

# Agua Fria Grassland Fuels Reduction Project

E.A. # AZ-020-2004-005

## INTRODUCTION

### Need for the Proposed Action

The BLM Phoenix Field Office (PFO) has conducted prescribed burning since 1993 to reduce fuels and restore native semi-desert grasslands on Black Mesa, Perry Mesa, Sycamore Mesa, and adjacent areas now comprising the Agua Fria National Monument (AFNM). Management-ignited fires have been successful in stimulating tobosa grass<sup>1</sup> growth and vigor; increasing the production of other native grasses and annual forbs; increasing ground cover for wildlife; reducing invasive woody plant species such as mesquite, acacia, snakeweed, juniper, and cacti; and reducing hazards posed to wildland firefighters by fire starts that occur seasonally along the adjacent Interstate 17. Nevertheless, the PFO believes that the use of additional available tools to remove woody plant species in concert with prescribed burning would improve efficiency in achieving the goals of the existing prescribed fire program.

Some areas of the AFNM contain relatively dense stands of invasive brush and juniper trees that inhibit the growth of grasses, and that are difficult to burn given the low intensity ground fires that result from the light fuels in these areas. In order to restore grass cover to these grassland areas, and to reintroduce fire into these fire-dependent grassland ecosystems, it is necessary to first cut, pile, and burn; or to cut, lop, and scatter, juniper trees with chainsaws and equipment such as a mechanized brush-ax. By reducing the density of juniper trees within specified burn blocks, grasses and other species will increase in density and allow for the future use of broadcast prescribed burning. This in turn will contribute toward achieving the grassland restoration and maintenance objectives of the existing prescribed fire program: "to reduce woody species abundance, increase ground cover, increase perennial grass vigor and production, increase annual grass/forb production, and improve pronghorn habitat suitability" (BLM, 1993b).

Additionally, the boundaries of certain burn blocks identified in the existing prescribed fire burning program require minor modifications to better utilize terrain features.

### Conformance with Land Use Plan

The proposed action and no action alternative are in conformance with the fire management objectives of the *Phoenix Resource Management Plan and Final Environmental Impact Statement* (RMP) (BLM, 1988), which provided that "...special management area activity plans developed would identify any areas where prescribed burning would benefit wildlife, watershed and rangeland resources (p. 17)."

The proposed action and no action alternative are also in conformance with the *Approved Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management and*

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<sup>1</sup> See Appendix 1 for a list of plants and animals mentioned in the text of this document.

*Decision Record (LUP Amendment) (BLM, 2004).* The LUP Amendment amended the RMP to allow, among other management actions, that “in areas suitable for fire where conditions allow, BLM will allow naturally ignited wildland fire, use prescribed fire and a combination of biological, mechanical and chemical treatments to maintain non-hazardous levels of fuels, reduce the hazardous effects of unplanned wildland fires and meet resource objectives (p. 9).”

#### Relationship to Statutes, Regulations, or Other Plans

The proposed action and no action alternative are consistent with the following plans:

*Black Canyon Habitat Management Plan (Revision) (HMP) (BLM, 1993a).* The HMP identified approximately 50,000 acres of the Black Mesa, Perry Mesa, Sycamore Mesa, and Cordes areas for prescribed burning to improve tobosa grassland habitat. This plan further stated that “[t]he desired plant community in crucial pronghorn antelope habitat is tobosa grass, native annual grasses and forbs with greater than 40% ground cover” and identified areas where “prescribed burns would help restore semi-desert grassland vegetation and improve pronghorn habitat (p. 22).”

*Black Canyon Tobosa Grassland Prescribed Burn (EA # AZ-024-93-016) (BLM, 1993b).* This is the current project plan and environmental assessment used for prescribed fire projects on the AFNM. The plan provides for “prescribed burning in semi-desert grassland areas in the Black Canyon Resource Conservation Area in order to restore and maintain tobosa grassland habitat. The objectives of the planned action are to: 1) reduce woody species abundance (2) increase ground cover (3) increase perennial grass vigor and production (4) increase annual grass/forb production and (5) improve pronghorn habitat suitability (p. 1).”

*Coordinated Resource Management Plan for the Copper Creek Allotment and the Horseshoe Allotment (EA# AZ-024-95-060) (BLM, 1988).* This plan prescribes the continued use of fire as burning prescriptions allow. The Horseshoe Allotment comprises approximately one-half of the Agua Fria National Monument.

*Memorandum of Understanding among Tonto National Forest, USDA; Prescott National Forest, USDA; and Phoenix District Office of the Bureau of Land Management, USDI; concerning Management of Lands and Resources in the Agua Fria Grassland Ecosystem (BLM MOU A-020-A1-002) (BLM and USFS, 1996).* This MOU states that the Agua Fria Grassland desired condition includes “historic fire intervals...present as a result of lightning and human-ignited fires and play[s] a role in maintaining the grassland ecosystem.”

## **DESCRIPTION OF ALTERNATIVES**

Two management alternatives are presented below, a “proposed action” and “no action.” As no unresolved conflicts involving alternate uses of resources, or options offering meaningful differences in environmental impacts, were identified during the course of this analysis, this range of two alternatives was considered to be sufficient.

### Proposed Action

The proposed action incorporates the existing *Black Canyon Tobosa Grassland Prescribed Burn* (EA # AZ-024-93-016) project plan and environmental assessment (appendix 2). Under the proposed action nine juniper thinning blocks will be established within burn blocks J and L (see map). Additional juniper thinning projects will be planned in the future within burn block K. The juniper thinning projects are designed to remove juniper trees that are less than 12 inches in diameter. The target stand density within the treatment blocks is approximately 6 trees per acre. The treatment blocks range in size from 65 acres to 370 acres, with a total of approximately 3,924 acres proposed to be treated by juniper thinning over the life of the project.

Methods for cutting the trees include using contract or government fire crews to cut the trees as close to ground level as possible with chainsaws. The trunk and branches of each felled tree will then be cut again (lopped) into sizes that can be safely moved by individuals and piled on the stump prior to burning when conditions allow, as per the stipulations indicated below.

Alternatively, felled trees will be lopped into small pieces and scattered with the resulting slash providing ground cover to a depth not to exceed 18 inches. This "lop and scatter" method will be used on a test basis to determine if scattering slash provides better cover for grass seedling growth. If level terrain and cultural inventory allow, a small wheeled tractor with a tree-cutting attachment may be used to facilitate more efficient and cost effective tree removal. It is anticipated that the use of such mechanized tree-cutting equipment will comprise a minor portion of the total juniper thinning area within the treatment blocks.

The proposed action also adjusts and makes minor modifications to the boundaries of burn blocks E, J, L, and Q to better utilize terrain features when conducting broadcast burning fuels treatments (see map). These modifications will add approximately 1,930 acres to the total area to be treated with management ignited broadcast burning.

The proposed action is one part of a multi-agency, ecosystem-wide effort to restore and maintain the "Agua Fria Grasslands." These actions will be coordinated with ongoing prescribed burning efforts conducted by the adjacent Tonto National Forest and Prescott National Forest. Through a cooperative management approach, fuels management projects will be managed in response to mutual resource goals and objectives.

The following stipulations will be implemented to protect sensitive resources:

- Prescribed and or managed fires, and pile burning, will be conducted in accordance with prescriptions in order to protect human health and safety, achieve resource objectives, and minimize adverse impacts to sensitive resources.
- These prescriptions will include the following guidelines to avoid impacts to cultural resources, endangered species, and otherwise sensitive wildlife habitats:
  - a. No more than one-half of the watershed of any stream occupied by endangered fish will be treated in a single year.

- b. Treatments applications will avoid canyon slopes and riparian areas to allow vegetative filtering of ash and sediments.
- c. If significant rainfall events occur immediately following treatments, endangered fish populations will be monitored for mortality.
- d. Broadcast fire will be used only after June 1 to avoid adverse impacts to pronghorn fawning.
- e. The BLM will continue to conduct cultural resource inventories to identify possible ancient agave fields and other sites that should be avoided by fire initiation or surface disturbing activities.
- f. Cultural resource specialists will participate in planning and monitoring prescribed burns.
- g. Minimum impact suppression techniques will be used to control prescribed burns as well as wildfires.
- h. The BLM will evaluate and implement site-specific protection measures to mitigate adverse impacts. Such protection measures could include using foam or retardant to protect historic structures; removing fuels around vulnerable sites; creating fire breaks that would protect sites; or covering vulnerable rock art in fire retardant fabric.
- i. The effects of prescribed burns on prehistoric agave fields would be mitigated through the avoidance of ignition or surface disturbances; the exclusion of such zones from burn area; or the use of fire breaks.
- j. Burn pile size and distribution will be limited to ensure generated heat does not sterilize soils.
- k. Burn pile locations will be inspected by cultural resource specialists to ensure avoidance of archaeological sites.
- l. Ground-disturbing treatment methods will require site-specific evaluations of potential impacts to cultural resources. Such evaluations would also apply to any areas proposed for biological treatment, using grazing practices that would involve livestock concentrations that could damage sensitive sites.
- m. Fuels management activities will be conducted so as to avoid surface disturbance at known archaeological sites. Temporary marking or on-site monitoring may be implemented to ensure effective site avoidance.
- n. Fires will not be intentionally ignited on known cultural resource sites.

### No Action Alternative

The no action alternative consists of current management. BLM would continue to treat approximately 50,000 acres identified in the *Back Canyon Tobosa Grassland Prescribed Burn (EA # AZ-024-93-016)* with prescribed fire only, utilizing established burn block boundaries. There would be no juniper thinning projects within the identified burn blocks; no juniper thinning and pile burning or lop and scatter slash treatments would occur. The boundaries of burn blocks E, J, L, and Q would not be modified to better take advantage of terrain features in prescribed fire operations.

## AFFECTED ENVIRONMENT

**Geography and Climate:** The "Agua Fria Grasslands" generally occur on the mesa tops of Black Mesa, Perry Mesa, and Sycamore Mesa within the AFNM, and on adjacent BLM and Prescott and Tonto National Forest lands. On January 11, 2000 President Clinton designated the 71,000-acre AFNM by presidential proclamation, citing the "extraordinary array of scientific and historic resources," "rich record of human history," and "outstanding biological resource" of the area.

The treatment areas are generally between 3,000 and 4,000 feet in elevation. The average annual precipitation in the area is approximately 14 inches. Precipitation is bimodal with peaks in January-February and July-August. Daytime temperatures range from nearly 30°F during the winter to over 100°F during the summer.

**Air Quality:** The planning area is in the Phoenix air-shed. Air quality in the area is generally good with seasonal inversion periods that result in increased carbon monoxide, ozone, and particulates. The AFNM is not within the PM 10, Carbon Monoxide, and Ozone non-attainment areas designated for the Phoenix metropolitan area in Maricopa County.

**Areas of Critical Environmental Concern:** The AFNM contains two Areas of Critical Environmental Concern (ACEC) (see map). Established by the RMP, Larry Canyon ACEC was designated to protect riparian resources and Perry Mesa ACEC was designated to emphasize protection and management of cultural resources.

**Cultural Resources:** The AFNM contains one of the most significant sets of archaeological sites in Arizona. Over 400 sites have been identified during surveys that have covered about 5% of the area. Prehistoric sites include pithouses, stone masonry pueblos, artifact scatters, rock art, and a wide array of agricultural features. These known sites are concentrated on the mesa tops and along canyon rims of Perry Mesa and Black Mesa. Historic sites, which were associated with ranching and mining after A.D. 1800, are less numerous and tend to be located in and along canyons. A search of existing records and literature revealed no known historic sites with exposed combustible materials that would be particularly susceptible to damage from burning.

**Socio-economics:** The nearest local community is Cordes Lakes, Arizona, approximately 20 miles west of the proposed project area. General demographic characteristics of the area are presented in Table 1 below:

Table 1. General demographic profile of Arizona, Yavapai County, and Cordes Lakes.

| Location       | Total Population | Ethnic Composition |          |       | % Families Below Poverty Level |
|----------------|------------------|--------------------|----------|-------|--------------------------------|
|                |                  | White Not Hispanic | Hispanic | Other |                                |
| Arizona        | 5,130,632        | 64                 | 25       | 11    | 10                             |
| Yavapai County | 167,517          | 87                 | 10       | 3     | 8                              |
| Cordes Lakes   | 2,058            | 91                 | 6        | 3     | 13                             |

**Native American Religious Concerns:** Indian tribes of central and northern Arizona, including the Hopi, Yavapai, and O'odham peoples, have expressed a cultural affiliation with the territory encompassed by the AFNM. They have expressed the concern that the prehistoric sites should be protected in view of their traditional cultural significance. Representatives of the Hopi Tribe have stated that prehistoric *Agave* cultivation areas are regarded as important cultural resources. These sites typically consist of relatively dense clusters of *Agave* plants that are associated with prehistoric artifacts and alignments, clusters, or dense concentrations of rocks near prehistoric village sites.

**Wildlife and Threatened or Endangered Species:** Wildlife species present in the area are characteristic of the vegetative communities present. Big game animals found in the area include pronghorn, mule deer, white-tailed deer, javelina, elk, and mountain lion. Small game species found in the area include Gambel's quail, mourning dove, and desert cottontail. Other wildlife species present include, but are not limited to, coyote, bobcat, raccoon, golden eagle, red-tailed hawk, various small mammals, reptiles, and migratory birds. The Sonoran Audubon Society has documented approximately 190 species of birds on the AFNM.

Wildlife species present in the area that are on the list of Species of Special Concern in Arizona include the common black hawk, lowland leopard frog, Mexican garter snake, desert tortoise, Arizona toad, and various bat species. These species occur primarily along the riparian areas. BLM-sensitive species present in the area include the Gila monster, longfin dace, speckled dace, desert sucker and various bat species. Sensitive plant species present in the area include the Arizona giant sedge (which appears in riparian habitat), and Hohokam Agave (which occurs on the lower canyon slopes just north of Black Canyon City).

Federally protected species present in the area include the endangered Gila topminnow and desert pupfish, the proposed endangered Gila chub, the threatened bald eagle, and the candidate yellow-billed cuckoo. All of these species are either aquatic or associated with riparian habitat within the area. Portions of Silver Creek, Indian Creek, Lousy Canyon, and a tributary of Larry Canyon are proposed critical habitat for the Gila chub.

Surveys for Federally listed southwest willow flycatchers have been conducted in riparian habitat within the monument. The habitat is not considered suitable for southwest willow flycatchers because it scours on a regular basis and the resulting patch sizes of persistent vegetation are too small.

**Water Quality:** The Agua Fria River watershed is a sub-basin of the Gila River. The Arizona Department of Environmental Quality has not evaluated water quality along the reach of the Agua Fria River within the AFNM; however, the river's upper reaches and headwaters do not meet state water quality standards due to heavy metals contamination from mine sources on private land.

The yearly average flow of the Agua Fria River is 36.5 cubic feet per second; however, this statistic masks the extreme variability in flows that can occur from year to year and season to season in a desert stream. The U.S. Geological Survey stream gage south of the Sycamore Creek confluence (approximately eight miles southwest of the juniper thinning project area) has

recorded stream flows as low as 0.10 cubic feet per second during the relatively dry months of August and September. In contrast, the mean flow in March is 389 cubic feet per second. High intensity rainfall events can turn the Agua Fria River into a raging torrent with peak water flows in excess of 33,000 cubic feet per second (BLM, 1994).

**Wetlands/Riparian Zones:** The AFNM contains over 50 miles of streams including the Agua Fria River and its tributaries. The riparian corridor at the northern part of the AFNM has a dominant overstory of sycamore, cottonwood, ash, and willow. Other plant species present include black walnut, canyon grape, netleaf hackberry, seepwillow, bulrush, and cattail. At the lower end, the dominant overstory consists of willow and ash, with sycamore and walnut absent (BLM, 1994).

**Wild and Scenic Rivers:** Portions of the Agua Fria River have been determined suitable for designation as either Wild or Scenic river segments. The 7.7-mile segment of the Agua Fria River extending from the confluence of Sycamore Creek south to the Horseshoe Ranch has been found suitable as a Scenic River; the 10.3-mile segment extending from the Horseshoe Ranch to the Arizona Department of Transportation pump house above Larry Canyon has been found suitable as a Wild River; and the 4.4-mile segment extending from the pump house to the confluence of Larry Canyon has been found suitable as a Scenic River (BLM, 1997).

**Livestock Grazing:** Three grazing allotments are in the proposed juniper thinning treatment area (Box Bar, EZ, and Sycamore). These allotments are classified "perennial-ephemeral" and are managed under rest-rotation grazing systems. Modified burn blocks E, J, and Q are in the Horseshoe allotment, and modified burn block L is in the EZ allotment.

**Recreational Resources:** With the designation of the AFNM, increased visitor use has occurred. Hiking in the area of archaeological sites, wildlife observation, and hunting are the primary forms of recreation that occur in the area. Recreational activity in the area is highest during the fall through spring seasons; however, visitation to the juniper thinning project area is light due to poor access. Visitation to the project area generally is seasonal and occurs during hunting seasons.

**Energy:** Two high voltage electric transmission lines and a natural gas pipeline traverse the AFNM adjacent to the eastern edge of interstate 17. The area proposed for juniper thinning is approximately 15 miles east of the nearest such energy distribution facility, a 500 kilovolt electric transmission line. This transmission line bisects the modified burn block E, and both the natural gas pipeline and smaller 230 kilovolt transmission line touch on the modified burn block Q.

**Soils:** Soils in the project area are a complex of clay uplands, clay loam hills, loam uplands and granitic loam hills. The Agua Fria River south to its confluence with Badger Spring Wash generally serves as the boundary between the clay soils to the east and granitic soils to the west. Slope generally increases from south to north and the steeper slopes generally have a rockier surface than the flatter areas. The treatment areas are located on the mesa tops in the areas with less than 30 percent slope, over shallow soils with moderate to high clay content. The *Soil*

*Survey of Yavapai County, Western Part* (SCS, 1976), contains detailed descriptions of the soils in the project area.

**Vegetation:** The mesa tops in the area are generally semi-desert grasslands dominated by tobosa grass and curly mesquite. Within this area, invasive species including snakeweed, mesquite, catclaw acacia, prickly pear cactus and juniper have become locally abundant. Many hillsides and canyon slopes are dominated by chaparral species including shrub live oak and mountain mahogany. Most canyon bottoms have streams that support riparian vegetative communities. These riparian areas have overstories of Fremont cottonwood, Gooding willow, Arizona sycamore and velvet ash with understories of seep willow, deer grass, bulrush, and Bermuda grass.

Due to past livestock grazing and fire suppression, vegetative communities are deviating from their ecological potential. Grasses in general, and cool season grasses in particular, are under-represented in the grassland community. Shrubs, cacti, and juniper are over-represented in many areas of the grassland.

## ENVIRONMENTAL IMPACTS

This discussion of the environmental impacts anticipated to result from implementation of the proposed action or no action alternatives is tiered to the RMP (BLM, 1988)). Additional discussions of relevant environmental impacts are found in the HMP (BLM, 1993a); the *Black Canyon Tobosa Grassland Prescribed Burn* (EA # AZ-024-93-016) (BLM, 1993b); the *Coordinated Resource Management Plan for the Copper Creek Allotment and the Horseshoe Allotment* (EA# AZ-024-95-060) (BLM and USFS, 1998); the *Biological Evaluation and Biological Opinion for the Reintroduction of Gila Topminnow and Desert Pupfish into Three Tributaries of the Agua Fria River* (BLM and USFWS, 1998a); the *Biological Evaluation and Biological Opinion on the Phoenix District Portion of the Eastern Arizona Grazing Environmental Impact Statement* (BLM and USFWS, 1998b); the *Biological Evaluation and Biological Opinion for the Phoenix Resource Management Plan and Environmental Impact Statement* (2-21-88-F-167) (BLM and USFWS, 1998c); the *Biological Evaluation and Biological Opinion for the Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management* (02-21-03-F-0210) (BLM and USFWS, 2004a); the *Biological Evaluation and Conference Opinion for the Existing Phoenix Resource Management Plan for the Agua Fria National Monument* (2-21-03-C-0409) (BLM and USFWS, 2004b); and the *Biological Opinion and Conference Opinion for the Gila Chub within the Agua Fria National Monument* (2-21-03-C-0409) (BLM and USFWS, 2004c).

The following critical elements of the human environment and other resources have been considered and are either not present or would not be affected by the proposed action and no action alternative:

Prime or Unique Farmlands (Surface Mining Control and Reclamation Act of 1977)  
Flood Plains (Executive Order 11988, as amended)



Hazardous or Solid Wastes (Resource Conservation and Recovery Act of 1976, and Comprehensive Environmental Response, Compensation and Liability Act of 1980)  
Invasive, Non-native Species (Lacey Act, as amended; Federal Noxious Weed Act of 1974, as amended; Endangered Species Act of 1973, as amended; E.O. 13112)  
Wilderness (Federal Land Policy and Management Act of 1976 and Wilderness Act of 1964)

Impacts to the following critical elements of the human environment and other resources are analyzed below for the proposed action and no action alternatives:

Air Quality (Clean Air Act of 1955, as amended)  
Areas of Critical Environmental Concern (Federal Land Policy and Management Act of 1976)  
Cultural Resources (National Historic Preservation Act of 1966, as amended)  
Environmental Justice (Executive Order 12898)  
Native American Religious Concerns (American Indian Religious Freedom Act of 1978)  
Threatened or Endangered Species (Endangered Species Act of 1973, as amended)  
Water Quality (Safe Drinking Water Act of 1974, as amended and Clean Water Act of 1977)  
Wetlands/Riparian Zones (Executive Order 11990)  
Wild and Scenic Rivers (Wild and Scenic Rivers Act of 1968, as amended)  
Livestock Grazing  
Outdoor Recreation Opportunities  
President's National Energy Policy (Executive Order 13212)  
Soils  
Vegetation

#### Air Quality

**Proposed Action:** A temporary decrease in air quality due to smoke may result from pile burning operations. Temporary increases in carbon dioxide and particulates are expected when combustion occurs. Smoke from pile burning operations is anticipated to dissipate quickly without producing a decrease in air quality that extends beyond a one or two day period. The prevailing winds of the area are from the southwest and are anticipated to carry smoke from pile burning and broadcast burning operations to the northeast away from metropolitan Phoenix and the outlying rural communities and ranch headquarters. Smoke resulting from the additional areas of modified burn blocks would pose an inconsequential increment to the column produced in burning the entire burn block.

**No Action:** No impacts to air quality would result as pile burning would not occur.

#### Areas of Critical Environmental Concern

**Proposed Action:** With modification of burn block E, approximately 400 additional acres of the Perry Mesa ACEC will be included in the existing program for management-ignited broadcast burning. The proposed juniper thinning will not impact either the Perry Mesa or Larry Canyon ACEC's as the juniper thinning area is outside the boundaries of both ACEC's.

**No Action:** Approximately 400 additional acres of semi-desert grassland will not be restored or maintained as this area will not be included in burn block E.

### Cultural Resources

**Proposed Action:** Prescribed burns can affect cultural resources directly through exposure to fire, or indirectly through ground disturbance or other effects resulting from the procedures used to initiate and control the burns. The effects of fire on archaeological resources are dependent upon the fire's intensity, duration, and the depth of heat penetration into the soil. For archaeological purposes, the severity of a fire is measured by its intensity, which generally varies in proportion to the accumulation of dry fuel on the ground. For example, archaeological sites in heavily forested areas are more vulnerable to damage than are sites in open grasslands.

Evidence indicates that the relatively low intensities of wild and prescribed grassland fires on the AFNM have not resulted in major damage to archaeological sites of the area. At least two large pueblo sites on Perry Mesa have been burned-over within the past decade. Neither site has suffered associated damage to walls, artifacts, or rock art. It is possible that the temporary loss of vegetation following a fire could increase the potential for soil erosion in susceptible areas; however, this problem has not been observed at the two sites known to have experienced fire. Historical structures with flammable materials, such as wooden cabins or mining features, could be destroyed by fire; however, no vulnerable structures have been identified in areas that would be subjected to prescribed burns. Wooden components of prehistoric structures, such as roof beams, are not exposed and are likely to be buried deeply enough to escape damage from fires of low intensity.

Physical damage to archaeological sites could result from ground disturbance caused by fire initiation, management, and suppression activities. Fire ignition techniques could cause damage if fires of relatively high intensity are started within sites. The Phoenix Field Office consulted with the State Historic Preservation Office in 1993 regarding the effects of fire management in the Perry Mesa National Register District. The two agencies agreed that emphasis would be placed on mitigating adverse impacts by avoiding physical disturbances to archaeological sites from fire initiation, management, and suppression activities.

The stipulations referenced in the proposed action will ensure that impacts to archaeological sites, both from juniper thinning and from modifying burn blocks E, J, L, and Q, are minimized.

**No Action:** No impacts to cultural resources are anticipated from not implementing the proposed action.

### Environmental Justice

**Proposed Action:** No impacts from the proposed action are anticipated to affect the local community of Cordes Lakes, and no adverse impacts to human health or the human environment will result from implementation of the proposed action. It is not expected that any person or group of people will experience a disproportionate share of environmental consequences as a result of implementation of the proposed action.

**No Action:** No person or group of people will experience a disproportionate share of environmental consequences from not implementing the proposed action.

#### Native American Religious Concerns

**Proposed Action:** During ongoing tribal consultations relating to the preparation of a management plan for the AFNM, the tribes have not, to date, identified any specific places of traditional cultural importance in the project area. Nevertheless, the tribes have expressed concern that archaeological sites be protected and preserved, including specific reference to prehistoric *Agave* cultivation sites. Species of *Agave* that have evolved in grassland habitats tend to have fibrous, tight rosettes that confer resistance to lower intensity burns. Other *Agave* species on Perry Mesa may also be resistant to damage from grassland fires, although any species introduced from other environments by prehistoric people may be less resistant. Prehistoric cultivation is indicated by areas with concentrations of *Agave* plants, in association with rocky zones. Such rocky zones do not tend to burn as intensely as areas of predominant grasses, which may account for the persistence of *Agave* plants in spite of natural and prescribed fires. Nevertheless, fires could cause minor damage to stands of *Agave*.

The stipulations referenced in the proposed action will ensure that impacts to archaeological sites, both from juniper thinning and from modifying burn blocks E, J, L, and Q, are minimized.

**No Action:** No impacts to Native American religious concerns are anticipated from not implementing the proposed action.

#### Wildlife and Threatened or Endangered Species

**Proposed Action:** The potential impacts to wildlife and threatened or endangered species from broadcast prescribed burning have been thoroughly analyzed and described for the project area (BLM and USFWS 1998a, 1998b, 1998c, 2004b, 2004c). Additionally, the *Biological Evaluation and Biological Opinion for the Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management (02-21-03-F-0210)* (BLM and USFWS, 2004a) specifically addressed a range of fuel and fire treatments including mechanical treatments such as juniper thinning. These documents contain conservation measures and/or terms and conditions which have been incorporated into the proposed action. Impacts associated with the proposed action would be the same as those described in these *Biological Opinions*.

The bald eagle is a transient visitor to the AFNM and does not nest in the project area; therefore, the proposed action would have no effect on this species. No other listed threatened, endangered, or proposed species occur in the area nor would any be affected by the proposed action. Impacts to other sensitive wildlife species, including the candidate yellow-billed cuckoo, are not anticipated because they occur in riparian areas or other vegetative types outside of treatment blocks. The juniper thinning area is not in riparian drainage areas, but is located on the mesa tops above the drainages. As no incremental increase in storm water runoff or sedimentation is anticipated to result from the thinning, no impacts to threatened or endangered species are anticipated.

Thinning juniper trees may result in temporary disturbance to wildlife; however, following treatment, habitat quality is expected to improve over time due to vegetative responses. Thinning may result in a loss of current perching and nesting habitat for woodland birds, but will result in an increase in habitat for grassland fauna, particularly pronghorn. The quality of forage and cover will improve for pronghorn and other grassland species. Reducing shrub and juniper abundance in pronghorn movement and fawning areas will facilitate movement and reduce predation rates.

Grassland fires by nature are quick burning due to light fuel loads, and result in patchy burn patterns due to inconsistent fuel densities. As such, impacts to small mammals are expected to be minor. Larger and more mobile species will avoid fire impacts by moving into unburned areas.

**No Action:** No impacts to wildlife and threatened or endangered species are anticipated to result from not implementing the proposed action.

#### Water Quality

**Proposed Action:** No incremental decrease in water quality is anticipated to result from juniper thinning or modifying burn blocks E, J, L, and Q. No increase in runoff or sedimentation is expected from implementing the proposed action. By acting to help restore and maintain the native semi-desert grassland of the area, a long-term, indirect impact of improved watershed condition—due to the filtration effect of healthy upland grasslands—will result.

**No Action:** No short-term impacts to water quality are anticipated to result from not implementing the proposed action. By not implementing the proposed action, the long-term, indirect impacts to improved water quality resulting from restored and maintained upland semi-desert grasslands will not accrue.

#### Wetlands/Riparian Zones

**Proposed Action:** No wetlands or riparian areas are included within the juniper thinning areas or modifications to burn blocks E, J, L, and Q; therefore, no direct impacts to riparian areas are anticipated. The restoration and maintenance of upland semi-desert grasslands will indirectly contribute to improved health of riparian areas over the long term.

**No Action:** No direct impacts to wetlands/riparian zones are anticipated as a result of not implementing the proposed action. Over the long term, not implementing the proposed action may result in less healthy riparian areas due to poor condition of upland terrain.

#### Wild and Scenic Rivers

**Proposed Action:** Segments of the Agua Fria River identified as “suitable” for designation as Wild or Scenic would not experience direct, short-term impacts resulting from the proposed juniper thinning and burn block modifications. These river segments may experience indirect,

long-term impacts as the use of thinning and management-ignited broadcast burning in the modified burn blocks, together with the existing burning program, is anticipated to result in the restoration and maintenance of the semi-desert grassland biome through which the Agua Fria River courses. Juniper thinning and broadcast burning is not expected to contribute to increased runoff of storm waters, or to sediment loads carried by the Agua Fria River.

**No Action:** Juniper thinning will not occur in burn blocks J, K, and L, and it will remain infeasible to introduce broadcast burning into these areas. Thus, the semi-desert grassland terrain adjacent to the Agua Fria River will be unlikely to be restored or maintained.

### Livestock Grazing

**Proposed Action:** The proposed juniper thinning and modifications to burn blocks E, J, L, and Q are expected to increase grass abundance and contribute toward reaching the area's potential natural plant community. This, in turn, will result in better quality, more dependable forage for livestock.

Implementation of prescribed burning requires rest from livestock grazing for one growing season before and at least one growing season after treatment. This requisite period of non-use may adversely impact livestock operations in the short-term, but should be offset by the long-term benefits to the vegetative community as a whole.

**No Action:** Juniper thinning will not occur in burn blocks J, K, and L, and it will remain infeasible to introduce broadcast burning into these areas. Additionally, modifications to burn blocks E, J, L, and Q will not occur; thus, livestock forage quality and quantity would likely be reduced over time as desirable grass species decline due to lack of periodic, low intensity grassland fires.

### Outdoor Recreation Opportunities

**Proposed Action:** Temporary disturbances to hunters and other visitors to the AFNM may occur in the project area during juniper thinning, and during broadcast burning. Nevertheless, it is expected that the time periods of likely recreational visitation and project implementation will not coincide, and such disturbance will be minimal.

**No Action:** No impacts to outdoor recreation opportunities are anticipated to result from not implementing the proposed action.

### President's National Energy Policy

**Proposed Action:** Juniper thinning and burn block modifications will have no impact on the high voltage electric and natural gas transmission facilities present on the AFNM. No sources of developable energy are known to exist in the proposed project area.

**No Action:** No impacts to energy development, production, supply and/or distribution would result from not implementing the proposed action.

## Soils

**Proposed Action:** Soils in the northern portion of the AFNM where the juniper thinning blocks are located generally are rockier and less susceptible to erosion than other areas of the monument. Also, the use of wheeled rather than tracked equipment will minimize surface disturbance. No, or minimal, soil loss will result from juniper thinning.

Following prescribed burning, soil loss may increase until ground cover is re-established. As vegetative cover increases, soil loss declines. Burning piles can sterilize soils if the pile fires get too hot. Soil sterilization can result in bare ground and site specific increases in soil erosion; however, piles will be located and constructed in such a manner as to minimize such effects.

**No Action:** Not implementing the proposed action may result in the indirect, long-term impact of increased soil erosion as upland grassland areas remain in poor condition, contributing to less permeable soils and unrestrained water runoff. Additionally, the potential for significant erosion following high intensity wildfires in untreated areas may increase.

## Vegetation

**Proposed Action:** The combination of prescribed fire and juniper thinning will effectively reduce shrub, cacti, and juniper that encroach on the semi-desert grassland vegetative community. Fire alone, while effectively reducing the abundance of light shrubs, rejuvenating many grass species, and encouraging native forb re-growth, is not effective in treating heavier fuels such as juniper trees. Without abundant understories of grasses, shrubs, cacti, and juniper are more resistant to fire. Cutting and piling heavy fuels, followed by pile burning, will effectively reduce the abundance of shrubs and juniper and allow native grasses to become established.

**No Action:** Invasive shrub, cacti, and juniper would continue to increase in abundance and distribution. Natural vegetative community objectives would remain unachieved. The area would remain susceptible to catastrophic wildfires that could carry into adjacent riparian or Sonoran desertscrub areas.

## Cumulative Impacts

**Proposed Action:** An incremental increase of approximately 5,864 acres will accrue toward the existing broadcast burning program and its long-term goals of restoring and maintaining the native semi-desert grasslands of the AFNM by reducing woody species abundance, increasing ground cover, increasing perennial grass vigor and production, increasing annual grass/forb production, and improving pronghorn habitat suitability. Additionally, this increase in acreage will contribute to improvement and maintenance of the natural and cultural values of the AFNM.

**No Action:** No incremental increase of acreage under the existing broadcast burning program and its long-term goals will accrue. A lesser area of semi-desert grassland may be expected to reach its potential native plant community. The improvement and maintenance of the natural and cultural values of the AFNM will not occur.

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USDA, Soil Conservation Service and Forest Service. 1976. *Soil Survey of Yavapai County, Western Part*. Arizona Agricultural Experiment Station.

## **AGENCIES AND INDIVIDUALS CONSULTED**

The following agencies were contacted and consulted-with regarding the proposed project:

Arizona Game and Fish Department  
Verde Ranger District, Prescott National Forest  
Cave Creek Ranger District, Tonto National Forest

Additionally, a letter describing the proposed project and inviting comment was mailed to citizens and interest groups that have indicated interest in being informed about projects occurring on the AFNM. Eight comment letters were received from this mailing and appear in the following pages. BLM Phoenix Field Office's responses to these comments, including explanations of changes to the proposed project and environmental assessment made as a result of the comments, are provided as indicated below:

### Responses

1-1. The BLM will time its management-ignited broadcast burning with the pre-monsoon months of June and July. This time period prior to the onset of higher relative humidity brought on by the summer rainy season is best for achieving maximum consumption of woody plants such as juniper, mesquite, and *Acacia*. Pile burning will be carried out in the fall and winter months as needed. These times of the year fall after nesting season for ground nesting and other birds, and after the pronghorn fawning period during April and May.

1-2. See comment 1-1.

1-3. Comment noted.

2-1. See comment 1-1.