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Department of  
Agriculture

Forest  
Service

**Southwestern  
Region**



# **Environmental Assessment**

for the

# **Lower Dillman Gravel Pit Expansion Project**

**Tusayan Ranger District  
Kaibab National Forest  
Coconino County, Arizona**

**April 2007**

**Information Contact**

Barbara McCurry, NEPA Planner  
P.O. Box 3088, Grand Canyon, AZ 86023  
928-635-8220; Fax 928-635-8204  
bmccurry@fs.fed.us



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# CHAPTER 1 – PURPOSE AND NEED

## Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. Specialist reports and supporting documents are located in the project record at the Tusayan Ranger District Office. The document is organized into four chapters and followed by appendices:

***Chapter 1 – Purpose and Need:*** This section includes information on the history of the project proposal, the purpose of and need for the project, and the agency’s proposal for achieving that purpose and need. This section also describes how the Forest Service informed the public of the proposal and how the public responded.

***Chapter 2 – Alternatives - Comparison of Alternatives, including the Proposed Action:*** This section provides a more detailed description of the agency’s no action alternative and the agency’s proposed action alternative for achieving the stated purpose. The proposed action alternative incorporates issues/concerns (if any) raised by the public and other agencies. This chapter includes mitigation measures specific to the proposed action alternative.

***Chapter 3 – Environmental Consequences:*** This section describes the environmental effects of implementing the proposed action alternative. 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 the evaluation and comparison of the proposed action alternative that follows.

***Chapter 4 – Consultation and Coordination:*** This section provides a list of agencies and persons consulted during the development of the environmental assessment.

***References:*** Literature used and cited during the development of the environmental assessment.

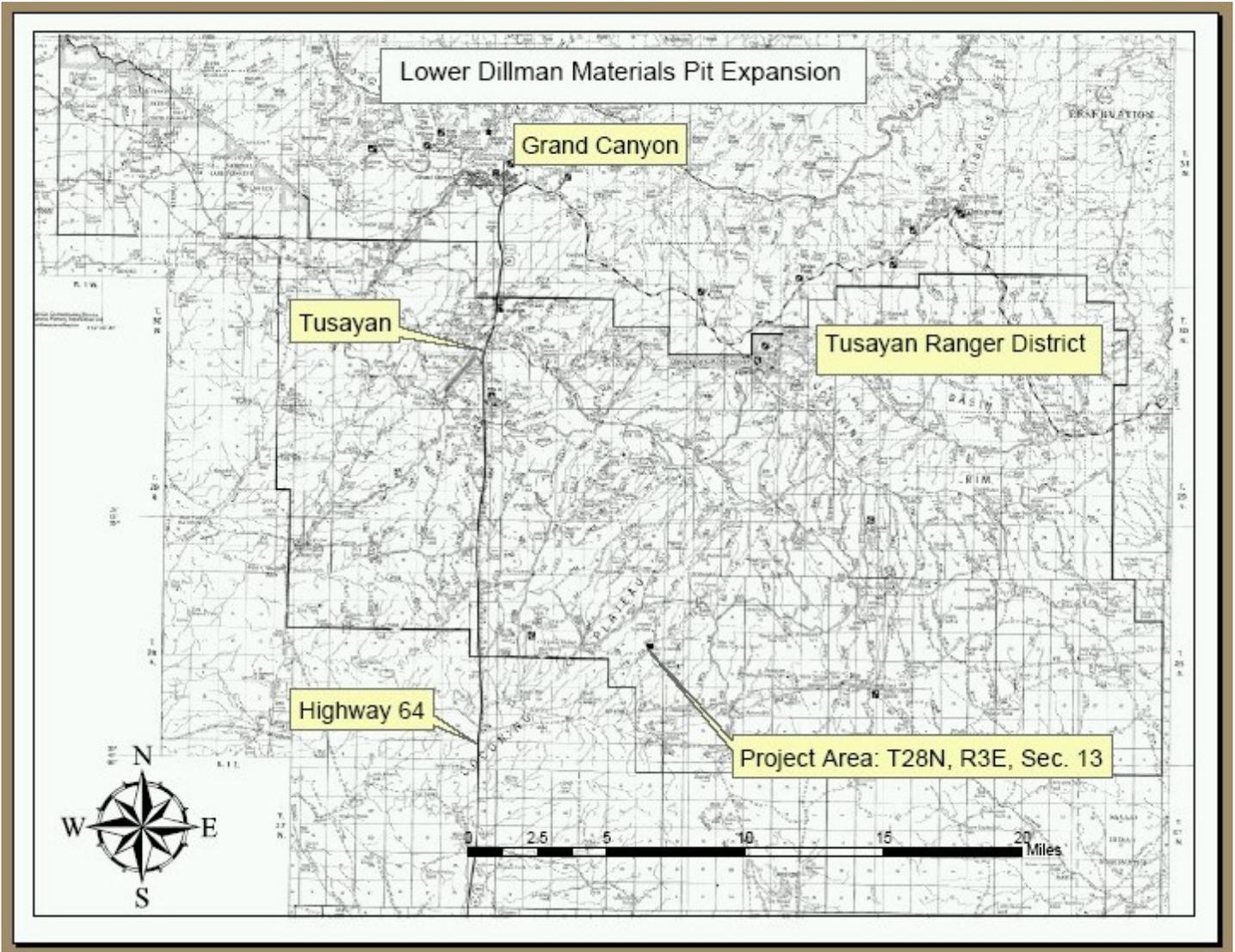
***Appendices:*** The appendices provide more detailed information to support the analyses presented in the environmental assessment.

## Purpose and Need for Action

The Tusayan Ranger District of the Kaibab National Forest proposes to re-open the existing five-acre Lower Dillman gravel pit, and to expand the existing pit by an additional four acres for intermittent use over a 15-20 year period. The pit was originally developed in 1981 as a source of surfacing materials for Forest Road (FR) 320 that provided access to the Hammer Timber Sale. It has been inactive since that single year of use with the exception of some minor entries for road maintenance purposes since that time.

This action is needed to provide a local Forest Service source of limestone gravel/aggregate for district road re-surfacing and maintenance projects. This action would also provide a less expensive option over a non-local private source for the processing and transportation of materials.

The project area is on National Forest System Lands within Kaibab National Forest's Ecosystem Management Area (EMA) 8, Arizona Game and Fish Department's Game Management Unit 9, and the Anita Grazing Allotment. The 9-acre project area is located approximately 12 miles south of the community of Tusayan and 6 miles east of State Highway 64 with access from Forest Roads (FR) 320, 305, and 318. The legal location for the project area is T. 28 N., R. 3 E., Section 13, of the Gila and Salt River Base Meridian, Coconino County, Arizona.



**Figure 1. Vicinity Map for Lower Dillman Project**

The following site-specific objectives were identified for the Lower Dillman Project:

- Provide a local source of aggregate for road maintenance activities that improve district roads needed for resource management and public access to National Forest System Lands on the Tusayan Ranger District, Kaibab National Forest.

- Identify and provide local source of aggregate to reduce costs and increase efficiencies on Forest Service road maintenance projects.

This action responds to the goals and objectives outlined in the Kaibab Forest Plan, as amended (2004). This proposal would help move the project area toward desired conditions described in that document.

### **Kaibab National Forest Plan Management Direction**

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

#### Transportation Facilities

- Execute construction, re-construction, and maintenance operations to provide transportation facilities that support resource management and protection and safe public access.
- Reconstruct and maintain arterial, collector, and local service roads that are needed for support of continuing long-term resource practices and public access to National Forest System Lands in an open-for-traffic mode.

#### Mineral Resources

- Prevent development of common variety sites within the visible foreground of Highway 64.
- Restrict or prohibit surface use in areas with habitat of threatened and endangered and sensitive plant and animal species, important recreation sites and facilities, and heritage resources nominated or posted to the National Register.

This environmental analysis meets the requirements of the Federal Land Policy and Management Act of 1976, the National Forest Management Act of 1976, and the National Environmental Policy Act of 1969 (and their amendments). It also complies with the following:

Endangered Species Act of 1973, as amended This action complies with the Endangered Species Act, and specifically with Section 7 of this Act, in that potential effects of this decision on listed species have been analyzed and documented.

National Historic Preservation Act of 1966, as amended Section 106 requirements for survey and evaluation have been met for all undertakings in this decision.

Forest Service Manual 7700 – Transportation System Chapter 7710 – Transportation Atlas, Records, and Analysis (also known as the Roads Analysis Process or RAP)

The following digital photos (Figures 2-5) were taken in February 2007 (B. McCurry) at Lower Dillman Gravel Pit. They show the existing 5-acre pit, the expansion area, and the current condition of FR 318.



**Figure 2. Existing Lower Dillman Pit (rabbitbrush) and Expansion Area (trees)**



**Figure 3. Existing Lower Dillman Pit looking north toward Red Butte**



**Figure 4. Existing Vegetation in Lower Dillman Pit Expansion Area**



**Figure 5. Forest Road 318 - Access into Lower Dillman Pit to be Reconstructed**

**Desired Condition:** Provide Forest Service road crews with a local source of aggregate materials for district road re-surfacing and maintenance.

## Proposed Action

The project proposes to re-enter the existing 5-acre Lower Dillman Gravel Pit in 2007 for the extraction and crushing of limestone aggregate to be used in district road re-surfacing and maintenance. The original pit would be expanded by an additional four acres over an intermittent operational period of 15 to 20 years. Approximately three-quarters of a mile of Forest Road 318 that accesses the pit would also be reconstructed, as well as a bladed travelway around the perimeter of the pit. (See Chapter 2. Alternatives for a more detailed description starting on page 8.)

Prior to pit expansion and road reconstruction, tree cutting and removal would be required. Tree removal would include juniper trees and pinyon pine. No ponderosa pine would be cut since the site does not support this species. There is no longer a commercial fuelwood market in that area (in part due to the remoteness of the location). Felled trees would be left on site and available under personal-use fuelwood permits over one to two fuelwood seasons. Any trees that remain past that time would be piled and burned on site when conditions are appropriate for pile burning.

## Decision Framework

Based on the environmental analysis in this document, the Tusayan District Ranger will decide whether and how to re-open and expand the Lower Dillman Gravel Pit for the extraction of aggregate for district road re-surfacing and maintenance in accordance with Forest Plan goals, objectives, and desired future conditions. The responsible official will decide whether to implement an action alternative, a modified action alternative, or the no action alternative. If an action alternative is selected, it will include:

- The location, design, and scheduling of the proposed pit expansion, other activities, or connected actions;
- Access management measures (road reconstruction of FR 318) and;
- Mitigation measures and monitoring requirements.

## Public Involvement

The proposal was listed in the Schedule of Proposed Actions (SOPA) on July 2005 and has been listed quarterly since that time. The proposal was provided to the public and other agencies for comment during initial public scoping on February 16, 2006.

The Forest Tribal Liaison conducted scoping (via letter) on January 25, 2006 with the Havasupai, Hualapai, Hopi, Yavapai-Prescott, Pueblo of Zuni, Navajo Nation, and the Navajo Nation Chapters of Bodaway-Gap, Cameron, Coalmine Canyon, Coppermine, LeChee, Leupp, and Tuba City. On September 20, 2005, the Forest Archaeology Staff officially consulted with the Hopi about projects listed on the 4<sup>th</sup> quarter SOPA that included the Forest Service/Grand Canyon School project (PR #81).

The Forest Service did not receive any comments or requests concerning the project from the tribes during tribal scoping. During general scoping, one comment was received from an individual that strongly supported the project. Two other responses were requests to receive further documentation of the project. (Documentation of public involvement and public comments can be found in the Project Record.)

Using the comments from the public, other agencies, and tribal partners, the interdisciplinary team developed a list of issues to address.

## **Issues**

The Forest Service separates issues into two groups: significant and non-significant issues. Significant issues are defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues are identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." A list of non-significant issues and reasons regarding their categorization as non-significant may be found at #87 in the project record.

There were no issues or concerns as the result of public scoping.

# CHAPTER 2 – ALTERNATIVES

This chapter describes and compares the alternatives considered for the Lower Dillman Gravel Pit Expansion Project. It includes a description of each alternative considered and a map of the project site for the proposed action alternative. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social, and economic effects of implementing each alternative.

## Alternative Development

Since there were no issues from initial public scoping of the proposed action (one comment received that supported the action), the District Ranger made the determination to consider two alternatives for detailed analysis in this assessment. Alternative 1, No Action, describes current conditions exclusive of the proposed expansion. Alternative 2, the Proposed Action and Preferred Alternative, describes re-opening the existing 5-acre Lower Dillman Gravel Pit for aggregate materials processing and extraction, the expansion of the pit by another 4 acres, and the reconstruction of a section of FR 318. The two alternatives represent a reasonable range of actions based upon the purpose and need and the results from public scoping.

## Alternatives Considered but Eliminated from Detailed Study

The original proposal included maintenance of FR 318, not reconstruction. The Forest engineers decided to reconstruct a three-quarter mile section of FR 318 about 300 feet south of the existing roadbed in order to move it out of the drainage and up on a side hill. There will also be a connector road or travelway to get past the pit that would define a driving area to keep traffic out of the pit proper but would stay within the 9-acre footprint of the project area.

## Alternatives Considered in Detail

### Alternative 1

#### No Action

Current management plans would continue to guide management of the project area. The Lower Dillman Gravel Pit would not be re-opened or expanded by four acres.

### Alternative 2

#### Proposed Action (Preferred Alternative)

The following are features of the proposed action:

- Re-open the existing 5-acre Lower Dillman Gravel Pit initially; exhaust the limestone aggregate source in the existing pit prior to expanding the pit an additional four acres.
- Reconstruct a three-quarter mile section of FR 318 where it joins FR 305; the existing roadbed would be rehabilitated by backfilling and seeding; the new roadbed would be moved about 300 feet out of the drainage to the south on a side hill. This work would be done by the Forest road crew and consists of clearing and grubbing (stumps would be piled at the edge of the pit for later disposal) and construction of a 12 foot wide, outsloped roadway with outsloped drains every two to three hundred feet. All disturbed areas along the roadway would be seeded with a native seed mix provided by the district. This alignment may receive some spot surfacing once material hauling begins.
- Expand the Lower Dillman Gravel Pit by an additional four acres. Initial work would involve tree cutting and removal of pinyon and juniper trees. No ponderosa pine would be cut since the site does not support this species. There is no longer a commercial fuelwood market in that area (in part due to the remoteness of the location). Felled trees would be left on site and available under personal-use fuelwood permits over one to two fuelwood seasons. Any trees that remain past that time would be piled and burned on site when conditions are appropriate for pile burning.
- A connector road or bladed travelway would be designated as a driving area around the perimeter of the pit to keep traffic out of the pit proper and allow access back to FR 318. This travelway would be bladed within the 9-acre footprint of the project area.

The estimated quantity of material available is 150,000 to 200,000 cubic yards with an estimate at each entry of 2,000 to 8,000 cubic yards, depending on available funding for this kind of work. The pit would not generally be used each year, but more likely every two to four years. Some of the material would be crushed and stockpiled. Equipment involves a crusher, loader, dump trucks, and water tender (for dust abatement as needed). District roads currently planned for re-surfacing include FR's 320, 302, 328, 307, and 311. Other district roads would be identified and included, as needed.

All equipment used in the extraction and crushing of rock would be located within the nine-acre site and would only be there on an intermittent basis when the pit is in operation.

The existing forest road system provides adequate access for implementation of project activities via Forest Roads 320, 305, and 318. There is a need to reconstruct a three-quarter mile section of Forest Road (FR) 318 to improve heavy equipment access into the project area, but there is no need to re-open closed roads, obliterate or close existing roads, or construct new roads. The reconstruction of FR 318 has been analyzed in the forest-level roads analysis process (KNF, Tusayan Ranger District RAP, 2006-07). Therefore, a site-specific roads analysis process (RAP) will not be undertaken for this project. (See Figure 6 on page 10 for proposed action map.)

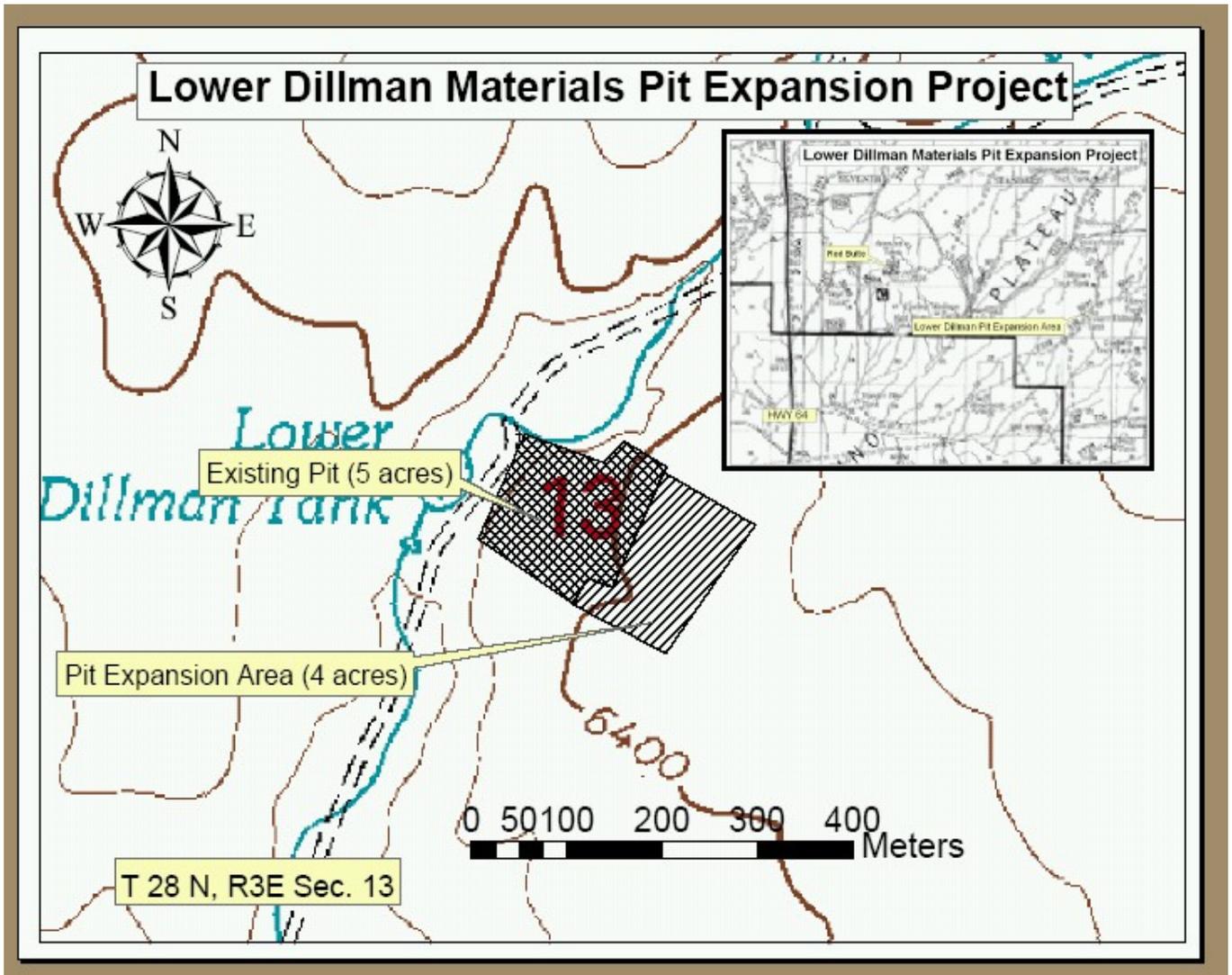


Figure 6. Proposed Action Map for Lower Dillman Project

## Mitigation Measures and Agreements Specific to Alternative 2

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

### ***Soils and Watershed***

1. During times of activity in the pit, the perimeter of both the existing and expanded sites should be contoured (bermed or ditched) to prevent spoil materials from washing off the site. Both sites should also be returned to their natural contour when they are inactive.

2. The Lower Dillman stock tank is vulnerable to excess sedimentation from pit activities on the northeast side. Emergency measures, such as straw bales, wattles, or temporary berms, will be employed when necessary to protect this tank.
3. Seeding with appropriate native species should be done when the pits are closed/abandoned.

### **Sensitive Plants**

4. Survey for Tusayan rabbitbrush during the appropriate season for detection and identification prior to each re-opening of the pit.

### **Noxious and Invasive Weeds**

5. Wash all vehicles and equipment prior to entering the project site.
6. Survey during the appropriate season for detection and identification of noxious weeds at least every three (3) years throughout the life of the project. New weed populations will be controlled as necessary.

### **Heritage**

7. All sites will be marked for avoidance prior to project activities. Project engineer must consult with South Zone Archaeologist to ensure site boundaries (flagging and/or paint) are still marked and visible prior to implementation.
8. The archaeologists and engineers agreed to expand the pit to within one chain (66 feet) of each heritage site, thus causing no effects to any of the artifact scatters. Following pit expansion, an archaeologist must monitor the sites to confirm that they have been avoided.
9. If any unrecorded sites are discovered during project implementation, work in the vicinity of the site must cease and the Forest Archaeologist must be notified immediately.
10. Road Maintenance and Reconstruction: Routine road maintenance activities within existing prisms and features, *where no heritage resource sites are known to exist*, will require no protective or mitigation measures. If ground disturbing activities are proposed in areas of no prior disturbance, project managers must contact the Forest Archaeologist so that protective measures, if warranted, can be devised.

### **Fire and Fuels**

11. Engineers must notify ADEQ and the Tusayan Ranger District for approval prior to any pile burning.

### **Range**

12. Avoid impacting the range monitoring plot in Blue Stem Wash, between Lower Dillman Tank and FR 305, during improvements to FR 318.

# CHAPTER 3 – ENVIRONMENTAL EFFECTS

This section summarizes the physical, biological, and social environments of the affected project area and the potential changes to those environments anticipated from the Proposed Action and No Action alternatives. It also presents the scientific and analytical basis for the comparison of alternatives.

## Soil, Air, and Water, including Wetlands and Floodplains

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### Affected Environment

**Soils and Hydrology.** There are no perennial waters, wetlands, or floodplains within the project area. The proposed area is not part of any municipal watershed or other domestic water supply. Lower Dillman Tank, a constructed stock pond, is less than a quarter-mile from the project area, on the west side of Forest Road 318. The tank holds water seasonally. The ephemeral drainage that feeds into Lower Dillman Tank adjoins the north and northwest sides of the project area.

The current Lower Dillman Pit is located on fairly level ground in Blue Stem Wash, which is a component of the Red Horse Wash fifth code watershed. According to the Terrestrial Ecosystem Survey (1991), erosion rates within the project area and the majority of the sub-watershed are within the sustainable range (Table 1.). Approximately 5% of the Blue Stem Wash sub-watershed is in unsatisfactory condition (the current erosion rate is predicted to be higher than the long-term tolerance rate. Another 21% of the sub-watershed has the potential for unsustainable erosion, but is currently in satisfactory condition. All of the unsatisfactory and high risk areas are upstream of Lower Dillman Pit.

The proposed pit expansion is adjacent to the existing disturbed area. It is also on level ground, in the same sub-watershed. Soils were formed in place, from limestone parent materials. They are high in carbonates; a pH of 8 is common in the subsoils. Ground disturbances that mix the calcareous subsoil with surface horizons will decrease soil productivity. The soils are also very gravelly or cobbly, which makes the area well suited to gravel extraction but limits many other mechanical treatments. The existing pit has not been restored to natural contours; it is an irregular jumble of shallow pits and mounds. It appears to be primarily internally drained. In the proposed expansion area, there is naturally a lot of exposed bare soil, with evidence of localized sheet and rill erosion and deposition. Because of the flatness of the site, there is little risk of unsustainable soil erosion occurring. Runoff is primarily toward the existing pit, where it is captured and prevented from entering Blue Stem Wash. If there is any future activity, the perimeter of both the existing and expanded sites should be contoured (bermed or ditched) to prevent spoil materials from washing off the site. Both sites should also be returned to their natural contour when they are inactive. Seeding with appropriate native species should be done when the pits are closed/abandoned.

**Table 1. Erosion Rates in the Blue Stem Was sub5 Watershed**

Blue Stem Wash sub5 Watershed - Tusayan RD											
Predicted Erosion Rates											
Unit	Acres	Potential		Natural		Current		Tolerance		Implementation	
		t/ac/yr	tons/yr	t/ac/yr	tons/yr	t/ac/yr	tons/yr	t/ac/yr	tons/yr	t/ac/yr	tons/yr
003	99.5	1.6	157.06	0.08	8.06	0.5	48.34	2.7	269.86	0.60	59.22
011	116.2	3.6	423.05	0.12	13.95	0.8	89.49	2.7	314.96	1.06	122.85
172	271.7	0.5	142.89	0.08	22.00	0.3	76.88	1.8	494.95	0.31	83.48
260	1286.6	2.7	3435.32	0.20	257.33	0.6	733.38	2.2	2843.46	0.78	1003.58
272	78.7	3.8	302.05	0.28	22.02	2.0	158.89	2.7	213.17	2.20	173.21
275	2234.9	1.7	3709.97	0.04	89.40	0.3	715.18	2.7	6056.64	0.45	1014.66
276	314.7	20.3	6391.46	0.84	264.34	2.8	887.44	1.4	429.87	4.57	1437.84
283	479.2	1.7	833.88	0.04	19.17	0.3	153.36	2.7	1298.74	0.46	221.41
287	1440.0	1.5	2157.15	0.16	233.28	0.3	466.57	2.1	3047.08	0.44	635.62
290	265.4	1.7	461.72	0.04	10.61	0.3	84.91	2.7	719.12	0.46	122.60
295	36.8	8.9	327.21	1.01	37.13	4.3	157.72	1.7	62.50	4.75	174.67
677	51.0	2.7	136.08	0.12	6.12	0.9	44.85	2.2	112.63	1.06	53.97
Sum/Avg.	6674.6	<b>2.8</b>	18477.83	<b>0.15</b>	983.42	<b>0.5</b>	3617.01	<b>2.4</b>	15863.00	<b>0.8</b>	5103.09

Rates reflect inclusion of rock outcrop acres.

Satisfactory Condition = Current Rate < Tolerance Rate

Unsatisfactory Condition = Current Rate > Tolerance Rate

At Risk = Potential Rate > Tolerance Rate

"Implementation" is the rate that occurs when 10% of area is disturbed to the point of reaching the Potential (maximum) erosion rate.

### **Air Quality**

The project area is within the Colorado River Airshed. The nearest Class I Airshed is Grand Canyon National Park, about 11 miles north of the project area. This Class I air quality maintenance area permits no long-term degradation of air quality. Prevailing winds within the project area are typically from the southwest.

## **Environmental Consequences**

### **Alternative 1 – No Action**

*Effect of No Action on Soils, Air Quality, and Hydrology.* The area would continue to be managed consistent with directions for Ecosystem Management Unit 8. This includes avoiding significant and permanent impairment of site productivity and maintaining air quality. The existing pit location would remain disturbed, with little impact on the surrounding area. The proposed expansion area would not be disturbed. There would be no change in runoff patterns or long-term soil productivity. Sections of Forest Road 318 would continue to experience erosion and tunneling from precipitation events due to its location in a drainage area.

## **Alternative 2 – Proposed Action**

*Effect of Proposed Action on Soils, Air Quality, and Hydrology.* Re-opening the existing pit would perpetuate the previous disturbance, but would not increase the area of disturbance. Soil productivity there has already been compromised; there would be no further loss. Expanding the pit would alter the topography and productivity of up to another four acres. Moisture from rain and snow melt would remain on site. There would be no change in the amount of water flowing to Blue Stem Wash, so there would be no change in erosion risk there. The reconstruction of the three-quarter mile section of FR 318 should improve erosion and soil runoff that is currently occurring.

Activities associated with the reopening, expansion, and operation of the gravel pit would have short-term but minimal effects to air quality through exhaust from machinery and equipment, road reconstruction, dust from traffic along gravel or natural surface roads that access the area, and intermittent smoke emissions from debris and pile burning during vegetation clearing activities.

## **Cumulative Effects**

The analysis area for cumulative impacts on soils and hydrology is the Blue Stem Wash sub-watershed. Ongoing activities and impacts in the Blue Stem Wash sub-watershed are livestock grazing, hunting, roads, and dispersed camping. All of these cause some soil erosion in excess of normal. All areas of high risk and unsatisfactory watershed conditions in the sub-watershed are upstream from the project area, so the proposed action has no potential to further impact them.

In 2004, a lightning strike near the north end of the watershed ignited the Mason fire. The fire was allowed to expand to eleven acres, according to the provisions of the Wildland Fire Use Program (1998). There was likely a small amount of short-term accelerated erosion there. That increased rate would have returned to normal after one of two years of litter deposition from trees.

Because the project area is inherently stable and because mitigations will be implemented to prevent erosion during and after construction, the proposed action does not significantly contribute to effects of other past, present, or future management actions.

The cumulative effects analysis area for air quality includes much of northern Arizona. The project area itself lies within the Colorado River Airshed, which covers the northwestern portion of Arizona including the City of Williams, as well as tribal, state, and private lands west and north of the Kaibab National Forest. A list of reasonably foreseeable projects for the Colorado River Airshed is extensive. Regulatory agencies such as Coconino County and the Arizona Department of Environmental Quality consider the overall effect and timing of activities within the airshed and follow a permitting process that would ensure that this project does not create regionally significant adverse effects on air quality and that emissions do not exceed national and state ambient air quality standards.

# Overstory Vegetation

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## Affected Environment

Natural overstory vegetation within the Lower Dillman Pit project area is predominately pinyon pine, juniper, and some Gambel oak. This habitat has been modified in the existing pit, but is intact in the proposed expansion area. The existing pit occupies five acres, the proposed expansion area is four more acres.

## Environmental Consequences

### Alternative 1 - No Action

There would be no change in the current overstory vegetation.

### Alternative 2 – Proposed Action

Four acres of pinyon-juniper woodland would be removed in the proposed expansion area. Additionally, some small trees would be removed during the reconstruction of FR 318.

## Cumulative Effects

The cumulative effects analysis area for pinyon-juniper overstory vegetation is the approximately 180,000 acres of pinyon-juniper woodland on the Tusayan Ranger District. Table 1 displays past, present, and reasonably foreseeable projects, activities, and events within the analysis area.

**Table 1. Past, Present, and Reasonably Foreseeable Projects, Activities, and Events in the Cumulative Effects Analysis Area**

Activity	Project Name	Time Frame	Acres
<i>Past Projects/Activities/Events</i>			
Hunting/Dispersed Camping Hunter blinds at Lower Dillman Tank (across from Lower Dillman Pit)			District-wide
Uranium Exploration Drilling		1980's	District-wide
Material Extraction	Lower Dillman Pit	1981	5
Commercial Fuelwood Harvest	Harbison Fuelwood Sale	1980's-early 1990's	550
Agra-axe	Harbison Grassland Maintenance	2002 - 2004	350
Agra-axe	No Name Habitat Improvement	2003	500
Wildland Fire Use	Mason WFU	7-2004	11
Range Analysis - EA	Anita-Cameron, and Moqui Range Allotment Grazing Authorization	2004	
Agra-axe (cut encroachment trees)	Nameless Grassland Habitat Improvement	2004 - 2005	500
Sage mowing	Sage Tank Grassland Mowing Project	2005	145
Wildland Fire Use	Mudersbach WFU	6-2005 to 7-2005	7260
Agra-Axe & Prescribed Burning	Moqui Grassland Maintenance	2006 - 2009	2990

<i>Table 1 - Past Projects/Activities/Events (cont.)</i>			
<b>Fence Modification</b>	<b>Pronghorn antelope fence modification</b>	<b>Ongoing</b>	<b>33 miles</b>
<b>Livestock Grazing; Fence Construction</b>	<b>Dillman Pasture Anita Grazing Allotment</b>	<b>Ongoing</b>	<b>1 mile</b>
<b>Fuelwood Harvesting</b>		<b>Ongoing</b>	<b>District-wide</b>
<b>Christmas Tree Harvesting</b>		<b>Ongoing</b>	<b>Location/acres vary each year</b>
<b>Drought/Bark Beetle Infestation</b>	<b>Tree mortality</b>	<b>Past 10 years</b>	<b>Northern AZ Project Area</b>
<b>Noxious Weeds</b>	<b>Noxious Weed Control</b>	<b>Past 10 years</b>	<b>District-wide</b>
<i>Current Projects/Activities</i>			
<b>Hunting/Dispersed Camping</b>			<b>District-wide</b>
<b>Livestock Grazing</b>	<b>Dillman Pasture Anita Grazing Allotment</b>	<b>Ongoing</b>	
<b>Agra-Axe &amp; Prescribed Burning</b>	<b>Moqui Grassland Maintenance</b>	<b>2006 - 2009</b>	<b>2990</b>
<b>Fuelwood Harvest</b>		<b>Ongoing</b>	<b>District-wide</b>
<b>Christmas Tree Harvest</b>		<b>Ongoing</b>	<b>Location/acres vary each year</b>
<b>Drought/Bark Beetle Infestation</b>	<b>Tree mortality</b>	<b>Bark beetles lessened in 2006; drought continues</b>	<b>Northern AZ</b>
<b>Noxious Weeds</b>	<b>Noxious Weed Control</b>	<b>Ongoing</b>	<b>District-wide</b>
<i>Foreseeable Projects/Activities</i>			
<b>Noxious Weeds</b>	<b>Noxious Weed Control</b>	<b>Ongoing</b>	<b>District-wide</b>
<b>Hunting/Dispersed Camping</b>			<b>District-wide</b>
<b>Wildland Fire Use</b>		<b>Foreseeable</b>	<b>District-wide</b>
<b>Uranium Mining Exploration</b>		<b>Foreseeable</b>	<b>District-wide</b>
<b>Livestock Grazing</b>	<b>Dillman Pasture Anita Grazing Allotment</b>	<b>Ongoing</b>	
<b>Lower Dillman Pit Expansion and Material Extraction, FR 318 reconstruction</b>	<b>Lower Dillman Pit Expansion Project</b>	<b>Starting in 2007 or 2008</b>	<b>9</b>
<b>Drought/Bark Beetle Infestation</b>	<b>Tree mortality</b>	<b>Bark beetles lessened in 2006; drought continues</b>	<b>Northern AZ</b>

Because pinyon-juniper woodland is widespread and plentiful throughout much of the Tusayan Ranger District (approximately 180,000 acres, or 50% of the district's land base), as well as on adjoining State and private lands, and only four acres would be destroyed by implementation of the Lower Dillman Pit project, there is no cumulative effect on the viability of this forest-type.

## Understory Vegetation, including Noxious Weeds and TES Plants

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### Affected Environment

The vegetation in the existing pit is very early seral – rabbitbrush, cheatgrass, mullein. Existing vegetation in the proposed expansion area is primarily closed-canopy pinyon-juniper, with a blue gramma understory. There is a lot of bare soil between understory plants. Other species present include cliffrose, algerita, rabbitbrush, agave, mutton bluegrass, squirreltail, sideoats gramma, three awn, needlegrass, and cheatgrass.

The USDI Fish and Wildlife Service has determined that there are no federally threatened or endangered (TES) plant species that occur on the South Zone of the Kaibab National Forest (letter from the USDI Fish and Wildlife Service to the USDA Forest Service Southwestern Region June 4, 2003; Consultation # 2-22-03-F-633). There is also no suitable or critical habitat present for any T&E listed species within the proposed project location.

Sensitive species are defined as "those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by: a) significant current or predicted downward trends in population numbers or density; or b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution" (FSM 2670.5(19)). Appendix 1 lists sensitive plant species that are known or suspected to occur on the South Zone of the Kaibab National Forest.

The only sensitive plant species known to occur on the Tusayan RD is Tusayan rabbitbrush (*Chrysothamnus molestus*). This species occurs on calcareous soils in pinyon-juniper woodland and grasslands. The project area has been mapped as TES Unit 287. Surveys nearby in the same TES unit have shown Tusayan rabbitbrush to occur frequently over a large area. The proposed project area was surveyed in November 2005 and February 2006; one Tusayan rabbitbrush plant was found in the proposed expansion area. Several populations were found immediately adjacent to the expansion area.

Tusayan flameflower (*Talinum validulum*) and leatherleaf clematis (*Clematis hirsutissima*) are two native species of interest which were previously on the FS sensitive list. Though they were removed from the list in 1999, forest biologists continue tracking their presence. There is no habitat for either of these species in the Lower Dillman Pit project area. Flameflower occurs in extremely shallow soils and leatherleaf clematis occurs on north-facing slopes.

Site inspections in November 2005 and February 2006 revealed that there are no noxious weeds other than cheatgrass in the existing pit and proposed expansion. A gravel pit located in the Upper Basin on the Tusayan Ranger District is heavily infested with Scotch thistle; the thistle has been introduced to several other locations on the district where gravel from the contaminated pit has been used. Lower Dillman Pit should be monitored closely to detect and control populations of invasive plants. Vehicles and machinery accessing the pit should be washed prior to entry in order to prevent introduction of weed seeds.

## Environmental Consequences

### **Alternative 1 – No Action**

The existing pit would continue to be dominated by non-native, early seral species. The expansion area would remain vegetated with primarily native species. Successful colonization by new invasive species would be unlikely in either location because there would be no new soil disturbance. There would be no impact to any threatened, endangered, or sensitive plants or their habitats.

### **Alternative 2 – Proposed Action**

Native vegetation in the proposed expansion would be removed. Good habitat for invasive, noxious plants would be created in both the existing and proposed sites. Monitoring and vehicle washing will decrease the likelihood of successful noxious weed establishment. There would be no impact on any threatened or endangered plant species or their habitat. At least one Tusayan rabbitbrush plant would be destroyed. Four acres of habitat for Tusayan rabbitbrush would be destroyed, at least in the short term. Mixing soil horizons during excavation could alter soil chemistry sufficiently to prevent rabbitbrush colonization in the long term, as well. Because suitable habitat is plentiful throughout much of the Ranger District, as well as on State and private lands south of the District (pers. comm., Gary Hase, 2005), and because the project would destroy only a single plant, impacts on Tusayan rabbitbrush and its habitat would be negligible.

## Cumulative Effects

The cumulative effects analysis area for rare plants and noxious weeds is the entire Tusayan Ranger District.

Because Tusayan rabbitbrush is widespread on the Tusayan Ranger District and only a single plant is likely to be destroyed by implementation of the Lower Dillman Pit project, there is no cumulative effect on the species.

There are very few noxious weed locations in the Tusayan Ranger District. Dalmatian toadflax is established in the right-of-way of Highway 64, inside the Ranger District compound, inside Ten-X Campground, along the western boundary of the Grand Canyon National Park Airport, and at the APS sub-station just west of the community of Tusayan. There is Dalmatian toadflax, bull thistle, and Scotch thistle in the right-of-way of Highway 180. Scotch thistle and diffuse knapweed occur along FR 307 and in a nearby gravel pit in the Upper Basin. Camelthorn, Russian knapweed, and Scotch thistle occur along Highway 64 east of Grand Canyon National Park near Upper Basin. One bull thistle plant has been found on the Anita allotment; another was found on the Moqui Allotment. Cheatgrass occurs throughout the Ranger District; its exact distribution has not been mapped. Because this and all future projects will be mitigated in order to prevent introduction and spread of noxious weeds, the Lower Dillman Pit project has no cumulative effects on noxious weeds.

## Rangeland Resources

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### Affected Environment

The proposed project is in the Dillman pasture (8800 acres) of the Anita Grazing Allotment. It is less than one-tenth-mile east of Lower Dillman Tank, a constructed stock pond in Blue Stem

Wash. There is currently no evidence of sediment movement from the pit into the tank. Forage within the existing pit is primarily annual grasses and forbs. Forage in the proposed expansion area is primarily perennial forbs and grasses. Production is naturally low (150 – 175 lbs./ acre) in both areas (TES 1991). There is a range monitoring plot in Blue Stem Wash, between Lower Dillman Tank and FR 305. Any improvements to the access road (FR 318) should avoid impacting the plot.

## Environmental Consequences

### **Alternative 1 – No Action**

There would be no change in the current forage production or utilization or in runoff or sediment inputs to Lower Dillman Tank.

### **Alternative 2 – Proposed Action**

There would be a small reduction in the total amount of forage available to livestock in Dillman pasture. There would be no forage available in the excavation areas for as long as they were active. Annual plants would return to the sites quickly once activity ended. In the long term, an attempt would be made to restore native vegetation, which would restore the inherent forage productivity. However, the high degree of soil disturbance in both areas may prevent successful establishment of native perennial vegetation. During implementation, the perimeter of the pits would be contoured to prevent sediment from leaving the site and entering Lower Dillman Tank. There would be no short-term or long-term impacts on water quality or water quantity for livestock.

## Cumulative Effects

The range resources cumulative effects analysis area is the Anita Grazing Allotment. Anita covers approximately 103,000 acres. Ongoing activities and impacts on the allotment include fuelwood gathering, roads, and dispersed camping. Each of these causes some ephemeral or long term loss of forage resources. Specific projects that have occurred on the allotment during the past 10 years are primarily burning and thinning for fuels reduction (Watson Burn, X-B Burn, Grapevine Burn, Tusayan East, Long Jim, Lonetree, and 10-X). Some lightning-caused fires are allowed to continue burning within pre-determined conditions and locations (the Transfer and Camp 36 Fires in 2005). This type of burning is called “Wildland Fire Use” and is used to decrease fuel loads and improve herbaceous vegetation. Each of these projects may briefly reduce forage availability, immediately after burning, but increases both the quality and quantity of forage in the long term. Each may also cause short-term increases in soil erosion, possibly causing a limited amount of increased sedimentation into water catchments.

A proposed future project on the Anita Allotment is the reconstruction of four existing water catchments (earthen tanks) and construction of eight new catchments. These proposed sites are all in ephemeral drainages. None are upstream or downstream of Lower Dillman Pit; Lower Dillman Pit would have no impact on water resources for livestock.

While the re-opening and expansion of Lower Dillman Pit would cause the loss of a small amount of forage resources, other projects in the Anita Allotment are increasing forage. These increases are on much larger acreages and more than compensate for losses in Lower Dillman Pit. The pit would have no impact on any water resources. There would be no significant cumulative impacts

on range resources in the Anita Allotment, or any other allotment, due to implementation of the proposed project.

## **Fire and Fuels**

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### **Affected Environment**

Historically, the project area and adjacent lands have experienced very few large wildfires. Fire risk is generally low within the project area.

Hazardous fuel reduction projects completed and planned for areas in the vicinity of Lower Dillman Pit focus on grassland and savannah restoration, pinyon-juniper woodland restoration, and wildland fire use. Treatments include mechanical thinning, piling and pile burning, fuelwood removal (both commercial and personal use), and prescribed or managed burning.

### **Environmental Consequences**

#### **Alternative 1 – No Action**

There would be no change to current fire risk or hazardous fuel conditions.

#### **Alternative 2 – Proposed Action**

No hazardous fuel currently exist in Lower Dillman Pit. Tree removal on the four-acre expansion area would reduce the risk of fire and hazardous fuel conditions in the immediate area. Cut trees would be piled and burned under controlled conditions.

### **Cumulative Effects**

The fire/fuels resources cumulative effects analysis area is Ecosystem Management Area 8 on the Tusayan Ranger District. This management area represents the pinyon-juniper woodland, grassland, and sagebrush areas on the district and covers approximately 240,000 acres. Because the proposed expansion area is so small, there would be no significant cumulative impacts on fire/fuels resources due to implementation of the proposed project.

## **Wildlife Resources**

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This section summarizes effects on federally listed species, Forest Service sensitive species, management indicator species (MIS), and migratory bird species of concern from the expansion of Lower Dillman Pit from five acres to nine acres. The Forest Service sensitive species analyzed include those on the Regional Forester's list published on July 21, 1999. The MIS analyzed include all of those in Ecosystem Management Area 8 on the Kaibab National Forest. The migratory bird species of concern analyzed include those on the U.S. Fish & Wildlife Service (FWS) birds of conservation concern list for the Colorado Plateau-Southern Rockies Region and the Partners in Flight priority bird list for applicable habitats in Arizona.

For some wildlife species addressed, habitat doesn't exist and/or their range does not overlap with the project area. For other wildlife, species impacts from the proposed project would be minor and would not result in impacts to habitat or population trends and therefore, no significant

impacts would occur to these species (see Appendix 2 for species and rationale). These species will not be discussed further in this section.

## Affected Environment

The Engineering section of the Kaibab National Forest proposes to expand Lower Dillman Pit from five acres to nine acres. Work would involve the removal of trees and reconstructing a section of FR 318 into the pit. Lower Dillman Tank is located north and just across from the entrance into the pit.

## Environmental Consequences

### Threatened and Endangered, and Sensitive Species (TE&S)

No federally listed species would be affected from implementation of the proposed action because no habitat exists for federally listed species in the project area. Bald eagles and condors have the potential to occur within the project area with the presence of carrion. Owing to the lack of perch trees (large snags or trees) for these two species in the project area and the opportunistic nature of potential use of the project area, the proposed action would not negatively affect these species or their populations.

### **Sensitive Species**

Though information on habitat requirements for the Navajo Jerusalem cricket and tiger beetle (*Cicindela purpurea cimarron*) are largely unavailable, population trends for these species are not likely to be adversely affected by the proposed action because of the small likelihood that these species occur within the project area. Habitat requirements for two tiger beetles (*Amblycheila picolominii* and *Amblycheila schwarzi*) are associated with bare rock/talus/scree slopes. Bare rock is found within the present pit but it is unknown if these two species are located within the project area. Population or habitat trends are not likely to be adversely affected by the proposed action.

### **Management Indicator Species (MIS) – Rocky Mountain Elk, Mule Deer, and Juniper Titmouse**

The MIS concept was developed for use in land-management planning and was based on the idea that monitoring population trends of selected species could allow assessment of the effects of habitat management on communities that include those species. The assumptions inherent in this approach include the following: a) the status of MIS will be reflected in the impacts of management activities at the Forest and the project level; b) changes in MIS populations can be assessed and tracked through time; and c) the changes are representative of overall ecosystem conditions. The selection of MIS, as described in the Federal Code of Regulations (36 CFR 219.19), may include the following: threatened or endangered plant and animal species identified on State and Federal lists; species with special habitat needs that may be significantly influenced by planned management programs; species commonly hunted, fished, or trapped; non-game species of special interest; or other plant or animal species that may reflect management activities. Information on the status of MIS and their associated habitat at the Forest-level, comes from the *Management Indicator Species for the Kaibab National Forest, October 15, 2003* (MIS Report).

There would be slight changes to cover for elk and mule deer in the project area with the removal of four acres of pinyon-juniper woodland. The use of Lower Dillman Tank by animals would likely be impacted when work is being done at the pit, or when the pit is in use. But this work would be intermittent and the use would not be for long periods of time and would only occur during daytime hours.

The proposed action would slightly affect the preferred habitat for the juniper titmouse, which consists of tall pinyon and juniper trees in moderate densities (Latta et. al. 1999). Removal of pinyon-juniper woodland would result in a slight negative effect on habitat for the juniper titmouse. No effects on population trends would occur, owing to the small degree of negative effects to habitat for this species and the small area of the proposed project area.

### **Migratory Bird Species of Concern**

This action would affect quality of mid-to-late successional pinyon-juniper woodlands, which are preferred by the gray flycatcher, pinyon jay, gray vireo, black-throated gray warbler, and Virginia's warbler. However, these species may exist in non-optimal habitat within the treatment area. Expansion would result in loss of this habitat, but the area proposed for treatment is small relative to the population extent of these species.

### **Local Species of Concern**

Potential foraging habitat exists within the proposed area for Allen's lappet-browed bat, spotted bat, and Townsend's big-eared bat. Project-related effects to foraging habitat for these species are not certain, though more open conditions could benefit foraging habitat for these bats by increasing insect abundance and flight maneuverability. These potential effects would not affect the population trends of these species, owing to the small area being expanded relative to population extent, and the absence of roost sites for these species within the project area.

### **Cumulative Effects**

Cumulative effects include past, present, and reasonably foreseeable future activities that are likely to occur. Past (past 15 years), present, and future activities and projects within the analysis area follow.

Previous projects that have occurred in the general area include the No Name, Nameless, and Harbison grassland restoration projects (approximately 1500 acres), Harbison fuelwood sales (550 acres), Tusayan South Fuel Reduction Project (1100 acres), Sage Tank Grassland Mowing project (145 acres), pronghorn antelope fence modification (33 miles), livestock fence construction (1 mile), and environmental analysis on livestock grazing for the Anita and Moqui allotments.

Grassland improvements, fuelwood sales, and fuel reductions have resulted in a positive trend in the abundance of forage and grass cover. Therefore, effects from the proposed action would not have a cumulative effect of contributing to this increasing trend.

Livestock fence construction listed above lessen the rate of improvement, but do not reverse the trend, owing to the small length of fence created, compared to that modified or removed to facilitate pronghorn movement, and the use of smooth bottom wire in the livestock fence construction project.

The proposed project would not result in significant impacts to species populations or habitat trends for any federally listed species, Forest Service sensitive species, MIS, or species of local concern.

## Heritage Resources ---

### Affected Environment

Archaeologists intensively surveyed the 4-acre expansion area that is proposed for ground disturbance within the Lower Dillman project area. Three small artifact scatters were identified. These sites have not been evaluated in sufficient detail to determine their eligibility to the National Register of Historic Places, but will be treated as eligible for the purposes of this activity (Weintraub, KNF Heritage Clearance 2006-25).

### Environmental Consequences

#### Alternative 1 – No Action

Under Alternative 1, there would be no measurable direct or indirect effects on any heritage resources.

#### Alternative 2 – Proposed Action

Under Alternative 2, there would be no effect to heritage resources because all three heritage sites will be completely avoided. Should any expansion plans change, heritage resource specialists will consider those projects subject to the Section 106 process of the National Historic Preservation Act of 1966. Heritage survey and clearance will have to be completed prior to reconstructing the three-quarter mile section of FR 318.

### Cumulative Effects

There are no cumulative effects from the no action or proposed action alternatives on heritage resources.

## Recreation and Scenic Resources ---

The Recreation Opportunity Spectrum (ROS) and Scenery Management System (SMS) are recreation management tools used to determine the types and extent of land management practices allowable in a project area. On the Kaibab National Forest, efforts were made to insure the two systems were mapped consistently and complemented one another. The intent is to insure consistent interpretation and application of the standards and guidelines, and effective and successful implementation of projects on the ground.

### Affected Environment

The 9-acre project area is located approximately 12 miles south of the community of Tusayan and 6 miles east of State Highway 64 with access from FR's 320, 305, and 318. Although the exact use numbers and patterns of use are not known, recreation use in and surrounding the project area

is estimated by South Zone recreation managers to be low with the exception of hunting season in the fall when use becomes moderate to high. Lower Dillman Tank, across from Lower Dillman Gravel Pit, has three sturdy scrap wood blinds constructed by hunters. Local residents are a significant user group, as they have immediate access to the national forest.

Other types of recreational activities visitors pursue in and near the project area may include viewing scenery and wildlife, dispersed camping, hiking, mountain biking, horseback riding, riding ATVs and motorcycles, and fuelwood collection. There are no special use permits in the vicinity of the project area. There are no developed recreational facilities in or near the project area. Given its location, the project area may be visible by hikers from the top of Red Butte.

The project area is classified as Roaded Natural (RN) in the Kaibab National Forest Plan. Roaded Natural landscapes are carefully managed to maintain or enhance recreation and scenic values, sites and features, are to be natural-appearing, with changes designed to appear in harmony with the natural setting. These areas may contain highly developed recreation sites and travel routes.

Scenic Integrity Objectives (SIO's) are used by the Forest Service to evaluate scenic aesthetics and guide the type and extent of change to the visual resources that may occur as the result of management activities. SIO's are a combination of the scenic characteristics and visual diversity of an area and how sensitive an area is to viewers. The Scenic Integrity Objective for this project is SIO-3, Moderate. This means the general setting description or desired condition is slightly altered. Noticeable deviations remain visually subordinate to the landscape character being viewed at the end of the project activity.

**Transportation System – Roads.** Guidelines for minerals management in the Forest Plan suggest an evaluation of transportation proposals for mineral development based on impacts on the SIO and the desired condition for the area. The Forest Plan stresses the fact that mineral development will not affect the visual foregrounds of sensitive travel corridors in these areas. There are no sensitive travel corridors designated within or nearby the Dillman Pit project area, so this does not apply. This project would reconstruct and relocate the first three-quarters of a mile of FR 318 where it starts from FR 305.

## Environmental Consequences

### Alternative 1 – No Action

If no action is taken, the degradation of the district road system would continue with the possibility of further road closures for public safety. Recreational use would likely remain similar to current use. The existing pit site would likely not be reclaimed.

### Alternative 2 – Proposed Action

Forest Road 318 would be improved. Local district roads would be re-surfaced and maintained at higher standards once Lower Dillman Pit is operational and there's a local source of aggregate (more cost-effective). Improved road maintenance may encourage more use of the road system in the southern half of the district and improve recreational opportunities. The project site would be reclaimed following the end of operations and once more blend back into the landscape.

## Cumulative Effects

Cumulative effects include past, present, and reasonably foreseeable future activities that are likely to occur. The geographical extent of the cumulative effects analysis area is a 5-mile radius from the project area. This analysis area includes similar scenic values and recreational pursuits that are currently underway in the project area. Current ongoing and recently implemented projects in the analysis area are listed in Table 2 starting on page 15. For most forest users this area will not be noticeable from any major travel corridors most of the time. The Lower Dillman Pit has been visible for over 25 years. This project provides the opportunity to reclaim the area in 15 to 20 years.

There would be no significant cumulative impacts to existing visual and recreational resources on national forest land within and nearby the project area if the area is reclaimed following the end of operations.

## Lands and Minerals

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### Affected Environment

There are currently no mining claims or oil and gas leases on the proposed 9-acre project area. There are currently no lands special uses associated with the proposed project area. Access to the project area is via Forest Service system roads 320, 305, and 318. There are no known caves or karst landforms on the proposed project area. Therefore, there is no conflict with the intent of the Federal Cave Protection Act of November 18, 1988.

### Environmental Consequences

#### **Alternative 1 – No Action**

The 9-acre project site would continue to be managed for lands special uses and minerals within guidelines specified in the Kaibab Forest Plan. The area is open for the location of mining claims under the General Mining Law of 1872. There are currently no mining claims located within the project area.

#### **Alternative 2 – Proposed Action**

The United States has mineral rights in the 9-acre project site, so the area would remain available for mining claims under the General Mining Law of 1872. The project area/activities would preclude most lands special uses which would still need to be evaluated on a case-by-case basis.

### Cumulative Effects

The proposed action would result in the loss of four additional acres of NFS lands for future lands special uses and activities. There would be no cumulative effects to mining claims since this activity is still allowed under the General Mining Law of 1872. There are no cumulative effects on cave resources since they don't exist in the project area.

## Economics and Lifestyles ---

### Affected Environment

The communities closest to the project area are those in Coconino County: Tusayan; Grand Canyon Village, South Rim; Valle; Cameron; Havasupai Village; and Williams. Occupied private land is about 6 miles from the project area. Fuelwood cutters, hunters, and other recreational users use the project area. The communities of Tusayan and Grand Canyon Village numbered 2,022 individuals according to the latest census in 2000 ([www.census.gov](http://www.census.gov)).

The principal economic activities in this area of Coconino County occur with federal, state, and local governments, retail trade, and the service sector. The trade and service sectors are oriented toward tourism. Commercial timber cutting and livestock grazing are enterprises that represent minor components of the economic environment.

General government revenue sources primarily include payroll tax, sales tax, corporate income tax, and property tax. In addition, under the Twenty-five Percent Fund Act of 1908, Coconino County receives 25% of annual national forest receipts for benefits to public schools and roads.

### Environmental Consequences

#### **Alternative 1 – No Action**

There would be no foreseeable economic changes in the local communities.

#### **Alternative 2 – Proposed Action**

The Forest Service would incur the costs of reopening and expanding the existing Lower Dillman Gravel Pit. The Forest Service would incur the cost of reconstructing FR 318. These costs would be offset by providing a local Forest Service source of aggregate materials for district road maintenance. These materials would not have to be purchased and hauled from a private company at more considerable costs.

There would be some negative short-term effects during the expansion of the pit, road reconstruction, and intermittent use of the pit. These primarily include: noise and human disturbance to wildlife during these activities; some noise disturbance to Forest visitors and permittees, primarily during the day; truck traffic on access routes; noticeable dust and equipment exhaust during pit operation; smoke from pile burning due to tree removal; and potential decrease in the quality of recreational experiences due to noise, the presence of equipment, and reconstruction of FR 318.

The proposed action would be beneficial to the communities and visitors by providing local materials for district road resurfacing and maintenance for improved access to their public lands. Improved road maintenance would enhance recreational access on the Tusayan Ranger District, particularly in the southern half of the district.

## Environmental Justice

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” issued February 11, 1994, provides the following responsibilities of federal agencies involved in federal projects:

“Considerations of environmental justice are included to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations ...”

The principle behind environmental justice is simple: people should not suffer disproportionately from federal actions because of their ethnicity or income level.

The proposed action deals with the operation and expansion of a Forest Service gravel pit and would occur regardless of a person’s ethnicity or income level. Although there is a high percentage of ethnic minority populations in the Southwest, there is no evidence that the proposed action alternative would disproportionately affect any of these groups. There is nothing that indicates the proposed action would have a disparate impact on any low-income populations.

## Cumulative Effects

There would be no measurable cumulative effects on economics or lifestyles from implementation of the proposed action.

# 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 Members

Barbara McCurry	NEPA Planner, Project Leader
Rick Stahn	Tusayan District Ranger/Silviculturalist
Chuck Nelson	Wildlife Biologist (retired)
Jeff Waters	Lead Wildlife Biologist
Lauren Johnson	Range, Soils, Watershed, Sensitive Plants, Noxious Weeds
Ron Tissaw	Civil Engineering Tech
Mike Lyndon	Archaeologist
Neil Weintraub	Archaeologist
Joel McCurry	Recreation Specialist
Dave Mills	Fire and Fuels Specialist

## Federal and State Officials and Agencies

Chip Ernst	NEPA Specialist
Tom Mutz	Lands/Minerals Specialist
Steve Jenner	Lands/Minerals Assistant
Melissa Schroeder	Forest Tribal Liaison (moved on)
John Booth	Engineering Staff Officer
John O'Brien	Roads Manager, Engineering
Karre Jo Santana	Resource Clerk, South Zone, Kaibab NF
Rick Miller	Arizona Game & Fish Department
Mark Fitch	Arizona Department of Environmental Quality

## Tribes

Havasupai Tribe	Hopi Tribe
Hualapai Tribe	Yavapai-Prescott Indian Tribe
Pueblo of Zuni	Navajo Nation (NN)
Coppermine Chapter (NN)	Bodaway Gap Chapter (NN)
Cameron Chapter (NN)	Coalmine Canyon Chapter (NN)
LeChee Chapter (NN)	Tuba City Chapter (NN)
Leupp Chapter (NN)	

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# APPENDICES

## Appendix 1. Potential Sensitive Plant Species on the Williams and Tusayan Ranger Districts

Common Name	Scientific Name	Suitable Habitat	Possible Habitat in Project Area?
Mt. Dellenbaugh sandwort	<i>Arenaria aberrans</i>	Meadows or near meadow edges within oak and pine forests; elev. 5500 – 9000 ft.	No – closed canopy P-J
Rusby's milkvetch	<i>Astragalus rusbyi</i>	Dry or temporarily moist basaltic soils in aspen, mixed conifer, ponderosa pine, and pine – oak.	No – too dry, wrong soils
Tusayan rabbitbrush	<i>Chrysothamnus molestus</i>	Calcareous soils; pinyon-juniper and grasslands.	Known
Arizona bugbane	<i>Cimicifuga arizonica</i>	Shady, moist canyon bottoms, seeps, springs; high humus soils; high humidity.	No – too dry, wrong soils
Cliff fleabane	<i>Erigeron saxatilis</i>	High on canyon walls in isolated pockets in sandstone outcrops.	No – wrong topography, wrong soils
Flagstaff pennyroyal	<i>Hedeoma diffusum</i>	Dolomitic limestone outcrops or soils in ponderosa pine forest.	No – wrong vegetation type, outside known range
Flagstaff beardtongue	<i>Penstemon nudiflorus</i>	Dry slopes in ponderosa pine, on light, dry, neutral soils in mountainous or eroded regions.	No – wrong vegetation type, outside known range

**Appendix 2. Species that would not have Habitat or Population Trends affected by either Alternative and Associated Rationale**

Common Name	Scientific Name	Status	Rationale
<b>Amphibians</b>			
Northern leopard frog	<i>Rana pipiens</i>	Sensitive	No habitat within project area. Found in fresh-water ponds or streams that typically hold water year-round and have aquatic vegetation.
<b>Birds</b>			
American peregrine falcon	<i>Falco peregrinus anatum</i>	Sensitive	No habitat within project area.
Arizona woodpecker	<i>Picoides arizonae</i>	FWS Bird of Conservation Concern (BCC)	Range does not overlap; found in extreme southeastern Arizona.
Baird's sparrow	<i>Ammodramus bairdii</i>	BCC	Range does not overlap; found in extreme southeastern Arizona.
Bell's vireo	<i>Vireo bellii</i>	BCC	No habitat in project area; breeds in riparian associated habitat with dense brush, willow thickets, mesquite, streamside thickets, and scrub oak.
Black swift	<i>Cypseloides niger</i>	BCC	No impacts to habitat or population trends; forages over forests and open areas and breeds in cliffs near waterfalls that do not occur within or near the project area.
Botteri's sparrow	<i>Aimophila botterii</i>	BCC	Range does not overlap project area; found in southeastern Arizona and further south.
Broad-billed hummingbird	<i>Cynathus latirostris</i>	BCC	Range does not overlap project are; found in southeastern Arizona and further south.
Buff-breasted flycatcher	<i>Empidonax fulvifrons</i>	BCC	No habitat within project area; found in canyons associated with riparian and pine/oak.
Burrowing owl	<i>Athene cunicularia</i>	BCC	No habitat within project area; associated with grassland/open habitat.
Chestnut-collared longspur	<i>Calcarius ornatus</i>	BCC	No habitat within project area; prefers grassland habitat.
Chihuahua savannah sparrow	<i>Passerculus sandwichensis rufofuscus</i>	Sensitive	No habitat within project area; prefers grassland habitat which does not exist in project area.
Costa's hummingbird	<i>Calypte costae</i>	BCC	Range does not overlap – occurs in southern Arizona.

Common Name	Scientific Name	Status	Rationale
Crissal thrasher	<i>Toxostoma crissale</i>	BCC	No potential habitat; occurs in chaparral habitat.
Elegant trogon	<i>Trogon elegans</i>	BCC	Range does not overlap; found in southern Arizona and northern Mexico.
Elf owl	<i>Micrathene whitneyi</i>	BCC	No habitat in project area; found in desert-wash woodland and Arizona walnut habitat.
Ferruginous hawk	<i>Buteo regalis</i>	BCC	No potential habitat; associated with grassland habitat.
Gilded flicker	<i>Colaptes chrysoides</i>	BCC	Range does not overlap; breeds in southern Arizona.
Golden eagle	<i>Aquila chrysaetos</i>	BCC	No impacts to population or habitat trends; forages over a wide area.
Grasshopper sparrow	<i>Ammodramus savannarum</i>	BCC	Range does not overlap; found in extreme southern Arizona.
Gray hawk	<i>Buteo nitidus</i>	BCC	No habitat found in project area; found in wooded watercourses.
Hairy woodpecker	<i>Picoides villosus</i>	MIS	No habitat in project area; associated with ponderosa pine which is not found in project area.
Lark bunting	<i>Calamospiza melanocorys</i>	BCC	No impacts to habitat or population trends; does not breed in northern Arizona, winters in southern Arizona.
Lucifer hummingbird	<i>Calothorax lucifer</i>	BCC	Range does not overlap; found in extreme southeastern Arizona.
Lucy's warbler	<i>Vermivora luciae</i>	MIS of late seral, low elevation (<7,000 feet) riparian habitat	No potential habitat; occurs in riparian cottonwood and willow habitat in mountain foothills and desert riparian mesquite.
Marbled godwit	<i>Limosa fedoa</i>	BCC	No habitat in project area.
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened	No habitat in project area.
Mountain plover	<i>Charadrius montanus</i>	BCC	Breeding and wintering ranges do not overlap; breeding range is in eastern New Mexico; winter range includes southwestern Arizona, central valley of California, and Baja California.

Common Name	Scientific Name	Status	Rationale
Northern beardless tyrannulet	<i>Camptostoma imberbe</i>	BCC	No potential habitat in project area; occurs in arid scrub, thickets, mesquite, or open riparian woodland.
Northern goshawk	<i>Accipter gentilis</i>	Sensitive	No impacts to habitat or population trends due to the small area proposed for expansion.
Northern harrier	<i>Circus cyaneus</i>	BCC	No impacts to habitat or population trends; associated with grasslands.
Prairie falcon	<i>Falco mexicanus</i>	BCC	No habitat within project area; associated with grassland habitat.
Purple martin	<i>Progne subis linnaeus</i>	AZ PFPB Species of pine habitat	No habitat within project area.
Rufous-winged sparrow	<i>Aimophila carpalis</i>	BCC	No potential habitat in project area; found in open, flat grassy areas with scattered thorn bush, mesquite, or cholla.
Short-eared owl	<i>Asio flammeus</i>	BCC	No potential habitat; occurs in fresh or saltwater marshes, bogs, dunes, or tundra.
Snowy plover	<i>Charadrius alexandrinus</i>	Coastal Subspecies Threatened; BCC	Only two breeding records from AZ, one in SE Arizona and the other in western AZ. Winters in western Mexico, year-round resident along California coast.
Solitary sandpiper	<i>Tringa solitaria</i>	BCC	No impacts to habitat or population trends; does not breed in northern Arizona, migrant.
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered	No potential habitat; occurs along rivers, streams, and other wetlands with dense riparian vegetation.
Sprague's pipit	<i>Anthus spragueii</i>	BCC	Breeding and wintering ranges do not overlap; does not breed in Arizona; winters in southern Arizona.
Swainson's hawk	<i>Buteo swainsoni</i>	BCC	No impacts to habitat or population trends due to small area of proposed pit expansion.
Turkey	<i>Meleagris gallopavo</i>	MIS	No impacts to habitat or population trends; prefers large open ponderosa pine stands with grass understory.
Varied bunting	<i>Passerina versicolor</i>	BCC	Range does not overlap; found in southern Arizona only.

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>	<b>Rationale</b>
Whiskered screech owl	<i>Megascops trichopsis</i>	BCC	Range does not overlap; found in southeastern and south Arizona.
Wilson's phalarope	<i>Phalaropus tricolor</i>	BCC	No impacts to habitat or population trends; does not breed in northern Arizona, migrant.
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	BCC	No potential habitat; occurs in large blocks of riparian woodlands (cottonwood, willow, or tamarisk).
Yellow breasted chat	<i>Icteria virens</i>	MIS	No potential habitat; occurs in riparian associated dense shrubby habitat.
Yuma rufous-crowned sparrow	<i>Aimophila ruficeps rupicola</i>	Sensitive	No habitat in project area; associated with open, grassy Upper Sonoran habitat.
<b>Fish</b>			
Apache (Arizona) trout	<i>Oncorhynchus apache</i>	Threatened	Range does not overlap and no potential habitat; restricted to perennial streams of upper Salt, Blue, and Little Colorado drainages, and introduced to North Canyon and Grant Creek.
Little Colorado spinedace	<i>Lepidomeda vittata</i>	Threatened	Range does not overlap and no potential habitat; occurs in north-flowing tributaries of the Little Colorado River with slow to moderate water currents.
Spikedace	<i>Meda fulgida</i>	Threatened, Critical Habitat	No potential habitat; occurs in moderate to large perennial streams with moderate to swift water velocities.
<b>Invertebrates</b>			
A tiger beetle	<i>Cicindela hirticollis corpuscular</i>	Sensitive	No habitat within project area; associated with perennial streams.
Aquatic macroinvertebrates	<i>Various species</i>	MIS	No habitat within project area.
Early elfin butterfly	<i>Incisalia (Callophrys) fotis</i>	Sensitive	No potential habitat; occurs in desert mountains and canyons in pinyon pine or pinyon-juniper habitat with substantial cliffrose.

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>	<b>Rationale</b>
Maricopa tiger beetle	<i>Cicindela oregano maricopa</i>	Sensitive	No potential habitat; associated with sandy, riparian situations, such as stream bands, edges, and sand bars.
Mojave giant skipper	<i>Agathymus alliae</i>	Sensitive	No potential habitat; found in open pine woodland canyons and desert with <i>Agave utahensis</i> .
Mountain silverspot Butterfly	<i>Speyeria Nokomis nitocris</i>	Sensitive	No potential habitat; occurs in open seepage areas.
Neumogen's giant skipper	<i>Agathymus neumoeni</i>	Sensitive	No potential habitat; uses dry, open woodlands or shrublands with <i>Agave parryi</i> .
Obsolete viceroy butterfly	<i>Limenitis archippus obsoleta</i>	Sensitive	No potential habitat; occurs in riparian canyons and desert arroyos.
Spotted skipperling	<i>Piruna polingii</i>	Sensitive	No potential habitat; occurs in moist meadows in coniferous and mixed woodlands.
<b>Mammals</b>			
Black-footed ferret	<i>Mustela nigripes</i>	Endangered	No potential habitat; one female ferret and her litter are estimated to require approximately 598 acres of Gunnison's prairie dog habitat; no Gunnison's prairie dog towns exist within the project area.
American pronghorn antelope	<i>Antilocapra americana</i>	MIS	No potential habitat in project area.
Desert bighorn sheep	<i>Ovis canadensis mexicana</i>	Sensitive	No habitat within project area.
Navajo Mexican vole	<i>Microtus mexicanus navaho</i>	Sensitive	No habitat within project area; associated with grasslands and savannah habitat.
Western red bat	<i>Lasiurus blossevillii</i>	Local Concern	No potential habitat; occurs in riparian habitat with cottonwoods, oaks, and sycamores.