated in the public involvement process and provided input to the Travel Management Planning project.

Glossary of Terms

- **Abbreviations:**
  - **AASHTO.** American Association of State Highway and Transportation Officials.
  - **CFR.** Code of Federal Regulations.
  - **EM.** Forest Service Engineering Manual.
  - **EO.** Executive Order.
  - **FSH.** Forest Service Handbook.
  - **FSM.** Forest Service Manual.
  - **USC.** United States Code

- **Access Right (1).** The right of ingress to and egress from a property that abuts a street or highway. (23 CFR 710.105)
- **Access Right (2).** The authority to pass over a property for purposes of ingress to or egress from a piece of property. (FSM 5460.5)
- **Administrative unit**. A National Forest, a National Grassland, a purchase unit, a land utilization project, Columbia River Gorge National Scenic Area, Land between the Lakes, Lake Tahoe Basin Management Unit, Midewin National Tallgrass Prairie, or other comparable unit of the National Forest System. (36 CFR 212.1, 36 CFR 261.2)
- **All-Terrain Vehicle.** A type of off-highway vehicle that travels on three or more low-pressure tires; has handle-bar steering; is less than or equal to 50 inches in width; and has a seat designed to be straddled by the operator. (FSH 2309.18.05)
- **Annual Maintenance.** Work performed to maintain serviceability, or repair failures during the year in which they occur. Includes preventive and/or cyclic maintenance performed in the year in which it is scheduled to occur. Unscheduled or catastrophic failures of components or assets may need to be repaired as a part of annual maintenance. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998)
- **Construction (1).** The supervising, inspecting, actual building, and incurrence of all costs incidental to the construction or reconstruction of a highway, including bond costs and other costs relating to the issuance in accordance with section 122 of bonds or other debt financing instruments and costs incurred by the State in performing Federal-aid project related audits that directly benefit the Federal-aid highway program. Such term includes--

  (A) locating, surveying, and mapping (including the establishment of temporary and permanent geodetic markers in accordance with specifications of the National Oceanic and Atmospheric Administration of the Department of Commerce);

  (B) resurfacing, restoration, and rehabilitation;

  (C) acquisition of rights-of-way;

  (D) relocation assistance, acquisition of replacement housing sites, and acquisition and rehabilitation, relocation, and construction of replacement housing;

  (E) elimination of hazards of railway grade crossings;

  (F) elimination of roadside obstacles;

  (G) improvements that directly facilitate and control traffic flow, such as grade separation of intersections, widening of lanes, channelization of traffic, traffic control systems, and passenger loading and unloading areas; and

  (H) capital improvements that directly facilitate an effective vehicle weight enforcement program, such as scales (fixed and portable), scale pits, scale installation, and scale houses. (23 USC 101)

- **Construction (2).** The erection, construction, installation, or assembly of a new fixed asset. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998)
- **Culvert.** A conduit or passageway under a road, trail, or other obstruction. A culvert differs from a bridge in that the top of a culvert does not serve as the road surface and is constructed entirely below the elevation of the traveled way. (Handbook of Steel Drainage & Highway Construction Products).
- **Cyclic Maintenance.** Preventive maintenance activities that recur on a periodic and scheduled cycle. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998)
- **Decommission.** Demolition, dismantling, removal, obliteration and/or disposal of a deteriorated or otherwise unneeded asset or component, including necessary cleanup work. This action eliminates the deferred maintenance needs for the fixed asset. Portions of an asset or component may remain if they do not cause problems nor require maintenance. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998)
- **Deferred Maintenance.** Maintenance that was not performed when it should have been or when it was scheduled and which, therefore, was put off or delayed for a future period. When allowed to accumulate without limits or consideration of useful life, deferred maintenance leads to deterioration of performance, increased costs to repair, and decrease in asset value. Deferred maintenance needs may be categorized as critical or non-critical at any point in time. Continued deferral of non-critical maintenance will normally result in an increase in critical deferred maintenance. Code compliance (e.g. life safety, ADA, OSHA, environmental, etc.), Forest Plan Direction, Best Management Practices, Biological Evaluations other regulatory or Executive Order compliance requirements, or applicable standards not met on schedule are considered deferred maintenance. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998)
- **Design Speed.** A selected speed used to determine the various geometric design features of the roadway with respect to topography, anticipated operating speed, the adjacent land use, and the functional classification of the road. The selected design speed should be consistent with the speeds that drivers are likely to expect on a given highway facility. (AASHTO, 2001, A Policy on Geometric Design of Highways and Streets)
- **Design Vehicle.** A selected vehicle, with representative weight, dimensions, and operating characteristics, used to establish the design controls for the road. There are four general classes of design vehicles: (1) passenger cars, (2) buses, (3) trucks, and (4) recreational vehicles. (AASHTO, 2001, A Policy on Geometric Design of Highways and Streets)
- **Designated road, trail, or area.** A National Forest System road, a National Forest System trail, or an area on National Forest System lands that is designated for motor vehicle use pursuant to 36 CFR 212.51 on a motor vehicle use map. (36 CFR 212.1)
- **Easement (1).** A type of special use authorization (usually granted for linear rights-of-way) that is utilized in those situations where a conveyance of a limited and transferable interest in National Forest System land is necessary or desirable to serve or facilitate authorized long-term uses, and that may be compensable according to its terms. (36 CFR 251.51)
- **Easement (2).** An interest in real property that conveys a right to use a portion of an owner's property or a portion of an owner's rights in the property. (23 CFR 710.105)
- **Easement (3).** An interest in land owned by another party that entitles the holder to a specific limited use or enjoyment. (FSM 5460.5)
- **Forest Road.** A road wholly or partly within, or adjacent to, and serving the National Forest System that is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. (23 USC 101)
- **Forest Road and Trail Act Easement.** An easement issued by the Forest Service to a Public Road Authority for a non-Federal-Aid road or non-Forest Highway crossing National Forest System lands. (FSH 2709.12, 30)
- **Forest Road or Trail.** A road or trail wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration and

utilization or the National Forest System and the use and development of its resources. (36CFR 212.1, 36 CFR 251.5, 36 CFR 261.2)

- **Forest Trail.** A trail wholly or partly within, or adjacent to, and serving the National Forest System and which is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. (23 USC 101)
- **Forest Transportation Atlas.** A display of the system of roads, trails and airfields of an administrative unit. (36 CFR 212.1)
- **Forest Transportation Facility.** A forest road or trail or an airfield that is displayed in a forest transportation atlas, including bridges, culverts, parking lots, marine access facilities, safety devices, and other improvements appurtenant to the forest transportation system. (36 CFR 212.1)
- **Forest Transportation System.** The system of National Forest System roads, National Forest System Trails, and airfields on National Forest System lands. (36 CFR 212.1)
- **Forest Transportation System Management.** The planning, inventory, analysis, classification, record keeping, scheduling, construction, reconstruction, maintenance, decommissioning, and other operations undertaken to achieve environmentally sound, safe, cost-effective, access for use, protection, administration, and management of National Forest System lands. (FSM 7705)
- **Fugitive Dust.** Particles lifted into the ambient air caused by man-made and natural activities such as the movement of soil, vehicles, equipment, blasting, and wind. This excludes particulate matter emitted directly from the exhaust of motor vehicles and other internal combustion engines, from portable brazing, soldering, or welding equipment, and from piledrivers.
- **Heavy maintenance.** Work usually done by highway agencies in repairing damage normally expected from seasonal and occasionally unusual natural conditions or occurrences. It includes work at a site required as a direct result of a disaster which can reasonably be accommodated by a State or local road authority's maintenance, emergency or contingency program. (23 CFR 668)
- **High Scenic Integrity.** Landscapes where the valued physical, biological and cultural features appear intact. Deviations may be present, but must repeat the form, line, color, texture and pattern common to the landscape character so completely and at a scale where they are not evident.
- **Highway.** The term ``highway" includes-- (A) a road, street, and parkway, (B) a right-of-way, bridge, railroad-highway crossing, tunnel, drainage structure, sign, guardrail, and protective structure, in connection with a highway; and (C) a portion of any interstate or international bridge or tunnel and the approaches thereto, the cost of which is assumed by a State transportation department, including such facilities as may be required by the United States Customs and Immigration Services in connection with the operation of an international bridge or tunnel. (23 USC 101)
- **Jurisdiction (1)**. The legal right or power to interpret and apply the law. Authority or control. (Webster)
- **Jurisdiction (2).** The legal right to control and regulate the use of a transportation facility. Roads on National Forest lands are under the control of the Forest Service, except for public roads established under the Act of July 26, 1866, private roads, roads for which the Forest Service has granted rights-of-way to private landowners or public road agencies, and roads whose use and rights pre-date the National Forest. Other factors may affect jurisdiction on acquired lands or easements. Review the granting document and obtain appropriate legal opinion for these cases, when necessary. There are roads on the transportation system where the Forest Service has limited rights of use and no jurisdiction over the traffic, such as private road systems and State, county, or township roads. (FSH 7709.59.21)
- **Jurisdiction (3)**. The legal right or authority to control, operate, regulate use of, maintain, or cause to be maintained, a transportation facility, through ownership or delegated authority. The authority to construction or maintain such a facility may be derived from fee title, easement, written authorization, or permit from a Federal agency, or some similar method. (23 CFR 660.103)

- **Local Road (1).** A road that primarily provides access to land adjacent to collector roads over relatively short distances at low speeds. (AASHTO, 2001, A Policy on Geometric Design of Highways and Streets)
- **Local Road (2).** A forest road that connects terminal facilities with forest collector, forest arterial or public highways. Usually forest local roads are single purpose transportation facilities. (FSH 7709.54, no longer in print)
- **Low-Volume Road.** A road that has an average daily traffic of 400 or less. (AASHTO, 2001, Guidelines for Geometric Design of Very Low-Volume Local Roads)
- **Maintenance (1).** The preservation of the entire highway, including surface, shoulders, roadsides, structures and such traffic-control devices as are necessary for its safe and efficient utilization. (23 USC 101)
- **Maintenance (2).** The upkeep of the entire forest transportation facility including surface and shoulders, parking and side areas, structures, and such traffic-control devices as are necessary for its safe and efficient utilization. (36 CFR 212.1)
- **Maintenance (3).** The act of keeping fixed assets in acceptable condition. It includes preventive maintenance normal repairs; replacement of parts and structural components, and other activities needed to preserve a fixed asset so that it continues to provide acceptable service and achieves its expected life. Maintenance excludes activities aimed at expanding the capacity of an asset or otherwise upgrading it to serve needs different from, or significantly greater than those originally intended. Maintenance includes work needed to meet laws, regulations, codes, and other legal direction as long as the original intent or purpose of the fixed asset is not changed. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998)
- **Maintenance Levels.** Defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria. (FSH 7709.58, 12.3)
  - **Maintenance Level 1.** Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed 1 year. Basic custodial maintenance is performed to keep damage to adjacent resource to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are "prohibit" and "eliminate". Roads receiving level 1 maintenance may be of any type, class or construction standard, and may be managed at any other maintenance level during the time they are open for traffic. However, while being maintained at level 1, they are closed to vehicular traffic, but may be open and suitable for non-motorized uses. (FSH 7709.58, 12.3)
  - **Maintenance Level 2.** Assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level. Appropriate traffic management strategies are either to (1) discourage or prohibit passenger cars or (2) accept or discourage high clearance vehicles. (FSH 7709.58, 12.3)
  - **Maintenance Level 3.** Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material. Appropriate traffic management strategies are either "encourage" or "accept." "Discourage" or "prohibit" strategies may be employed for certain classes of vehicles or users. (FSH 7709.58, 12.3)
  - **Maintenance Level 4.** Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated. The most

appropriate traffic management strategy is "encourage." However, the "prohibit" strategy may apply to specific classes of vehicles or users at certain times. (FSH 7709.58, 12.3)

- **Maintenance Level 5.** Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double-lane, paved facilities. Some may be aggregate surfaced and dust abated. The appropriate traffic management strategy is "encourage." (FSH 7709.58, 12.3)

- **Moderate Scenic Integrity.** Landscapes where the valued physical, biological and cultural features appear slightly altered. Noticeable deviations remain visually subordinate to the landscape character being viewed.
- **Motor Vehicle.** Any vehicle which is self-propelled, other than:
  - A vehicle operated on rails; and
  - Any wheelchair or mobility device, including one that is battery-powered, that is designed solely for use by a mobility-impaired person for locomotion, and that is suitable for use in an indoor pedestrian area. (36 CFR 212.1, 36 CFR 261.2)
- **Motor Vehicle Use Map.** A map reflecting designated roads, trails, and areas on an administrative unit or a Ranger District of the National Forest System. (36 CFR 212.1)
- **Motorized Equipment (1).** Any machine activated by a nonliving power source except small battery-powered hand-carried devices such as flashlights, shavers, Geiger counters, and cameras. (36 CFR 261.2)
- **Motorized Equipment (2).** Machines that use a motor, engine, or other nonliving power sources. This includes, but is not limited to, such machines as chain saws, aircraft, snowmobiles, generators, motorboats, and motor vehicles. It does not include small battery or gas powered hand-carried devices such as shavers, wristwatches, flashlights, cameras, stoves, or other similar small equipment. (FSM 2320.5)
- **National Forest System.** As defined in the Forest Rangeland Renewable Resources Planning Act, the ``National Forest System" includes all National Forest lands reserved or withdrawn from the public domain of the United States, all National Forest lands acquired through purchase, exchange, donation, or other means, the National Grasslands and land utilization projects administered under title III of the Bankhead-JonesFarm Tennant Act (50 Stat. 525, 7 U.S.C. 1010-1012), and other lands, waters or interests therein which are administered by the Forest Service or are designated for administration through the Forest Service as a part of the system. (36 CFR 212.1)
- **National Forest System Land.** All lands, waters, or interests therein administered by the Forest Service. (36 CFR 251.51)
- **National Forest System Road.** A forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county or other local public road authority. (36 CFR 212.1, 36 CFR 251.51, 36 CFR 261.2)
- **National Forest System Trail**. A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a State, county or other local public road authority. (36 CFR 212.1)
- **Obliteration (1).** To eliminate completely so as to leave no trace. (Webster)
- **Obliteration (2).** The reclamation and or restoration of land to resource production from that of a transportation facility. (FSH 7709.54, no longer in print)
- **Off-Highway Vehicle (*1*).** Any motorized vehicle designed for or capable of cross county travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain. (36 CFR 212.1)
- **Off-Highway Vehicle (2).** Any motorized vehicle designed for or capable of cross county travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain; except that term excludes (A) any registered motorboat, (B) any fire, military, emergency or law enforcement vehicle when used for emergency purposes, and any combat or combat support vehicle when used for national defense purposes, and (C) any vehicle whose use is expressly authorized by

the respective agency head under a permit, lease, license, or contract. (EO 116-44 as amended by EO 11989). See also FSM 2355. 01 - Exhibit 01.

- **Off road Vehicle.** Synonymous with off-highway vehicle. (FSM 7709.55 34)
- **Open to Public Travel (1).** The road section is available, except during scheduled periods, extreme weather or emergency conditions, passable by four-wheel standard passenger cars, and open to the general public for use without restrictive gates, prohibitive signs, or regulation other than restrictions based on size, weight, or class of registration. Toll plazas of public toll roads are not considered restrictive gates. (23 CFR 460.2)
- **Open to Public Travel (2). E**xcept during scheduled periods, extreme weather conditions, or emergencies, open to the general public for use with a standard passenger auto, without restrictive gates or prohibitive signs or regulations, other than for general traffic control or restrictions based on size, weight, or class of registration. (23 CFR 660.103)
- **Operating Costs for Traffic Monitoring, Management, and Control.** Includes labor costs, administrative costs, costs of utilities and rent, and others costs associated with the continuous operation of traffic control, such as integrated traffic control systems, incident management programs, and traffic control centers. (23 USC 101)
- **Operating Speed.** The speed at which drivers are observed operating their vehicles during free-flow conditions. (AASHTO, 2001, A Policy on Geometric Design of Highways and Streets)
- **Passenger Cars.** These include passenger cars of all sizes, sport/utility vehicles, minivans, vans and pickup trucks. (AASHTO, 2001, A Policy on Geometric Design of Highways and Streets)
- **Permit.** A special use authorization which provides permission, without conveying an interest in land, to occupy and use National Forest System land or facilities for specified purposes, and which is both revocable and terminable. (36 CFR 251.51)
- **Private Road.** A road under private ownership authorized by easement to a private party, or a road which provides access pursuant to a reserved or private right. (FS-643, Roads Analysis; Informing Decisions About Managing the National Forest Transportation System, August 1999.)
- **Public Agency.** Any organization with administrative or functional responsibilities which are directly or indirectly affiliated with a governmental body of any nation, State, or local jurisdiction. (23 CFR 635.102)
- **Public Authority.** A Federal, State, county, town or township, Indian tribe, municipal or other local government or instrumentality thereof, with authority to finance, build, operate or maintain toll or toll-free highway facilities. (23 CFR 460.2)
- **Public Lands Highway**. A forest road under the jurisdiction of and maintained by a public authority and open to public travel or any highway through unappropriated or unreserved public lands, nontaxable Indian lands, or other Federal reservations under the jurisdiction of and maintained by a public authority and open to public travel. (23 USC 101)
- **Public Road.** Any road or street under the jurisdiction of and maintained by a public authority and open to public travel. (23 USC 101)
- **Reconstruction.** To construct again. (Webster)
- **Recreational Vehicle.** These include motor homes, cars with camper trailers, cars with boat trailers, motor homes with boat trailers and motor homes pulling cars. (AASHTO, 2001, A Policy on Geometric Design of Highways and Streets)
- **Rehabilitation (1).** Minor reconstruction. Non-standard highway-related operation and maintenance activities to provide minor upgrades to a highway. (23 CFR 625)
- **Rehabilitation (2).** Renovation or restoration of an existing fixed asset or any of its components in order to restore the functionality or life of the asset. Because there is no significant expansion or change of purpose for the fixed asset, the work primarily addresses deferred maintenance. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998)
- **Repair.** Work to restore a damaged, broken, or worn-out fixed asset, component, or item of equipment to normal operating condition. Repairs may be done as annual maintenance or deferred

maintenance activities. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998)

- **Replacement.** Substitution or exchange of an existing fixed asset or component with one having essentially the same capacity and purpose. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998)
- **Restoration.** To bring back to an original state. (Webster)
- **Right-of-Way (1).** Land authorized to be used or occupied for the construction, operation, maintenance and termination of a project or facility passing over, upon, under or through such land. (36 CFR 251.51)
- **Right-of-Way (2).** A privilege or right to cross over or use the land of another party for egress and ingress such as roads, pipelines, irrigation canals, or ditches. The right-of-way may be conveyed by an easement, permit, license, or other instrument. (FSM 5460.5)
- **Road (1).** A motor vehicle route over 50 inches wide, unless identified and managed as a trail. (36 CFR 212.1)
- **Road (2).** A general term denoting a facility for purposes of travel by vehicles greater than 50 inches width. Includes only the area occupied by the road surface and cut and fill slopes. (FSM 2355.05)
- **Road Construction or Reconstruction.** Supervising, inspecting, actual building, and incurrence of all costs incidental to the construction or reconstruction of a road. (36 CFR 212.1)
- **Road Decommissioning.** Activities that result in the stabilization and restoration of unneeded roads to a more natural state. (36 CFR 212.1)
- **Road Maintenance.** The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective. (FSM 7705)
- **Road Management Objectives.** Defines the intended purpose of an individual road based on management area direction and access management objectives. Road management objectives contain design criteria, operation criteria, and maintenance criteria. (FSH 7709.55, 33)
- **Roadway.** The portion of a highway, including shoulders and auxiliary lanes, for vehicular use. (AASHTO, 2001, A Policy on Geometric Design of Highways and Streets)
- **Routine Maintenance.** Work that is planned to be accomplished on a continuing basis, generally annually or more frequently. (FSH 7709.58, 13.41)
- **Other than Routine Maintenance.** Work that can be deferred without loss of road serviceability, until such time that the work can be economically or efficiently performed. The frequency of such work is generally longer than a year. (FSH 7709.58, 13.41)
- **Service Life.** The length of time that a facility is expected to provide a specified service. (FSH 7709.56b, 05)
- **Special Use Authorization.** A permit, term permit, lease, or easement which allows occupancy, use, rights, or privileges of National Forest System land. (36 CFR 251.51)
- **Subject to the Highway Safety Act (HSA).** National Forest System roads that are open to use by the public for standard passenger cars. This includes roads with access restricted on a seasonal basis and roads closed during extreme weather conditions or for emergencies, but which are otherwise open for general public use. (FSM 7705)
- **Trail.** A route 50 inches or less in width or a route over 50 inches wide that is identified and managed as a trail. (36 CFR 212.1)
- **Trailhead.** The transfer point between a trail and a road, lake, or airfield. The area may have developments that facilitate the transfer from one transportation mode to another. (FSM 2353.05)
- **Trail Vehicle.** Vehicle designed for trail use, such as bicycles, snowmobiles, trail bikes, trail scooters, and all terrain vehicles. (FSM 2353.05)
- **Travel Management atlas.** An atlas that consists of a forest transportation atlas and a motor vehicle use map or maps. (36 CFR 212.1)

- **Travel Route.** A road, river or trail, that is open for use by members of the general public. (36 CFR 292.21)
- **Unauthorized Road or Trail.** A road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas. (36 CFR 212.1)
  Unauthorized roads are categorized into two types and recorded in the SYSTEM linear event in the Infra Travel Routes database. The two types are:
    - **Undetermined.** Roads where long term purpose and need has yet to be determined, and
    - **Not Needed.** Roads not needed for long-term management of national forest resources as determined through an appropriate planning document. (Travel Routes National Data Dictionary for Roads)
- **Vehicle.** Any device in, upon, or by which any person or property is or may be transported, including any frame, chassis, or body of any motor vehicle, except devices used exclusively upon stationary rails or tracks. (36 CFR 261.2)
- **Wheelchair.** A device designated solely for use by a mobility impaired person for locomotion that is suitable for use in an indoor pedestrian area. (36 CFR 212.1, FSM 2352.05)
- **Wet Weather Road System.** A system of roads, trails, and areas that are open for motor vehicle use to provide limited access to NFS lands when emergency travel restrictions are in place
- **Wet Weather Roads Policy.** Emergency travel restrictions, implemented at the discretion of the Forest Supervisor or District Ranger, based on soil moisture conditions and the potential for road and resource damage. The policy is implemented through the issuance of an official Order describing the conditions, prohibitions and exemptions to the Order. An Exhibit (map) that clearly depicts those roads, trails, and areas that are open for motor vehicle use is included with the Order.

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Appendix 1 – Maps and Tables

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Appendix 2 - Proposed Forest Plan Amendment

Kaibab Forest Plan Amendment

Since the 1988 plan (as amended) permits cross country travel in most areas of the Williams RD, and does not incorporate the MVUM as the enforcement tool for motorized travel designation, the plan would be amended to implement the MVUM provisions of the Travel Management Rule for the Williams Ranger District.

To provide for consistency between the plan and the Travel Management Rule, the following amendment is made:

Add the following Forest-wide Standard (page 34-1; just above Other Forest-wide Guidelines):

5. Motor vehicle use off the designated system is prohibited on the Williams Ranger District, except as identified on the MVUM.

The following direction regarding off-highway vehicle use in the forest plan would be corrected in the Forest Plan (including changing terminology from ORV to OHV throughout). **This does not constitute an amendment because the intent of the forest plan direction is not being changed.**

Change the following:

Public Issues and Management Concerns – Dispersed Recreation (page 11)

Additional areas are closed to off-~~road~~highway vehicle use to protect sensitive soils, vegetation and important aquatic habitats, except as identified on the MVUM.

Table 1. Acres Closed to Off-~~Road~~Highway vehicle Use. (Page 11)

Acres Closed	This Plan (as amended)	Previous Plan
	Acres Closed 560,305	Acres Closed 11,392
These figures do not include acres of classified wilderness also closed to ~~ORV~~OHV use or significant landforms on the Forest effectively closed because of rough terrain.		

Management Direction – Goals – Outdoor Recreation (page 18)

Establish off-~~road~~highway vehicle (~~ORV~~OHV) closures as needed to maintain other resource objectives. Managed ~~ORV~~OHV use to provide ~~ORV~~OHV opportunities while protecting resources and minimizing conflicts with others.

Guidelines for Recreation Resource Operations and Improvements (page 41)

3. Monitor off ~~road~~ highway vehicle (~~ORV~~OHV) use; prevent resource damage and user conflicts.
8. Prohibit competitive ~~ORV~~OHV events.

Chapter 4 - Management Direction

These additional guidelines apply only to resource operations and improvements in *GAs* 2, 10, and13:

Guidelines for Timber Resource Operations and Improvements: (page 43)

12. Salvage stands, or parts thereof, that are moderately or severely damaged by dwarf mistletoe, insects, fire, or windthrow using the uniform shelterwood or clearcutting with planting methods; restrict ~~ORV~~ OHV use during stand re-establishment.

Guidelines for Facility Operations and Improvements: (page 47)
1. Transportation Facilities includes roads, motorized trails, and user created wheeltracks. Guidance for other trails is in the Recreation Resource Operations.
3. Obliterate all temporary roads and skid trails; restrict ~~ORV~~ OHV use ~~until revegetated~~.

Guidelines for GA 2, 10, 13 (page 39)
1. Identify, describe, and geographically locate existing conditions in the implementation land area, regarding:
z. Off ~~road~~ highway vehicular closure areas.

Guidelines for Recreation Resource Operations and Improvements: (page 41)
3. Monitor off ~~road~~ highway vehicle (~~ORV~~OHV) use; prevent resource damage and user conflicts.
8. Prohibit competitive ~~ORV~~OHV events.

Geographic Area 8 – Southern Tusayan Woodland: (page 56)
Management Direction for Recreation Resources:
Provide off ~~road~~ highway vehicle area closures and manage ~~ORV~~ OHV use that occurs on other areas to maintain recreation, visual, heritage, soil, water, wildlife, and other resource values.

GA 9 - Management Direction for Recreation Resources: (page 59)
The Coconino Rim escarpment is closed to motorized vehicles. Provide other off ~~road~~ highway vehicle area closures and manage ~~ORV~~OHV use that occurs on other areas to maintain recreation, visual, heritage, soil, water, wildlife, and other resource values.

Glossary: Off ~~road~~ highway Vehicle - *Any motor vehicle designed for or capable of cross country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain.*

Appendix 3 – Scoping and Issue Processing Report

Williams Travel Management Planning

Issue Processing Report

Dec. 21, 2009

The following is the result of analyzing comments received on the Proposed Action for Williams Travel Management Planning. The scoping of the proposed action occurred between March and June of 2008. While early planning efforts summarized these comments in general, additional analysis was needed in order to track issues through the planning process and ensure that alternatives and analysis prepared for the Environmental Assessment was responsive to the input received on the Proposed Action. This documentation was also prepared to for inclusion into the Project Record and Environmental Analysis following the approval of this analysis by the Responsible Official.

Each comment document (email, letter, form handed out at public meetings) received during the scoping period was given a unique number for easy identification. The number corresponds to the place in the Project Record where the original comment is filed (e.g. 45-1 is the first document contained in Tab 45 of the project record; and 60-28 is the 28th document under Tab 60). Documents were read by District staff and each issue contained in the document was highlighted and noted on separate sheets. These sheets were used to develop the issue list found below and account for which comment(s) raised each issue. Issues are grouped into general resource or interest areas, though some may address multiple areas.

Each issue was then considered and evaluated to determine whether the concern(s) were already resolved through land use designations, implementation of Forest Plan standards and guidelines and Best Management Practices (BMPs), project-specific design criteria or mitigation measures, through processes or analyses routinely conducted by the Interdisciplinary Team (IDT or ID Team), or beyond the scope of the project. All concerns that fell within these categories were considered resolved. On the other hand, concerns that would have to be addressed through spatial location of activities or concerns that would drive (or partially drive) an alternative were considered unresolved.

This process is documented in the following pages. Below each issue, in bold text, is the determination that was made regarding whether the issue was resolved or unresolved. The

unresolved concerns were developed into the Key Issues for the Williams Ranger District Travel Management Environmental Assessment.

Access

Road closures will restrict public access to public forests, decreasing the recreational opportunities and traditional activities of visitors: (45-1, 47-7, 55-7, 58-3, 58-9, 60-1, 60-6, 60-8, 60-11, 60-23,)

Unresolved – Proposed Action (PA) restricts recreation opportunities.

Restricting forest access by prohibiting off-road travel and/or closing roads will reduce the accessibility to the forest and recreational opportunities available to those with limited mobility (handicapped/older): (55-4, 60-13, 58-2)

Resolved – beyond the scope; access for people with disability is addressed through existing law, regulation, and policy.

Several responses listed specific roads and/or areas remain open to motorized access: (46-3, 47-11, 50-1, 50-2, 50-3, 53-3, 53-4, 53-5, 58-7, 60-10, 60-25)

Unresolved – Proposed Action (PA) restricts recreation opportunities.

Closing roads near wilderness areas (Sycamore) will create hardship for those looking to use wilderness area and is not consistent with the intent of the congressional designation of wilderness areas (not establishing buffers) (60-25)

Resolved – buffers are beyond the scope; through implementation of the Forest Plan and BMPs.

Roadside parking within "one vehicle length" is ambiguous and would be impossible to adhere to (large vehicles, etc.) (60-18, 60-19, 60-21)

Resolved – through project design.

Impacts to Natural Resources

Off Road Travel causes damage to Natural Resources: (45-2, 45-14, 47-9, 51-4, 53-1, 60-11, 60-17)

Resolved – through BMPs, project design, and mitigation measures.

Closing some roads will benefit wildlife and hunting opportunities (45-4)

Resolved – through analyses routinely conducted by the IDT.

Allowance of MBGR will cause unacceptable damage to forest resources (45-8, 45-9, 45-11, 45-12, 45-13, 45-15, 47-1)

Resolved – through existing law, regulation, and policy.

There were a number of comments regarding the reduction of roads, the prohibition of off-road travel the camping corridor strategy and the motorized trail areas. The central idea of these concerns was that concentrating these uses will have negative impacts on forest resources and visitor safety/enjoyment (47-3, 48-1, 47-10, 51-3, 58-1, 60-7, 60-15, 60-18, 60-19, 60-21)

Unresolved – Proposed Action (PA) restricts recreation opportunities.

General Recreation

Off Road Travel prohibitions will impact recreation opportunities/visitor enjoyment of the national forest (45-1, 60-12, 60-25,)

Unresolved – Proposed Action (PA) restricts recreation opportunities.

Noise created from motorized off road travel disrupts those seeking quite recreation opportunities (45-10, 45-14, 51-4)

Resolved – through Forest Plan, BMPs, project design, and mitigation measures.

The PA does not accommodate the uses of motorized vehicles and more trails/routes are needed to meet the demand and reduce user conflicts (53-5, 60-4, 60-7, 60-14)

Unresolved – Proposed Action (PA) restricts recreation opportunities.

Comments suggested that the closing of Road 6E to Stone Dam near Ash Fork will limit the access to these historic areas and decrease recreational opportunities that are needed in the Ash Fork area (51-5, 55-1, 58-4, 58-6,)

Unresolved – Proposed Action (PA) restricts recreation opportunities.

Many of the problems seem to be coming from riders coming out of campgrounds, do not allow OHVs to be operated within one-half mile of campgrounds, and require it to be hauled out to riding site. (58-5)

Resolved – beyond the scope of the project

Dispersed Camping

Dispersed camping corridor (and roadside parking) strategy will pose a safety hazard and not be enjoyable due to the dust and/or traffic: (45-6, 47-10, 51-2, 55-3, 58-1, 60-6, 60-25)

Unresolved – Proposed Action (PA) restricts recreation opportunities.

Dispersed camping is a popular activity and restricting dispersed camping will have negative impacts on recreational opportunities and experiences (dispersed camping is a highly regarded traditional activity): (47-16, 47-23, 54-1, 60-23, 60-26).

Unresolved – Proposed Action (PA) restricts recreation opportunities.

There are not enough camping areas identified in the northern portion of the district to accommodate the use of that area by hunters (58-1)

Resolved – beyond the scope of the project; project is about travel management and is not designating camping areas.

Allowing “car camping” near sensitive wildlife habitat and wilderness areas will disrupt wildlife, damage habitat and be detrimental to wilderness values (45-8, 45-9, 45-12, 45-13, 45-15, 47-1, 47-8)*

Resolved – through Forest Plan and BMPs

*This issue was not fully developed in the scoping responses; many just said that we should not allow this to take place.

Big Game Retrieval

There were many concerns with the BGR retrieval strategy outlined in the PA. There were various reasons for these concerns:

- Because of the size of animals, seasonality restrictions and species restrictions would decrease the hunting experience, hunter success, and could result in increased meat spoilage (45-4, 45-6, 47-6, 47-15, 47-20, 48-1, 49-3, 58-7, 60-5, 60-15, 60-18, 60-19, 60-21, 60-27)
  Unresolved
- Restricting MBGR is not actually needed because there is no resource damage occurring from using vehicles to retrieve animals; resource damage is also addressed by AZ laws (45-6, 47-5, 47-18, 48-1, 53-5, 55-3, 56-2, 60-10,)
  Resolved – through Forest Plan, BMPs, project design, and mitigation measures.
- Allowing MBGR will reduce quality of hunting experience by scaring game (45-11).
  Resolved – beyond the scope
- The off road restrictions and BGR restrictions outlined in the PA will decrease the opportunity for less mobile hunters (handicapped and/or elderly) to participate in hunting activities (45-6, 51-1, 55-4, 58-7, 60-10)
  Resolved – access for people with disability is addressed through existing law, regulation, and policy.

Firewood Cutting

The PA would restrict wood cutting opportunities which is a much valued and needed activity on the district; there would be environmental (fuel accumulation), social and economic impacts from such restrictions (47-21, 48-1, 49-1, 53-5, 58-1, 58-5, 59-1, 60-6, 60-9)
Resolved – through existing law, regulation, and policy.

The closure of existing wood cutting roads [user created?] would result in new routes being created and used, increasing erosion (60-20)
Resolved – through Forest Plan, BMPs, project design, and mitigation measures.

Miscellaneous

The Proposed Action includes user created routes that may impact archeological resources (60-29).
Unresolved

The allowance of MBGR and a dispersed camping corridor would damage habitat and cause resource damage (60-29).
Unresolved

There were various comments that suggested changes to the proposed action or the TM approach as a whole; however, these statements were not supported with specific rationale making identification of a specific issue difficult:

"Game Retrieval should remain open" (46-2, 47-3, 47-10, 54-1, 55-8)

"Game retrieval should be allowed for all deer, elk and buffalo hunts"; also suggests the collection of a permit fee for BGR which could be applied to road maint. Funding (59-2)

"…need to maintain reasonable rules for off road travel" (60-5)

"Allow dispersed camping 300' from any road that remains open (59-3)

"Allow game retrieval for more than 1 mile off roads, at least 1 ½ to 2 miles" (59-4)

"TM Plan is going past what is needed and what can be enforced" (47-14)

"There needs to be some OHV trails developed…" suggests areas (60-28)

"why close off areas without resource concerns like Bixler Saddle" (45-5)

Others were outside the scope of this project or were already decided by law, regulation or policy:

Requests noise regulations for National Forest (music, loud engines) (60-5)

No off road recreation should be allowed in wilderness areas (47-12)

Buffer dispersed campsites (48-1)

Improve Road #6 (49-5)

Most of the damage we see comes from past or current administrative uses such as logging, special use permits and ranching operations and fuelwood cutting (58-2, 58-5, 45-6)

The Williams Ranger District should prepare an Environmental Impact Statement (60-29)

There were several requests for further information, maps, news releases, etc. (including the request to extend the comment period): (46-1, 47-2, 47-13, 60-2, 47-17, 47-22, 47-24, 48-1, 51-6, 53-2)

There were some concerns about current enforcement levels and if/how we would be able to enforce any of the regulations that came out of TM Planning (48-1, 49-4, 58-5, 60-7)

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Appendix 4 – Past, Present and Reasonably Foreseeable Future Actions

Past, Present, and Reasonably Foreseeable Actions Considered in Specialist Reports

Kaibab National Forest, Williams Ranger District

Following is a partial listing of actions considered in the cumulative effects analysis for this project:

- Activities such as vegetation management, fuels management, livestock grazing, recreational activities, and other management activities (e.g. noxious weeds treatments) have occurred in the past, are occurring, and are reasonably foreseeable actions on the District. These activities could occur on private lands as well.
- Firewood cutting has occurred in the past and would likely continue in the foreseeable future on the District and private lands.
- Private landowners may harvest timber on their lands for lumber or to reduce fire hazards.
- Urban development and interface growth will continue on private lands.
- Management of Camp Navajo and currently designated wildernesses (e.g. Sycamore Canyon Wilderness, Kendrick Mountain Wilderness) would continue.
- Road construction and maintenance and right-of-way brushing can be expected to continue on non-National Forest System land. Road construction, reconstruction, and decommissioning are expected to continue to move towards Forest Plan desired conditions.
- Road realignment, reconstruction, or decommissioning may occur with future vegetation management projects.
- Recreation activities are expected to continue to increase on the Forest. Future recreation projects may be developed.
- Historic and ongoing mining activities.
- Adjacent National Forest System Lands have been and will continue to be managed to meet the multiple-use goals and objectives established in their Forest Plans.

Following is a partial listing of projects considered in the cumulative effects analysis for this project:

Past:

Project	Year NEPA completed	Activities	Status
Branigan (WRD)	**1992**	**Vegetation management: Timber Sale (TS) & Timber Stand Improvement (TSI); Closed approx. 2 miles of road**	**Completed 2006**
Government (WRD)	**1992**	**Veg. Mgt: TS & TSI; Closed approx. 3 miles of road**	**Ongoing – Approx. 80% implemented**
Beacon (WRD)	**1997**	**Veg. Mgt: TS, TSI, & Broadcast Burning (BB); Closed approx. 3 miles of road; Reconstructed approx. 2.5 miles of road**	**Completed 2008**
Elk – Lee (WRD)	**1997**	**Veg. Mgt: TS, TSI, & BB; Closed approx. 3.5 miles of road; Reconstructed approx. 3 miles of road**	**Ongoing – Approx. 30% implemented**

Present:

Project	Year NEPA completed	Activities	Status
Spring Valley (WRD)	**1999**	**Veg. Mgt: TS, TSI, & BB; Closed approx. 3 miles of road; Reconstructed approx. 0.5 miles of road**	**Ongoing – Approx. 50% implemented**
Frenchy (WRD)	**2001**	**Veg. Mgt: TS, TSI, & BB; Closed approx. 1.5 miles of road**	**Ongoing – Approx. 15% implemented**
Pineaire (WRD)	**2004**	**Veg. Mgt: TS, TSI, & BB; Closed approx. 0.5 miles of road**	**Completed**
Dogtown (WRD)	**2004**	**Veg. Mgt: TS, TSI, & BB; includes some temporary roads and dozer lines**	**Currently being implemented**
City (WRD)	**2005**	**Veg. Mgt: TS, TSI, & BB; includes some temporary roads and dozer lines**	**Currently being implemented**
Twin (WRD)	**2005**	**TSI & Fuel reduction; includes some**	**Ongoing – Approx. 40% implemented**

		temporary roads and dozer lines	
Ida Grassland Restoration	**2008**	**Grassland Restoration, mechanical thinning of junipers and pines, no road closures or additions**	**Currently being implemented**
Bill Williams Cap (WRD)	**2009**	**Fuel reduction / Hazard Tree removal on 6 ac.**	**DM signed – implementation 2010**
Community Tank (WRD)	**2009**	**Grassland Restoration, thinning and burning on 2,450 ac / 2 mi of road obliteration**	**DN/FONSI signed – implementation 2010**

Foreseeable Future:

Project	**Estimated Year NEPA Completed**	**Activities**	**Status**
McCracken (WRD)	**2010**	**Thinning (15,200 ac), Burning (17,000 ac), Grassland Restoration**	**PA released in 2008; developing analysis.**
Four Forest Restoration Initiative (Multiple Projects)	**Multiple**	**Restoration of Ponderosa Pine ecosystem (thinning, burning)**	**Planning team and collaborative group developing strategy and initial PAs.**
Aspen Restoration (WRD)	**2010**	**Restoration of Aspen stands; may include burning, overstory removal, fencing, site prep, planting.**	**Developing Proposal**
Bearizona Access Road	**2010**	**Entrance construction and improvement relocation for private theme park near Hwy 64 and I-40 interchange**	

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Appendix 5 – Agency Response to Comments