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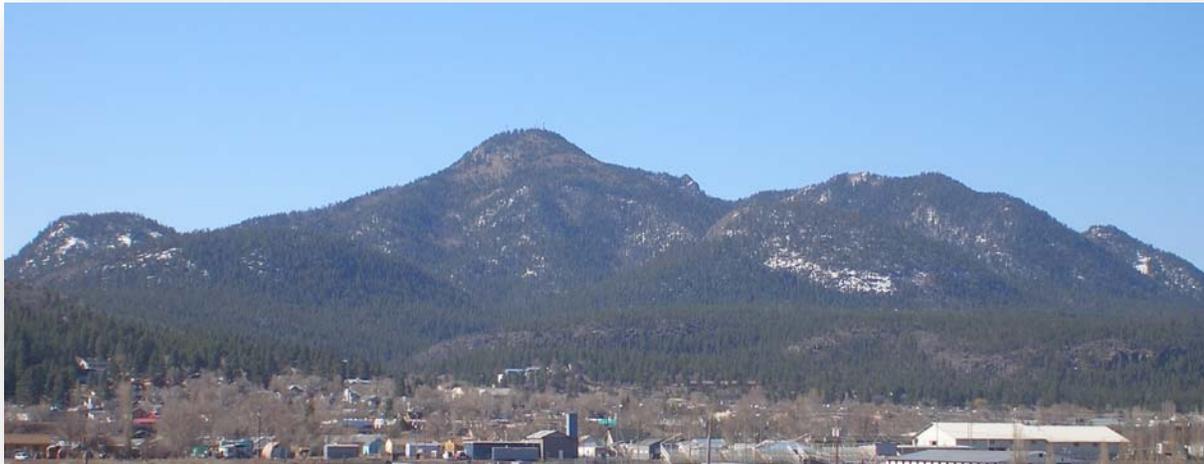
April 2011



BILL WILLIAMS MOUNTAIN RESTORATION PROJECT

Scoping Packet

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



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Introduction

The following scoping document is provided to share some specifics regarding the Bill Williams Mountain Restoration Project. It includes the Purpose and Need for Action and the Proposed Action. The Proposed Action was developed to allow the Forest Service reasonably constrained flexibility to sustain a variety of ecosystem goods and services. It strives to resolve the disparity between the desired conditions and the existing conditions within the project area. Multiple treatments would be applied on approximately 15,200 acres of the analysis area to satisfy social and ecological needs in a way that ensures ecosystem services are not impaired or degraded.

An existing condition and desired condition report was prepared for the project area and is attached (Appendix 1). A vicinity map and a general location of the project area is included in the existing and desired conditions report. Maps illustrating the proposed action can be found following the description of the proposed action (Appendix 2).

Given the scope and complexity of the project, we will be preparing an Environmental Impact Statement (EIS). An EIS will adequately allow us to understand and give consideration to the potential impacts of the proposed action. The Notice of Intent (NOI) for this EIS should be published in the Federal Register in April 2011.

Background

Bill Williams Mountain lies just southwest of Williams, Arizona and has an elevation of 9,256 feet. It was identified by both the City of Williams and the USDA Forest Service as a critical resource deserving special protection from catastrophic wildfire in the Greater Williams Area Community Wildfire Protection Plan (2005).

There is a multi-million dollar electronics site on the top of the mountain providing communications towers for the Department of Public Safety, USDA Forest Service, Arizona State Land Department, Burlington Northern Santa Fe railroad and several other governmental and private enterprises. The north side of the mountain is home to a small ski resort, and private property, homes and other infrastructure surround the base of the mountain. It is an important sacred site and traditional use area to several Southwestern tribes and has been determined eligible as a traditional cultural property.

Bill Williams Mountain is also the apex of six watersheds; the Sycamore and Hell Canyon watersheds to the south and east, the Cataract Creek and Spring Valley Wash watersheds to the north, and the Ash Fork Draw and Upper Partridge Creek watersheds to the west. The City of Williams relies heavily on three of these watersheds to provide clean and abundant water to the city of Williams reservoirs for their domestic drinking water.

Two large wildfires in Northern Arizona in 2010 and the ensuing monsoon rains highlighted the values-at-risk in the project area and the need for treatment on Bill Williams Mountain. The Eagle Rock Fire burned almost 3,500 acres and the Schultz Fire burned approximately 15,200 acres. These fires involved closures, and evacuations. The long lasting impacts from these high intensity fires included widespread flooding, erosion, sedimentation, snags, road damage, and altered landscapes. A stand replacing wildfire on Bill Williams Mountain could result in a loss of

BILL WILLIAMS MOUNTAIN RESTORATION PROJECT

critical emergency communications systems, silting in of reservoirs, loss of water storage, loss of recreational areas and opportunities, and the potential loss of lives and homes.

Vegetation treatments and prescribed burning have been planned and implemented in many areas surrounding the mountain. These included the City and Twin Projects; however our experiences from last summer and lessons learned from previous years have led us to re-evaluate the treatments within these areas and the need to treat the steep slopes of the mountain.

It is not a question of “if” but “when” a large fire will occur on the mountain. It is time to take significant steps to reduce hazardous fuels and reduce the risk of a high intensity stand-replacing fire from happening near the City of Williams. Treating Bill Williams Mountain has become a high priority for Kaibab National Forest land managers.

Purpose and Need for Action

The purpose of the Bill Williams Mountain Restoration Project is to improve the health and sustainability of forested conditions on and surrounding Bill Williams Mountain by reducing hazardous fuels and moving vegetative conditions in the project area towards the desired conditions. This work would be done to directly and indirectly improve the watershed conditions contributing to the City of Williams water supply.

There is a need for:

- Reintroducing fire as a natural part of the ecosystem;
- Reducing the risk for intense stand-replacement wildland fires;
- Reducing fuel buildup to help prevent the spread of wildland fire onto private property and into drainages leading to the City of Williams reservoirs;
- Reducing overall stand densities and moving stand conditions toward forest structures considered to be more typical of forest structure under pre-settlement fire regimes;
- Treating fuel accumulations to abate fire risks to Mexican spotted owl habitat;
- Improving tree vigor and stand resiliency;
- Improving the diversity of age classes and structure of woody vegetation;
- Improving ground cover, including down woody debris, fine litter and herbaceous understory composition and productivity;
- And by improving the motorized transportation system to provide for a more sustainable road system where poorly located roads are relocated or obliterated.

Specific needs for the proposed timber management actions are also listed below:

- To provide forest products, such as firewood, for people living in Williams, AZ and the surrounding area, in order to meet their needs for forest and wood products, while protecting these resources for future generations.

There is a need to amend the Kaibab National Forest (KNF) Land Management Plan (Forest Plan, as amended, 1988) to re-designate the land suitability classification within the project area to allow restoration treatments to move vegetative conditions towards the reference conditions for the area. This amendment is needed because the long-term desired conditions for the area (achieved through strict-sense restoration and maintenance burning) would preclude timber production over the landscape and not meet the intent of the Forest Plan.

BILL WILLIAMS MOUNTAIN RESTORATION PROJECT

There is a need to amend the Forest Plan (1988, as amended) to allow the Forest to deviate from Forest Plan guidelines for Mexican Spotted Owls in order to achieve restoration objectives on steep slopes (slopes $\geq 40\%$).

There is also a need to amend the Forest Plan (1988, as amended) to allow the Forest to deviate from Forest Plan standards and guidelines in ponderosa pine stands outside of goshawk post-fledgling family areas (PFAs) and goshawk nest areas in order to achieve restoration objectives.

Proposed Action

To meet the purpose and need for action, the Kaibab National Forest proposes the following actions:

Mechanical Treatments

The Proposed Action includes a combination of commercial timber harvest treatments and non-commercial mechanical treatments on approximately 15,200 acres. Treatments would thin stands with mechanized equipment to meet or move toward the desired conditions, and in some stands, non-commercial treatments may be the only treatments feasible/necessary to achieve resource objectives.

The operability zones portrayed in Map 1 are used to define the proposed action and illustrate the operational feasibility of mechanically treating the project area. These zones share common operational attributes such as topography, terrain and potential logging system.

Operability Zones 1, 2 & 6: Ground-based logging systems would be used to treat up to 11,100 acres within these zones and are limited in use to slopes less than 40%.

Operability Zones 3 & 4: Ground-based logging systems would be used to treat up to 200 acres within these zones. Because of the location of these zones near the top of the mountain and the only roaded access along Forest Service Road (FSR) 111 (Bill Williams Mtn Rd), these zones would require specialized equipment (e.g. forwarder and excaliner). Additionally, these zones would require an adverse skid to reach FSR 111 and then, due to the switchbacks along FSR 111 near the summit, skidding would also be required down FSR 111 to reach a suitable landing. Initial reviews of these zones indicate that the proposed ground-based logging system within these zones would be the most economically feasible treatment option however helicopter logging systems may also be utilized.

Operability Zone 5: A cable logging system would be used to treat up to 350 acres within this zone. Slopes within this zone are steep ranging from 40-60% and approximately 1 mile of new road (to be closed following harvest) would be needed to facilitate removal of the fuels. Initial review of this zone indicates that the proposed cable logging system would be the most economically feasible treatment option however helicopter logging systems may also be utilized.

Operability Zone 7: Helicopter logging would be used within this zone to treat up to 3,500 acres due to steep slopes and limited access. Flights would average about 4,000 feet.

Post-Mechanical Treatments

Activity slash treatments will be accomplished using whole-tree skidding, machine piling, hand piling, mulching, crunching, commercial/personal use fuelwood sales, lop & scatter and/or prescribed burning.

Rehabilitation and reclamation of areas impacted from treatments would occur to ensure the health and productivity of the forested ecosystem is sustained.

Strategic Fuels Treatments

Strategic fuel treatments designed specifically to enhance control lines are proposed to enable land managers to achieve resource objectives with prescribed fire while serving to protect important resources. Treatments will reduce surface, ladder, and canopy fuels (i.e. fuel loading) up to 300 feet along both sides of potential control lines. These lines are illustrated in Map 2 and are located along the boundaries of the proposed burn blocks. Approximately 1,500 to 2,500 acres would receive non-commercial treatments and fuels would most likely be thinned by hand-felling techniques or, where practical, machinery equipped with cutting or grinding heads. These treatments represent the minimum acreage needed to prepare stands on steeper slopes for prescribed burning and would be combined with mechanical treatments where possible.

Prescribed Fire

Prescribed fire would be used on approximately 15,200 acres of the project area within Operability Zones 1 through 7. In some areas, prescribed fire would be used in conjunction with mechanical treatments to achieve restoration and fuel treatment objectives, such as in Operability Zones 1, 2 & 6. In other areas where operability is limited and more costly (Zones 3, 4, 5 & 7), only prescribed burning may be used to meet resource objectives; this would be dependent on implementation of the strategic fuel treatments designed to enhance control lines (described above).

- Prescribed burning may be implemented across the project area either prior to or following the mechanical treatments, with the exception of areas on steep slopes requiring the strategic fuels treatments described above. In most areas of the project, prescribed fire will follow mechanical treatments. Areas to be burned will be grouped into several burn units using natural and man-made features, such as roads, trails, and natural rock stringers, for control lines. The size, location, timing, and sequence of burning will consider impacts, such as smoke and risk of fire escape, to downwind communities and users of the National Forest.
- A combination of firing techniques, including ground and aerial ignitions, would be used to accomplish objectives and minimize the risk to human resources.
- Because the intent of prescribed burning is to reduce fuel loading, raise crown base heights and reduce live tree density, maintenance burning would be required.

Transportation

The proposed action includes:

- Constructing approximately 23 miles of new roads to provide sustainable access for ground-based logging treatments (Map 3).
- Constructing approximately 16 miles of temporary roads that would be obliterated after use (Map 3).

BILL WILLIAMS MOUNTAIN RESTORATION PROJECT

- Obliterating up to 28 miles of poorly located roads (Map 4).

Map 5 illustrates the transportation system after implementation of the project. Most of the newly constructed roads would be closed following implementation and allowed to re-vegetate naturally; additionally, drainage features such as culverts will be removed to minimize the long-term maintenance investment of retaining these roads. The resulting open road system after implementation would reflect the July 2011 travel management decision (Map 6).

Trails

Because of the proposed changes to the transportation system, the Proposed Action would extend the Bixler Trail by converting a portion of Forest Service Road (FSR) 45 (from Bixler saddle south) to a non-motorized trail, constructing approximately 1 mile of new trail, and constructing a new trailhead and parking area along FSR 122 (shown on Map 5).

Forest Plan Amendments

The Proposed Action includes three Forest Plan amendments:

1. Amend the Forest Plan to re-designate the land suitability classification on 8,954 acres of ponderosa pine cover type within the project area to allow restoration treatments to move vegetative conditions towards the reference conditions for the area.
2. Allow a one-time project specific amendment to the Forest Plan to allow the Forest to deviate from Forest Plan guidelines for Mexican Spotted Owls on steep slopes (slopes $\geq 40\%$).
3. Allow a one-time project specific amendment to the Forest Plan to allow the Forest to deviate from Forest Plan standards and guidelines in ponderosa pine stands outside of goshawk post-fledgling family areas (PFAs) and goshawk nest areas.

Implementation

Implementation of the proposed action would begin in 2012 and would occur as funding and/or favorable conditions allow.

BILL WILLIAMS MOUNTAIN RESTORATION PROJECT

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Appendix 1 – Existing and Desired Conditions Report

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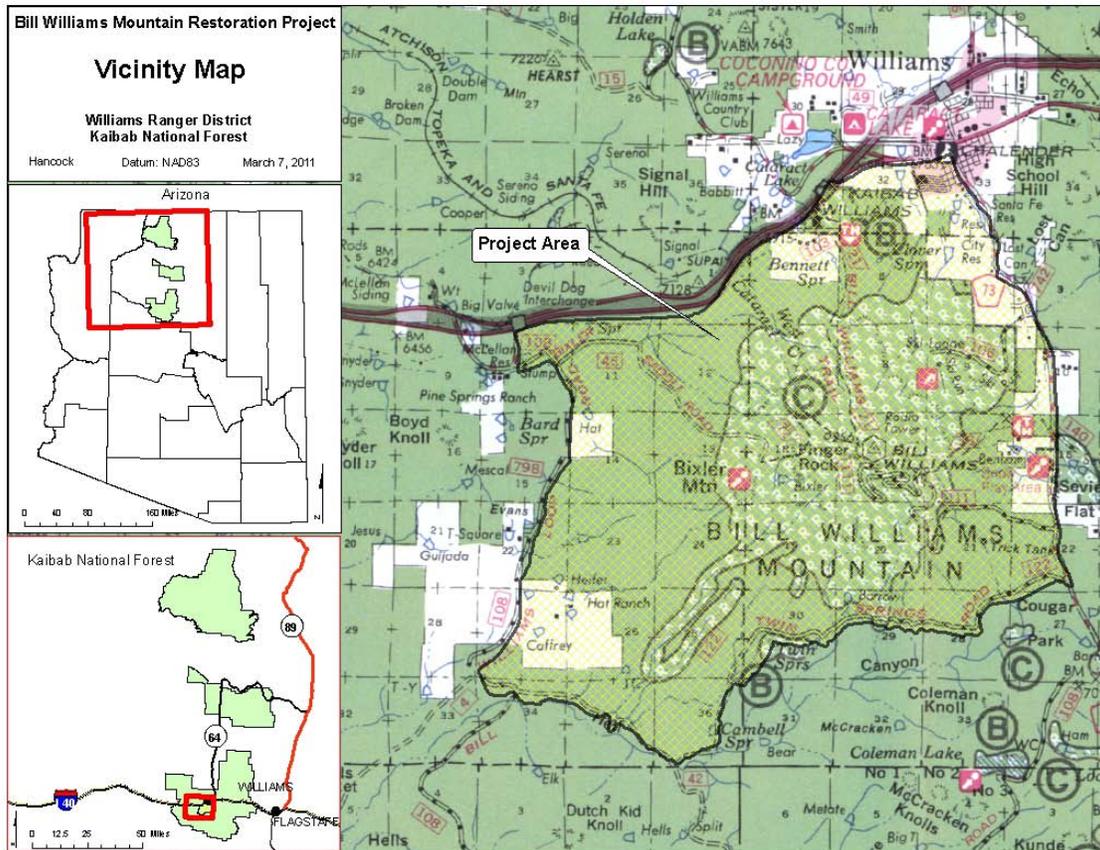
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Existing and Desired Conditions Report for the Bill Williams Mountain Restoration Project

Area and Scope

The Bill Williams Mountain Restoration Project is located 4 miles south-southwest of the city of Williams, Arizona (see Vicinity Map). The project area is approximately 18,000 acres with about 2,500 of those acres being private land. It encompasses Bill Williams Mountain which is the primary watershed for the city, has historic and cultural value, and is an important communication site for Northern Arizona. The project area is bounded by I-40 on the north, Perkinsville Road on the east, FR 122 on the south and FR 108 on the west. All or portions of Sections 1-3, 10-15, 22-27, & 34-36 T21N R1E; Sections 4-10, 15-22, & 27-31 T21N R2E; and Sections 31-33 T22N R2E Gila & Salt River Meridian are included in the project area.

The project area is guided by management direction described in the Kaibab National Forest Land Management Plan (Forest Plan) (1988, as amended). The project area falls within Geographic Area 2 – Williams Forestland and encompasses Land Use Zones 6 and 21. Land Use Zone – Special Area 6 is a botanical area for the protection of Arizona Bugbane, a candidate species for threatened status. Land Use Zone 21 is an existing developed recreation site, the Elk Ridge Ski Area.



Current Condition

Watershed Health

Citizens of Williams, Arizona depend on the Williams Municipal Watershed as a source of public drinking water and for other benefits that multiple-use management of this watershed provide. Approximately one third (5,932 acres) of the project area occurs in the Williams Municipal Watershed, which is approximately 26,061 acres in size.

The project area overlaps portions of six subwatersheds, including the two subwatersheds of Cataract Creek Headwaters and Dogtown Wash which make up the majority of the land base within the Williams Municipal Watershed. Table 1 below lists the six subwatersheds, the total watershed area, and the project area acreage within each watershed.

Table 1. Subwatershed (HUC12) names and acreages occurring within the Bill Williams Restoration Project Area.

HUC12 Number	Subwatershed Name	Total Acres	Project Area Acres
150100040502	Cataract Creek Headwaters	16,695	5,148
150602020202	Devil Dog Canyon	11,192	1,331
150100040501	Dogtown Wash	11,660	816
150602010302	Johnson Creek	30,207	2,719
150602020203	Meath Wash	26,851	1,639
150602020204	Upper Hell Canyon	27,152	6,007
	Total	123,757	17,660

As can be seen in Table 2 below, three of the watersheds in the project area are currently impaired and three are functioning at risk. All watersheds in the project area have soils that are either impaired or functioning at risk. Reasons for these soil conditions include inadequate vegetative cover due to excessive fuel loads that prevent establishment of herbaceous understory vegetation; recent high-severity wildfire that has removed soil vegetative cover; and encroachment of ponderosa pine, pinion, and juniper into historically open meadows and savannahs. All of the watersheds in the project area exhibit departures from historic fire regimes (i.e., departures from historical ranges of variability in vegetation, fuel composition, fire frequency, fire severity, and fire pattern). Treatments that would reduce the risk of high-severity stand replacing wildfires would improve the fire regime condition and therefore improve watershed health in each of the treated watersheds. Road density, location, and distribution also contribute to impaired or functioning at risk watershed conditions.

Table 2. Watershed conditions of the six subwatersheds within the Bill Williams Mountain project area.

	Aquatic Physical				Aquatic Biological		Overall Watershed Score
Subwatershed Name	Watershed Acres	Water Quality	Water Quantity	Aquatic Habitat	Aquatic Biota	Riparian/Wetland Vegetation	
Cataract Creek Headwaters	16,695	2.0	3.0	3.0	2.0	3.0	2.4 - Impaired
Devil Dog Canyon	11,192	1.0	3.0	1.0	2.0	1.0	1.8 – Functioning at risk
Dogtown Wash	11,660	2.0	3.0	1.0	2.0	1.0	2.0 – Functioning at risk
Johnson Creek	30,207	2.0	3.0	3.0	2.0	3.0	2.4 – Impaired
Meath Wash	26,851	1.0	3.0	1.0	2.0	1.0	1.7 – Functioning at risk
Upper Hell Canyon	27,152	1.5	2.0	3.0	2.0	3.0	2.4 - Impaired
Total	123,757						
	Terrestrial Physical			Terrestrial Biological			
Subwatershed Name	Roads and Trails	Roads and Trails	Fire Regime	Forest Cover	Rangeland Vegetation	Invasive Species	Forest Health
Cataract Creek Headwaters	2.7	2.7	2.0	1.0	2.0	2.0	1.0
Devil Dog Canyon	2.0	2.0	2.0	1.0	2.0	2.0	1.0
Dogtown Wash	2.7	2.7	3.0	1.0	2.0	2.0	1.0
Johnson Creek	2.3	2.3	2.0	1.0	2.0	2.0	1.0
Meath Wash	2.0	2.0	2.0	1.0	2.0	2.0	1.0
Upper Hell Canyon	2.7	2.7	2.0	1.0	2.0	2.0	1.0

Runoff impounded in seven reservoirs serves as the primary water supply for the City of Williams. These reservoirs have a combined water storage capacity of 2,755 acre-feet (897 million gallons) of water. Table 3 below lists the seven reservoirs in the Williams Municipal Watershed, their approximate water storage capacities and percentages of total available surface water supply. Water from these reservoirs originates from snow melt and summer precipitation.

Table 3. Reservoirs, associated water storage capacities, and percentages of total municipal surface water in the City of Williams Municipal Watershed.

Reservoir Name	Water Storage Capacity (Million Gal.)	Water Storage Capacity (Acre-feet)	Percent of Total Water Storage Capacity
Dogtown	360	1,105	40.2
Kaibab Lake	300	921	33.4
Cataract	109	335	12.2
Santa Fe Reservoir	70	215	7.8
City Dam	36	111	4.0
Upper and Lower Saginaw	22	68	2.4

Overstory Vegetation

The base of Bill Williams Mountain is primarily surrounded by ponderosa pine cover type. The southwestern slope of the mountain consists of dry ponderosa pine and gradually transitions to Douglas-fir and white fir at higher elevations. The northeastern slope of the mountain consists of Douglas-fir and white fir cover types with scattered aspen and ponderosa pine. Stands within the project area that average above 40% slope represent 17% of the project area.

The ponderosa pine cover type is approximately 65% of the project area. Some ponderosa pine stands are on the steep slopes of Bill Williams but mainly are on lower slopes surrounding the mountain. This type includes a mix of ponderosa pine, white fir, gambel oak, and alligator juniper. White fir is more apparent in these stands closer to the base of Bill Williams Mountain.

Mixed hardwood and oak woodland cover types are generally on the slopes of the mountain with smaller isolated stands at the base. Mixed hardwoods are comprised of gambel oak, choke cherry, maple, mountain mahogany and cliff rose. Oak woodlands are predominantly composed of gambel oak mixed with scattered ponderosa pine, Douglas-fir, white fir and alligator juniper. In general, drainages that lead off the slopes of Bill Williams Mountain are moister micro sites and are primarily regenerating in white fir (Figure 1). As the drainages lead lower in elevation white fir becomes scarce.



Figure 1: White Fir regeneration within the City Project Area at the base of Bill Williams Mtn. White fir trees provide ladder fuels and are associated with historically stand replacing fire regimes.

Compared with pre-settlement evidence, vegetation on the benches between drainages has become denser and has experienced crown closure of Douglas-fir and ponderosa pine. Crown closure has encouraged significant white fir regeneration which is invading the understory (Figure 2).



Figure 2: Located along the Bill Williams Lookout Road. This picture shows white fir regenerating under legacy ponderosa pine.

Aspen stands occur on the mountain and remnant aspen trees can be found in other cover types. Recruitment of aspen is generally isolated to scree and rock out crops where overstory competition is minimal and ungulate browse is light. Most stands of aspen on Bill Williams Mountain consist of larger older trees and are being encroached and replaced by conifers.

Pinion and Juniper woodlands comprise approximately 10% of the project area and are concentrated in the western portion. Juniper and pinion-juniper sites are primarily stocked with alligator juniper but often have scattered ponderosa pine, gambel oak, utah juniper, and pinion pine. The acre distribution of all the cover types is displayed in the table below.

Cover Type on FS Lands	Acres	% of Project Area	# OF STANDS	% of SDI MAX
Ponderosa pine	10,613.50	60.80%	213	57.22%
Douglas-fir	363.43	2.06%	13	72.52%
White fir	1,593.00	9.02%	36	66.09%
Oak woodland	657.03	3.72%	16	
Mixed hardwoods	146.39	0.83%	2	
Pinion juniper woodlands	659.06	3.73%	7	
Juniper woodlands	941.96	5.33%	11	
Aspen	101.50	0.57%	4	
Grasslands	71.60	0.41%	6	
Mountain mahogany	40.10	0.23%	1	
Scree	22.60	0.13%	2	

Diversity and Sustainability

The high density of similarly aged trees in the project area impedes the development of grasses, forbs, and shrubs in the forest understory. Some stands also have a large number of fairly even-aged trees which is hindering the regeneration and development of younger trees in the understory. Because of these factors, the forested landscape in the project area is less diverse and more uniform in age and structure than desired (Figure 3).



Figure 3: Bill Williams Trail within MSO PAC. Photo shows MSO habitat, aspen clones in decline & uniform forest structure. Trees in foreground are 9 to 16" DBH.

Over the past 10 years there has been a significant decline in aspen vigor in most of these sites. Aspen mortality in these sites ranges from 40% to almost 100%. This mortality is related to a number of factors including drought, past late freezes, insect attacks, and disease. In response to these disturbances aspen start sprouting from their root systems. New aspen development within the project area is being seriously impacted by ungulate browsing and overstory competition. This is leading to the potential for the complete loss of many of these aspen sites.

Many natural meadows, grasslands, open savannahs and forest openings within the project area are being reduced in size and number by the encroachment of ponderosa pine, juniper, and oak. These meadows and open areas provide areas of high grass/understory plant productivity and diversity which benefit wildlife species that utilize grass, forbs, and shrubs for feed and low hiding cover. The Kaibab National Forest and Arizona Game and Fish Department have worked together to identify an antelope travel corridor south of the Bill Williams Mountain area and into the southwestern edge of the project boundary. This area was identified as a priority area for restoration treatments in the midscale assessment document: South Zone Grassland Restoration Assessment for the Tusayan and Williams Ranger Districts, Kaibab National Forest (USDA Forest Service, 2007).

The Bill Williams Mountain project area also hosts unique plant and wildlife species habitat. Mexican spotted owls (*Strix occidentalis lucida*) have historically inhabited the mountain at its highest elevations. Other species such as Arizona bugbane (*Cimicifuga arizonica*), Mexican whip-poor-wills (*Tapacminos cuerporruin*), and Cassin's finches (*Carpodacus cassinii*) inhabit

the higher reaches of the Bill Williams Mountain. Additionally, habitat for peregrine falcons (*Falco peregrinus*), northern goshawks (*Accipiter gentilis*), golden eagles (*Aquila chrysaetos*), pronghorn antelope (*Antilocapra americana*) and Gunnison's prairie dog (*Cynomys gunnisoni*) occurs within the project area.

Insect and Diseases

Insects, diseases, and mistletoe infections are naturally occurring agents of disturbance that create snags and other important microhabitat for wildlife; however, uncharacteristic outbreaks of these change agents can lead to a widespread die-off of forest ecosystems. Insects and diseases outbreaks have occurred throughout the project area. Between 2000 and 2003, fir engraver beetles affected larger fir trees across the mountain leaving high densities of white fir snags on the steep mountain slopes. Other bark beetles such as Ips and western pine beetle were also active in the project area during the last drought. Mortality from these bark beetles often occurred in ponderosa pine, Douglas-fir and pinion. Currently bark beetles are not at epidemic levels but do exist in the project area.

Dwarf mistletoe infection levels in the project area are very high. This tree parasite slows the growth of trees and can eventually lead to tree mortality. Young ponderosa pine infected from the overstory will often succumb to mortality long before they mature. Mistletoe-created witches' brooms also add to the forest fuel ladder that aids ground fires in moving into the overstory canopy. Left unmanaged, these sites cannot be maintained in a sustainable uneven-aged condition.

Fire and Fuels

Fire is a natural component of the forested ecosystem in northern Arizona. In the past, lightning-caused fires burned across the forested landscape every few years. Fire was the process that thinned the forest and kept it open on dryer slopes and benches. On lower slopes, fires burned often and at low intensities through grasses and light fuels of an open forest. In drainages and on higher north facing slopes fuel moistures were higher which allowed greater tree densities and longer fire return intervals. The mixture of slope, aspect, and landforms (drainages and benches) made fire severity highly variable on Bill Williams Mountain.

Due to the spatial arrangement of high density trees and fuels, the slopes of Bill Williams Mountain currently pose a high risk of stand replacement crown fire. Fuel loadings within the project area range from 6-20 tons per acre in the ponderosa pine type to 12-45 tons per acre in the mixed conifer. Closed tree canopies with understory tree regeneration create "ladder fuels" to carry surface fires into the overstory. The ponderosa pine type and mixed conifer forest within the project area is at a high risk for stand-replacing wildfires while the risk for the woodland types in the project area ranges from low to high. Stands on the slopes of the mountain are at high to extreme risk for crown fire.



Figure 4: City Project EA Boundary, South Base of Bill Williams Mountain. Low crowns, dense conditions pose a risk for crown fire.

The Bill Williams Mountain project area is within the Wildland Urban Interface boundary as defined by the Greater Williams Area Community Wildfire Protection Plan (City of Williams, 2005). The area contains developed private inholdings. Much of this privately held land has homes and other structures. Crown fires threaten not only the homes and property in these areas but also the safety of the residents. Firefighter safety is a great concern in urban interface areas when wildfires are burning. Firefighters cannot be safely placed in dense stands of trees to suppress wildfires.

Desired Condition

The Project's Interdisciplinary Team (IDT) developed a specific desired condition for the Bill Williams Mountain project area based on "Management Direction" found in the Forest Plan. The desired condition consists of long-term goals for the project area. In many cases it may take many years for the project area to reach some of these goals.

In general, forest conditions would provide for diversity within stands without sustaining crown fire. These conditions would allow managers to use wildfire and prescribed fire to maintain the area as a functioning ecosystem without causing loss of ecosystem function or to human safety, lives and values. The desired condition would mimic reference conditions of pre-Euro-American settlement and follow the Kaibab National Forest Plan direction to:

- Protect human life and improvements.
- Treat fuel accumulations to abate fire risk.
- Not allow fires to spread to lands of other ownership.
- Minimize acreage burned by high-intensity fires.
- Protect and enhance wildlife habitat.

Within the Ponderosa Pine cover type:

- Ponderosa pine cover type outside of goshawk post-fledgling family areas (PFAs)/nests and outside of Mexican spotted owl (MSO) Protected Habitat (Protected Activity Centers and pine-oak sites having a slope greater than 40%) and Target/Threshold Habitat
Tree density, spatial orientation, and species distribution of trees in the ponderosa pine cover type will be maintained in a state that is close to vegetative reference conditions. Vegetative reference conditions are vegetative conditions that existed in the project area over 140 years ago prior to Euro-American settlement of the area. (See the Vegetative Reference Conditions section below for a more complete definition of vegetative reference conditions.) Stands will be fairly open (approximately 10 to 50 trees per acre or 10 to 50 ft² basal area per acre) with groups of ponderosa pine surrounded by 30 to 80% open interspaces with scattered individual trees. Stands will be uneven-aged with enough younger trees developing in the understory to replace larger trees over time as they are lost to mortality. Understory grasses, forbs, and shrubs will increase in diversity and abundance. The risk of stand-replacing wildfires will be low.
- Ponderosa pine cover type within goshawk PFAs
The ponderosa pine cover type will be composed of a diversity of multiple age classes as specified for goshawk post-fledging areas (PFAs) in the Forest Plan. This distribution will be composed of approximately 20% old growth forest (vegetative structural stage 6), 20% mature forest (vegetative structural stage 5), 20% mid-aged forest (vegetative structural stage 4), 20% young forest (vegetative structural stage 3), and 20% very young forest (vegetative structural stages 1 and 2). Canopy densities of vegetative structural stage (VSS) 4, 5, and 6 groups of trees will be maintained at levels above those specified in the Forest Plan (50 to 60% canopy cover). Tree spacing is non-uniform and clumpy. The risk of stand-replacing wildfires will be lower but still be moderate.
- Ponderosa pine cover type within goshawk nest sites
These sites will be composed mostly of VSS 5 and 6 groups of trees. Canopy cover will be between 50 to 70%. Tree spacing is non-uniform and clumpy. Tree density and fuel loadings will be maintained at a level that reduces the risk of stand-replacing wildfires below current risk levels. This risk will generally be moderate to moderate/high.
- Ponderosa pine cover type within Mexican spotted owl (MSO) Protected or Target/Threshold Habitat
These sites will have conditions at or above MSO nest/roost characteristics that are specified in the Forest Plan (150 ft² basal area per acre; twenty 18” or greater diameter trees per acre; VSS 4, 5, and 6 groups will each have 15% or more of total site stand-density index [SDI]; 20 ft² basal area per acre of oak). Tree density and fuel loadings will be maintained at a level that reduces the risk of stand-replacing wildfires below current risk levels. This risk will generally be moderate to moderate/high.
- General desired conditions for the ponderosa pine cover type
 - Dwarf mistletoe will be present, but infection levels will be maintained at a manageable level that allows for sustainable uneven-aged management.
 - A variety of oak and juniper size and age classes will be maintained in areas where these species were part of the vegetative reference condition. Age class distribution of oak and juniper will be such that some large oak and juniper are always maintained in these areas.

- Large trees of all species will be developed throughout the cover type, and many are allowed to attain a very old age. Risk of mortality of these large trees from wildfires or prescribed burning will be low.
- Fuel loading will average 5 to 7 tons per acre in most of the goshawk habitat in the ponderosa pine type. Fuel loadings will be maintained at lower levels in the wildland-urban interface and in areas along major roads that can be used as fuel breaks.

Mixed Conifer:

- Mixed conifer cover type outside goshawk PFAs and MSO Protected and Target/Threshold Habitat

The mixed conifer cover type will be composed of a diversity of multiple age classes as specified for landscapes outside of goshawk PFAs in the Forest Plan. This distribution will be composed of approximately 20% old growth forest (vegetative structural stage 6), 20% mature forest (vegetative structural stage 5), 20% mid-aged forest (vegetative structural stage 4), 20% young forest (vegetative structural stage 3), and 20% very young forest (vegetative structural stages 1 and 2). Densities of vegetative structural stage (VSS) 4, 5, and 6 groups of trees will be maintained at levels above those specified in the Forest Plan (40 to 60% canopy cover or 50 to 60% canopy cover in goshawk PFAs). Tree spacing is non-uniform and clumpy. The risk of stand-replacing wildfires will be moderate.

- Mixed conifer cover type in goshawk nest sites

These sites will be composed mostly of VSS 5 and 6 groups of trees. Canopy cover will be between 50 to 70%. Tree spacing is non-uniform and clumpy. Tree density and fuel loadings will be maintained at a level that reduces the risk of stand-replacing wildfires below current risk levels. This risk will generally be moderate to moderate/high.

- Mixed conifer cover type within Mexican spotted owl (MSO) Protected (Protected Activity Centers or MSO mixed conifer sites having a slope greater than 40%) or Target/Threshold Habitat

These sites will have conditions at or above the MSO nest/roost characteristics that are specified in the Forest Plan (150 to 170 ft² basal area per acre; twenty 18" or greater diameter trees per acre; VSS 4, 5, and 6 groups will each have 10% or more of total site SDI). Tree density and fuel loadings will be maintained at a level that reduces the risk of stand replacing wildfires below current risk levels. This risk will generally be moderate to moderate/high.

- General desired conditions for the mixed conifer cover type

- Dwarf mistletoe will be present, but infection levels will be maintained at a manageable level that allows for sustainable uneven-aged management.
- A variety of oak and juniper size and age classes will be maintained in areas where these species were part of the vegetative reference condition. Age class distribution of oak and juniper will be such that some large oak and juniper are always maintained in these areas.
- Where an aspen component currently exists within mixed conifer sites, aspen will be maintained as a viable stand component over time.

- Large trees of all species will be developed throughout the cover type and many are allowed to attain a very old age. Risk of mortality of these large trees from wildfires or prescribed burning will be low.
- Fuel loading will average 10 to 15 tons per acre in most of the goshawk habitat in the mixed conifer type. Fuel loadings will be maintained at lower levels in urban interface areas and in areas along major roads that can be used as fire control lines.

Woodlands:

- Woodlands will be maintained at stocking levels that are much closer to reference conditions. The exception to this would be areas within oak woodlands that are identified as part of MSO Protected Activity Centers and woodlands within goshawk PFAs. These areas will have higher densities as specified in the Forest Plan. Grass and forb production and species richness will be high, relative to site productivity, in juniper and pinion-juniper woodlands and moderate to high in oak woodlands. Woodlands will be in an uneven aged condition that sustains a mosaic of vegetation densities, age classes, and species composition.

Grasslands:

- Grasslands will be maintained as open meadows or very open savannahs. Tree stocking will be maintained close to vegetative reference conditions. Grass and forb production will be at or close to the full potential for the site.

Aspen:

- Aspen sites will be vigorous and free to grow without excess competition from conifers. As older aspen are lost to mortality, new aspen can sprout and freely grow into replacement trees. Where aspen exists within mixed conifer or ponderosa pine sites, some openings in the overstory will be maintained over time to allow for aspen regeneration and development. Aspen will be maintained across the landscape at current levels or above, and the diversity of plants and animals that occur in these stands aspen will be improved.

Fire and Fuels:

- Surface fuels are to average less than 7 tons per acre in pine and pine-oak forests and 10 tons per acre in mixed conifer forests.
- Conditions within the project area would have an average stand canopy base height (CBH) above 18 feet with canopy bulk densities (CBD) below .05kg/m³ in ponderosa pine forest types and CBH above 10 feet in with CBD of .08kg/m³ in mixed conifer types.

The Entire Project Area:

- The probability of stand-replacing wildfire will be reduced on and surrounding Bill Williams mountain, thereby conserving the capability of the watershed to provide clean and abundant water to the city of Williams.

- All six subwatersheds in the project area will be in good condition with little unsustainable erosion/sedimentation and, where feasible, soils in unsatisfactory condition would be improved.
 - Herbaceous vegetation, woody debris, and fine litter would be at sufficient levels (on average less than 50% bare soil) to protect soil surfaces from raindrop impact and minimize soil erosion in treated watersheds.
 - Poorly located roads and roads in a state of disrepair would be relocated or obliterated to reduce sedimentation and channelization of drainages.
- Periodic understory fires will be reintroduced into the area.
- Fuel loadings and fire ladders will be maintained at low levels in the wildland-urban interface and in areas along major roads that can be used as fire control lines. Overall area fuel loading will be low to moderate.
- A spectrum of high quality outdoor recreation settings and opportunities will be available in the Bill Williams Mountain project area.
- Sustainable scenery is highly dependent upon ecosystem health. Scenery will be restored to historic conditions in most areas and these provide durable, attractive attributes. Middleground and background views will have healthy historic forest patterns and forest cover conditions. Foreground views will have diverse forest cover displaying many large trees as well as all other ages of trees. There will be spatial variation of forest and openings.
- Noxious weeds will be maintained at a very low to nonexistent level.
- Rangeland will be in satisfactory condition.
- There will be a diversity of cool and warm season plants.
- Threatened, endangered, and sensitive species will occur at similar or higher population sizes as today.
- Key habitat components (e.g. large downed logs and woody debris; existing and recruitment snags; large trees, especially yellow pines; etc.) for threatened, sensitive, and management indicator species (MIS) will be maintained over time throughout these species' habitat.

The Vegetative Reference Condition

Reference conditions are those vegetative conditions that existed on this forest at a point of time prior to Euro-American settlement of the area. This analysis uses the year 1870 as a reference point because it is just prior to Euro-American settlement of the area and it is a point in time where we can fairly easily estimate past tree stocking by looking at presettlement evidence that still exists on the site (old trees, stumps, fallen trees, stump holes). Reference conditions more closely represent the conditions that probably existed on the forest for a long period of time than current conditions do. This is because the reference point is chosen at a point of time prior to heavy vegetative manipulation of the area from grazing, fire exclusion, and logging that occurred after the late 19th century. Also, long-term climatic conditions have not varied to a great extent since the last ice age (10,000 years ago). Many studies confirm that there has been a drastic change in the forest state, particularly in respect to increased tree density, over the past 140 years. Visual observations of presettlement evidence in the project area indicate that ponderosa pine cover type reference condition average tree density ranged from 5 to 30 trees per acre compared to a current average tree density of approximately 500 trees per acre. Woodland and

mixed conifer cover types have also significantly increased in tree density from reference conditions.

Additional Pictures Illustrating the Existing Condition:



Figure 5: Twin Project Area between Bill Williams Mountain and Bixler Mountain. Dense overstory conditions on the Southwest portion of the project area.



Figure 6: White Fir regeneration under Ponderosa Pine on the South west side of Bill Williams Mountain on the Bixler Trail.



Figure 7: White fir mortality from fir engraver beetle. Beetle kill fir slash is the main contributor to large dead and down material on steep slopes.



Figure 8: Wildlife habitat features such as Oak cavities and snags at risk from white fir litter fuels. Picture was taken by Bixler Trail.



Figure 9: City Project Boundary “Buffer”. Thinning up to 12” DBH. Dog Hair thicket stumps.



Figure 10: City Project Boundary “Buffer”. The right side is the treatment and left side is outside of treatment. Ponderosa Pine Cover Type



Figure 10: Large white fir is located in mesic micro sites, typically drainages. Picture was taken by the Williams ski run area.



Figure 11: Large white fir snags still exist from the last fir engraver epidemic. Picture was taken by the Williams ski run area.

Definitions:

Cover type – This term refers to the most represented species within a stand. There can be multiple species within a cover type.

Crowns – Tree crowns are generally from the lowest live limb to the top of the tree. Crowns consist of leaves/needles and limbs.

Crown Closure- This is the interaction of trees as they start to compete for resources within a stand. As trees start to grow closer together, growing space and crown space become limited; this is when you get crown closure.

Density- This term refers to the density of trees generally measured in Trees per Acre and Stand Basal Area. Managers use other forms of forest/stand tree density measures to determine stand condition based on forest dynamics.

Encroachment- This is the movement of any living organism to an area that inhibits growth to another living organism. Encroachment can encourage higher stress levels and higher risk of fire within a stand.

Fuel loadings – Accumulation of dead and down material is generally what this term is referring but fuel loading can also mean live trees.

Ladder fuels – Under certain conditions, fire that is burning on the forest floor can climb upward using ladder fuels. These consist of smaller trees positioned under larger trees.

Mortality- Because trees within the forest grow as a group, stands; mortality refers to multiple trees dying due to an impact of competition, stress, or insects and diseases.

Overstory competition – This term refers to the competition of resources between the trees that are representing the overstory tree composition.

Pre-settlement evidence – This is evidence that is left behind to describe the forest structure and composition on a particular stand. Evidence included but not limited to, stumps, stump holes, snags, trees with fire scars, ECT. Pre settlement evidence provides a snapshot in time of the condition within the natural range of variability.

Recruitment- This term refers to regeneration within the forest successfully avoiding mortality to become part of the stand. The forest can regenerate a lot of trees, depending on the contrition, only a certain amount will be recruited into the stand.

Restoration – There are many definitions of restoration. Typically restoration restores functions within the forest such as snags, logs, fire ect. Other types of restoration focus on structure and arrangement of trees within the natural range of variability.

Snags- Dead and standing trees that provide wildlife habitat and vertical dead fuel structure to a stand.

Stands – A stand is a delineation of a small portion of the landscape that is similar in cover type and overstory connectivity. Stands can range from approximately 150 acres to 1 acre in size.

Stand-replacement wildfires- This term refers to a type of fire that drastically changes the overstory arrangement of trees. Generally these fires kill all of the overstory and are replaced by regeneration in the future.

Stand Density Index- Any index that expresses relative stand density based on a comparison of measured stand values with some standard condition.

Slash – Dead and down material that is created naturally or mechanically.

Appendix 2 - Maps

BILL WILLIAMS MOUNTAIN RESTORATION PROJECT

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Bill Williams Mountain Restoration Project

Operability Map

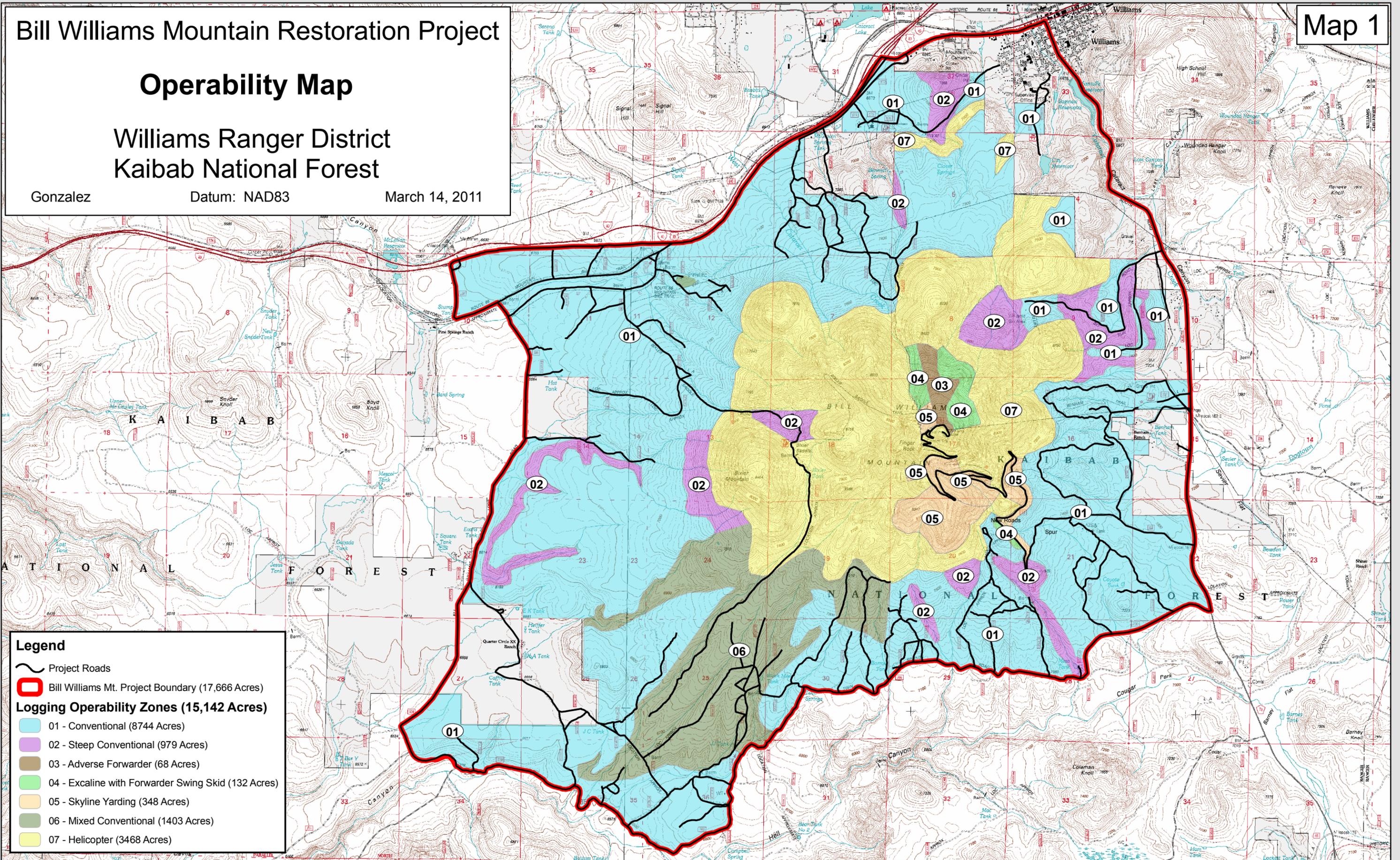
Williams Ranger District
Kaibab National Forest

Gonzalez

Datum: NAD83

March 14, 2011

Map 1



Legend

- Project Roads
- Bill Williams Mt. Project Boundary (17,666 Acres)
- Logging Operability Zones (15,142 Acres)**
 - 01 - Conventional (8744 Acres)
 - 02 - Steep Conventional (979 Acres)
 - 03 - Adverse Forwarder (68 Acres)
 - 04 - Excaline with Forwarder Swing Skid (132 Acres)
 - 05 - Skyline Yarding (348 Acres)
 - 06 - Mixed Conventional (1403 Acres)
 - 07 - Helicopter (3468 Acres)

Bill Williams Mountain Restoration Project

Strategic Fuels Treatment Map

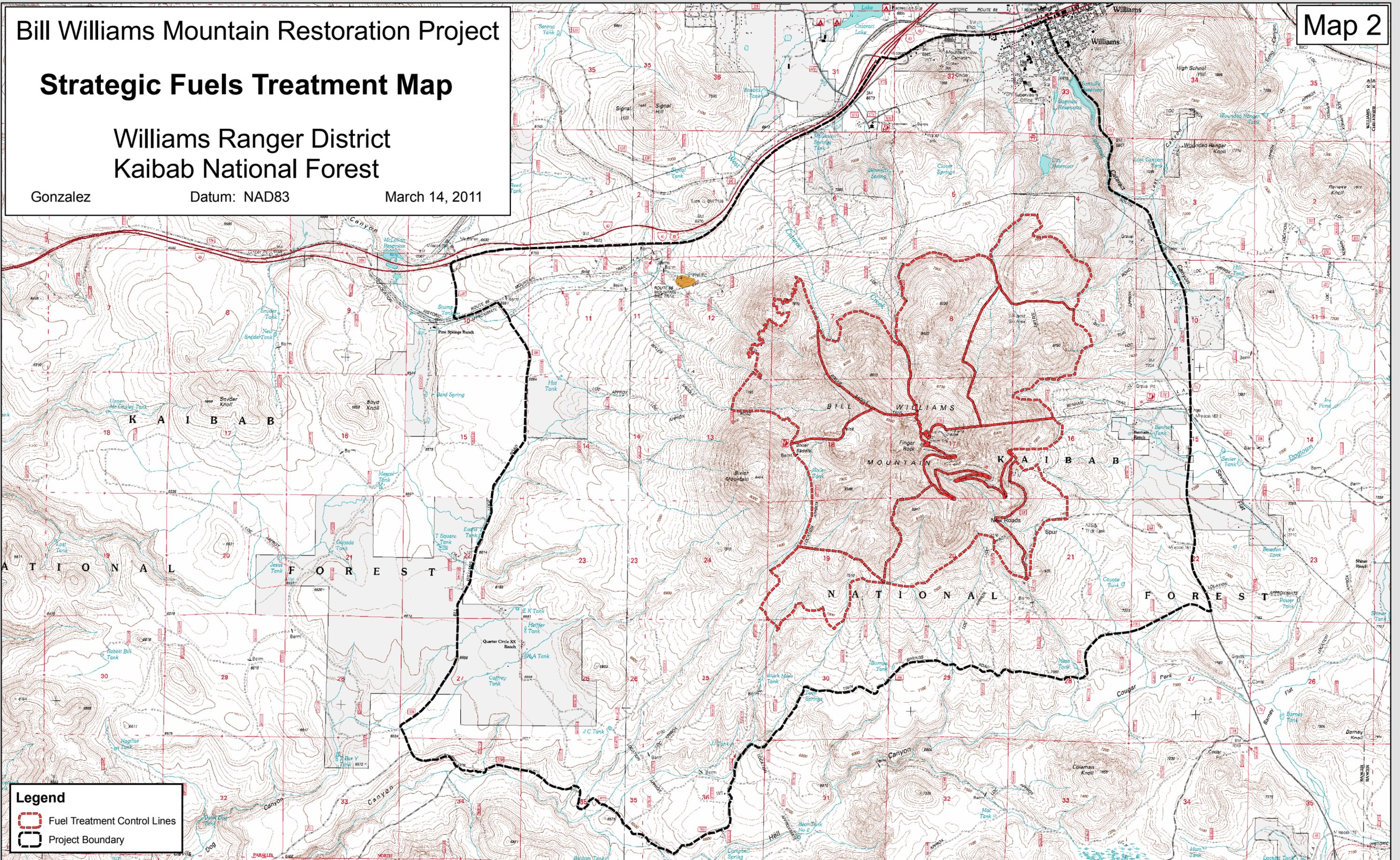
Williams Ranger District
Kaibab National Forest

Gonzalez

Datum: NAD83

March 14, 2011

Map 2



Legend

- Fuel Treatment Control Lines
- Project Boundary



Bill Williams Mountain Restoration Project

Proposed Transportation System Map

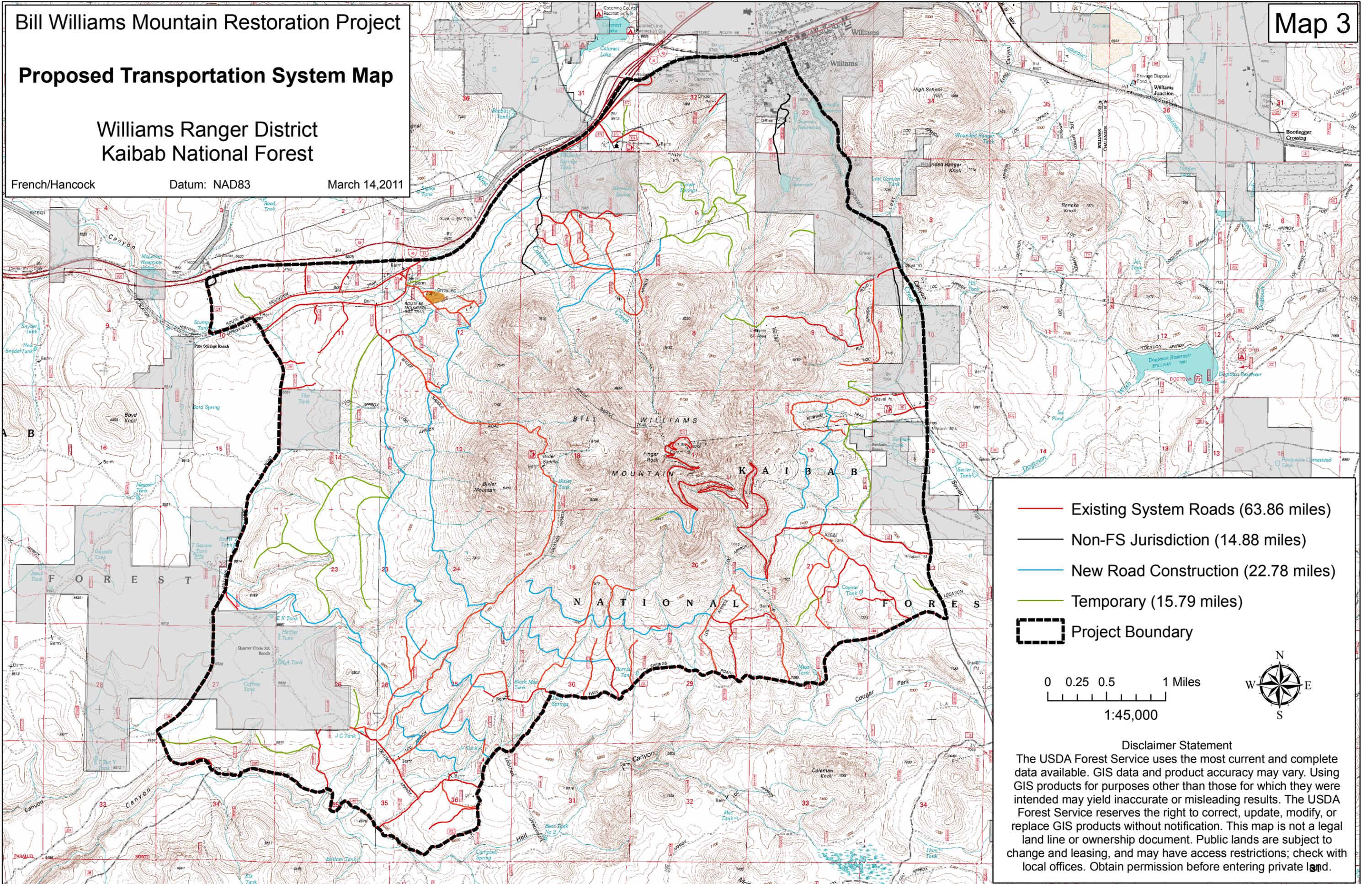
Williams Ranger District
Kaibab National Forest

French/Hancock

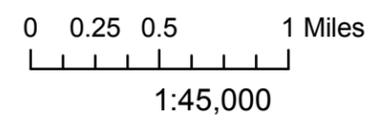
Datum: NAD83

March 14, 2011

Map 3



- Existing System Roads (63.86 miles)
- Non-FS Jurisdiction (14.88 miles)
- New Road Construction (22.78 miles)
- Temporary (15.79 miles)
- Project Boundary



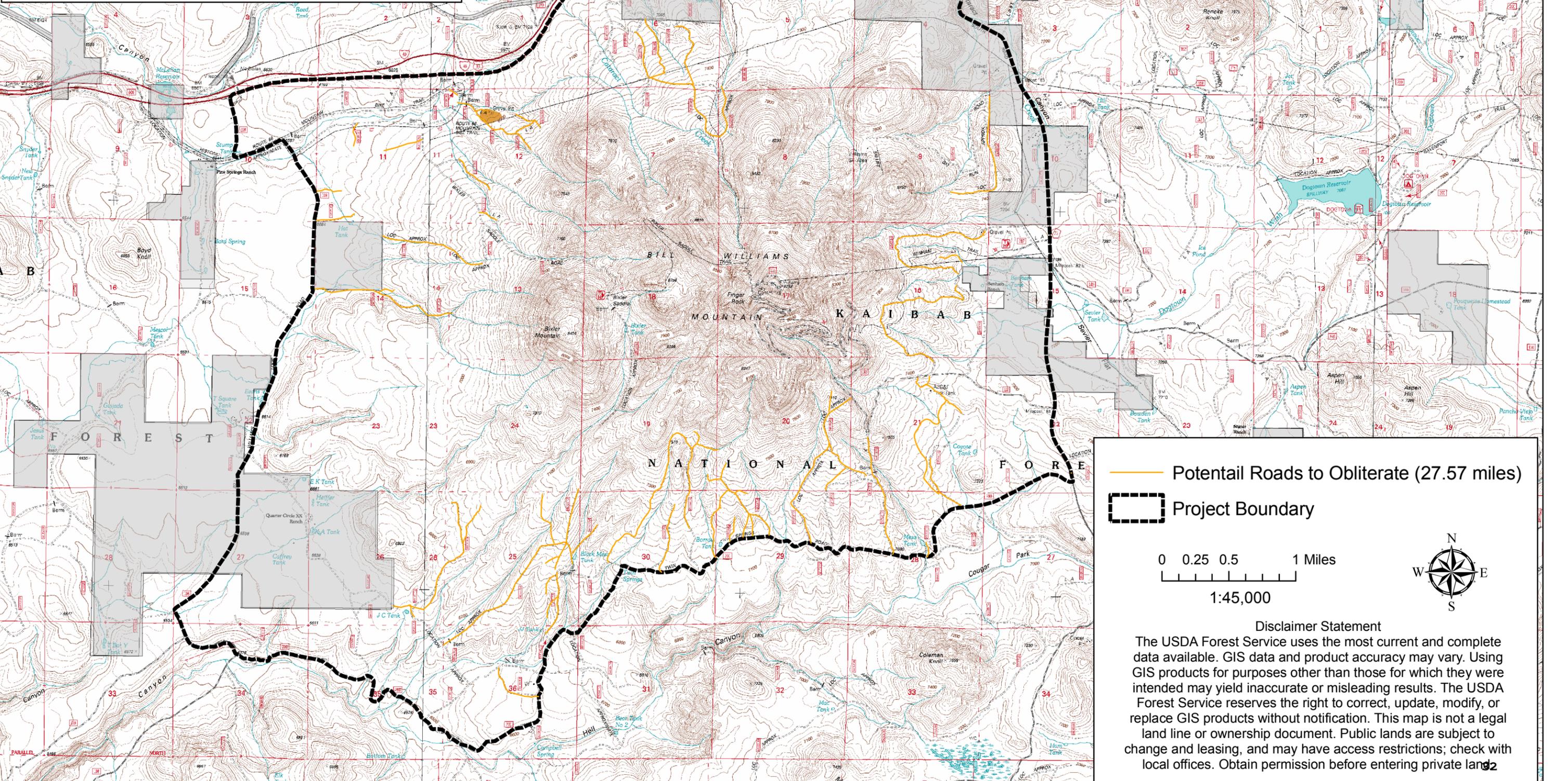
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Bill Williams Mountain Restoration Project

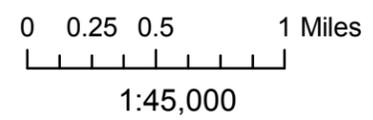
Road Obliteration Map

Williams Ranger District
Kaibab National Forest

French/Hancock Datum: NAD83 March 14, 2011



-  Potential Roads to Obliterate (27.57 miles)
-  Project Boundary



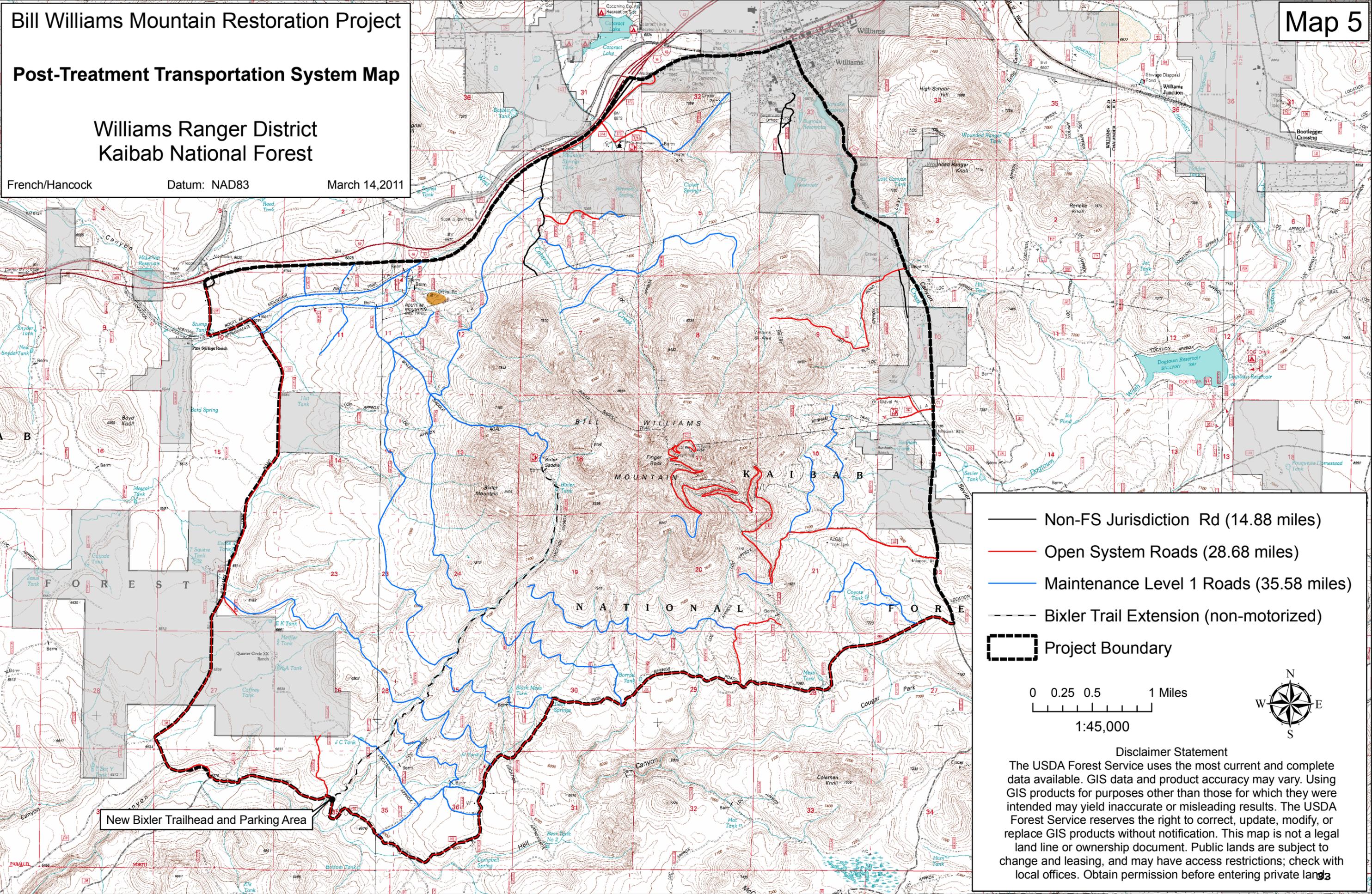
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Bill Williams Mountain Restoration Project

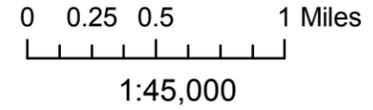
Post-Treatment Transportation System Map

Williams Ranger District
Kaibab National Forest

French/Hancock Datum: NAD83 March 14, 2011



- Non-FS Jurisdiction Rd (14.88 miles)
- Open System Roads (28.68 miles)
- Maintenance Level 1 Roads (35.58 miles)
- Bixler Trail Extension (non-motorized)
- Project Boundary



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New Bixler Trailhead and Parking Area

