September 29, 2014

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ARIZONA
SAFFORD FIELD OFFICE

EA #: DOI-BLM-AZ-G010-2014-0020-EA
Project Name: Rockhouse Prescribed Fire Treatment
Lease/Serial/Case File No.: N/A
Applicant: Bureau of Land Management (BLM), Gila District Fire Management Area
BLM Contact Person: Mark Pater, Fire Ecologist
Legal Description and Map Name: This proposal identifies prescribed fire management area for consideration for the application of the Rockhouse Prescribed Fire Treatment. The area includes:
Sections 31, 32, T11S, R21E;
Sections SE 22, 26, E¼ 35, 36, T11S, R20E;
Sections 1, E¼ 2, E¼ 11, 12, 13, NE¼ 24, T12S, R20E
Sections 5, 6, 7, 8, S¼ 9, SW¼ 10, NW¼ 15, 16, 17, 18, 19, 20, W½ 29, 30, NE¼ 31, NW¼ 32, T12S, R 21E G&SRM
Quad Names: Cherry Spring Peak, The Mesas, Hookers Hot Springs

Maps 1 and 2 show the general locations.
Map 3 shows the riparian areas within the proposed burn unit.

I. INTRODUCTION

Background and Purpose for the Proposal:

The purpose of applying prescribed fire as a resource management tool is to try to achieve resource management goals and objectives as identified in the Safford District Resource Management Plan and the Muleshoe Ecosystem Management Plan.

Prescribed fire has been identified as a tool that can be applied to achieve resource objectives to improve upland health, wildlife habitat, reduce invasive species, and improve watershed function.

A prescribed fire burn plan will be developed that identifies goals, objectives, issues, constraints, management actions, and monitoring that will enable the BLM to safely and effectively apply prescribed fire as a resource management tool.

Land ownership within the proposed prescribed fire project area includes:

Land Ownership	Acres	Percent of Project Area
BLM	6,332	66%
AZ State Trust Lands	1,990	21%
Private	1,259	13%
Total	**9,581**	**100%**

The Need for the Proposal:
The U.S. Department of the Interior, Bureau of Land Management (BLM), Gila District Fire Management Program is proposing to apply prescribed fire as a resource management tool to improve wildlife habitat by promoting an increase in native grass and forb cover and species diversity, improve native species diversity and watershed function by reducing undesirable woody and succulent species (e.g. *Agave schottii*, *Gutierrezia sarothrae, Opuntia* spp.) cover.

Conformance with Land Use Plan:
The proposed action is subject to the *Safford District Resource Management Plan and Environmental Impact Statement,* approved 1991; *Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management,* March 2004 (BLM/AZ/PL-04/002). This proposed action has been reviewed to determine if it conforms to the land use plan terms and conditions as required by 43 CFR 1610.5, BLM MS 1617.3.

Relationship to Statutes, Regulations or Other Plans or Policies:
Muleshoe Ecosystem Management Plan and Environmental Assessment, May 1998 (BLM/AZ/PL-98/024)

Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management, September 2004 (02-21-03-F-0210)

Gila District Fire Management Plan, 2013

The BLM decision only authorizes use of BLM land. Use of non-BLM land (National Forest, State Trust land, private land) is subject to the agency or private landowners' permission.

II. THE PROPOSED ACTION AND ALTERNATIVES

Under the February 2009 Guidance for Implementation of Federal Wildland Fire Management Policy, only two types of fire are recognized: wildland fire or prescribed fire. Two alternatives are presented in this document (management of wildland fire for multiple objectives; full suppression) in relation to the proposed action (prescribed fire).

Description of the Proposed Action:
This proposal identifies a management area for consideration for the application of prescribed fire as a resource management tool. The goals of implementing the Rockhouse prescribed fire treatment include:

- Use prescribed fire in a safe, carefully planned, and cost-efficient manner.
- Reduce wildfire risk to watersheds and other values and to benefit, protect, maintain, sustain, and enhance natural and cultural resources.
- Utilize prescribed fire to restore natural ecological processes and functions, and to achieve land management objectives.

National wildland fire management policy directs federal agencies to work towards restoring fire-adapted ecosystems maintaining these ecosystems using appropriate tools in a manner that will provide sustainable environmental, social, and economic benefits.

Alternative A:
Managing Wildland Fire for Resource Benefit
In contrast to planning and implementing a prescribed fire within predetermined boundaries and prescriptive parameters a wildland fire may be concurrently managed for one or more objectives and these objectives can change as the fire spreads across the landscape. Objectives are affected by changes in fuels, weather, topography; varying social understanding and tolerance; and involvement of other governmental jurisdictions having different missions and objectives.

This management alternative does not have predetermined boundaries or prescriptive parameters that govern when fire can be applied to the landscape in a controlled fashion.

Management response to a wildland fire on federal land is based on objectives established in the applicable Land/ Resource Management Plan and/or the Fire Management Plan. Managers use a decision support process to guide and document wildfire management decisions (Wildland Fire Decision Support System – WFDSS). This process provides situational assessment, analyzes hazards and risks, defines implementation actions, and documents decisions and rationale for those decisions.

Alternative B:
No Action Alternative: Full Suppression
Continue with full suppression as outlined in the Gila District 2010 Fire Management Plan. BLM will suppress natural or human-caused wildland fires by first addressing the safety concerns of firefighters and the public and then addressing resource concerns. Private lands and

structures located near this management area require protection from wildfire. The priority appropriate management action is to prevent wildfires from spreading to private land.

Regarding Threatened and Endangered species (T&E), the Conservation Measures as outlined in Appendix B in the Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management (September 2004) will be adhered to.

Alternatives Considered but Eliminated from Detailed Analysis:
None

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES:

Determine Scope of the Assessment:

Issues Identified:
Fire is an essential ecological process in many fire dependent ecosystems. Fire exclusion, due primarily to aggressive fire suppression actions, has contributed to an unbalanced ecosystem condition. As one component of fire management, prescribed fire is used to alter, maintain, or restore vegetative communities; achieve desired resource conditions; and to protect life, property, and values that could be degraded and/or destroyed by severe wildfire.

The *Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management,* March 2004 (BLM/AZ/PL-04/002) allows for the planned application of prescribed fire under specific conditions of fuels, weather, and other variables, to allow the fire to remain in a predetermined area and to achieve site-specific fire and resource management objectives.

The upland management objectives for this area are to improve watershed conditions and wildlife habitat by converting shrub-invaded grassland to more open, denser stands of grass with mid- to tall-statured perennial grasses replacing annual or short growth forms of perennial grasses.

The application of prescribed fire is intended to reduce the overabundance and continuity of shindagger (*Agave schottii*) as well as other undesirable invasive species such as broom snakeweed (*Gutierrezia sarothrae*) and prickly pear (*Opuntia* spp.). The application of prescribed fire is also intended to promote an increase of warm-season perennial grasses as well as warm- and cool-season forbs.

Description of Impacts:

Impacts of the Proposed Action: Prescribed Fire
Critical Elements:

> **ACEC:** Swamp Springs-Hot Springs Watershed ACEC. The proposed burn unit encompasses 5,311 acres BLM and private lands within this ACEC. Special management provisions as stated in Appendix 2 of the *Safford District Resource Management Plan and Environmental Impact Statement* include managing the area to accelerate recovery of upland vegetation communities. Although the proposed prescribed fire burn unit does not include the Swamp Springs or Hot Springs drainages directly, the proposed burn unit is sufficiently close enough to these two drainages to warrant consideration. Bass Canyon is an important riparian ecosystem that is located along the eastern portion of the project area and will require careful consideration when applying fire to the landscape. The Rockhouse drainage is a significant riparian area located to the east of the project area that will also require consideration when applying fire to the landscape.

When working to maintain the riparian integrity of these drainages, the most effective application of prescribed fire is to keep ignitions high on the slopes above the drainages and allow fire to slowly back downslope. This backing action minimizes erratic fire behavior and intensity thereby reducing potentially detrimental fire effects. Nighttime relative humidity levels are generally significantly higher in drainages as opposed to the surrounding uplands which should also significantly minimize fire behavior and intensity.

Air Quality: Air quality could temporarily decline during implementation of a prescribed fire event. Air quality could temporarily decline in localized areas where active burning is occurring. After the prescribed fire project is completed and the fire is out, air quality should quickly return to pre-fire conditions.

Threatened and Endangered Animal Species: Potentially affected species include: lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*).

BLM will also follow the general Conservation Measures for fuels treatments as well as the species-specific Conservation Measures as outlined in Appendix B of the *Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management* (September 2004, 02-21-03-F-0210). The Bureau will complete consultation with the US Fish and Wildlife Service to ensure compliance with the Endangered Species Act before the fire is initiated. A copy of the consultation will be attached to this EA. If at any point the prescribed fire expands outside of the planned burn area in a way that may affect listed species or for some reason one or more of the conservation measure cannot be met the Bureau will enter into emergency consultation with the US Fish and Wildlife Service.

Threatened and Endangered Plant Species: No federally listed plants occur within the action area.

Threatened and Endangered Fish Species: Potentially affected species include: Gila chub (*Gila intermedia*), loach minnow (*Tiaroga cobitis*), spikedace (*Meda fulgida*), Gila topminnow (*Poeciliopsis occidentalis occidentalis*), and desert pupfish (*Cyprinodon macularius*). Implementation Detailed information on species status can be found in the Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality (02-21-03-F-0210).

BLM will follow the Conservation Measures for fuels treatments as well as the species-specific Conservation Measures as outlined in Appendix B of the *Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management* (September 2004, 02-21-03-F-0210). The Bureau will complete consultation with the US Fish and Wildlife Service to ensure compliance with the Endangered Species Act before the fire is initiated. A copy of the consultation will be attached to this EA. If at any point the prescribed fire expands outside of the planned burn area in a way that may affect listed species or for some reason one or more of the conservation measure cannot be met the Bureau will enter into emergency consultation with the US Fish and Wildlife Service.

BLM Sensitive Fish Species: Potentially affected species include: desert sucker (*Pantosteus clarki*), Sonora sucker (*Catostomus insignis*), longfin dace (*Agosia chrysogaster*), and speckled dace (*Rhinichthys osculus*).

Implementation of the general Conservation Measures for fuels treatments as well as the species-specific Conservation Measures for federally listed fish species as outlined in Appendix D of the *BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management* Finding of No Significant Impact (FONSI) and Environmental Assessment (EA-AZ-910-2003-0001) will also benefit BLM sensitive fish species, which occupy habitat within the project area and vicinity.

Direct Effects of the proposed action on federally listed and BLM sensitive fish species

The direct effects of wildfire on fish and their habitats vary greatly due to fire size and shape; fire intensity, duration, frequency, and location; vegetation type and structure; soils types; topography, and species mobility. Potential effects from the proposed action may include, but are not limited to: 1) mortality, 2) water temperature; 3) chemical toxicity from smoke or ash; and 4) damage or loss of aquatic, riparian, or upland vegetation.

Populations of Gila topminnow, desert pupfish, Gila chub, longfin dace, speckled dace, Sonora sucker, and desert sucker are located within the proposed project area and occupy small to medium-sized habitats that are vulnerable to alteration and destruction. Additional populations of Gila chub, longfin dace, speckled dace, Sonora sucker, desert sucker, in addition to loach minnow and spikedace also occupy complex and much larger habitats outside of the project area in Hot Springs Canyon that are more stabile and resilient to perturbations. Fish populations are more likely to occur, and thus persist, in larger, less isolated habitats and they appear to be more resilient to the effects of fire.

Indirect Effects of the proposed action on federally listed and BLM sensitive fish species

The proposed action may indirectly affect populations of Gila topminnow, desert pupfish, Gila chub, loach minnow, spikedace, longfin dace, speckled dace, Sonora sucker, and desert sucker because all species occupy habitat within the project area and will likely experience more effects from the proposed action than those fish populations and their habitats located further away.

Indirect effects from fire that may affect federally listed and BLM sensitive fish species and critical habitat include physical, chemical, and biological. Fires alter hydrologic processes by removing vegetation and organic components of ground cover resulting in changes to the physical and chemical properties of watersheds. Loss of vegetation exposes soil to erosion and results in less water infiltration and increased overland flow that may result in higher sediment and ash transport into occupied waters impairing and modifying habitat and forage areas. Heavy ash and soot content in water clogs fish gills and may lead to direct mortality of individuals. Additionally, inflow of ash and sediment

into a water body is capable of filling spaces between gravel and adversely affecting spawning habitats, resulting in the loss of individuals and reproductive potential. Sediment and ash flow can also inhibit respiration in macroinvertebrates (a primary food resource for many species of fish), resulting in a reduction, change, or elimination of prey species. A reduction in the amount of prey can ultimately affect fish numbers and reproduction.

Populations of native fish that occupy habitat that is located outside of the project area will likely not be affected by the proposed action due to distance from project area and riparian vegetation buffers that will be able to capture and retain any ash or sediment resulting from the proposed project from entering their habitats.

Proposed Critical habitat for spikedace and loach minnow:
Direct effects of fire on loach minnow and spikedace proposed critical habitat would likely be from damage or loss of aquatic, riparian, or upland vegetation. Vegetation removal may result in increased water temperatures, increased erosion and sediment loading, and an influx of ash that can increase turbidity and change acidity of the water.

The Physical and Biological Features (PBFs) essential to the conservation of loach minnow and spikedace, which may require special management considerations or protection, include the following:

- Habitat to support all life stages of spikedace and loach minnow (i.e., egg, larval, juvenile, and adult). This habitat includes perennial flows with a stream depth generally less than 1 m (3.3 ft), and with slow to swift flow velocities between 5 and 80 cm per second (1.9 and 31.5 in. per second) for spikedace and between 0 and 80 cm per second (0.0 and 31.5 in. per second) loach minnow. Appropriate stream microhabitat includes glides, runs, riffles, the margins of pools and eddies, and backwater components over sand, gravel, and cobble substrates with low or moderate amounts of fine sediment and substrate embeddedness. Appropriate habitat for spikedace will have a low gradient of less than approximately 1.0 percent, at elevations below 2,100 m (6,890 ft). Water temperatures should be in the general range of 8.0 to 28.0 °C (46.4 to 82.4 °F). Appropriate habitats for loach minnow will have a low stream gradient of less than 2.5 percent, are at elevations below 2,500 m (8,202 ft). Water temperatures should be in the general range of 8.0 to 25.0 °C (46.4 to 77 °F);

  This PBF could be negatively affected if an influx of sediments and ash from impacted adjacent habitats entered proposed critical habitat. Spikedace spawn in highly oxygenated riffle habitat and excessive sedimentation could suffocate their eggs. Loach minnow deposit eggs on the downstream undersurfaces of cobble and boulders and excessive fines and/or ash can fill in areas where eggs would otherwise be deposited.

- An abundant aquatic insect food base consisting of mayflies, true flies, black flies, caddisflies, stoneflies, and dragonflies;

  This PBF could be negatively affected if an influx of sediments and ash from impacted adjacent upland habitats entered proposed critical habitat as both loach minnow and

spikedace depend on an abundant aquatic insect food base for survival. Their preferred prey base requires gravel, cobble, and boulder habitat with low to moderate amounts of fine sediment and substrate embeddedness. Excessive sedimentation and an influx of ash and soot can affect aquatic insect diversity and abundance either short-term or long-term depending on species and amount of affected habitat.

- Streams with no or no more than low levels of pollutants;

  This PBF could be negatively affected if an influx of sediments and ash from impacted adjacent habitats entered critical habitat.

- Perennial flows, or interrupted stream courses that are periodically dewatered but that serve as connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted;

  The proposed action would not affect this PBF.

- No nonnative aquatic species, or levels of nonnative aquatic species that are sufficiently low as to allow persistence of loach minnow and spikedace; and

  The proposed action would not affect this PBF.

- Streams with a natural, unregulated flow regime that allows for periodic flooding or, if flows are modified or regulated, a flow regime that allows for adequate river functions, such as flows capable of transporting sediments.

  The proposed action would not affect this PBF.

Critical habitat for Gila chub:
Direct effects of fire on Gila chub critical habitat would likely be from damage or loss of aquatic, riparian, or upland vegetation. Vegetation removal may result in increased water temperatures, increased erosion and sediment loading, and an influx of ash that can increase turbidity and change acidity of the water.

The direct and indirect effects of the proposed action on Gila chub critical habitat would generally be short-term. Although landscape and watershed level changes from large fires can last for many years, the proposed action should minimize the risk of large wildfires.

- Perennial pools, areas of higher velocity between pools, and areas of shallow water among plants or eddies all found in headwaters, springs, and cienegas, generally of smaller tributaries;

This PBF could be negatively affected if an influx of sediment and ash from impacted adjacent upland habitats entered Gila chub critical habitat and either altered or filled pools. Gila chub prefer deeper water habitat and commonly inhabit pools associated with overhanging cover or large woody debris.

- Water temperatures for spawning ranging from 17 to 24 °C (62.6 to 75.2 °F), and seasonally appropriate temperatures for all life stages (varying from approximately 10 °C to 30 °C).

  This PBF could be negatively affected if prescribed fire entered the riparian zone and removed vegetation that provided overhanging cover and buffered the stream from temperature extremes.

- Water quality with reduced levels of contaminants, including excessive levels of sediments adverse to Gila chub health, and adequate levels of pH (*e.g.,* ranging from 6.5 to 9.5), dissolved oxygen (*e.g.,* ranging from 3.0 to 10.0) and conductivity (*e.g.,* 100 to 1000 mmhos).

  This PBF could be negatively affected if an influx of sediment and ash from impacted adjacent upland habitats entered critical habitat and altered water quality, such as reduced dissolved oxygen and increased pH.

- Food base consisting of invertebrates (*e.g.,* aquatic and terrestrial insects) and aquatic plants (*e.g.,* diatoms and filamentous green algae);

  This PBF could be negatively affected if an influx of sediment and ash from impacted adjacent habitats entered critical habitat as Gila chub depend on an abundant aquatic insect food base for survival. Excessive sediment may smother aquatic insects (Newcombe and MacDonald, 1991), thereby reducing chub food production and availability, and related turbidity may reduce the chub's ability to see and capture food. Excessive sedimentation and an influx of ash and soot can affect aquatic insect diversity and abundance either short-term or long-term depending on species and amount of affected habitat.

- Sufficient cover consisting of downed logs in the water channel, submerged aquatic vegetation, submerged large tree root wads, undercut banks with sufficient overhanging vegetation, large rocks and boulders with overhangs, a high degree of streambank stability, and a healthy, intact riparian vegetation community;

  This PBF could be negatively affected if prescribed fire entered the riparian zone and removed vegetation that provided overhanging cover for Gila chub.

- Habitat devoid of nonnative aquatic species detrimental to Gila chub or habitat in which detrimental nonnatives are kept at a level that allows Gila chub to continue to survive and reproduce; and

  The proposed action would not affect this PBF.

- Streams that maintain a natural flow pattern including periodic flooding.

  The proposed action would not affect this PBF.

  Implementation of conservation measures is expected to minimize effects to Gila chub critical habitat and loach minnow and spikedace proposed critical habitat from prescribed fire activities (Appendix B of the Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management (September 2004, 02-21-03-F-0210)). General conservation measures will govern activities that could affect riparian and aquatic ecosystems. Additional site-specific measures developed in lower level planning documents (i.e., prescribed fire burn plans), will also serve to further minimize any adverse affects from prescribed fire and vegetation treatments to critical or proposed critical habitats.

T&E Species Conclusion:
Site specific potential impacts were considered in consultation Galiuro Firescape BO (02EAAZ00-2013-F-0093) and incorporated by reference.

Visual Resource Management (VRM): The *Safford District Resource Management Plan and Environmental Impact Statement* designated the Muleshoe Ranch public lands (exclusive of wilderness) as a VRM Class II area to preserve scenic quality but to allow some modification of the landscape. The objective of Class II is to retain the existing character of the landscape. The level of change should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape.

Following the proposed prescribed fire treatment, residual soil moisture should allow herbaceous species to begin re-growth (green-up) relatively quickly. Subsequent precipitation events should further promote re-growth as well as new growth through germination from seed.

Floodplain: There are no floodplains as defined by the Floodplain Compliance Executive Order 11988 (1977) within the project area. Therefore, there will be no affect from implementing the Rockhouse prescribed fire treatment.

Cultural Resources: Located within or near the boundary of the prescribed fire area are 25 reported sites. These sites consist of lithics procurement, food processing, habitation and rock art. Also present within or adjacent to prescribed fire are ranching, mining, commerce routes, historic roads, goat herding and Civilian Conservation Corps project sites. The Pride and Browning Ranch are located near this prescribed fire area and will either have to be monitored or protected if threatened by fire. Much of the archaeology is in the form of rock, lithics, or pottery, either on or just below the soil surface. The application prescribed fire may damage some of these artifices; however within prescribed fire area the fuel loading does not contain any appreciable concentrations of

heavy fuels (100 hr – 1,000 hr fuels) that could cause permanent damage to rock art, pottery, and lithics. Appropriate application of prescribed fire can reduce the potential loss of or damage to these sites.

In May and June of 2011, 41 acres of land within the burn area were surveyed and six known sites revisited by Dan McGrew, Safford Field Office Archeologist. The survey was conducted in areas of high potential for cultural resources. No new sites were located. See "A Cultural Resources Reconnaissance for the Rockhouse Prescribed Burn Plan, 2012 BLM AZ 0410-11-018".

Native American Religious Concerns: A letter explaining the prescribed fire proposal and maps were sent to tribal contacts on November 17, 2010 to offer the opportunity to identify concerns and traditional religious and cultural sites that may be located within the project area, identify impacts that could potentially occur, and provide recommendations on how these potential impacts could be avoided or mitigated.

Wetlands/Riparian Zones: Although the proposed prescribed fire burn unit does not include the Swamp Springs or Hot Springs drainages directly, the proposed burn unit is sufficiently close enough to these two drainages to warrant consideration. Bass Canyon and Double R drainages are important riparian ecosystems that are located in the western portion of the project area and will require careful consideration when applying fire to the landscape. The Rockhouse drainage is a significant riparian area located in the northern portion of the project area that will also require consideration when applying fire to the landscape.

When working to maintain the riparian integrity of these drainages, the most effective application of prescribed fire is to keep ignitions high on the slopes above the drainages and allow fire to slowly back downslope. This backing action minimizes erratic fire behavior and intensity thereby reducing potentially detrimental fire effects. Nighttime relative humidity levels are generally significantly higher in drainages as opposed to the surrounding uplands which should also significantly minimize fire behavior and intensity.

Ignition operations will be initiated along the top of the ridges and as far down as midslope. Ignitions initiated at midslope are expected to move primarily upslope with some downslope movement. Conservation Measure RA-14 B) states "An appropriately-sized buffer adjacent to perennial streams in order to minimize soil and ash from entering the stream". A 500' buffer may allow enough room for the ash and sediment produced from the fire to settle out and be entrained into the soil profile prior to reaching drainage bottoms. Large ash accumulations are not expected to occur in these areas after burning; grasses typically leave little ash due to the fineness of fuels and their almost complete biomass removal by fire. Trees are relatively sparse and result in limited ash. Therefore, significant deterioration of water quality in the riparian areas is not expected after prescribed burning. If fire, however unlikely, does travel to the drainage bottoms, it will only be, most likely, in segmented locations (like fingers) emulating a natural fire pattern. These segmented locations would have little volume of ash and sediment that would be introduced into the drainage bottom. This is due to the amount of vegetation to burn, the

rocky ground, and restriction of the burn plan in how, when, and where fire will be introduced.

Wild and Scenic Rivers: Not Applicable

Wildlife
The upland wildlife management objectives for this area are to improve wildlife habitat for bighorn sheep, mule deer, javelina, scaled and Gambels quail by converting shrub-invaded grassland to more open, denser stands of grass with mid- to tall-statured perennial grasses replacing annual or short growth forms of perennial grasses.

The application of prescribed fire is intended to reduce the overabundance and continuity of shindagger (*Agave schottii*) as well as other undesirable invasive species such as prickly pear (*Opuntia* spp.). The application of prescribed fire is intended to reduce the frequency/density of the afore-mentioned less desirable species and is intended to promote an increase of warm-season perennial grasses as well as warm- and cool-season forbs. The proper application of prescribed fire is intended to increase edge effect and species diversity to benefit all wildlife species.

Wastes (Hazardous or Solid): There are no hazardous or solid waste issues identified within the Muleshoe Ecosystem Management Area. The drip torches will be fueled so that no fuel will be spilled on the ground. When drip torches are used the fuel will be under ignition so that it will be volatilized during application. Hence no fuel (i.e. hydrocarbons will be considered as a probable pollutant.)

Nonnative/Invasive Plants: To reduce the potential for the spread of noxious and invasive weeds equipment *contaminated* with weed seed and/or biomass will be thoroughly power washed and all vegetative material and soil removed before transporting equipment. This includes trucks, trailers, and all other machinery.

Water Quality (Surface, Ground, Drinking): Sediment will be a result of ash and some soil erosion after the prescribed fire treatment. Most of movement of sediment within the stream would occur during the wet season (summer monsoon or winter rains) following the prescribed fire treatment.

Where ignitions are initiated the degree of slope and existing weather conditions will dictate the impact of fire resulting in ash and sediment degradation to water quality due to the type of fire (low heat) and predicted distance (500 feet) from any annual, perennial, or larger ephemeral drainages. Large ash accumulations are not expected to result following burning; grasses typically leave little ash due to the fineness of fuels and their almost complete biomass removal by fire. Trees are relatively sparse and result in limited ash. Therefore, significant deterioration of water quality in the riparian areas is not expected after prescribed burning. If fire, however unlikely, does travel to the drainage bottoms, it will only be, most likely, in segmented locations (like fingers) emulating a natural fire

pattern. These segmented locations would have little volume of ash and sediment that would be introduced into the drainage bottom.

Prime Farmland: Not Applicable

Wilderness: The proposed prescribed fire project area does include 2,690 acres of the Redfield Canyon Wilderness Area. The *Muleshoe Ecosystem Management Plan and Environmental Assessment* states: "Prescribed fires within wilderness will be from natural ignition sources only unless ignition occurs outside wilderness boundaries."

Although prescribed fire ignitions will not take place within the wilderness area the potential does exist for the proposed prescribed fire treatment to expand into the wilderness area. If this does occur the fire would be permitted to burn as long as it meets the prescription specified under the upland objective. Management-ignited prescribed fires will be allowed on units which are partially in wilderness as long as the ignition occurs on the portion of the unit outside of the wilderness and then burns in to the wilderness (*Muleshoe Ecosystem Management Plan and Environmental Assessment*, May 1998 [BLM/AZ/PL-98/024], pp. 58, 73).

	Low	**High**	**Desired**
Temperature (°F)	70	95	90
Relative Humidity (%)	20	8	10
Wind speed (mph)	5	15	10
Wind Direction	S-SW	S-SW	
Live Fuel Moisture	60	30	30

Invasive and Nonnative Species: The absence of natural fire regimes is one factor that has allowed many shrub and succulent species to increase. Though these species are native and naturally occurring, they do have the potential to increase and reduce the diversity of the herbaceous understory. The application of prescribed fire provides the potential for desirable native herbaceous species to increase.

Environmental Justice (Social E**conomics):** The closest communities to the proposed action are Willcox, AZ and Cascabel, AZ. There is no expectation that implementation of the proposed action would have measurable impacts to the economy or social values of these two communities. No aspect of the proposed action is expected to impact low income, minority groups or children in the two communities.

National Energy Policy: There are no energy reserves identified within the Rockhouse Prescribed Fire planning areas or the Muleshoe Ecosystem Management Area.

An El Paso Natural Gas pipeline is located across the southern portion of the proposed burn unit (see Map 1).

Soils: The soils within the proposed project area are shallow in nature and formed on basic and intermediate igneous rocks. Plant-soil moisture relationships are fair to good. The application of prescribed fire should have no negative impacts.

Vegetation: The application of prescribed fire will help to reduce invasive species such as shindagger (*Agave schottii*), broom snakeweed (*Gutierrezia sarothrae*) and prickly pear (*Opuntia* spp.). The vegetative disturbance created with the application of prescribed fire provides opportunities to encourage a greater level of native plant diversity within the treated landscape. A more diverse native plant community promotes healthy watershed function.

Impacts of Alternative A: Managing Wildland Fire for Resource Benefit

A wildland fire may be concurrently managed for one or more objectives and objectives can change as the fire spreads across the landscape. Objectives are affected by changes in fuels, weather, topography; varying social understanding and tolerance; and involvement of other governmental jurisdictions having different missions and objectives (Guidance for Implementation of Federal Wildland Fire Management Policy. February 2009, pg. 7).

A wildland fire event that is managed for multiple objectives (managed for resource benefit) can burn for an undetermined length of time and is not bound by pre-identified, specific boundaries. In short, the fire is allowed to burn freely.

Wildfires that are managed for resource benefit do have the potential to burn at higher fire intensity levels and some burned areas may experience varying levels of deleterious impacts as compared to impacts from planned ignitions on a prescribed fire.

ACEC: Swamp Springs-Hot Springs Watershed ACEC. Special management provisions as stated in Appendix 2 of the *Safford District Resource Management Plan and Environmental Impact Statement* include managing the area to accelerate recovery of upland vegetation communities. Bass Canyon is an important riparian ecosystem that is located along the eastern portion of the project area and will require careful consideration when managing a wildland fire for resource benefit on this landscape. The Rockhouse drainage is a significant riparian area located to the east of the project area that will also require consideration when managing a wildland fire for resource benefit on this landscape.

Air Quality: Air quality could be negatively affected by implementation of managing a wildland fire for resource benefit. Wildland fires can produce high quantities of unplanned smoke for duration of the wildfire event. Air quality should return to pre-fire status soon after a wildland fire that has been managed for resource benefit has stopped burning.

Threatened and Endangered Animal Species: Potentially affected species include: lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae.*

Only natural ignition fires (lightning) can be managed to benefit the resource. Human caused wildland fires will be suppressed in every instance and will not be managed for

resource benefit (Interagency Standards for Fire and Fire Aviation Operations. 2011. pg.09-3.). When managing wildland fire for resource benefit, BLM will follow the general Conservation Measures for fire management and suppression as well as species-specific Conservation Measures as outlined in Appendix B of the Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management (September 2004, 02-21-03-F-0210). The Bureau will complete consultation with the US Fish and Wildlife Service to ensure compliance with the Endangered Species Act. A copy of the consultation will be attached to this EA. If at any point the fire expands outside of the planned burn area in a way that may affect listed species or for some reason one or more of the conservation measure cannot be met the Bureau will enter into emergency consultation with the US Fish and Wildlife Service.

Threatened and Endangered Plant Species: There are no federally list plant species within the action area.

Threatened and Endangered Fish Species: Potentially affected species include: Gila chub (*Gila intermedia*), loach minnow (*Tiaroga cobitis*), spikedace (*Meda fulgida*), Gila topminnow (*Poeciliopsis occidentalis occidentalis*), and desert pupfish (*Cyprinodon macularius*).

BLM will follow the general Conservation Measures for fire management and suppression as well as species-specific Conservation Measures as outlined in Appendix B of the Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management (September 2004, 02-21-03-F-0210). The Bureau will complete consultation with the US Fish and Wildlife Service to ensure compliance with the Endangered Species Act. A copy of the consultation will be attached to this EA. If at any point the fire expands outside of the planned burn area in a way that may affect listed species or for some reason one or more of the conservation measure cannot be met the Bureau will enter into emergency consultation with the US Fish and Wildlife Service.

BLM Sensitive Fish Species: Potentially affected species include: desert sucker (*Pantosteus clarki*), Sonora sucker (*Catostomus insignis*), longfin dace (*Agosia chrysogaster*), and speckled dace (*Rhinichthys osculus*).

Implementation of the general Conservation Measures for fire management and suppression as well as the species-specific Conservation Measures for federally listed fish species as outlined in Appendix D of the *BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management* Finding of No Significant Impact (FONSI) and Environmental Assessment (EA-AZ-910-2003-0001) will also benefit BLM sensitive fish species, which occupy habitat within the project area and vicinity.

Direct and Indirect Effects of Alternative A (Managing Wildland Fire for Resource Benefit) on federally listed and BLM sensitive fish species, proposed critical habitat for

loach minnow and spikedace, and critical habitat for Gila chub would be the same or similar to the effects of the proposed action (*i.e.,* prescribed fire).

T&E Species Conclusion:
This alternative was not considered in the site specific Biological Evaluation and subsequent Biological Opinion therefore re-initiation would have to take place if this alternative is selected.

Visual Resource Management: The *Safford District Resource Management Plan and Environmental Impact Statement* designated the Muleshoe Ranch public lands (exclusive of wilderness) as a VRM Class II area to preserve scenic quality but to allow some modification of the landscape. The objective of Class II is to retain the existing character of the landscape. Managing a wildland fire for resource benefit may be seen and attract the attention of the casual observer. Wildland fire management activities may significantly impact the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape.

Following this type of management action for a wildland fire event, residual soil moisture should allow herbaceous species to begin re-growth (green-up) relatively quickly. Subsequent precipitation events should further promote re-growth as well as new growth through germination from seed.

Floodplain: Within the proposed project area, there are no floodplains as defined the Floodplain compliance as defined by the Executive Order 11988 (1977). Therefore; there will not be an effect on floodplains from implementation of the No Action Alternative.

Cultural Resources: Located within or near the boundary of the prescribed fire area are 25 reported sites. These sites consist of lithics procurement, food processing, habitation and rock art. Also present within or adjacent to prescribed fire are ranching, mining, commerce routes, historic roads, goat herding and Civilian Conservation Corps project sites. The Pride and Browning Ranch are located near this prescribed fire area and will either have to be monitored or protected if threatened by fire. Much of the archaeology is in the form of rock, lithics, or pottery, either on or just below the soil surface. The application prescribed fire may damage some of these artifices; however within prescribed fire area the fuel loading does not contain any appreciable concentrations of heavy fuels (100 hr – 1,000 hr fuels) that could cause permanent damage to rock art, pottery, and lithics. Appropriate application of prescribed fire can reduce the potential loss of or damage to these sites.

Native American Religious Concerns: The application of prescribed fire treatments will proceed in accordance with the *BLM Gila District Fire Management Plan* (2007) and the *Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management* (March 2004). A letter explaining the WFU proposal and maps were sent to tribal contacts on November 17, 2010 to offer the opportunity to identify concerns and traditional religious and cultural sites that may be located within the project area, identify

impacts that could potentially occur, and provide recommendations on how these potential impacts could be avoided or mitigated.

Wetlands/Riparian Zones: Bass Canyon and Double R drainages are important riparian ecosystems that are located in the western portion of the project area and will require careful consideration when managing a wildland fire incident. The Rockhouse drainage is a significant riparian area located in the northern portion of the project area that will also require consideration when managing a wildland fire incident.

Wildfires that are managed for resource benefit do have the potential to burn at higher fire intensity levels and some burned areas may experience varying levels of deleterious impacts as compared to impacts from planned ignitions on a prescribed fire.

Increased fire intensity increases the potential for hydrophobic soils to be created. With hydrophobic soils precipitation is not able to infiltrate into the shallow and deep ground water increasing sheet erosion potential which increases the amount of erosion and sedimentation within wetlands and riparian zones. The four factors that lead to hydrophobic soils are a thick layer of plant litter prior to the fire, high-intensity surface and/or crown fires, prolonged periods of intense heat and coarse textured soils. According to the USDA Natural Resource Conservation Service (www.statlab.iastate.edu/survey/SQI/) a thin layer of soil at or below the mineral soil surface can become hydrophobic after intense heating. The hydrophobic layer is the result of a waxy substance that is derived from plant material burned during a hot fire. The waxy substance penetrates into the soil as a gas and solidifies after it cools, forming a waxy coating around soil particles. The fine fuel types found within the proposed prescribed fire burn unit do not meet the four factors that lead to the creation of hydrophobic soils (Wildfire Effects, Fire and Hydrophobic Soils, Jodi Ferdiani, Trees Foundation, December 2008. http://www.treesfoundation.org/publications/article-339).

Wild and Scenic Rivers: Not Applicable

Wildlife

The upland wildlife management objectives for this area are to improve wildlife habitat for bighorn sheep, mule deer, javelina, scaled and Gambels quail by converting shrub-invaded grassland to more open, denser stands of grass with mid- to tall-statured perennial grasses replacing annual or short growth forms of perennial grasses.

The management of natural ignition wildfire may mimic the planned outcome of prescribed fire and is also intended to reduce the overabundance and continuity of shindagger (*Agave schottii*) as well as other undesirable invasive species such as prickly pear (*Opuntia* spp.). The management of natural ignition wildfire would also seek to reduce the frequency/density of the afore-mentioned less desirable species and promote an increase of warm-season perennial grasses as well as warm- and cool-season forbs. The careful management of natural-ignition wildland fire is intended to increase edge effect and species diversity to benefit all wildlife species. However, where prescribed fire is applied within pre-determined parameters (i.e. weather, fuel conditions, tiem of

year, ignition parameters), managing wildland fire to meet resource objectives is more challenging.

Wastes (Hazardous or Solid): There are no hazardous or solid waste issues identified within the Muleshoe Ecosystem Management Area.

Water Quality (Surface, Ground, Drinking): Unplanned wildfire events have the potential of increased sediment loads resulting in high levels of ash and soil moving offsite and into major drainages/waterways (e.g. Bass Canyon, Rockhouse Canyon, Double R Canyon). Most movement of ash and sediment within the stream channel would occur during the wet season (summer monsoon or winter rains) following the wildfire event.

Serious conditions may arise with an unplanned, high intensity wildfire occurrence. This may be attributed to higher fire intensity levels, significant loss of vegetative cover, potential for hastily created roads and fire lines, and other associated fire suppression activities. Any single of combination of these types of factors has the potential to result in temporarily decreasing water quality.

Prime Farmland: Not Applicable

Wilderness: The proposed prescribed fire project area does include 2,690 acres of the Redfield Canyon Wilderness Area. The *Muleshoe Ecosystem Management Plan and Environmental Assessment* states: "Natural ignition fires will be permitted to burn if they meet the prescription specified under the upland objective (*Muleshoe Ecosystem Management Plan and Environmental Assessment*, page 58). Otherwise they will be suppressed with the appropriate suppression response." Fire suppression activities in the Redfield Canyon Wilderness will adhere to the general guidelines outlined in the *Muleshoe Ecosystem Management Plan and Environmental Assessment,* pages73-74.

Invasive and Nonnative Species: The absence of natural fire regimes is one factor that has allowed many shrub and succulent species to increase. Though these species are native and naturally occurring, they do have the potential to increase and reduce the diversity of the herbaceous understory. Managing a wildland fire event for resource benefit provides the potential to improve plant diversity and promote the establishment of more desirable native herbaceous species.

Environmental Justice (Social Economics): The closest communities to the alternative action are Willcox, AZ and Cascabel, AZ. There is no expectation that implementation of the proposed action would have measurable impacts to the economy or social values of these two communities. No aspect of the proposed action is expected to impact low income, minority groups or children in the two communities.

National Energy Policy: There are no energy reserves identified within the Rockhouse Prescribed Fire planning areas or the Muleshoe Ecosystem Management Area.

An El Paso Natural Gas pipeline is located across the southern portion of the proposed burn unit (see Map 1).

Soils: The majority of soils within the proposed project area are shallow in nature and formed on basic and intermediate igneous rocks. Plant-soil moisture relationships are fair to good. Wildland fire impacts may include the creation of hydrophobic areas where fire intensity levels became very high to extreme. Hydrophobic soils would negatively impact the plant-soil moisture relationships.

Vegetation: Managing a wildland fire event for resource benefit should help to reduce invasive species such as shindagger (*Agave schottii*), broom snakeweed (*Gutierrezia sarothrae*) and prickly pear (*Opuntia* spp.). The vegetative disturbance created through appropriate management of fire for resource benefit should provide opportunities to encourage a greater level of native plant diversity within the treated landscape. A more diverse native plant community promotes healthy watershed function.

Impacts of the No Action Alternative: Full Wildfire Suppression

ACEC: Swamp Springs-Hot Springs Watershed ACEC. Special management provisions as stated in Appendix 2 of the *Safford District Resource Management Plan and Environmental Impact Statement* include managing the area to accelerate recovery of upland vegetation communities. Bass Canyon is an important riparian ecosystem that is located along the eastern portion of the project area and will require careful consideration when managing wildfire suppression activities on this landscape. The Rockhouse drainage is a significant riparian area located to the east of the project area that will also require consideration when managing wildfire suppression activities.

Unplanned wildfires have the potential to burn at higher fire intensity levels and have more detrimental impacts on the landscape than planned ignitions from a prescribed fire. Suppression actions on an unplanned wildfire can also result in greater impacts on the landscape (e.g. hand line construction, increased number of personnel, staging areas, etc.).

Air Quality: Air quality could be negatively affected by implementation of the No Action Alternative. Unplanned wildfire events could produce higher quantities of unplanned smoke for unknown lengths of time. Air quality should return to pre-fire status soon after a wildland fire is completely suppressed.

Threatened and Endangered Animal Species: Potentially affected species include: lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*).

For any unplanned fire that the Bureau initiates suppression on, that may affect listed species, the Bureau will initiate an emergency consultation and to the extent possible the BLM will follow the general Conservation Measures for fire suppression as well as species-specific Conservation Measures as outlined in Appendix B of the Biological and

Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management (September 2004, 02-21-03-F-0210).

Threatened and Endangered Plant Species: There are no federally listed plant species in the action area.

Threatened and Endangered Fish Species: Potentially affected species include: Gila chub (*Gila intermedia*), loach minnow (*Tiaroga cobitis*), spikedace (*Meda fulgida*), Gila topminnow (*Poeciliopsis occidentalis occidentalis*), desert pupfish (*Cyprinodon macularius*).

For any unplanned fire that the Bureau initiates suppression on, that may affect listed species, the Bureau will initiate an emergency consultation and to the extent possible the BLM will follow the Conservation Measures for fire suppression as well as species-specific Conservation Measures as outlined in Appendix B of the Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management (September 2004, 02-21-03-F-0210).

If the appropriate application of prescribed fire, such as this proposed project, is not used to assist in the restoration of a watershed to protect and enhance the native vegetative community, federally listed aquatic species may not be benefited in the long term.

BLM Sensitive Fish Species: Potentially affected species include: desert sucker (*Pantosteus clarki*), Sonora sucker (*Catostomus insignis*), longfin dace (*Agosia chrysogaster*), and speckled dace (*Rhinichthys osculus*).

Implementation of the general Conservation Measures for fire suppression as well as the species-specific Conservation Measures for federally listed fish species as outlined in Appendix D of the *BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management* Finding of No Significant Impact (FONSI) and Environmental Assessment (EA-AZ-910-2003-0001) will also benefit BLM sensitive fish species, which occupy habitat within the project area and vicinity.

Direct and Indirect Effects of the No Action Alternative (Full Wildfire Suppression) on federally listed and BLM sensitive fish species, proposed critical habitat for loach minnow and spikedace, and critical habitat for Gila chub would be the same or similar to the effects of the proposed action (i.e., prescribed fire). Under the No Action Alternative, general and species-specific conservation measures will be implemented unless protection of human life or safety or valuable property warrant another response.

T&E Species Conclusion:
For full-suppression wildland fire management, the BLM will follow conservation measures as described in the 2004 Biological Opinion for the *BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management*.

Visual Resource Management: The *Safford District Resource Management Plan and Environmental Impact Statement* designated the Muleshoe Ranch public lands (exclusive of wilderness) as a VRM Class II area to preserve scenic quality but to allow some modification of the landscape. The objective of Class II is to retain the existing character of the landscape. Management activities for wildland fire suppression actions may be seen and attract the attention of the casual observer. Wildland fire suppression activities may significantly impact the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape.

Floodplain: Within the proposed project area, there are no floodplains as defined the Floodplain compliance as defined by the Executive Order 11988 (1977). Therefore; there will not be an effect on floodplains from implementation of the No Action Alternative.

Cultural Resources: Located within or near the boundary of the prescribed fire area are 25 reported sites. These sites consist of lithics procurement, food processing, habitation and rock art. Also present within or adjacent to prescribed fire are ranching, mining, commerce routes, historic roads, goat herding and Civilian Conservation Corps project sites. The Pride and Browning Ranch are located near this prescribed fire area and will either have to be monitored or protected if threatened by fire. Much of the archaeology is in the form of rock, lithics, or pottery, either on or just below the soil surface. Full wildfire suppression activities may cause irreparable levels of damage to some of these artifices. The use of hand crews, engines and other mechanical tools puts all of these sites at risk of damage or destruction. Although the safety of fire crews and, civilian personal are always foremost in this agency's consideration, this alternative is the culture department's least favored course of action and should only be used if necessary.

Native American Religious Concerns: Full wildfire suppression will proceed in accordance with the *BLM Gila District Fire Management Plan* (2007) and the *Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management* (March 2004). A letter explaining the prescribed fire proposal and maps were sent to tribal contacts on November 17, 2010 to offer the opportunity to identify concerns and traditional religious and cultural sites that may be located within the project area, identify impacts that could potentially occur, and provide recommendations on how these potential impacts could be avoided or mitigated.

Wetlands/Riparian Zones: Bass Canyon and Double R drainages are important riparian ecosystems that are located in the western portion of the project area and will require careful consideration when managing a wildland fire incident. The Rockhouse drainage is a significant riparian area located in the northern portion of the project area that will also require consideration when managing a wildland fire incident.

Unplanned wildfires have the potential to burn at higher fire intensity levels and have more detrimental impacts on the landscape. Suppression actions on an unplanned wildfire can also result in greater impacts on the landscape as opposed to impacts from a prescribed fire (e.g. hand line construction, increased number of personnel, staging areas, etc.).

Increased fire intensity increases the potential for hydrophobic soils to be created. With hydrophobic soils precipitation is not able to infiltrate into the shallow and deep ground water increasing sheet erosion potential which increases the amount of erosion and sedimentation within wetlands and riparian zones. The four factors that lead to hydrophobic soils are a thick layer of plant litter prior to the fire, high-intensity surface and/or crown fires, prolonged periods of intense heat and coarse textured soils. According to the USDA Natural Resource Conservation Service (www.statlab.iastate.edu/survey/SQI/) a thin layer of soil at or below the mineral soil surface can become hydrophobic after intense heating. The hydrophobic layer is the result of a waxy substance that is derived from plant material burned during a hot fire. The waxy substance penetrates into the soil as a gas and solidifies after it cools, forming a waxy coating around soil particles. The fine fuel types found within the proposed prescribed fire burn unit do not meet the four factors that lead to the creation of hydrophobic soils (Wildfire Effects, Fire and Hydrophobic Soils, Jodi Ferdiani, Trees Foundation, December 2008. http://www.treesfoundation.org/publications/article-339).

Wild and Scenic Rivers: Not Applicable

Wildlife:
Full suppression wildfire management will continue to maintain the vegetative conditions in the current state and no measurable benefits to wildlife would be realized.

Wastes (Hazardous or Solid): There are no hazardous or solid waste issues identified within the Muleshoe Ecosystem Management Area.

Water Quality (Surface, Ground, Drinking): Unplanned wildfire events have the potential of increased sediment loads resulting in high levels of ash and soil moving offsite and into major drainages/waterways (e.g. Bass Canyon, Rockhouse Canyon, Double R Canyon). Most movement of ash and sediment within the stream channel would occur during the wet season (summer monsoon or winter rains) following the wildfire event.

Prime Farmland: Not Applicable

Wilderness: The proposed prescribed fire project area does include 2,690 acres of the Redfield Canyon Wilderness Area. The *Muleshoe Ecosystem Management Plan and Environmental Assessment* states: "Natural ignition fires will be permitted to burn if they meet the prescription specified under the upland objective. Otherwise they will be suppressed with the appropriate suppression response." Fire suppression activities in the Redfield Canyon Wilderness will adhere to the general guidelines outlined in the *Muleshoe Ecosystem Management Plan and Environmental Assessment,* pages73-74.

Invasive and Nonnative Species: The absence of natural fire regimes is one factor that has allowed many shrub and succulent species to increase. Though these species are native and naturally occurring, they do have the potential to increase and reduce the

diversity of the herbaceous understory. The No Action alternative would continue to suppress wildfires and facilitate the increase of some shrub and succulent species.

Environmental Justice (Social Economics): The closest communities to the no action alternative are Willcox, AZ and Cascabel, AZ. There is no expectation that implementation of the proposed action would have measurable impacts to the economy or social values of these two communities. No aspect of the proposed action is expected to impact low income, minority groups or children in the two communities.

National Energy Policy: There are no energy reserves identified within the Rockhouse Prescribed Fire planning areas or the Muleshoe Ecosystem Management Area.

An El Paso Natural Gas pipeline is located across the southern portion of the proposed burn unit (see Map 1).

Soils: The majority of soils within the proposed project area are shallow in nature and formed on basic and intermediate igneous rocks. Plant-soil moisture relationships are fair to good. Wildland fire impacts may include the creation of hydrophobic areas where fire intensity levels became very high to extreme. Hydrophobic soils would significantly reduce the plant-soil moisture relationships. The four factors that lead to hydrophobic soils are a thick layer of plant litter prior to the fire, high-intensity surface and/or crown fires, prolonged periods of intense heat and coarse textured soils. According to the USDA Natural Resource Conservation Service (www.statlab.iastate.edu/survey/SQI/) a thin layer of soil at or below the mineral soil surface can become hydrophobic after intense heating. The hydrophobic layer is the result of a waxy substance that is derived from plant material burned during a hot fire. The waxy substance penetrates into the soil as a gas and solidifies after it cools, forming a waxy coating around soil particles." The fine fuel types found within the proposed prescribed fire burn unit do not meet the four factors that lead to the creation of hydrophobic soils (Wildfire Effects, Fire and Hydrophobic Soils, Jodi Ferdiani, Trees Foundation, December 2008. http://www.treesfoundation.org/publications/article-339).

Since these soils are shallow in nature, handline construction during full suppression actions could significantly reduce or delay the ability of plants to become reestablished.

Vegetation: Continued full suppression action will not help to promote opportunities that encourage a greater level of native plant diversity within the affected landscape. A more diverse native plant community promotes healthy watershed function.

Cumulative Impacts:

The proposed burn unit is located in the southeastern portion of the Muleshoe Ecosystem Management Area and includes Arizona State managed lands to the east and borders U.S. Forest Service (USFS, Coronado NF) managed lands in the Galiuro Mountains to the north. Maps 1 and 2 show the general locations.

The proposed project area is bounded by the Jackson Cabin road on the west; Bass Canyon to the northeast, Pine Canyon to the southeast and a two-track road provides the boundary/control feature between these two drainages. USFS-managed lands border the burn unit to the north (Galiuro Mountains, Coronado NF). The USFS, Safford Ranger District is proposing to apply prescribed fire to a burn unit that will border the northern boundary of the proposed Rockhouse Rx burn unit (see attached map).

ACEC: Swamp Springs-Hot Springs Watershed ACEC. When working to maintain the riparian integrity of identified riparian areas, the most effective application of prescribed fire is to keep ignitions high on the slopes above the drainages and allow fire to slowly back downslope. This backing action minimizes erratic fire behavior and intensity thereby reducing potentially detrimental fire effects. Nighttime relative humidity recovery levels should significantly minimize fire behavior and intensity.

Air Quality: Air quality could temporarily decline during implementation of a prescribed fire event. After the prescribed fire project is completed and the fire is out, air quality should quickly return to pre-fire conditions.

Threatened and Endangered Species: Human impacts in the area have been occurring for 150 years. Primary actions that have resulted in the current condition are grazing, fire suppression and mining. Since the ecosystem plan was finalized actions have occurred such as prescribed fires, discontinuation of livestock grazing, re-establishment of federally listed species and increase recreation. Increase in recreation may have additive impacts to the species and their habitats. The Bureau and TNC will continue to implement the ecosystem plan including additional prescribed fires. There is no current plan to renew or modify the ecosystem plan; therefore all known future actions are stated in the plan.

BLM Sensitive Fish Species: Cumulative impacts would be the same or similar to those listed for threatened and endangered species.

Visual Resource Management: Post-fire effects will be visually evident for a period of time following any fire event. The application of prescribed fire needs to be planned for appropriately to minimize visual impacts.

Floodplain: There will not be a cumulative impact on floodplains within the proposed project area. Within the proposed project area, there are no floodplains as defined by the Executive Order 11988 (1977).

Cultural Resources: While some damage may occur on some of the sites, the cultural resources advisor understands that fire is a natural part of land management and views the prescribed fire action or Alternative B as the least intrusive of the three possible actions. Alternative C is viewed as necessary in case of emergency and should be used as such. Regardless of the selected Alternative, cultural monitoring will be necessary after any fire event.

Native American Religious Concerns: Fire management activities will proceed in accordance with the *BLM Gila District Fire Management Plan* (2007) and the *Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management* (March 2004). A letter explaining the application of prescribed fire proposal and maps were sent to tribal contacts on November 17, 2010 to offer the opportunity to identify concerns and traditional religious and cultural sites that may be located within the project area, identify impacts that could potentially occur, and provide recommendations on how these potential impacts could be avoided or mitigated.

Wetlands/Riparian Zones: When working to maintain the riparian integrity of identified riparian areas, the most effective application of prescribed fire is to keep ignitions high on the slopes above the drainages and allow fire to slowly back downslope. This backing action minimizes erratic fire behavior and intensity thereby reducing potentially detrimental fire effects. Nighttime relative humidity recovery levels should significantly minimize fire behavior and intensity.

Wild and Scenic Rivers: Not Applicable

Wildlife
The careful application of prescribed fire to the landscape is intended improve wildlife habitat for bighorn sheep, mule deer, javelina, scaled and Gambel's quail by changing shrub-invaded grassland to more open stands of grass and forb dominated vegetation.

The application of prescribed fire is intended to reduce, but not eliminate, the overabundance and continuity of shindagger (*Agave schottii*) as well as other undesirable invasive species such as prickly pear (*Opuntia* spp.). The application of prescribed fire is intended to reduce the frequency/density of the afore-mentioned less desirable species and is intended to promote an increase of warm-season perennial grasses as well as warm- and cool-season forbs. The careful application of prescribed fire is also intended to increase edge effect and species diversity to benefit all wildlife species.

Wastes (Hazardous or Solid): There are no hazardous or solid waste issues identified within the Muleshoe Ecosystem Management Area.

Water Quality (Surface, Ground, Drinking): Cumulative impacts would include ash and some soil potentially moving offsite into major drainages/waterways (e.g. Bass Canyon, Rockhouse Canyon, Double R Canyon). Most movement of sediment within the streambeds would occur during the wet season (summer monsoon or winter rains) following the prescribed fire treatment.

Severe conditions may be created during an unplanned, high intensity wildfire occurrence. Increased fire intensity increases the potential for hydrophobic soils to be created. With hydrophobic soils precipitation is not able to infiltrate into the shallow and deep ground water increasing sheet erosion potential which increases the amount of erosion and sedimentation within wetlands and riparian zones. The four factors that lead to hydrophobic soils are a thick layer of plant litter prior to the fire, high-intensity surface

and/or crown fires, prolonged periods of intense heat and coarse textured soils. According to the USDA Natural Resource Conservation Service, (www.statlab.iastate.edu/survey/SQI/) a thin layer of soil at or below the mineral soil surface can become hydrophobic after intense heating. The hydrophobic layer is the result of a waxy substance that is derived from plant material burned during a hot fire. The waxy substance penetrates into the soil as a gas and solidifies after it cools, forming a waxy coating around soil particles. The fine fuel types found within the proposed prescribed fire burn unit do not meet the four factors that lead to the creation of hydrophobic soils (Wildfire Effects, Fire and Hydrophobic Soils, Jodi Ferdiani, Trees Foundation, December 2008. http://www.treesfoundation.org/publications/article-339).

Prime Farmland: Not Applicable

Wilderness: The proposed prescribed fire project area does include 2,690 acres of the Redfield Canyon Wilderness Area. The potential does exist for the proposed prescribed fire treatment to expand into the wilderness area. The *Muleshoe Ecosystem Management Plan and Environmental Assessment* states: "Prescribed fires within wilderness will be from natural ignition sources only unless ignition occurs outside wilderness boundaries." If this does occur the fire would be permitted to burn as long as it meets the prescription specified under the upland objective. Management-ignited prescribed fires will be allowed on units which are partially in wilderness as long as the ignition occurs on the portion of the unit outside of the wilderness and then burns in to the wilderness (*Muleshoe Ecosystem Management Plan and Environmental Assessment*, May 1998 [BLM/AZ/PL-98/024], pp. 58, 73).

Invasive and Nonnative Species: The application of prescribed fire provides the potential for a diverse variety of desirable native species to increase and reduce the potential of invasive and non-native plants from occurring.

Environmental Justice (Social Economics): The application of prescribed fire in cooperation with resource managers and in accordance with resource management goals is intended to promote a healthy and vegetatively diverse landscape. There have been no known economic impacts to individuals or groups, other than the Muleshoe Cooperative Management cooperators (BLM, TNC), in the past. All future action will have no economic impact on individuals or groups outside of the BLM and TNC. The closest communities to the proposed action are Willcox, AZ and Cascabel, AZ. There is no expectation that implementation of the proposed action would have measurable impacts to the economy or social values of these two communities. No aspect of the proposed action is expected to impact low income, minority groups or children in the two communities.

National Energy Policy: There are no energy reserves identified within the Rockhouse Prescribed Fire planning areas or the Muleshoe Ecosystem Management Area.

An El Paso Natural Gas pipeline is located across the southern portion of the proposed burn unit (see Map 1). The gas company will be notified to allow for the detection of possible leaks prior to the application of prescribed fire.

Soils: The majorities of soils within the proposed project area are shallow in nature and formed on basic and intermediate igneous rocks. Plant-soil moisture relationships are fair to good. The application of prescribed fire should have minimal, if any, negative impacts.

Vegetation: The cumulative impacts from the proposed prescribed fire treatment would allow fire to behave at a manageable level to promote and create diverse, healthy plant communities.

Description of Mitigation Measures:

Proposed Action:

The application of prescribed fire in cooperation with resource managers and in accordance with resource management goals is intended to promote a healthy and vegetatively diverse landscape. A prescribed fire treatment may require livestock grazing permittees not to allow livestock to graze the affected area for a minimum of two growing seasons in order to allow for adequate vegetative recovery.

Alternative A (Managing Wildland Fire for Resource Benefit) and No Action:

If damage to livestock grazing infrastructure (e.g. fences, water lines) is incurred through a wildfire event, the Safford BLM Field Office will work with the affected permittee(s) to repair fire-damaged materials.

Compliance and Monitoring:

Air Quality: Under all of the proposed actions, Arizona Department of Environmental Quality will be consulted under current protocol.

Soils:

Proposed Action: Buffer zones will be identified and applied during the prescribed fire treatment along indentified riparian zones. During the planning effort, riparian areas will be identified and monitored as the fire approaches the riparian areas.

It is recommended that grazing within the burned areas be deferred for two full growing seasons to allow the soil to be adequately protected with the regeneration of live vegetation and subsequent vegetative litter.

Alternative A (Managing Wildland Fire for Resource Benefit) and No Action: Monitoring would follow current protocol for post-fire rehabilitation.

Persons/Agencies Consulted: Tim Goodman, Wildlife Biologist, BLM.

References:

Arizona BLM, Gila District 2010 Fire Management Plan.

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U.S. Department of the Interior, Bureau of Land Management. 2003. Arizona Statewide Land Use Plan Amendments for Fire, Fuels, and Air Quality Management Environmental Assessment and Finding of No Significant Impact (FONSI). U.S. Department of the Interior, Bureau of Land Management, Arizona State Office.

U.S. Fish and Wildlife Service. 2004. Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management, September 2004 (02-21-03-F-0210).

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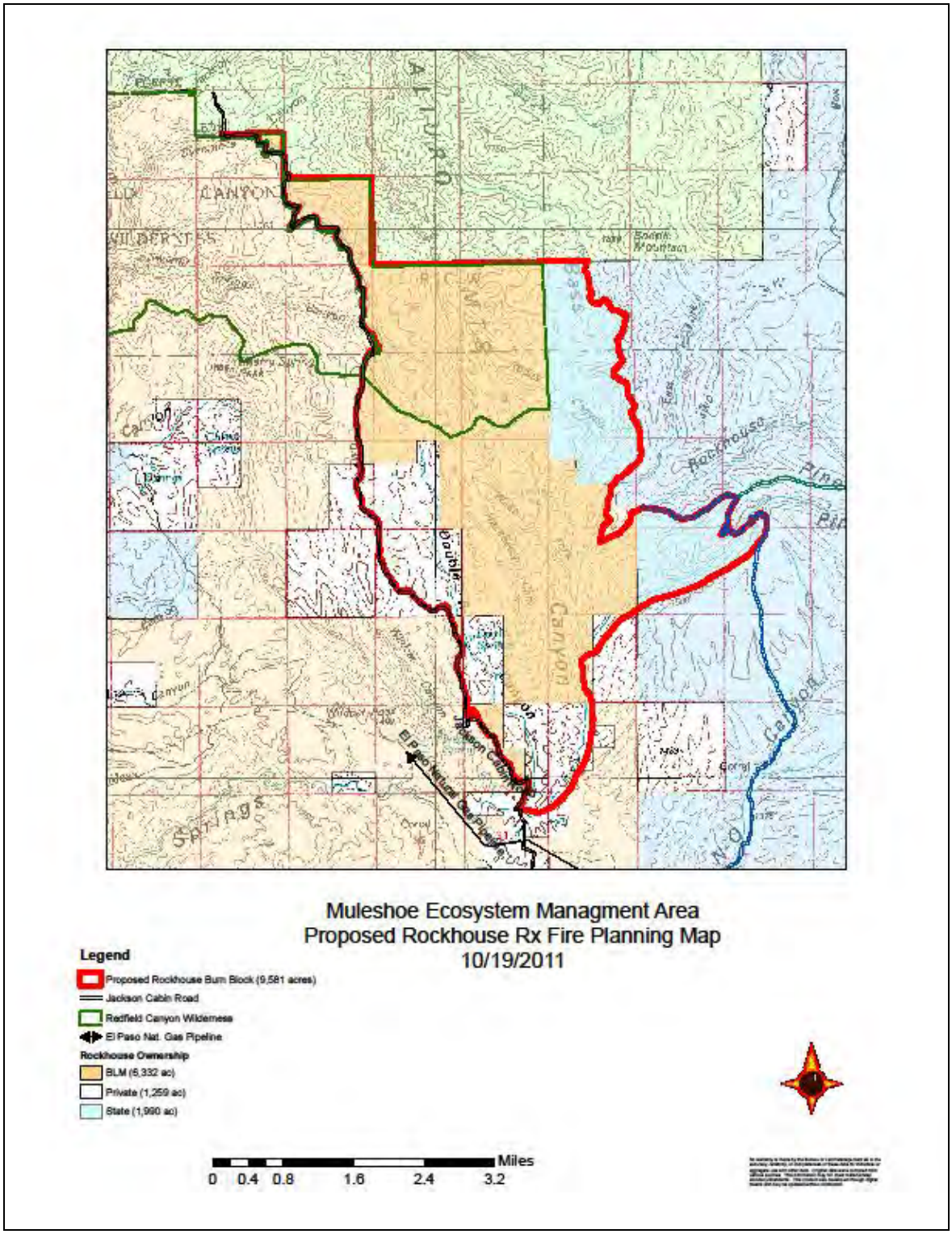
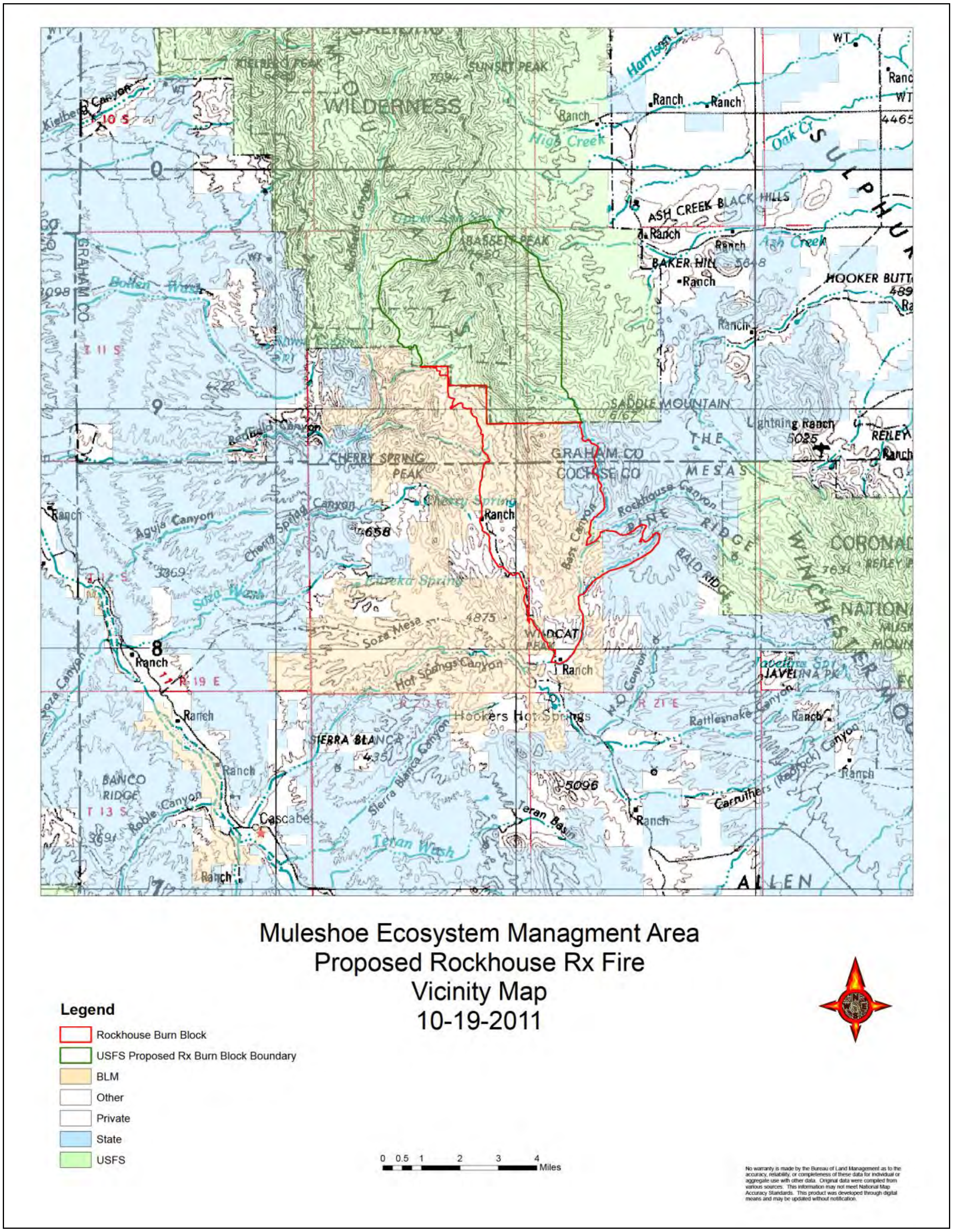
Date: September 2, 2014

Map 1


Muleshoe Ecosystem Managment Area
Proposed Rockhouse Rx Fire Planning Map
10/19/2011
Legend
Proposed Rockhouse Burn Block (9,581 acres)
Jackson Cabin Road
Redfield Canyon Wilderness
El Paso Nat. Gas Pipeline
Rockhouse Ownership
BLM (6,332 ac)
Private (1,259 ac)
State (1,990 ac)
Miles
0 0.4 0.8 1.6 2.4 3.2

Map 2


WILDERNESS
SUNSET PEAK
High Creek
Harrison Cr
Oak Cr
ASH CREEK BLACK HILLS
Ash Creek
BAKER HILL
HOOKER BUTT
BASSETT PEAK
7650
SADDLE MOUNTAIN
6767
Lightning Ranch
5025
THE MESAS
GRAHAM CO
COCHISE CO
CHERRY SPRING PEAK
Cherry Spring
Rockhouse Canyon
Bass Canyon
PINE RIDGE
BALD RIDGE
CORONADO
NATIONAL
WINCHESTER MOUNTAINS
Aguja Canyon
Cherry Spring Canyon
4658
3369
Soza Wash
Eureka Spring
Soza Mesa
4875
WILDCAT PEAK
Hot Springs Canyon
Hookers Hot Springs
Soza Canyon
SIERRA BLANCA
4351
Sierra Blanca Canyon
5096
Teran Basin
Teran Wash
Rattlesnake Canyon
Carruthers (Redrock) Canyon
JAVELINA PK
BANCO RIDGE
Roble Canyon
Cascabel
Bolten Wash
GRAHAM CO
T 11 S
T 12 S
T 13 S
R 19 E
R 20 E
R 21 E
ALLEN
Ranch
Muleshoe Ecosystem Managment Area
Proposed Rockhouse Rx Fire
Vicinity Map
10-19-2011
Legend
Rockhouse Burn Block
USFS Proposed Rx Burn Block Boundary
BLM
Other
Private
State
USFS
0 0.5 1 2 3 4
Miles
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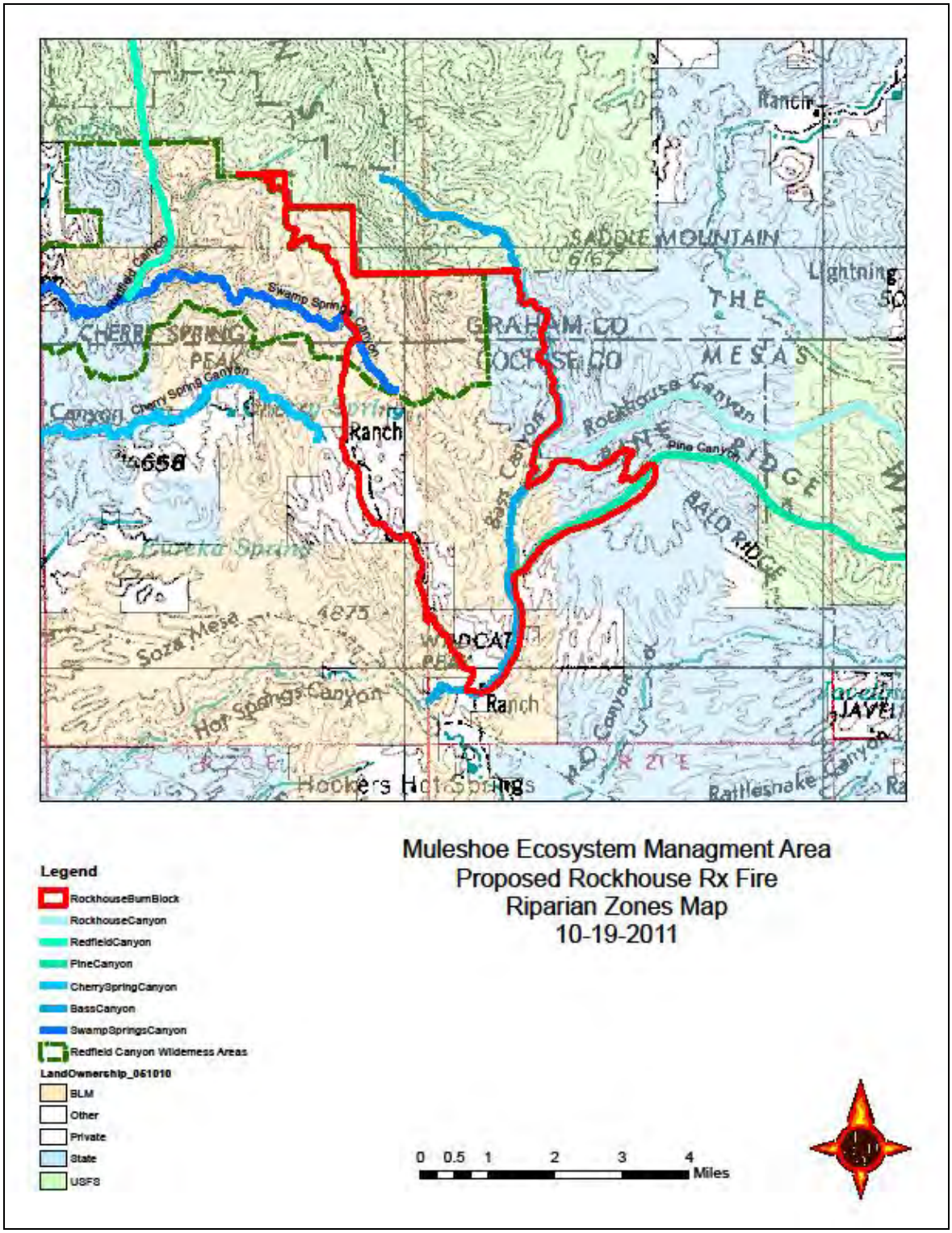
Map 3


SADDLE MOUNTAIN
6167
THE MESAS
GRAHAM CO
COCHISE CO
CHERRY SPRING PEAK
Swamp Springs Canyon
Cherry Spring Canyon
Rockhouse Canyon
Pine Canyon
BALD RIDGE
East Canyon
Eureka Spring
Soza Mesa
4675
Hot Springs Canyon
Hookers Hot Springs
Rattlesnake Canyon
Ranch
Legend
RockhouseBurnBlock
RockhouseCanyon
RedfieldCanyon
PineCanyon
CherrySpringCanyon
BassCanyon
SwampSpringsCanyon
Redfield Canyon Wilderness Areas
LandOwnership_061010
BLM
Other
Private
State
USFS
Muleshoe Ecosystem Managment Area
Proposed Rockhouse Rx Fire
Riparian Zones Map
10-19-2011
0 0.5 1 2 3 4
Miles