# ARIZONA GAME AND FISH DEPARTMENT
# HABITAT PARTNERSHIP COMMITTEE
## HABITAT ENHANCEMENT AND WILDLIFE MANAGEMENT PROPOSAL

| | |
|---|---|
| Game Branch / HPC Project Number: | 11-608 |
| Possible Funding Partners: | |

# PROJECT INFORMATION

**Project Title**: Houston Mesa Restoration

**Region and Game Management Unit**: Region 6, Unit 22

**Local Habitat Partnership Committee (LHPC)**:
- 

**Was the project presented to the LHPC?**
**YES**[x] **NO**[]

**Has this project been submitted in previous years?** **YES**[] **NO**[X]
**If Yes, was it funded?** **YES**[] **NO**[] → **HCP Project #**:

**Project Type**: Thinning and Prescribed Fire

**Brief Project Summary**:
The primary aim of the Houston Mesa Restoration is to decrease tree densities and reintroduce fire to its historic role on the landscape. Through pre-burn thinning treatments and seasonally timed burns, varying seral stages of browse species will be created. Additionally, with a decrease in tree densities, ground cover will increase, providing stability for watersheds, and improved game habitat and rangeland conditions.

The project consists of 12,777 acres, divided into two blocks (Block A: 9.939 ac., Block B: 2,838 ac.) with identified manual and mechanical treatment areas (Map 2). The project is three tiered. First, pre-burn thinning of a targeted two thousand acres, (1000 ac. manual, and/or mechanical thinning if machinery is available). Once complete, an initial black-lining of the project area will secure it for a large-scale, landscape style prescribed fire utilizing an aerial ignition source. A landscape burn will promote the creation of mosaic vegetation conditions and will allow fire to move more naturally through the area.

**Big Game Wildlife Species to Benefit**: Elk (70%), Mule deer (15%), Whitetail deer (15%),

**Implementation Schedule** (Month/Day/Year):

Project Start Date:
05/01/2011

Project End Date:
06/01/2013

**Environmental Compliance**:
NEPA Completed: YES[x] No[] N/A[]
Projected Completion Date: _____

State Historic Preservation Office - Archaeological Clearance:
YES[x] No[] N/A[]
Projected Completion Date: _____

Arizona Game and Fish Department EA Checklist: N/A[]
To be Completed by: _____
Projected Completion Date: _____

# PROJECT FUNDING

| | |
|---|---|
| **Special Big Game License Tag Funds Requested**: | **$ 85,000 (1:3.6)** |
| **Cost Share or Matching Funds**: | **$304,808.84** |
| **Total Project Costs**: | **$ 398,808.84 ( $33.25 per treated acre)** |

# PARTICIPANT INFORMATION

| | | |
|---|---|---|
| **Applicant** (please print): Zachary S Holder | **Address**: 1009 East Hwy 260 Payson, AZ 85541 | **E-mail**: zsholder@fs.fed.us |
| **Telephone**:602-402-9025 | | **Date**: 08/19/2011 |

**AGFD Contact and Phone No.** (If applicant is not AGFD personnel): Henry Apfel (928)-476-6426

**Project has been coordinated with**: Henry Apfel (AGFD), Natalie Robb (AGFD) Ray Tanner (allotment permittee), Tessa Nicolet (Regions Fire Ecologist), and The Eastern Arizona Counties Resource Advisory Committee.

**NEED STATEMENT – PROBLEM ANALYSIS:**

There is a need to restore fire to the ecosystem in order to reduce tree densities and create varying successional stages of browse species. Combined, this will stimulate herbaceous species growth leading to increased ground cover, more stable watershed conditions, and improved habitat and rangeland conditions. Existing conditions within the project area indicate widespread encroachment of woody species (primarily alligator and one-seed juniper) into semi-arid desert grasslands and increased occurrences within the Madrean Encinal Woodlands and Mogollon Chaparral. The lack of fine herbaceous fuels due to the departure of the natural fire return interval and high levels of herbivory has severely restricted the influence of fire on the ecosystem. Both of these processes have increased canopy closure and reduced the amount of herbaceous ground vegetation. As an ecosystem disturbance, fire is necessary to maintain the diversity and productivity of the semi-arid desert grassland and Madrean Encinal Woodland vegetative communities.

**PROJECT OBJECTIVES:**

1. Create and maintain a mosaic of vegetative seral stages which resemble vegetation conditions shaped by naturally occurring free spreading fire as part of ecological function.
2. Enhance elk, mule deer, white-tailed deer, Gambles' quail and javelina habitat by re-establishing seral stages in woodland and shrub communities that depict natural variability from the effects of free-spreading fire; providing increased forage, shelter, and breeding habitat.
3. Ensure adequate and effective ecological recovery of areas treated with prescribed fire and wildland fire managed for multiple resource objectives.
4. Protect natural and cultural values at risk of destruction from uncharacteristic wildfire.
5. Reduce tree density to 3-10 trees/acre in semi-desert grassland communities and Madrean Encinal communities 15-30 trees/acre in Madrean Encinal communities in all species while maintaining clumpiness and feathered, unsymmetrical edges in all thinning units
6. Reduce tree density across project area by at least 30 percent utilizing warm season prescribed fire and thinning treatments to mimic fire's natural role in ecosystem function.
7. Exclude fire from Pinyon pine refugeia swells in project area.
8. Reduce the risk of high intensity wildfire and potential damage to adjacent and surrounding communities.

**PROJECT DESCRIPTION AND STRATEGIES:**

The Houston Mesa Restoration Project aims to reintroduce fire into the Medrean-Encinal ecosystem. Manual thinning and contracted mastication are currently under way. Approximately 1,000 acres has archaeological clearance for skid steer tree shear use, provided the availability of equipment, with an additional 1,200 acres approved for hand thinning and awaiting mechanical approval. Thinning treatments will be accomplished by fall fiscal year (FY) 2012. Block A black-lining will begin in winter FY 2012, followed by the utilization of a helicopter plastic sphere dispenser (PSD) in the late spring and early summer of FY 2013. Block B will be burned in 2014 utilizing agency funding. Vegetation monitoring will occur before and after the initial treatment. When vegetation cover increases by ten percent of post-treatment levels, then secondary treatment will begin.

**PROJECT LOCATION:**

The project area consists of approximately 12,777 acres of the Payson Ranger District. Centrally located on the district, the project is bordered by the town of Payson to the south, the Diamond Rim to the north and east, and the Verde River and Shoofly Canyon to the west. The project area is divided into two blocks (Block A: 9,939 ac., Block B: 2,838 ac.). Legal description of the project area fully or partially includes: T11.5N, R11E, section 31, T11N, R11E, sections 4-10 and 14-22, T11N, R10E, sections 1-3, 10-12, 13-15, and 22-26, and T11.5N, R10E, sections 25, 35, and 36 (SEE MAP 1).

**LAND OWNERSHIP AT PROJECT SITE (Please state specifically if PRIVATE PROPERTY and provide landowner's name):**

Then entire project area lies on the Payson Ranger District of the Tonto National Forest.

**HABITAT DESCRIPTION:**

There are fifteen vegetation classes within the project area, with vegetation associations for each block (see table). Past land management practices have contributed to a change in vegetation composition. Juniper/oak savannas with historically open, scattered structures have shifted to woodlands, with dense, closed canopies, decreasing grassland distribution. These dense woodland structures are more prone to large scale, stand replacement fires not characteristic to the historic fire regime of the area.

| Vegetation Class | Block A | Block B | Total |
|---|---|---|---|
| Apacherian-Chihuahuan Semi-Desert Grassland and Steppe | 13 | 4 | **17** |
| Inter-Mountain Basins Mixed Salt Desert Scrub | 1 | 0 | **1** |
| Inter-Mountain Basins Semi-Desert Grassland | 270 | 146 | **416** |
| Inter-Mountain Basins Semi-Desert Shrub-Steppe | 6 | 1 | **7** |
| Madrean Encinal | 6053 | 2265 | **8318** |
| Madrean Juniper Savanna | 16 | 50 | **96** |
| Madrean Lower Montane Pine-Oak Forest and Woodland | 1678 | 16 | **1,694** |
| Madrean Pinyon-Juniper Woodland | 719 | 63 | **782** |
| Mogollon Chaparral | 466 | 151 | **617** |
| North American Warm Desert Riparian Systems | 4 | 24 | **28** |
| North American Warm Desert Riparian Systems - Stringers | 44 | 75 | **119** |
| Rocky Mountain Gambel Oak-Mixed Montane Shrubland | 0 | 0 | **5** |
| Rocky Mountain Montane Riparian Systems | 527 | 61 | **588** |
| Southern Rocky Mountain Ponderosa Pine Savanna | 2 | 1 | **3** |
| Southern Rocky Mountain Ponderosa Pine Woodland | 86 | 0 | **86** |
| **Grand Total** | **9,938** | **2,857** | **12,777** |

Out of the vegetation classes, the Madrean-Encinal is the most prevalent. Large-scale, landscape prescribed burns are the most effective and efficient form of treatment for such an expansive area.

**ITEMIZED USE OF FUNDS:**

Special Big Game License Tag Funds

| Activity | Acres | Cost per Acre | Amount |
|---|---|---|---|
| Helicopter PSD | 9,000 | $2.70 | $25,000 |
| Ignitions Personnel (line preparation, black lining, implementation) | 9,000 | $5.55 | $50,000 |
| Plastic spheres and burn fuel | 9,000 | $1.11 | $10,000 |
| | | **Total** | **$85,000** |
| | | **Total Cost Per Acre: $9.40** | |

Cost Share or Matching Funds

| Source | Activity | Acres | Cost per Acre | Amount |
|---|---|---|---|---|
| USDA Forest Service | Manual Thinning | 1,000 | $100.00 | $100,000 |
| USDA Forest Service | Completed NEPA Surveys and Layout | 12,777 | $2.92 | $37,308.84 |
| Eastern AZ Counties Resource Advisory Committee | Mastication around communities | 300 | $166.67 | $50,000 |
| Ray Tanner, allotment permittee | Contract thinning project (misc. grants) | 1,000 | 117.50 | 117,500 |
| | | | **Total** | **$304,808.84** |
| | | | **Total Cost per Acre: $23.85** | |

**LIST COOPERATORS AND DESCRIBE POTENTIAL PARTICIPATION:**

Current cooperators are the USDA Forest Service, the Eastern Arizona Counties Resource Advisory Committee, the Arizona Game and Fish Department, Ray Tanner (allotment permittee), the Natural Resource Conservation Service, the Arizona Deer Association (AZ Game and Fish Partnership), the Arizona Elk Society (AZ Game and Fish Partnership), and the Rocky Mountain Elk Foundation.

**PROJECT MONITORING PLAN:**

**Pre-implementation Monitoring:** The newly formed Tonto National Forest Fire/Fuels Module based out of Payson, Arizona will conduct the baseline (in progress) and post treatment monitoring for the Houston Mesa Restoration Project. All monitoring will be conducted in accordance to National and Regional Monitoring Guidelines.

- Canopy Cover – The entire project area will be assessed for existing percent canopy cover utilizing remote sensing techniques
- Fuel Bed (Herbaceous Cover) – Transects will be placed at existing Park-3 Step locations to allow for historical comparison. Ground cover, plant frequency, plant dominance, production, woody species composition, fuel bed depth, and utilization data will be collected
- Photo Points- Photo points will be established throughout the project area to capture the existing condition. All photo points will have a latitude and longitude, azimuth of photo, name of photographer, and a brief description of the photo.

**Implementation Monitoring (First Order Fire Effects)**: During the implementation of prescribed fire operation, no less than two qualified Fire Effects Monitors (FEMO) or Field Observers (FOBS) will be dedicated to collect first order fire effects observations at predetermined temporal and spatial intervals as well as any targets of opportunity that my present themselves. At the conclusion of implantation the FEMO and/or FOBS will produce a detailed summary report of the observed first order fire effects.

- Fire Intensity – An ocular estimate of flame length will be made and recorded at various location in the project area
- Rate of Spread – Areas throughout the project will be set up to capture that rate of which the active fire front passes through the fuel bed. These plots will be established on representative fuels, slops, and aspects.
- Canopy Scorch height- An ocular estimate of flame scorch height to overstory canopy will be made and recorded at various location in the project area
- Fine Dead Fuel Moistures – At requested times and location, fine dead fuel moisture will be collected throughout the burn period and documented.
- Smoke Observation- Written and photographic descriptions of smoke volume, color, column direction and behavior will be collected throughout the burn period.
- Weather Observations- Temperature, relative humidity, dew point, wind velocity, and sky condition, will be collected and recorded at an interval requested by the burn boss.
- Fire Behavior Photo Series- Various locations throughout the project with representative fuels will have photo series taken by a motion sensor camera to record the interactions between the fuel bed, canopy, and burning front. All photo series will have latitude and longitude, azimuth, and a brief narrative. Each frame in the photo series will be time stamped and dated.

**Post Implementation Monitoring (Second Order Fire Effects):** At days 30, 60, 90 the Forest Fire/Fuel Module will assess post treatment fire effects.

- Soil Health- Across varying representations of fire severity, soil stability and hydrophobicity plots will assess if any areas within the project require rehabilitation treatments.
- Photo Points- At pre-establish locations; photos will be collected to identify secondary fire effects, recover rates, and mortality. All photo points will have a latitude and longitude, azimuth of the photo, name of photographer, and a brief description of the photo.

**Long Term Monitoring: (Years One, Three, and Five post treatment)**

- Canopy Cover – The entire project area will be assessed for percent canopy cover utilizing remote sensing techniques. Data can then be analyzed to asses effeteness of treatment and assist with establish the maintenance cycle
- Fuel Bed (Herbaceous Cover) – Transects will be place at previous sample location to collect post treatment ground cover, plant frequency, plant dominance, production, woody species composition, fuel bed depth, and utilization. Data will be analyses with historical and baseline data to validate project objects and allow for adaptive management.

Photo Points- Photo will be taken at established locations throughout the project area to capture treatment effectiveness and document post treatment response. All photo points will have a latitude and longitude, azimuth of the photo, name of photographer, and a brief description of the photo.

**PROJECT MAINTENANCE:**

As this area shifts more to the desired condition, natural disturbances such as wildfire can be more easily utilized to maintain the project area. The inturpluation of on-site post treatment monitoring data will be utilized to indicate the need for maintenance in the project area. If the monitoring data indicates a change greater that ten percent towards pretreatment condition re-entry with prescribed fire or other operate management tools will be incorporated into the next thinning and maintenance burn cycle.

**PROJECT COMPLETION REPORT TO BE FILED BY:**

Project completion report will be filed the Tonto Fuels Crew Foreman, Zachary Holder or his acting, in collaboration with the Payson Ranger District Fire Management Office, the Tonto National Forest Deputy Fire staff, Forest Fire Ecologies, and Forest Fire Biologist. The Fuels Crew Foreman will maintain contact with wildlife managers, Henry Apfel and Natalie Robb through the project to prove informal and formal status updates.

# ARIZONA GAME AND FISH DEPARTMENT
# TREE SHEARING WORKSHEET

**PROJECT TITLE:** Houston Mesa Restoration

**1) What is the estimated acreage of the project?**
12,777 acres

**2) How are the trees going to be cleared? (agra axe, chain saw, push):**
Select areas around communities within the project area will receive tree cleared utilizing a masticator to provide wildfire protection. Identified areas not directly adjacent to the private homes will receive agra-axe and chain saw thinning treatments. (See Map 3)

**3) What is the estimated number of trees per acre?**
Within the project area, there is approximately one hundred thirty to one hundred sixty trees per acre.

**4) Describe trees to be cleared (species, estimated diameter, single stem, multi-stem):**
Species to be thinned primarily consist of multi-stem alligator juniper and one-seed juniper in a size class of $\leq$ 16" DRC. The treatment area is considered a savannah, therefore, not all trees will be cut, and single-stemmed trees will be selected for retention.

**5) Describe terrain (slope, soil type, rocks)**
Slope of the mechanical area ranges from 0-40%. The soil types of the area open for mechanical treatment are Typic Haplustalfs and Typic Ustochrepts. They are characterized as being a gravelly to cobbly laom. These soil are typically at low of moderate risk for erosion or compaction. (See Map 4)

**6) Please list any special land management status for the project site (e.g. Wilderness, National Park, National Monument). If private land, list landowner.**
There is no special land status.

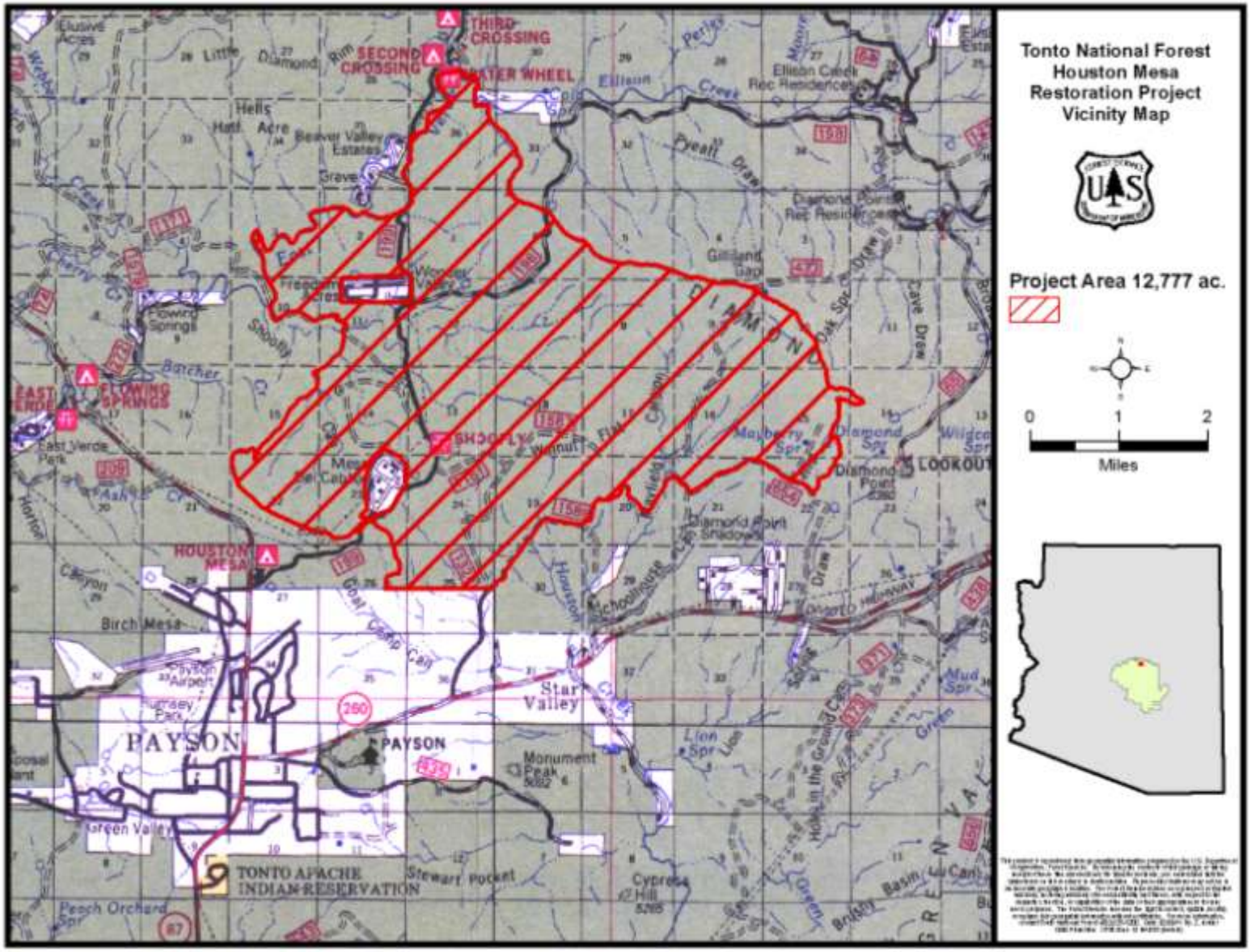
**7) Please provide the following information about access to the proposed site:**
Type of access (mark one): [x]2x4 vehicles []4x4 only []Foot only**
**If foot access only: Distance in miles: Approx. hiking time:

Does access to this site require crossing private or tribal lands? YES[] NO[x]

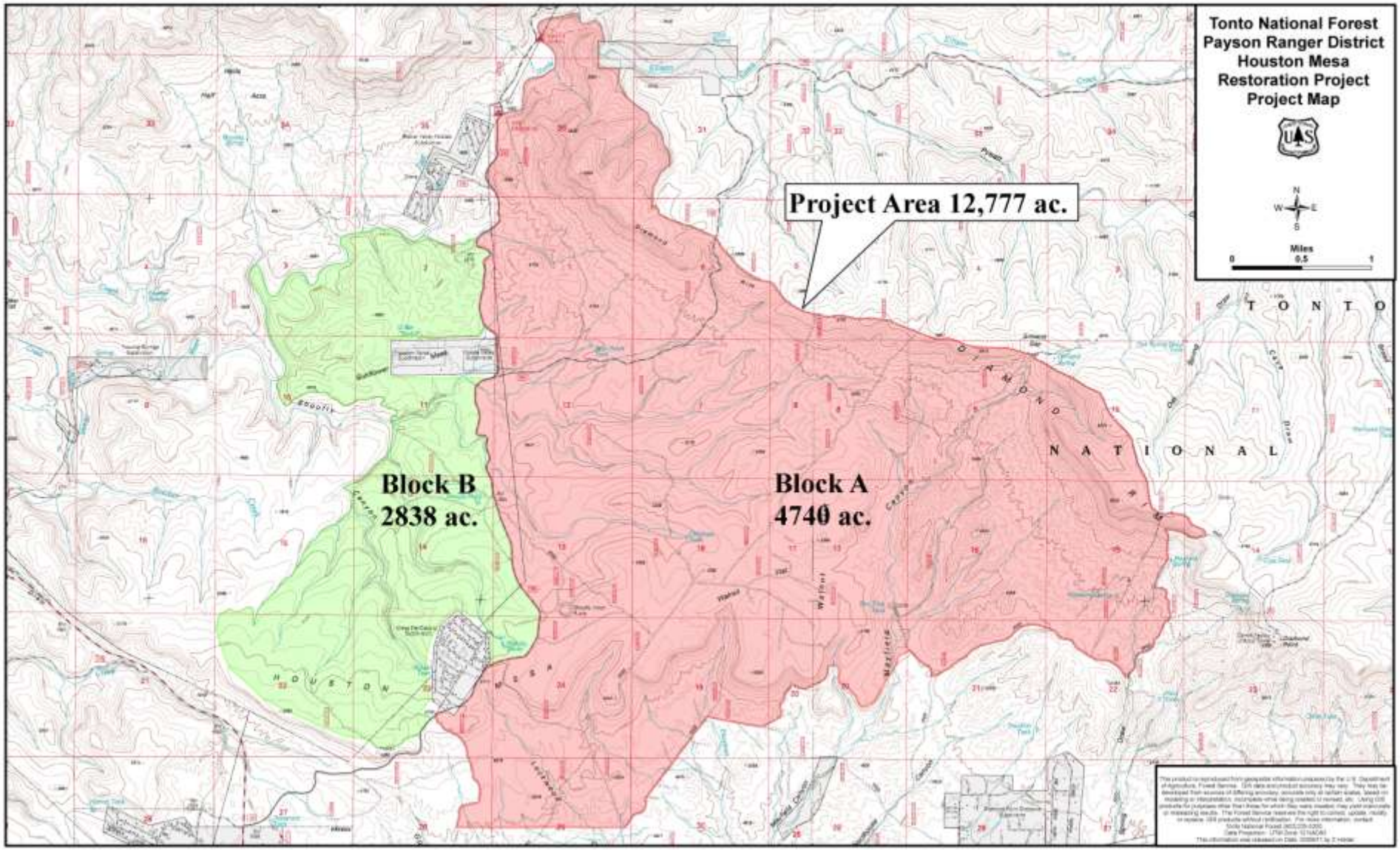
Is the site relatively accessible for tree shearing equipment? YES[x] NO[]

Please describe any restrictions to public access: N/A

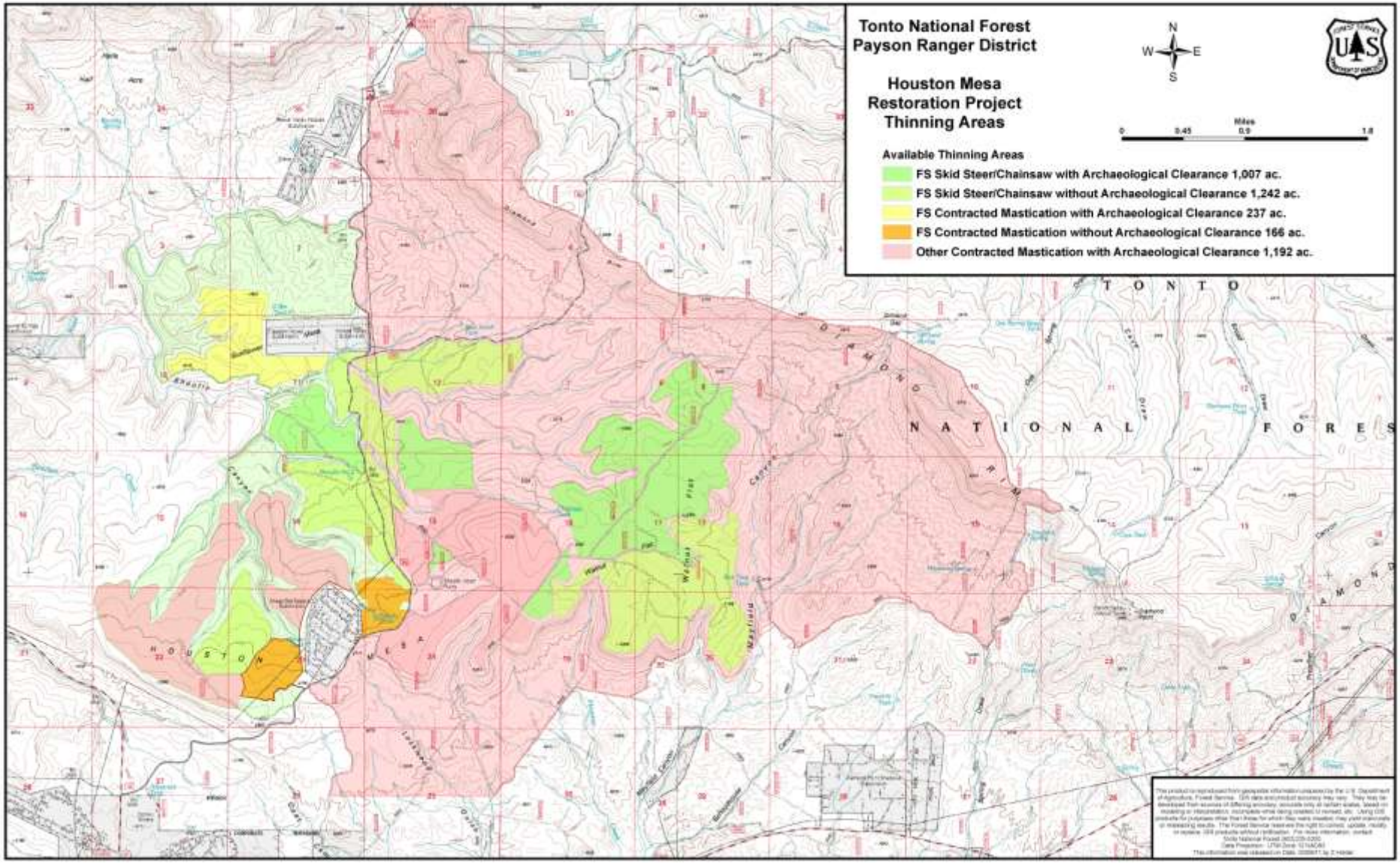
**Map 1**


Tonto National Forest
Houston Mesa
Restoration Project
Vicinity Map
Project Area 12,777 ac.
0
1
2
Miles
PAYSON
TONTO APACHE
INDIAN RESERVATION
HOUSTON
MESA
THIRD
CROSSING
SECOND
CROSSING
WATER WHEEL
DIAMOND
RIM
LOOKOUT
Star
Valley
Birch Mesa
Stewart Pocket
Cypress
Hill
Monument
Peak
Peach Orchard

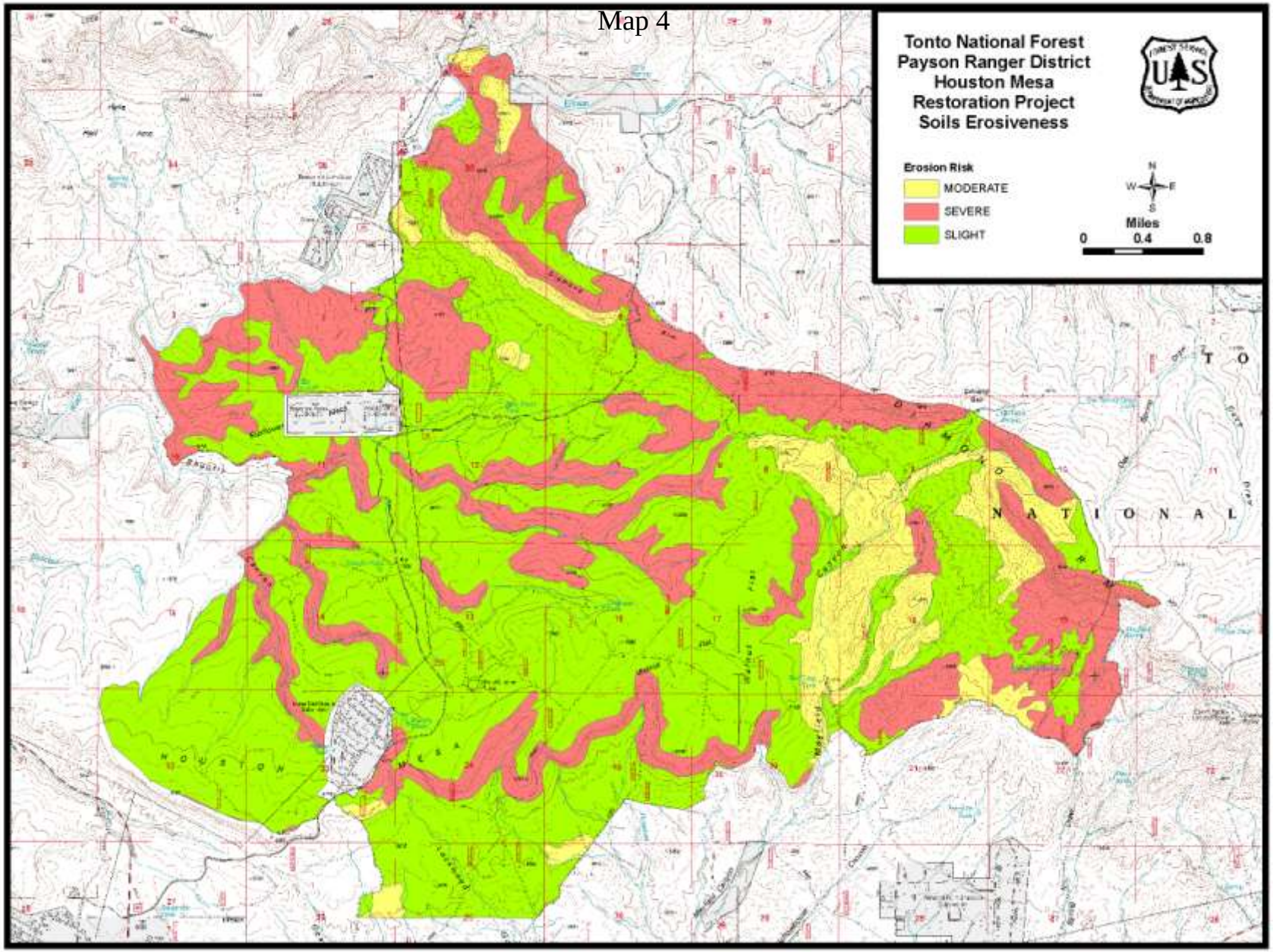
Map 2


Tonto National Forest
Payson Ranger District
Houston Mesa
Restoration Project
Project Map
Project Area 12,777 ac.
Block B
2838 ac.
Block A
4740 ac.
TONTO
NATIONAL
HOUSTON
MESA
Miles
0
0.5
1

Map 3


Tonto National Forest
Payson Ranger District
Houston Mesa
Restoration Project
Thinning Areas
N
W
E
S
Miles
0
0.45
0.9
1.8
Available Thinning Areas
FS Skid Steer/Chainsaw with Archaeological Clearance 1,007 ac.
FS Skid Steer/Chainsaw without Archaeological Clearance 1,242 ac.
FS Contracted Mastication with Archaeological Clearance 237 ac.
FS Contracted Mastication without Archaeological Clearance 166 ac.
Other Contracted Mastication with Archaeological Clearance 1,192 ac.
T O N T O
N A T I O N A L
F O R E S
H O U S T O N
M E S A

Map 4


Tonto National Forest
Payson Ranger District
Houston Mesa
Restoration Project
Soils Erosiveness
Erosion Risk
MODERATE
SEVERE
SLIGHT
N
W
E
S
Miles
0
0.4
0.8
T O
N A T I O N A L